

Jury comprehension and use of forensic science

Author:

Wheate, Rhonda Marie

Publication Date:

2007

DOI:

<https://doi.org/10.26190/unsworks/17988>

License:

<https://creativecommons.org/licenses/by-nc-nd/3.0/au/>

Link to license to see what you are allowed to do with this resource.

Downloaded from <http://hdl.handle.net/1959.4/38644> in <https://unsworks.unsw.edu.au> on 2024-04-27

**JURY COMPREHENSION
AND USE OF
FORENSIC SCIENCE**

RHONDA MARIE WHEATE

BSc (Hons) (*Uni. Western Syd. Mac.*)

LLB (Hons) (*Aust. Nat. Uni.*)

A thesis submitted in fulfilment
of the requirements
for the degree of
Doctor of Philosophy
at University College,
the University of New South Wales,
Australian Defence Force Academy

© June 2007

- Volume 1 of 2 -

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at UNSW or any other educational institution, except where due acknowledgment is made in the thesis. Any contribution made to the research by others, with whom I have worked at UNSW or elsewhere, is explicitly acknowledged in the thesis.

I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

.....

Rhonda Marie Wheate

8 June 2007

ABSTRACT

The ability of jurors and juries to comprehend and utilise scientific evidence in Australian criminal trials has been examined. From mock jury surveys relating to DNA profiling evidence, it was determined that most respondents were able to comprehend some basic and applied statistics, although their ability was in part related to their knowledge of English and their level of education. The point at which mock jurors were prepared to convict an accused solely on the basis of DNA profiling evidence was examined and found to be low compared with the strength of DNA profiling evidence commonly presented in Australian courts. Mock jurors also demonstrated the ability to process evidence that was presented in a Bayesian framework; commencing with prior odds, introducing new information and culminating in posterior odds.

From a survey of Australian forensic scientists, including fraud investigators, it was found that most practitioners' concerns could be addressed by greater pre-trial consultation between experts and legal advocates. Improved knowledge within the legal profession concerning the jargon, principles, procedures, limitations and conclusions to be drawn from different scientific disciplines, prior to presenting this evidence in court, is recommended as the means by which complex evidence can be better adduced from expert witnesses and better presented to juries in criminal trials.

Finally, from interviewing actual jurors in criminal trials in the Australian Capital Territory it was determined that where jurors' expectations of scientific evidence, particularly DNA profiling evidence, are not met, high levels of juror frustration and speculation may culminate in hung juries. The adversarial setting of criminal proceedings was also found to produce an environment in which jurors felt that information that would assist them in reaching a verdict was being deliberately withheld. The ability of the jury to ask questions and the allowed nature of those questions were also examined, with the resultant recommendation that juries be given more explicit information at the commencement of trials to inform them about their rights and obligations when asking questions.

ACKNOWLEDGEMENTS

My supervisors, Dr James Robertson (*Director of Forensic Services, Australian Federal Police*) and Professor Greg Jackson (*School of Physical, Mathematical and Environmental Sciences, UNSW at the Australian Defence Force Academy*), know how pleased I am to have finally accomplished this feat! (*Sed fugit interea, fugit irreparabile tempus...*)*

This work is the product of a great deal of encouragement and support from family, friends and many facets of the legal profession and the forensic science community. I am very grateful for the assistance given by the Hon. Jeffrey Miles (*Chief Justice of the Supreme Court of the ACT (retired)*), the Hon. Terence Higgins (*Chief Justice of the Supreme Court of the ACT*), the Hon. Ken Crispin (*Justice of the Supreme Court of the ACT*), Jill Circosta (*Registrar of the Supreme Court of the ACT*) and the ACT Director of Public Prosecutions. This work would also have been impossible without the support of Greg Reinhardt (*the Australian Institute of Judicial Administration*), Alastair Ross and Anna Davey (*the National Institute of Forensic Science*), Professor Ian Freckelton, Judith Fordham, Mark Nolan and Nicole Steele.

Within the forensic science community, the contribution of each of the state and territory forensic service providers has been invaluable. The willingness of the Directors and their experts to fill in my surveys, discuss their work and share many decades of experience with me is tremendously appreciated. I hope the results of my research prove interesting, informative and beneficial to the forensic science community.

This work was initiated by Dr Eric Magnusson based upon his keen interest in science and the communication of it to lay people. Despite the discontinuance of our association, I hope the results have answered some of his questions about how scientific evidence is currently presented in Australian courts and how things might be changed - if only by a little - so that juries may better understand the many wonderful things that forensic science has to offer our criminal justice system.

Nial, thank you.

*I have learnt that it takes many years to be granted access to jurors
by the Attorney-General, but the wait is worthwhile:
The continued enthusiasm and support I have been given
by those mentioned above, culminating in this thesis,
made the “trials and tribulations” of empirical work well worth it.
(Pun intended).*

* But meanwhile it flees, irretrievable time flees... *Vergil*, Georgics 3.284.

ABBREVIATIONS

ACT	Australian Capital Territory
AFP	Australian Federal Police
AGAL	Australian Government Analytical Laboratories
AIC	Australian Institute of Criminology
AIIA	Australian Institute of Judicial Administration
ALRC	Australian Law Reform Commission
ANZFSS	Australian and New Zealand Forensic Science Society
BioSAG	Biology Specialist Advisory Group
CSI	Crime Scene Investigation (television series)
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DNA	Deoxyribonucleic Acid
mtDNA	Mitochondrial Deoxyribonucleic Acid
NATA	National Association of Testing Authorities
NIFS	National Institute of Forensic Science
NSW	New South Wales, Australia
NT	Northern Territory, Australia
PCR	Polymerase Chain Reaction
QLD	Queensland, Australia
RFLP	Restriction Fragment Length Polymorphism
SA	South Australia
SAFE	Survey of Australian Forensic Experts
SAG	Specialist Advisory Group
SMANZFL	Senior Managers of Australian and New Zealand Forensic Laboratories
SNP	Single Nucleotide Polymorphisms
STR	Short Tandem Repeats
TAFE	Technical And Further Education
TAS	Tasmania, Australia
UK	United Kingdom
UNSW	University of New South Wales
USA	United States of America
VIC	Victoria, Australia
VFSC	Victoria Forensic Science Centre
WA	Western Australia

TABLE OF CONTENTS

INTRODUCTION

1.1 THE SECRET JURY	1
1.2 THE ABLE JURY?	2
1.3 EXPERT EVIDENCE - THE INTERSECTION OF SCIENCE AND LAW	4
1.4 INTERNATIONAL RESEARCH ON JURORS AND SCIENTIFIC EVIDENCE	6
1.5 AIM	10
1.6 METHOD	11
1.7 THESIS	12

PUBLIC UNDERSTANDING OF DNA PROFILING EVIDENCE

2.1 INTRODUCTION	13
2.1.1 The “DNA Fingerprint”	13
2.1.2 Bayes’ Theorem	17
2.1.3 Source Attribution	21
2.1.4 Mock Jury Research	24
2.1.5 Earlier Research	28
2.1.6 The Prosecutor’s Fallacy and Ways of Expressing DNA Profiling Results	28
2.2 OBJECTIVES	30
2.3 METHOD	31
2.3.1 Participants	31
2.3.2 Procedure	32
2.3.3 Analysis	36
2.4 RESULTS and DISCUSSION	39
2.4.1 Sample Size	39

2.4.2 Response Rate	39
2.4.3 School of Origin	39
2.4.4 Summary of Respondents	40
2.4.5 Responses to Substantive Questions	40
2.5 DEMOGRAPHICS OF RESPONDENTS	71
2.6 RESPONDENTS' EVALUATIONS	82
2.7 REFLECTIONS ON THE SURVEY ITSELF	91
2.7.1 Delivery Method	91
2.7.2 Facts Scenario	93
2.7.3 Sample Size and Response Rate	94
2.7.4 Variables	95
2.8 CONCLUSIONS	96
 AUSTRALIAN FORENSIC SCIENTISTS	
3.1 INTRODUCTION	102
3.1.1 Science and the Law	102
3.1.2 How Much Scientific Evidence is "Enough"?	106
3.1.3 Beyond Admissibility: Testing the Evidence	108
3.1.4 Science and the Legal Profession	111
3.1.5 Forensic Science and the Prosecution	112
3.1.6 Forensic Science and the Defence	115
3.1.7 Forensic Science and the Judiciary	120
3.1.8 Forensic Science and the Jury	121
3.1.9 Forensic Scientists as "Expert" "Witnesses"	122
3.2 AIM	125
3.3 METHOD	126
3.3.1 Apparatus	126
3.3.2 SAMPLING	127
3.3.3 PROCEDURE	131

3.4 RESULTS AND DISCUSSION	131
3.4.1 Demographics	131
3.4.2 Forensic Disciplines	132
3.4.3 Court Experience	133
3.4.4 Work for Prosecution and Defence	134
3.4.5 Interactions Between Scientists and Lawyers – Pre-Trial	135
3.4.6 Presenting Evidence in Court	142
3.4.7 Expert Witness, Expert Evidence and Juries	191
3.4.8 Experts and Opposing Experts	198
3.5 CONCLUSIONS	209

REAL JURORS AND EXPERT EVIDENCE

4.1 INTRODUCTION	212
4.2 THE JURY	216
4.3 THE SCIENTIFIC EXPERT	220
4.4 THE EXPERT EVIDENCE	224
4.5 THE COURT PROCESSES	229
4.6 OBJECTIVES	239
4.7 METHOD	240
Monitoring the Trial	244
4.8 THE TRIALS STUDIED	247
4.8.1 Trial One - Facts	247
4.8.2 Trial One - Evidence	247
4.8.3 Trial One – Court Processes	249
4.8.5 Trial One - Deliberations	260
4.8.6 Trial Two - Facts	261
4.8.7 Trial Two - Evidence	262
4.8.8 Trial Two - Deliberations	264

4.9 RESULTS and DISCUSSION	265
4.9.1 The Scientific Evidence – Juror Expectations	268
4.9.2 Acceptance of the DNA Profiling Evidence by Jurors	277
4.9.3 Would the Verdict have been Different without the Scientific Evidence?	282
4.9.4 Presentation of the Case	287
4.9.6 The Expert Witness	298
4.9.7 The Expert Witness – Impartiality	302
4.9.8 The Expert Witness – Helpfulness	305
4.9.9 The Expert – Communication Skills	306
4.9.10 The Expert – Confidence, Appearance and Presentation Devices	310
4.9.11 The Expert Witness - Notes	315
4.9.12 Things to Help Understand the DNA Evidence	317
4.9.12 Court Processes – Questions and the Trial Transcript	326
4.9.13 Other Resources	336
4.9.14 Citing Other References	340
4.9.15 Understanding the DNA Profiling Evidence	344
4.9.16 DNA Evidence in Context	349
4.9.17 Juror Confidence	353
4.9.18 Deliberations	356
4.9.19 Making Decisions and Taking Risks	364
4.9.20 Jury Duty as an Experience	371
4.9.21 Juror Demographics	377
4.9.22 Reflections of Survey Methodology	380
4.10 CONCLUSIONS	381

CONCLUSIONS AND RECOMMENDATIONS 388

REFERENCE LIST 392

APPENDICES 398

CHAPTER 1

INTRODUCTION

“Good communication with the jury is a field in which anecdote, self-assurance and self-delusion abound, within the ranks of the legal profession and the judiciary.”¹

1.1 The Secret Jury

Trial by jury is a feature of the Australian legal system which never fails to draw an opinion or anecdote from media commentators, members of the general public,² and the legal profession.³ This level of interest perhaps belies the fact that very little is actually known about what happens between jurors once they are selected and a trial is set in motion. The legislative veil of secrecy around juries has been pierced only rarely in Australia; most notably in the general study of jury management in NSW by Findlay in 1994⁴ and more recently in a study of the effects of prejudicial pre-trial publicity on jurors, by Chesterman.⁵ Other researchers have been confined to studying mock juries, due to various legislative barriers in all Australian states and territories which provide that:⁶

A person shall not solicit information from, or harass, a juror or former juror for the purpose of obtaining information on the deliberations of a jury. (Maximum penalty on indictment: imprisonment for 7 years.)

The deliberations of a jury include statements made, opinions expressed, arguments advanced or votes cast by members of the jury in the course of their deliberations

and:

A person shall not, except in accordance with this Act, wilfully publish any material, broadcast any matter or otherwise disclose any information which

¹ Justice Eames, G. (2003, 22 January). *Towards Better Direction - Better Communication with Jurors*. Paper presented at the Supreme and Federal Court Judges Conference, Adelaide.

² Bell, A. (1997). Twelve Men and True! Bah Humbug. *New Law Journal*, December 19, 1857.

³ Brown, D., & Neal, D. (1988). Show Trials: The Media and the Gang of Twelve. In M. Findlay & P. Duff (Eds.), *The Jury Under Attack* (pp. 243). Sydney: Butterworths.

⁴ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

⁵ Chesterman, M. (2001). *Managing Prejudicial Publicity*. Sydney: Law and Justice Foundation of New South Wales.

⁶ For example, *Jury Act 1977* (NSW) ss 68A(1) and (2). The comparable legislation in other Australian jurisdictions is: *Juries Act 1967* (ACT), *Juries Act* (NT), *Jury Act 1995* (QLD), *Juries Act 1927* (SA), *Juries Act 2003* (TAS), *Juries Act 2000* (VIC) and *Juries Act 1957* (WA).

is likely to lead to the identification of a juror or former juror in a particular trial or inquest.⁷

This ban on questioning and identifying jurors can be overcome for the purpose of research into matters relating to juries or jury service, however this requires permission from the relevant Attorney-General⁸ and usually the judge or coroner to specifically tell the jurors that they are allowed to participate.⁹ In most other circumstances, jurors and former jurors are prohibited from discussing (or even offering to discuss) jury deliberations with other people,¹⁰ particularly if the juror has reason to believe the information will be published.¹¹

1.2 The Able Jury?

Whilst these measures are necessary to protect jurors, and the right of the accused to a fair trial, they do make it difficult to assess how well the jury system is functioning. In particular, it is difficult to determine how well twelve untrained,¹² underpaid¹³ and usually inconvenienced strangers comprehend and utilise the evidence they hear in court, especially in cases where the evidence is provided by highly trained experts such as forensic scientists. Specifically where the evidence is very technical, extremely long, or challenged by expert witnesses called by the opposition, concerns have long been held about the ability of lay jurors to comprehend and make reasonable decisions based on that evidence.¹⁴

For under the system of law inherited from the United Kingdom,¹⁵ Australian jurors are representatives of the wider community; they are brought into the trial process to ensure “that the law will not be applied in a way that affronts the conscience of the common man”,¹⁶ they are not chosen for their knowledge, views or skills.¹⁷ Jurors are randomly

⁷ *Jury Act 1977 (NSW)* s 68(1).

⁸ *Jury Act 1977 (NSW)* s 68(5) (identifying jurors) and 68A(3) (questioning jurors).

⁹ *Jury Act 1977 (NSW)* s 68B(1).

¹⁰ *Jury Act 1977 (NSW)* s 68B.

¹¹ *Juries Act 2000 (VIC)* s 78(2).

¹² See, for example: Victorian Law Reform Committee. (1996). *Jury Service in Victoria*. Melbourne: Victorian Law Reform Committee at 1.32, 1.33 and Recommendations 73,74.

¹³ See, for example: *Ibid.* at 1.30 and Recommendations 76,77,78.

¹⁴ Justice Crispin, K. (1992). Coping with Complexity. *Criminology Australia*, 4(2), 11.

¹⁵ Landsman, S. (1993). The History & Objectives of the Civil Jury System. In R. Litan (Ed.), *Verdict: Assessing the Civil Jury System* (Vol. 1, pp. 22). Washington: The Brookings Institution; NSW Law Reform Commission. (2005). *Majority Verdicts* (111). Sydney: NSW Law Reform Commission.

¹⁶ Devlin, P. (1981). *The Judge*. Oxford: Oxford University Press at 127.

selected from the appropriate state or territory electoral rolls, and must serve unless they are ineligible, disqualified or challenged due to occupation, personal association, criminal record or any other of the limited reasons provided for in the various Acts.¹⁸

Whilst potential jurors may be excluded if their ability to speak or understand the English language is insufficient,¹⁹ this is the only basis for exclusion (aside from physical or mental disability) that has any direct bearing on a juror's ability to comprehend evidence. Furthermore, research suggests that even potential jurors who have an identifiable disability (lingual, intellectual or otherwise) may nevertheless find themselves on a jury panel and deliberating on a verdict, despite their inability to properly participate or to grasp the evidence.²⁰

Nevertheless, judicial support for the jury system is not diminished and has been eloquently expressed:

“The status in our system of criminal justice of a jury at trial is of absolutely fundamental constitutional legitimacy and importance. The empanelling of a lay jury, chosen at random from the general body of citizens, to be the sole tribunal of fact is not some irksome survival from a feudal past, whether real or imagined. The contribution of lay juries to our system of criminal justice is the lynch-pin of that system.”²¹

It is evident that as science and technology become more specialised and thus further removed from the domain of the ordinary juror, jury performance needs to be examined to determine how expert evidence in trials is being utilised. In addition, modern approaches to teaching and communication need to be examined in the context of communicating complex evidence to lay people, so that recommendations can be made

¹⁷ Compare this with the vetting which occurs in other jurisdictions such as the USA, where potential jurors are closely questioned prior to being chosen to serve on a jury. See, for example; Judicial Council of California. (2002). *A Guide to California Jury Service*. Judicial Council of California. Available: <http://www.courtinfo.ca.gov/jury/index.htm> [2002, June 20] Step 1: Selection of a Jury.

¹⁸ *Jury Exemption Act* 1965 (Cth) s 4; *Jury Act* 1977 (NSW) ss 5-7; *Juries Act* 2000 (VIC) ss 5, 8, 9; *Jury Act* 1995 (QLD) s 4; *Juries Act* 1927 (SA) ss 11, 12, 13; *Jury Act* 1899 (TAS) ss 4, 6, 7, 7A; *Juries Act* 1957 (WA) ss 4, 5; *Juries Act* 1967 (ACT) ss 9, 10, 11; *Juries Act* (NT) ss 9, 10, 11.

¹⁹ *Jury Act* 1977 (NSW) Sch 1, Sch 2; *Juries Act* 2000 (VIC) Sch 2 item (3); *Jury Act* 1995 (QLD) ss 4(3)(j), (k); *Juries Act* 1927 (SA) s 13; *Jury Act* 1899 (TAS) s 7; *Juries Act* 1957 (WA) s 5; *Juries Act* 1967 (ACT) ss 10, 11; *Juries Act* (NT) ss 10, 11.

²⁰ Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission Vol 1 paras 220-221; Vol 2 paras 3.18, 3.19.

²¹ *R v Lisoff* [1999] NSWCCA 364 per Spigelman CJ, Newman and Sully JJ at [49].

about assisting jurors in comprehending and using expert evidence in an appropriate manner when deliberating and deciding upon a verdict.²²

1.3 Expert Evidence - The Intersection of Science and Law

In Australia, science and law intersect in the domain of “forensic science”, which is science “having to do with courts of law or legal proceedings”.²³ In criminal trials,²⁴ scientific witnesses can be called upon by the prosecution, the defence, or even the court itself²⁵ and may write reports and appear in court as witnesses providing information on which they have specialised knowledge.²⁶

Their role goes beyond that of most other witnesses. Whereas ordinary witnesses are usually allowed to give only a plain account of their actual perceptions, free of any personal interpretations, beliefs or estimations, expert witnesses are allowed to give their *opinions*.²⁷ Thus experts are afforded a special status under the various *Evidence Acts* within Australia.²⁸ Although the evidence they provide may be on subjects to which many jurors have been exposed,²⁹ expert witnesses are called specifically because additional information requiring “specialised knowledge” is required (for instance, how does one determine whether or not two fingerprints “match”?).³⁰

²² Edmond, G., & Mercer, D. (1997). Scientific Literacy & the Jury: Reconsidering Jury "Competence". *Public Understanding of Science*, 6, 329.

²³ From the Latin *forensis*: “of the forum”.

²⁴ The issue of expert witnesses and jury comprehension in civil matters is a large and contentious one. See for example; Lord Woolf. (1996). *Access to Justice - Final Report*. London: HMSO; Cecil, J., Hans, V., & Wiggins, E. (1991). Citizen Comprehension of Difficult Issues: Lessons from Civil Jury Trials. *American University Law Review*, 40, 727. The research in this thesis examines juries and expert witnesses in the context of criminal proceedings only.

²⁵ The issue of court-appointed experts was not canvassed in this thesis, because preliminary investigations revealed that most jurors, potential jurors and practicing forensic scientists were unfamiliar with the concept or debate surrounding it. Also, there was no scope to communicate the different proposed models for court-appointed experts within the framework of administering the surveys in this research.

²⁶ *Evidence Act 1995 (Cth)* s 79: “If a person has specialised knowledge based on the person's training, study or experience, the opinion rule does not apply to evidence of an opinion of that person that is wholly or substantially based on that knowledge.” Legislation in some States mirrors this provision (*Evidence Act 1995 (NSW)* s 79; *Evidence Act 2001 (TAS)*) whilst the territories and remaining states rely on the Commonwealth Act.

²⁷ *Evidence Act 1995 (Cth)* s 76: “Evidence of an opinion is not admissible to prove the existence of a fact about the existence of which the opinion was expressed.” This rule is subject to exceptions in ss 77, 78, 79, 81 92(3), 110 and 111.

²⁸ *Evidence Act 1995 (Cth)* s 79.

²⁹ Not least by the media and entertainment industries; for example AAP. (2006, June 14). Fresh Clues in Pensioner Death. *News.com.au* “...Forensic tests indicated his killer was a woman, who injured her finger during the murder and left a large amount of blood around the house.”

³⁰ *Evidence Act 1995 (Cth)* s 79.

Unfortunately, when science is brought into a courtroom, it may be the most difficult and contentious aspects of it that are discussed.³¹ Furthermore, the discussion is led by legal counsel who are very often unfamiliar with scientific principles or the details of the scientific evidence they are required to lead or cross-examine.³²

So not only is the subject matter often inherently difficult,³³ but it is presented in an adversarial forum by legally, but not scientifically trained, counsel, to be adjudged by ordinary people who may have no scientific training or predetermined level of skill - that is, the twelve citizens of the jury.³⁴ Thus it is not inconceivable that jurors might experience difficulty when required to make important decisions based on scientific evidence. Nevertheless, they are not allowed to give reasons for their decisions³⁵ and are legally prevented from being able to discuss any difficulties during or after the trial.

This lacuna in what is known about how juries cope with scientific evidence is exacerbated by the rate of technological change and advancement in science and thus forensic science.³⁶ The advent of DNA profiling evidence, for example, was not matched by any system of training for lawyers, judges or jurors in how to understand or make decisions based on this conceptually complex forefront of molecular biology and statistics. In contrast, forensic biologists and laboratory technicians and assistants have undertaken years of formal education and on-the-job training in order to master their discipline, establish good laboratory practices and become accredited as experts in their field.³⁷ On-going training is provided by individual laboratories, and national

³¹ Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131.

³² Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79.

³³ See Rendle, D. F. (2005). Advances in Chemistry Applied to Forensic Science. *Chemical Society Reviews*, 34, 1021 for a summary of the chemistry involved in several fundamental forensic disciplines.

³⁴ Baldwin, J., & McConville, M. (1979). *The Jury*. Oxford: Oxford University Press.

³⁵ Some literature suggests that requiring decision-makers to provide reasons for their decisions is a good way of minimizing bias and errors and maximizing accountability. Within criminal trials, jury deliberations are thought to fulfill this role, (Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 30) without the need for juries to “publish” their reasons (Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? www.criminal-courts-review.org.uk, 1 at 38).

³⁶ Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy at 1.

³⁷ International collaboration to improve the reliability of the presentation of DNA data in trials has also been conducted. Taroni, F., & Aitken, C. G. (2000). DNA Evidence, Probabilistic Evaluation and Collaborative Tests. *Forensic Science International*, 108, 121.

organisations such as the National Institute of Forensic Science (NIFS) co-ordinate regular training courses for expert witnesses.³⁸ In addition, most Australian government laboratories subscribe to professional Codes of Ethics,³⁹ and have accreditation from the National Association of Testing Authorities (NATA),⁴⁰ which involves on-going training, testing and inspections,⁴¹ and assessment which evaluates staffing, existing training and supervision, scientific methods, quality control, proficiency testing, equipment, recording and reporting of test results; and the environment in which the laboratory operates.⁴²

1.4 International Research on Jurors and Scientific Evidence

Outside Australia, considerable work has been done to determine how well jurors cope within the civil and criminal legal arenas. The most recent literature includes a broad-ranging study by Young in 1999 into the criminal trial system in New Zealand⁴³, the Auld Review of the Criminal Courts of England and Wales⁴⁴ and Viscount Runciman's 1993 Royal Commission on Criminal Justice in the United Kingdom.⁴⁵

The Young Report⁴⁶ is a particularly valuable resource, as it is comprised of a significant body of information and recommendations based on empirical data collected from real jurors in criminal cases. In relation to expert evidence, Young noted that presentation of expert evidence in the New Zealand trials was hampered by poor presentation, featuring legal jargon⁴⁷ and few visual aids.⁴⁸ Nevertheless, it was

³⁸ For example: *Fire Accelerant Recovery and Identification Workshop* 25-7 March 2002 Sydney; *Firearms Critical Issues Workshop* 10-2 April 2002 Hobart; *Young / New Practitioners Workshop* 11-2 May 2002 Canberra; *Evidence Location and Recovery Workshop* 18-9 May 2002 Sydney; *Botanical Identification of Cannabis* 18-19 May 2002 Canberra; *Advanced Ridgeology Comparison Techniques* 20-5 May 2002 Canberra; *Forensic Comparison of Architectural Paint Workshop* 26-30 May 2003 Melbourne; *Post Blast Explosives Residue Analysis* 21-5 July 2003 Melbourne.

³⁹ For example, the Australian and New Zealand Forensic Science Society Code of Ethics, at http://www.anzfss.org.au/code_of_ethics.htm.

⁴⁰ Petterd, C., & Royds, D. (1999). "Independent" Forensic Practitioners - Fact of Fiction? *Australian Journal of Forensic Sciences*, 31, 45 at 46.

⁴¹ A list of Australian forensic providers currently accredited by NATA is available on the NATA website <http://www.nata.asn.au>.

⁴² <http://www.nata.asn.au/go/accreditation/how-to-become-accredited> accessed June 2006.

⁴³ Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission.

⁴⁴ The Right Honourable Lord Justice Auld. (2001). *Review of the Criminal Courts of England and Wales* at <http://www.criminal-courts-review.org.uk/auldconts.htm>.

⁴⁵ Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO.

⁴⁶ Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission.

⁴⁷ Ibid. Vol 1 paras 108, 109; Vol 2 paras 3.14, 3.15.

⁴⁸ Ibid. Vol 1 paras 89-91, 106; Vol 2 para 3.15.

concluded that individual juror's difficulties in comprehending expert evidence were overcome with the help of more able jurors,⁴⁹ even though many jurors expressed confusion due to the piecemeal and disordered manner in which evidence was led and questions were asked of witnesses,⁵⁰ or because of their own inability to comprehend the evidence.⁵¹

Of particular relevance to the research in this thesis was Young's discussion of questions asked (or not asked) by jurors, during trials and deliberations.⁵² In earlier Australian research on this subject, it was noted by a judge that:⁵³

“This is a topic upon which judges have strong differences of opinion. There are many who say that nothing should be said to a jury which may tend to encourage it to ask questions. My experience has been that juries do want to ask questions about the evidence during the course of a particular witness' testimony and that, more often than not, those questions are singularly pertinent.”

Whether jurors are willing and able to ask pertinent questions about scientific evidence, and whether their questions would aid their comprehension and use of expert evidence, are areas which have not been fully explored in Australian criminal trials.

As part of a broad review of the criminal justice system of England and Wales, the Auld Review⁵⁴ examined the role of expert witnesses, the performance and preparation of advocates and the presentation of expert evidence to juries in criminal trials. Lord Justice Auld concluded that changes could and should be made to improve the presentation and comprehension of expert evidence in English and Welsh criminal trials, and made recommendations including that:⁵⁵

- Each juror should be provided at the start of the trial with a copy of the charge or charges;

⁴⁹ Ibid. Vol 1 para 106.

⁵⁰ Ibid. Vol 1 paras 80, 81, 82.

⁵¹ Ibid. Vol 2 paras 3.18, 3.19.

⁵² Ibid. Vol 1 paras 98-104, Vol 2 paras 4.11-4.21, 4.24-4.25.

⁵³ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration 132.

⁵⁴ The Right Honourable Lord Justice Auld. (2001). *Review of the Criminal Courts of England and Wales*

⁵⁵ Ibid. Chapter 11, The Trial: Procedures and Evidence at 14.

- The judge at the start of the trial should address the jury, introducing them generally to their task as jurors and giving them an objective outline of the case and the questions they are there to decide;
- The judge should supplement his opening address with, and provide a copy to each juror of, a written case and issues summary prepared by the parties' advocates and approved by him;
- The judge, in the course of his introductory address, and the case and issues summary, should identify:
 - the nature of the charges;
 - the evidence agreed;
 - the matters of fact in issue; and
 - with minimal reference to the law, a list of likely questions for their decision; and

the case and issues summary should be amended and fresh copies provided to the judge and jury.

In reference to expert evidence and disputes between experts which may unnecessarily confuse jurors, it was recommended, *inter alia*, that:⁵⁶

- The prosecution and defence should normally arrange for their experts to discuss and jointly to identify at the earliest possible stage before the trial those issues on which they agree and those on which they do not agree, and to prepare a joint statement for use in evidence indicating the measure of their agreement and a summary of the reasons for their disagreement; and
- Failing such arrangement, the court should have power to direct such a discussion and identification of issues and preparation of a joint statement for use in evidence and to make any consequential directions as may be appropriate in each case.

Lord Woolf's 1996 report on the civil justice system in England and Wales⁵⁷ focussed on "access to justice" in terms of reducing costs, delay and complexity, however, the results pertaining to expert evidence provide some interesting insights which are also relevant for criminal trials. In particular, Lord Woolf's findings and recommendations

⁵⁶ Ibid. Chapter 11, The Trial: Procedures and Evidence at 129-151.

⁵⁷ Lord Woolf. (1996). *Access to Justice - Final Report*. London: HMSO.

about the necessity for impartial experts⁵⁸ (even within an adversarial legal system) were echoed in the results of the work reported in this thesis. Similarly, Lord Woolf's call for greater use of pre-trial time to narrow down and resolve expert evidence issues,⁵⁹ is a suggestion which could yield valuable results in the criminal trial process as well as the civil.

Prior to Lord Woolf's Report, a Royal Commission on Criminal Justice was established in the United Kingdom,⁶⁰ largely in response to a series of serious miscarriages of justice including the *Birmingham Six* case.⁶¹ The Commission, chaired by Viscount Runciman of Doxford, examined the criminal justice system and the final report covered issues including: the competence and objectivity of expert witnesses; the suitability of calling expert evidence; simplification of the manner of presentation of expert evidence; inequality between prosecution and defence experts; delays in obtaining expert evidence; and the effect of case management practises on forensic practitioners. The results of the Commission's investigations led to the establishment of a Criminal Cases Review Commission to ensure that where criminal matters require further investigation, a body independent of the prosecution and defence was available to consider matters and so avoid further miscarriages of justice.

Work in the USA on jury issues has also been extensive,⁶² however, significant differences between American and Australian jury selection and trial processes have tended to limit the application of the American results. In particular, American procedures for selecting jurors by extensive use of questionnaires, verbal interviews and

⁵⁸ Ibid. paras 25-37.

⁵⁹ Ibid. paras 42, 43.

⁶⁰ 14 March 1991.

⁶¹ In 1975 the "Birmingham Six" were wrongly convicted of planting two bombs in Birmingham, England which killed 21 people and injured 182 others. After two unsuccessful appeals the six men were eventually released from prison in 1991, when it was concluded that police fabrications and faulty and suppressed scientific evidence had led to their convictions.

⁶² Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1; ABA Section of Litigation. (1989). *Jury Comprehension in Complex Cases: Report of the Special Committee of the ABA Section of Litigation*. Chicago: American Bar Association; Shuman, D., Champagne, A., & Whitaker, E. (1994). An Empirical Examination of the Use of Expert Witnesses in the Courts - Part II: A Three City Study. *Jurimetrics*, 34, 193; Champagne, A., Shuman, D., & Whitaker, E. (1991). An Empirical Examination of the Use of Expert Witnesses in American Courts. *Jurimetrics*, 31, 375; Rosenthal, P. (1983). Nature of Jury Response to the Expert Witness. *Journal of Forensic Sciences*, 28(2), 528; Shuman, D., Champagne, A., & Whitaker, E. (1996). Assessing the Believability of Expert Witnesses: Science in the Jury Box. *Jurimetrics*, 37, 23; Edmond, G., & Mercer, D. (1997). Scientific Literacy & the Jury: Reconsidering Jury "Competence". *Public Understanding of Science*, 6, 329.

the collection and analysis of detailed information on prospective jurors is markedly different from the Australian procedure, whereby the court (including legal counsel) knows only the name and occupation of any prospective juror. Furthermore, the methods used for collecting, analysing and presenting DNA profiling evidence in Australian courts is dissimilar to the wide variety of practices evident in the USA. Thus while American research is drawn upon in this thesis, it is not relied upon for close comparative purposes with the Australian scene.

1.5 Aim

This thesis attempts to examine how well jurors comprehend scientific evidence in criminal trials and how juries use that evidence to arrive at a verdict. Particular emphasis is given to the area of DNA profiling evidence, as it has emerged as a frequently used and valuable tool for modern forensic science, both by linking the accused to the crime scene and by casting doubt on the guilt of persons who may already have been convicted.⁶³ DNA profiling evidence is also of particular interest because the statistical nature of the results may be unsuitable for consideration by lay jurors. This research investigates whether concerns are justified about jurors misunderstanding DNA profiling statistics and/or unwittingly believing that DNA profiling evidence conclusively identifies individuals.

For the first time in Australia, this research also systematically draws upon the views of forensic scientists who have experience in giving evidence before juries. Their collective insight enables an assessment of how the legal profession is perceived to utilise expert evidence (and experts), and allows a direct comparison to be made between how forensic scientists perceive the use of their evidence in court and how jurors actually react to that evidence. This research also affords the opportunity to improve the communication between forensic scientists and legal practitioners, by making recommendations for the presentation of expert evidence that will also benefit the jury.

⁶³ Connors, E., Lundregan, T., Miller, N., & McEwen, T. (1996). *Convicted by Juries Exonerated by Science: Case Studies in the use of DNA Evidence to Establish Innocence After Trial*. Virginia: US Department of Justice Office of Justice Programs and National Institute of Justice.

1.6 Method

An initial study was conducted to determine what the Australian community understands about DNA profiling evidence. This mock jury research examined several aspects of DNA profiling evidence, including the effect of statistical results on jury comprehension, the ability of respondents to comprehend and compare different DNA profile results and the relationship between DNA profiling results of different weights and mock jurors' willingness to convict. Chapter Two gives a more detailed discussion of this research.

Chapter Three reports on a nation-wide survey of forensic scientists, designed to determine how a broad range of scientific disciplines are actually utilised in court. In the states and territories of Australia, criminal matters can be heard at first instance in Magistrates Courts, District⁶⁴ / County⁶⁵ Courts⁶⁶, and Supreme courts, depending on the nature of the offence and whether the accused pleads guilty or not guilty. This survey focussed on the experiences of forensic scientists who have given evidence in the District, County and Supreme courts, because only in these courts can the evidence be heard by a jury.

This thesis concludes with a pilot study examining what real jurors did with scientific (DNA profiling) evidence in the deliberations rooms of two jury trials. Twenty-one jurors completed written and oral questionnaires after deliberations, answering a broad range of questions about the expert evidence they had heard and various related aspects of the trial process. The preliminary results reveal a fruitful area for further research and expose important information on how jurors' expectations, knowledge and reactions to the circumstances of a legal trial dramatically affect the way in which scientific experts and scientific evidence are perceived and utilised. This pilot study is the precursor to a larger, Australia-wide investigation, which it is anticipated will proceed in the future. Chapter Four details the outcome of the initial research.

Chapter Five contains recommendations and conclusions relating to all aspects of the substantive chapters.

⁶⁴ In New South Wales, Queensland, South Australia and Western Australia.

⁶⁵ In Victoria only.

⁶⁶ Neither the Australian Capital Territory or Tasmania have a court in this level of the hierarchy.

1.7 Thesis

Science is an inherently difficult branch of learning, with many complex concepts and subtle, yet critical, distinctions. Similarly, the law is a detailed and multifarious combination of precepts, traditions and knowledge. When these fields intersect and require twelve ordinary citizens to assimilate the information and come to their own conclusions, questions inevitably arise as to the efficacy of the situation.

In order to determine whether changes need to be made in respect of juries and scientific evidence, it is necessary to examine the existing situation. This thesis appraises the use of scientific evidence in general, and DNA profiling evidence in particular, so as to determine whether juries need assistance in comprehending and using scientific evidence, and trial procedures could be adapted to improve the interaction of jurors, scientists and legal practitioners. The stated objectives of any changes include maximising the proper use of scientific evidence by jurors, by improving the liaison between expert witnesses, jurors and the legal profession, with minimal changes to existing legal procedures.

CHAPTER 2

PUBLIC UNDERSTANDING OF DNA PROFILING EVIDENCE

“Accurate DNA testing is replacing the fingerprint as the most scientific way to determine guilt or innocence.”⁶⁷

-v-

“It must be stressed here that DNA profiling does not and cannot prove that a sample of biological material comes from a particular individual.”⁶⁸

2.1 INTRODUCTION

2.1.1 The “DNA Fingerprint”

The examination of deoxyribonucleic acid (DNA) at multiple loci to identify whether two or more samples could have a common origin, is perhaps the most high profile tool of modern forensic science⁶⁹ and has been lauded as “the most advanced and effective crime-fighting tool ever provided to police”.⁷⁰

Healthy humans have 23 pairs of chromosomes in the nucleus of their cells. DNA is the basis of these chromosomes, and provides a unique genetic code for each person (except for identical twins), formed from a combination of their parents’ codes. Importantly, each person’s DNA is generally the same throughout their entire body, and it differs from everyone else’s DNA (again, except for identical twins). DNA found outside the nucleus of the cell (in the mitochondria) is also examinable for forensic purposes, however this mitochondrial DNA (mtDNA) is inherited only from the maternal side.⁷¹ It can identify siblings who share the same mother, but can not reveal their paternity.⁷²

⁶⁷ Branson, L. (1999, December 18). DNA Tests Catch the Prosecutors. *Canberra Times*, p. 5

⁶⁸ Gutowski, S. J. DNA Typing in Criminal Investigations. In I. R. Freckelton & H. Selby (Eds.), *Expert Evidence* (Update 13 ed., Vol. 3, pp. 8). Sydney: Law Book Company Limited.

⁶⁹ Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Forensic Science International*, 159, 148 at 151.

⁷⁰ Lagan, B., & Kennedy, L. (2000, April 22). Test Case. *Sydney Morning Herald*, p. 32, quoting a press release by New South Wales Premier the Hon. Robert Carr of April 4 2000.

⁷¹ Isenberg, A. R., & Moore, J. M. (1999). Mitochondrial DNA Analysis at the FBI Laboratory. *Forensic Science Communications*, 1(2), 1 at 1.

⁷² Hutchinson, C., Newbold, J., Potter, S., & Edgell, M. (1974). Maternal Inheritance of Mammalian Mitochondrial DNA. *Nature*, 251, 536; Isenberg, A. R., & Moore, J. M. (1999). Mitochondrial DNA

Nevertheless, mitochondrial DNA is a reasonable source of information from forensic samples which are small or very degraded and from which nuclear DNA can not be extracted.⁷³

Modern “DNA profiling” is a process which commonly begins with very small samples of DNA being extracted and copied many millions of times. This is achieved by a *polymerase chain reaction* (PCR) which precedes specific areas of DNA (called *loci*) being examined in detail. Particular loci are chosen because they tend to differ from person to person and the DNA code at each locus is believed to be independent of the DNA code at the other loci typically used.

DNA profiling is extremely useful in cases where the accused has denied being present at the place from which forensic scientists have been asked to look for DNA. Thus if two samples of DNA (one from the accused and one from the crime scene) are examined and found to differ at one or more loci, it may be concluded that the samples did not originate from a common source. That is, (assuming no human error or system malfunction), such evidence is often completely *exculpatory*.

If the results at all of the loci studied appear to be the same in both samples, it may be concluded that the samples could have originated from the same source. Because the DNA profiling process does not examine the entire length of DNA, however, it can not be said that the two samples match completely, (because it is possible that if other loci were examined the samples may differ). Thus such evidence is often *inculpatory* (in the sense that it may place the suspect at the scene of the crime), but it is not scientifically *conclusive*.

To determine the significance of a match between two samples at all of the loci studied, biologists use DNA databases which indicate how common a particular result is (for a particular loci) within a specified population. The results for each loci are multiplied

Analysis at the FBI Laboratory. *Forensic Science Communications*, 1(2), 1 at 2; *R v Keir* (NSW Supreme Court Court of Criminal Appeal, unreported, NSWSC 70012/02).

⁷³ Wilson, M., DiZinno, J., Polanskey, D., Replogle, J., & Budowle, B. (1995). Validation of Mitochondrial DNA Sequencing for Forensic Casework Analysis. *International Journal of Legal Medicine*, 108, 68; von Wurmb-Schwark, N., Malyusz, V., Fremdt, H., Koch, C., Simeoni, E., & Schwark, T. (2006). Fast and Simple DNA Extraction from Saliva and Sperm Cells Obtained from the Skin or Isolated from Swabs. *Legal Medicine*, 8(3), 177; Divne, A.-M., & Allen, M. (2005). A DNA Microarray System for Forensic SNP Analysis. *Forensic Science International*, 154, 111.

together, giving an overall figure for how common that DNA profile is within that specified population.⁷⁴ In effect, these calculations represent the probability that DNA samples from two different people would produce the same DNA profiles.

Although traditional fields of forensic science such as fingerprints and toxicology remain important, this sort of DNA profiling has been widely embraced as “increasingly simple, nearly infallible and offer[ing] fresh hope for breakthroughs”⁷⁵ in relation to previously unsolved crimes, wrongly convicted innocent parties,⁷⁶ suspects who could be exonerated, and in the identification of new offenders.

Advances in DNA profiling technology have been well documented in the media and since the original application of DNA analysis to forensic casework,⁷⁷ DNA profiling has featured prominently in countless television shows, movies, documentaries and public debates.⁷⁸ It is said that the public “has come to expect that all crimes can and will ultimately be solved by forensic scientists through the use of modern technology”⁷⁹, and that “one of the problems facing forensic scientists is that the general public often has an unrealistic expectation of what forensic science can achieve.”⁸⁰ Popular television shows such as “Crime Scene Investigation” (CSI) have contributed to a perceived knowledge-base within the general community which is remarkable for all that it may be extraordinarily ill-informed. As noted by Hampel J in the Victorian Supreme Court, “DNA testing is widely regarded as extremely reliable and discriminating. *Its limitations and particularly limits as to the conclusions which can be made from the tests are not generally appreciated.*”⁸¹

⁷⁴ Justice Wood, J. (2003). Forensic Sciences From the Judicial Perspective. *Australian Bar Review*, 23, 1 at 3.

⁷⁵ New York Times. (2000, February 27 2000). DNA Stretches Limit of Rape Laws. *Sydney Morning Herald*, www edition.

⁷⁶ See for example www.innocenceproject.org and Kenefick, K. (2000, August). The Wisconsin Innocence Project. *Profiles in DNA*, 12 for two examples of the highly publicised American “Innocence Projects”.

⁷⁷ Jeffreys, A. J., Brookfield, J., & Semeonoff, R. (1986). DNA Fingerprint Analysis in Immigration Test Cases. *Nature*, 322, 290.

⁷⁸ Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Forensic Science International*, 159, 148 at 151.

⁷⁹ Janovsky, T. J. (2003). Forensic Science - Society is Depending (Dependent?) On Us. *Australian Journal of Forensic Sciences*, 35(1), 161; Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at 275.

⁸⁰ Ross, A. (1998). Controversy Corner - The Quest for Truth. *Australian Journal of Forensic Sciences*, 30, 41.

⁸¹ *R v Lucas* [1992] 2 VR 109 at 118 (emphasis added).

Of most concern is the “overstatement” of some aspects of DNA profiling technology”⁸², namely, the false impression that DNA profiling enables scientists to conclusively identify the source of a sample. In actual fact, the technique of examining a limited number of loci can never produce this level of certainty; two samples may match at all of the examined loci but fail to match at loci which were not typed.⁸³ For this reason, to baldly conclude that two samples of DNA “match” in their entirety would be a statistical overstatement.⁸⁴ As has been noted judicially, “a match obtained by any blood tests, DNA or otherwise, between the suspect and the offender does not establish that the two are one and the same person...”⁸⁵, merely that the accused *could be* the offender. Nevertheless, it is not uncommon for DNA profiling results to be reported in the media and portrayed in television programmes, whether by direct statement or careless omission, as absolute identifications: conclusive, infallible, and irrefutable evidence of innocence or guilt.⁸⁶ There is also significant concern that where the statistical references made to DNA profiling results involve very large numbers, juries may be unreasonably overwhelmed by the figures and tend to convict.⁸⁷ In this environment, statistics may well be incorrectly viewed as “an unnecessary frill if a scientific experiment has been done correctly”.⁸⁸

The research in this chapter examines what members of the general public understand about DNA profiling statistics, what they expect from DNA profiling evidence and how significant a role it plays in their determination of guilt or innocence in a criminal trial. DNA profiling evidence was chosen for study above other forensic disciplines, as it is heavily utilised in forensic work, it is a type of evidence commonly presented in court,

⁸² Raymond, T. (1989, 30-31 October). *DNA Profiling: the Transition from Watching Brief to the Courts - A Victorian Perspective*. Paper presented at the DNA and Criminal Justice, Canberra.

⁸³ In other contexts this has been phrased as “We can never be sure that all swans are white as long as we have not seen all swans.” Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Forensic Science International*, 159, 148 at 154.

⁸⁴ Gutowski, S. J. DNA Typing in Criminal Investigations. In I. R. Freckelton & H. Selby (Eds.), *Expert Evidence* (Update 13 ed., Vol. 3, pp. 8). Sydney: Law Book Company Limited.

⁸⁵ *R v Pantoja* (1996) 88 A Crim R 554 at 560 per Hunt CJ at CL and Hidden J.

⁸⁶ AAP. (17 October 2005). Falconio Murder Trial Told of DNA Match, *Sydney Morning Herald*. Sydney.

⁸⁷ Henderson, J. (2002). The Use of DNA Statistics in Criminal Trials. *Forensic Science International*, 128, 183 at 183.

⁸⁸ Carmody, G. (1999, May 3-7). *Statistics*. Paper presented at the International Symposium on Setting Quality Standards, San Antonio Texas.

it is commonly poorly presented or misrepresented in popular culture and its statistical aspects present special difficulties in becoming comprehensible to the general public.

This research did not focus on the many other issues relating to DNA profiling evidence, including issues of: Database size, origin and content; calculation of statistics;⁸⁹ expression of statistical results; the ethics of source attribution;⁹⁰ and analysis of mixed samples.⁹¹ Nor did this research in this chapter delve into the area of conflicting expert opinions and their affect on juries, although it is noted that “as science becomes more technical, jurors become confronted with greater difficulties in deciding between conflicting opinions when scientists disagree”⁹² and that this is likely to have a significant impact when the evidence is as inherently complex as DNA profiling evidence.

2.1.2 Bayes’ Theorem⁹³

It is difficult to estimate the impact that DNA profiling evidence may have on a criminal trial, particularly in combination with other evidence.⁹⁴ English clergyman and mathematician Thomas Bayes (1702-1761) developed a theorem which mathematically combines various pieces of evidence, or, seen another way, can be used to update the probability of an event occurring, in the light of newly acquired information.⁹⁵ This is a mathematical approach to what is otherwise an intuitive process; as one Hong Kong juror reported when asked about the helpfulness of the judge’s summing up: “At first I

⁸⁹ Buckelton, J., & Triggs, C. M. (2005). Relatedness and DNA: Are We Taking it Seriously Enough? *Forensic Science International*, 152, 115; Ayres, K. L., Chaseling, J., & Balding, D. J. (2002). Implications for DNA Identification Arising from an Analysis of Australian Forensic Databases. *Forensic Science International*, 129, 90.

⁹⁰ DNA Advisory Board. (2000). Statistical and Population Genetics Issues Affecting the Evaluation of the Frequency of Occurrence of DNA Profiles Calculated from Pertinent Database(s). *Forensic Science Communications*, 2(3), 1.

⁹¹ See, for example, Banks, A., & Pitsis, S. (2004, 27 July). Black DNA no Proof of Rape, Says Lawyer. *The Australian (news.com.au)*, reporting a defence contention that the application of the Harvey Weinberg Equation to Aboriginal populations for the calculation of DNA profiling statistics is inappropriate.

⁹² Walker, T. (1985). Consider Your Verdict: New Evidence from the Chamberlain Committee. *Law Institute Journal*, 6, 650.

⁹³ An early draft of part of this section was prepared with the kind assistance of Professor David J Balding, July 2004.; any subsequent errors are entirely my own.

⁹⁴ Henderson, J. (2002). The Use of DNA Statistics in Criminal Trials. *Forensic Science International*, 128, 183 at 184.

⁹⁵ Selvanathan, A., Selvanathan, S., Keller, G., Warrack, B., & Bartel, H. (1994). *Australian Business Statistics* (Vol. 1). Melbourne: Thomas Nelson Australia.

think that the chance of guilty is 70%. After his comment it is 85%”.⁹⁶ However, although jurors may intuitively combine evidence and update the probability of a person’s innocence or guilt, studies suggest that statistical evidence is often undervalued, oversimplified, misunderstood or even ignored, by jurors uncomfortable with mathematics and often resorting to heuristics to cope with complex or multiple pieces of evidence.⁹⁷ Bayes’ Theorem may thus be a way of ensuring that statistical evidence is neither ignored nor inappropriately (under)valued.⁹⁸

Using Bayes’ Theorem, if a juror starts with the probability that event “A” will occur, and then new information (evidence) is introduced, it is possible to then calculate a new, posterior, probability. The posterior probability may be useful in coming to a verdict: If the posterior probability is very high, (“beyond a reasonable doubt”, in Australian criminal law), the decision-maker may pronounce guilt, whereas if the evidence shows that the posterior probability of guilt is very low, an acquittal may be appropriate. Although jurors may find it difficult to consciously assess all evidence in a Bayesian manner,⁹⁹ the theorem is nevertheless instructive as a model of optimal evidence assessment.¹⁰⁰

Bayes’ approach has long been suggested for identification evidence,¹⁰¹ however, in terms of DNA profiling evidence, it can be utilised as follows:

Imagine that a murder was committed by someone in an isolated farmhouse at which 20 unrelated people were present. One person is charged with the murder. Assuming that

⁹⁶ Duff, P., Findlay, M., Howarth, C., & Tsang-fai, C. (1992). *Juries: A Hong Kong Perspective*. Hong Kong: Department of Law City Polytechnic of Hong Kong.

⁹⁷ Cooper, J., & Neuhaus, I. M. (2000). The "Hired Gun" Effect: Assessing the Effect of Pay, Frequency of Testing, and Credentials on the Perception of Expert Testimony. *Law and Human Behaviour*, 24(2), 149; also see Kaye, D., & Koehler, J. (1991). Can Jurors Understand Probabilistic Evidence? *Journal of the Royal Statistical Society: Series A*, 154(1), 75; and Faigman, D., & Baglioni, A. (1988). Bayes' Theorem in the Trial Process: Instructing Jurors on the Value of Statistical Evidence. *Law and Human Behavior*, 12, 1 for coverage of these studies.

⁹⁸ Aitken, C. G., & Taroni, F. (2005). *Statistics and the Evaluation of Evidence for Forensic Scientists* (2nd ed.). Chichester: John Wiley and Sons.

⁹⁹ Callen, C. (1991). Cognitive Science, Bayesian Norms & Rules of Evidence. *Journal of the Royal Statistical Society: Series A*, 154(1), 129 contends that humans are simply incapable of acting as “Bayesian personalists”.

¹⁰⁰ Koehler, J., Chia, A., & Lindsey, J. (1995). The Random Match Probability in DNA Evidence: Irrelevant and Prejudicial? *Jurimetrics*, 35, 201 at 217.

¹⁰¹ Finkelstein, M., and Fairley, W. (1970) “A Bayesian Approach to Identification Evidence” *Harvard Law Review* 83: 489 cited in Faigman, D., & Baglioni, A. (1988). Bayes' Theorem in the Trial Process: Instructing Jurors on the Value of Statistical Evidence. *Law and Human Behavior*, 12, 1 at 2.

everyone in the house was a potential murderer, the “prior odds” that the accused is guilty are 1 in 20.

When DNA profiling is carried out on blood found at the scene, the forensic biologist may consider two competing hypotheses, which are the opposite of one another:

- (A) The blood used for the DNA profile originated from the accused; and
- (B) The blood used for the DNA profile did not originate from the accused.

If proposition (A) is divided by proposition (B) the result is called a “likelihood ratio”.¹⁰² If this ratio is greater than 1, the odds are that the crime scene sample did indeed come from the accused. If the ratio is less than 1, then the odds are that the sample did not come from the accused. If the ratio is exactly 1, then the result is neutral. In this way, the likelihood ratio explicitly examines the intrinsic probative value of a piece of evidence.¹⁰³

The mathematical expression of Bayes’ Theorem is as follows, where “p” signifies “the probability of”, and “A” and “B” signify propositions A and B (as given above):

$$p(A/B) = \frac{p(B/A) \cdot p(A)}{p(B/A) \cdot p(A) + p(B/\text{not } A) \cdot p(\text{not } A)}$$

Following on from the example given above, the forensic biologist might find that the results “were at least 250,000 times more likely to have occurred if the blood had originated from the accused than if it had originated from someone else”.¹⁰⁴ (This kind of figure is calculated by multiplying the probability of a match at each loci typed.) Thus, the likelihood ratio is that 1 in 250,000 people would have the same profile as was found in the sample DNA.

¹⁰² Evett, I. W., & Weir, B. S. (1998). *Interpreting DNA Evidence*. Sunderland Massachusetts: Sinaue.

¹⁰³ Saks, M., & Koehler, J. (1991). What DNA Fingerprinting Can Teach the Law about the Rest of Forensic Science. *Cardozo Law Review*, 13, 361.

¹⁰⁴ Adapted from *R v Pengelly* [1992] 1 NZLR 545, cited in Freckelton, I., & Selby, H. (1993-). *Expert Evidence*. Sydney: Law Book Company.

This information can be combined with the earlier knowledge about who was present at the farmhouse: Bayes' Theorem multiplies the prior odds by the likelihood ratio, to give a new figure, called the "posterior odds". In this example, the posterior odds would be:

$$\frac{1}{20} \times \frac{250,000}{1} = 12,500$$

This result means that the odds are now 12,500 to 1 in favour of the accused having committed the murder. In this way, two separate pieces of information have been combined to give an updated view on whether the accused did commit the crime.

The beauty of Bayes' model, however, is that it is not limited to only numerical data; it can be used for quantitative evidence too.¹⁰⁵ It is important to note that just because each person will naturally evaluate the prior odds at a different value to other people (that is, the values are *subjective*), it does not mean their chosen values are *arbitrary*.¹⁰⁶ Rather, their values will accord with the information known to them at the time, (justifying an individual response). However, as more evidence is introduced (including objective likelihood ratios such as the results of DNA profiling), the posterior odds are likely to come closer and closer together.¹⁰⁷ Bayes' Theorem does not require judges or jurors to calculate "true" probabilities, but rather provides a sound method for analysing, evaluating and combining evidence in a coherent and sensible manner.¹⁰⁸

This kind of mathematical approach to DNA profiling, and indeed to other types of evidence,¹⁰⁹ whilst logically acceptable, has not been embraced by courts in Australia or overseas. It was held by Hunt CJ in *R v Milat*, for example, that juries in all cases involving DNA profiling evidence should actually be directed to *not* apply a strictly mathematical approach to issues of chance.¹¹⁰ In *R v Adams*¹¹¹ the English Court of

¹⁰⁵ Biedermann, A., & Taroni, F. (2006). Bayesian Networks and Probabilistic Reasoning About Scientific Evidence When There is a Lack of Data. *Forensic Science International*, 157(2), 163.

¹⁰⁶ Aitken, C. G. G. (2003). Evaluation of Evidence. *Australian Journal of Forensic Sciences*, 35(1), 105

¹⁰⁷ Ibid. at 109.

¹⁰⁸ Ibid. at 109, 114; Taroni, F., & Aitken, C. G. (2000). DNA Evidence, Probabilistic Evaluation and Collaborative Tests. *Forensic Science International*, 108, 121.

¹⁰⁹ Finkelstein M, Fairley WB "A Bayesian Approach to Identification Evidence" (1970) *Harvard Law Review* 83:489 cited in Faigman, D., & Baglioni, A. (1988). Bayes' Theorem in the Trial Process: Instructing Jurors on the Value of Statistical Evidence. *Law and Human Behavior*, 12, 1 at 2.

¹¹⁰ (1996) 87 A Crim R 446.

¹¹¹ (1996) 2 Cr App R 476 at 482.

Appeal declared that “[t]o introduce Bayes’ Theorem, or any similar method, into a criminal trial, plunges the jury into inappropriate and unnecessary realms of theory and complexity, deflecting them from their proper task.”¹¹² Whilst Bayes’ Theorem has not been directly addressed in the USA, it has been said that “[m]athematics, a veritable sorcerer in our computerized society, while assisting the trier of fact in the search for truth, must not [be allowed to] cast a spell over him”.¹¹³ This despite research which consistently shows that jurors are less likely to be “overwhelmed” by statistical information than they are to be so *underwhelmed* by it that they ignore it completely.¹¹⁴

Nevertheless, Bayes’ Theorem is still popular amongst forensic scientists and academics, some of whom view it as the only logical approach to organising and utilising evidence in a criminal trial.¹¹⁵ In this view, Bayes’ Theorem is a useful way of coping with the many pieces of evidence which may contribute towards a case, and require a rational decision. Although the process has been criticised as an “atomistic” (rather than an “holistic”) approach to evaluating evidence,¹¹⁶ the theorem clarifies not only the probative value of each piece of evidence (the likelihood ratio) but also how important that evidence is in the context of other evidence (the prior and posterior odds). In any case, the common law has not espoused a reasonable alternative for dealing with evidence which is scientific in nature and presented in numerical form, and which may contribute to many such pieces of evidence within a single case.

2.1.3 Source Attribution

Some of the time, the statistical results of DNA profiling may result in such large numbers that it may be *very likely* that two samples (for example, from the crime scene and from the suspect) came from the same person. Some laboratories have made it a

¹¹² This comment was cited and “strongly endorsed” in the judgement of the full court of the Court of Appeal (Criminal Division) in *R v Doheny and Adams*, July 31 1996 (95/0185/W2) at 6; 1 Cr App R 369 at 372, per Lord Justice Phillips, Jowitt and Keene JJ.

¹¹³ *People v Collins* (1968) 66 Cal. Repr. 497 at 497, cited in Faigman, D., & Baglioni, A. (1988). Bayes’ Theorem in the Trial Process: Instructing Jurors on the Value of Statistical Evidence. *Law and Human Behavior*, 12, 1 at 3.

¹¹⁴ Ibid.; also Saks, M. J., & Kidd, R. (1981). Human Information Processing and Adjudication: Trial by Heuristics. *Law and Society Review*, 15, 123.

¹¹⁵ For example, Saks, M., & Koehler, J. (1991). What DNA Fingerprinting Can Teach the Law about the Rest of Forensic Science. *Cardozo Law Review*, 13, 361; also see *Chapter 3 – Survey of Australian Forensic Scientists*.

¹¹⁶ Jackson, J. (1991). Towards a Dialectic Theory of Proof for Legal Procedure. *Journal of the Royal Statistical Society: Series A*, 154(1), 107.

policy to not only provide the courts with the statistical results of their calculations, but to follow this mathematical information with the conclusion that:¹¹⁷

“[In the opinion of the forensic biologist], in the absence of other information, these results provide extremely strong support for the proposition that the items in this case and the [sample provided by the accused] have the same source.”

In Victoria this conclusion is issued whenever the likelihood ratio is greater than one million.¹¹⁸ In New Zealand the analyst has the discretion to identify individuality if the calculated likelihood ratio is greater than one million million, although this option has apparently never been taken.¹¹⁹

In the USA, the policy of the Federal Bureau of Investigation (FBI) is to type 13 loci for a DNA profile, which commonly generates results of less than one in a trillion chance of a random match.¹²⁰ In such cases, the FBI argues that to reduce the problem of explaining statistical evidence to a jury, the DNA sample may be attributed to a specific source (that is, the accused).¹²¹ This positive identification, or *source attribution*,¹²² does not require the profile to be “unique” in the sense that there is not another like it in the entire world, but rather that the profile is unique within the group of people from which the perpetrator of a crime could logically have come.¹²³

Although source attribution should not be confused with the “ultimate question” (Did the accused commit the crime of which they are accused?), it is still significant that a

¹¹⁷ Personal communication to the author from Dr Henry Roberts, Forensic Scientist, Biological Examination Branch, Victoria Police Forensic Services Centre, Forensic Services Department, by email, 28 July 2004.

¹¹⁸ Personal communication to the author from Dr Henry Roberts, Forensic Scientist, Biological Examination Branch, Victoria Police Forensic Services Centre, Forensic Services Department, by email, 28 July 2004.

¹¹⁹ Personal communication to the author from Dr Sue Vintiner, Forensic Scientist, Institute of Environmental Science and Research Limited, by email, 27 July 2004.

¹²⁰ Budowle, B., Chakraborty, R., Carmody, G., & Monson, K. L. (2000). Source Attribution of a Forensic DNA Profile. *Forensic Science Communications*, 2(3), 1

¹²¹ Henderson, J. (2002). The Use of DNA Statistics in Criminal Trials. *Forensic Science International*, 128, 183 at 186.

¹²² Budowle, B., Chakraborty, R., Carmody, G., & Monson, K. L. (2000). Source Attribution of a Forensic DNA Profile. *Forensic Science Communications*, 2(3), 1.

¹²³ Ibid. The “logical” group of people from which the accused could have come would include those of the same gender and racial background and would naturally exclude those who were of a different race or gender, or, for example, those who were so geographically removed from the crime scene that it would not have been possible for them to commit the crime.

forensic scientist can testify that the DNA found at the scene, for example, can be attributed directly to the accused.

In contrast, it is the policy of the major laboratories in the ACT and NSW,¹²⁴ the two locations in which the mock jury research reported in this chapter was carried out, that jurors are never told that “the accused was the source of the DNA profile” recovered from the crime scene or the victim. Forensic biologists instead provide the court with statistical information which indicates the probability that the relevant samples originated from the same source.¹²⁵ It is only if the two samples are found to *differ* that an absolute exclusion is reported.

For these reasons, it is necessary to investigate the way in which ordinary citizens (including jurors, lawyers and judges)¹²⁶ comprehend and utilise DNA profiling statistics. The study in this chapter looked exclusively at members of the general public, and the DNA profiling evidence which they might encounter as jurors. It explored whether mock jurors could identify how a case against an accused changes, in light of new evidence, and examined whether respondents understood DNA profiling evidence presented in statistical form. Without mentioning Bayes’ Theorem explicitly, the survey questions presented a prior odds (background evidence which was “50:50” with respect to the accused’s guilt) and then added more information against the accused (with statistical DNA profiling results), to see whether respondents would be able to combine the evidence in a reasonable fashion, at least by recognising that the DNA profiling results strengthened the case against the accused. In the second stage of the research, even stronger DNA profiling evidence was provided, and respondents were again asked to reassess the case in light of the new statistical evidence.

¹²⁴ Personal communication to the author from Dr Robert Goetz, Senior Forensic Biologist and Head of the Forensic Biology Laboratory, Division of Analytical Laboratories, NSW, by email, 27 July 2004.

¹²⁵ Most other Australian jurisdictions follow this course (including Tasmania (Personal communication to the author from Dr Laszlo Szabo, Section Head, DNA Profiling Section, Forensic Science Service Tasmania, by email, 26 July 2004), and South Australia (Personal communication to the author from Dr Chris Pearman, Manager (Biology), Forensic Science South Australia, by email, 27 July 2004).).

¹²⁶ For judges, see Freckelton, I., P. Reddy, et al. (2000). *Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne, Australian Institute of Judicial Administration.

2.1.4 Mock Jury Research

This research invited members of the general public to consider specific scientific evidence and reach conclusions based on that evidence which would parallel a verdict in a jury trial. For this reason, the study may be characterised as mock jury research and it contributes to a body of research which attempts to demystify what occurs within actual juries.¹²⁷

Work with mock juries has long been considered valuable for the insight it can provide into the workings of real jurors and juries, particularly in response to the various criticisms of juries (often “moral panics”)¹²⁸ which include an alleged inability to deal with complex evidence.¹²⁹ Jury decisions have been a notorious source of significant frustration for the accused and an enigmatic source of fodder for appellate courts, because often only conjecture and speculation are available concerning what occurred during deliberations. This frustration was expressed by the solicitor retained by Lindy and Michael Chamberlain in 1981:

“I cannot see why there cannot be publication by the jury of its deliberation, be it initially limited to merely indicating the scientific evidence that it accepted, particularly in cases where there has been complex and conflicting evidence. This, of course, should not be done until there is more appropriate research into how it should be done.”¹³⁰

Mock jury research has the potential to shed some light on this area because in Australia all jurisdictions have legislation which fiercely protects the privacy of both jurors and their deliberations. In the ACT and NSW, this is manifested in provisions which prohibit, *inter alia*;

- disclosure of information (especially about deliberations) by jurors;¹³¹
- the disclosure of protected information¹³² such as a juror’s identity or address;¹³³ and

¹²⁷ Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622.

¹²⁸ Farrant, D. (2000, March 3). Calls for Reforms to Stop Jury Bullying. *Melbourne Age*, p. 3.

¹²⁹ Duff, P., & Findlay, M. (1997). Jury Reform: of Myths & Moral Panics. *International Journal of the Sociology of Law*, 25, 363.

¹³⁰ Budowle, B., Chakraborty, R., Carmody, G., & Monson, K. L. (2000). Source Attribution of a Forensic DNA Profile. *Forensic Science Communications*, 2(3), 1; Tipple, S. (1986). “Forensic Science: The New Trial By Ordeal?” *NSW Law Society Journal* August: 44 at 50.

¹³¹ *Jury Act 1977* (NSW) s 68B.

¹³² *Juries Act 1967* (ACT) s 42C(2).

¹³³ *Jury Act 1977* (NSW) s 68.

- soliciting information from, or harassing, jurors or former jurors¹³⁴ especially with the intention of publishing that information.¹³⁵

These legislative provisions generally contain an exception whereby information can be disclosed in accordance with an authority granted by the state or territory Attorney-General for the conduct of research into matters relating to jurors, juries¹³⁶ or jury service¹³⁷; however, such authority is rarely granted and for the reasons explored below, mock jury research is sometimes still preferable to questioning real jurors.¹³⁸

In contrast to working with actual juries, mock jury research has the great advantage that discrete variables can be studied with minimal interference from non-controllable factors.¹³⁹ This enables the chosen variables to be examined in detail, and manipulated so that every nuance can be observed. This is of particular concern for areas including scientific evidence, as it cannot be assumed that even in trials where scientific evidence is important, juries will discuss the evidence sufficiently to enable research to be carried out. In fact, some mock jury research indicates that although expert evidence may be influential, “[mock] jurors rarely, if ever, discuss the expert or the expert testimony”.¹⁴⁰ Thus a research project in which the mock jurors are forced to concentrate on scientific evidence to the exclusion of all else, has the potential to uncover data which may otherwise be extremely difficult to obtain.

Furthermore, the conditions in each trial are unique, thus there is an infinite number of variables which can interfere with the validity of conclusions about specific factors.¹⁴¹ For example, the judge, legal counsel, expert witness, court officials, court rooms, the accused, individual jurors and juries are different in every case, and jurors can be

¹³⁴ *Jury Act 1977 (NSW)* s 68A.

¹³⁵ *Juries Act 1967 (ACT)* s 42C(3).

¹³⁶ For example, *Jury Act 1977 (NSW)* ss 68(5), 68A(3).

¹³⁷ For example *Juries Act 1967 (ACT)* ss 42C(5)(e), 42C(6)(d), 42C(7)(a).

¹³⁸ Duff, P., & Findlay, M. (1997). Jury Reform: of Myths & Moral Panics. *International Journal of the Sociology of Law*, 25, 363.

¹³⁹ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 7.

¹⁴⁰ Kovera, M. B., McAuliff, B. D., & Hebert, K. S. (1999). Reasoning About Scientific Evidence: Effects of Juror Gender and Evidence Quality on Juror Decisions in a Hostile Work Environment Case. *Journal of Applied Psychology*, 84(3), 362 citing Brekke, N., & Borgida, E. (1988). Expert Psychological Testimony in Rape Trials: A Social-Cognitive Analysis. *Journal of Personality and Social Psychology*, 55, 372.

¹⁴¹ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 7.

greatly influenced by these elements, which technically are factors external to the evidence itself.¹⁴² Many of these variables have been examined by other researchers, (for example, the effect on jurors of the level of “expertise” of the expert,¹⁴³ the quality of the expertise,¹⁴⁴ the gender of the jurors,¹⁴⁵ the effect of “hired gun” experts¹⁴⁶), and so have been deliberately excluded in this research. Importantly, in mock jury research it is possible to control a great many of these factors, leaving only the desired variables to be manipulated at will. In this way it is possible to study large numbers of mock jurors under very similar conditions.¹⁴⁷

In terms of total sample size, which is important in minimising the errors and maximising the validity of any research, mock jury research is also often preferable. Research utilising real jurors inevitably involves individual trials with only twelve jurors on each panel, thus not yielding a large total jury sample size. In comparison, mock jury research can be conducted using as many respondents as desired, enabling important comparisons to be made between groups of jurors, in terms of their age, gender, education and occupation, which may be instructive in analysing how they deal with the variables being studied.¹⁴⁸

Mock jury research, where discrete variables are studied in isolation, is also particularly useful when complex evidence is being examined. Otherwise, jurors may be faced not only with the complex evidence of interest, but may also have to grapple with legal complexity (including the onus or burden of proof, the standard of proof, causation, liability, and judicial instructions), a large volume of evidence (often in addition to the

¹⁴² Duff, P., Findlay, M., Howarth, C., & Tsang-fai, C. (1992). *Juries: A Hong Kong Perspective*. Hong Kong: Department of Law City Polytechnic of Hong Kong; also Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622.

¹⁴³ Cooper, J., Bennett, E., & Sukel, H. (1996). Complex Scientific Testimony: How Do Jurors Make Decisions? *Law and Human Behavior*, 20, 379.

¹⁴⁴ Kovera, M. B., McAuliff, B. D., & Hebert, K. S. (1999). Reasoning About Scientific Evidence: Effects of Juror Gender and Evidence Quality on Juror Decisions in a Hostile Work Environment Case. *Journal of Applied Psychology*, 84(3), 362.

¹⁴⁵ Ibid.

¹⁴⁶ Cooper, J., & Neuhaus, I. M. (2000). The "Hired Gun" Effect: Assessing the Effect of Pay, Frequency of Testing, and Credentials on the Perception of Expert Testimony. *Law and Human Behaviour*, 24(2), 149.

¹⁴⁷ See Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 6 for a summary of the advantages and disadvantages of different methodologies for jury research.

¹⁴⁸ Shuman, D., Champagne, A., & Whitaker, E. (1996). Juror Assessments of the Believability of Expert Witnesses: A Literature Review. *Jurimetrics*, 36, 371.

complex evidence), a lengthy or interrupted trial, and a variety of expert witnesses who each have different qualifications, communication skills, appearance and personality, impartiality and familiarity with the evidence.¹⁴⁹ Each of these factors may complicate the decision-making process of jurors and cloud the ability of researchers to truly measure the comprehensibility of the complex evidence.¹⁵⁰

The disadvantage of mock jury research is that it may not reflect the court room and trial environment in its entirety.¹⁵¹ This means that not only may the physical conditions be unrepresentative of a real court room, but the nature of the mental, cognitive and emotional experience may be entirely different.¹⁵² For example, mock jurors are not faced with the real repercussions of a guilty verdict being handed down over a real accused.¹⁵³ This may mean that their deliberations are affected in ways which render mock jury work irreconcilable with the behaviour of real juries.¹⁵⁴ Nevertheless, it is noted that the ecological validity of any research (how closely it mimics conditions in the “real world”) does not determine the broader applicability of the results of such research, provided experimental conditions and internal validity are properly established.¹⁵⁵

Furthermore, in the research detailed in this chapter, these disadvantages have been rendered largely insignificant because the aim was solely to determine how jurors respond to a discrete piece of evidence (DNA profiling). This chapter examines the ability of mock jurors to comprehend and utilise DNA profiling as the sole source of evidence in the scenario. The nature of the methodology excludes extraneous influences and unnecessary distractions, (including other potentially complicated evidence), and presents a uniform piece of scientific evidence to a large body of respondents.

¹⁴⁹ Ibid.

¹⁵⁰ Cooper, J., Bennett, E., & Sukel, H. (1996). Complex Scientific Testimony: How Do Jurors Make Decisions? *Law and Human Behavior*, 20, 379.

¹⁵¹ Saks, M.J. (1997) What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 7.

¹⁵² Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622

¹⁵³ Duff, P., Findlay, M., Howarth, C., & Tsang-fai, C. (1992). *Juries: A Hong Kong Perspective*. Hong Kong: Department of Law City Polytechnic of Hong Kong reports on a real juror who “..didn’t want to send anybody to jail”.

¹⁵⁴ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 7, 8.

¹⁵⁵ Anderson, C. A., & Bushman, C. J. (1997). External Validity of "Trivial" Experiments: The case of laboratory aggression. *Review of General Psychology*, 1, 19.

2.1.5 Earlier Research

This research was initiated by Magnusson in 1995¹⁵⁶, in conjunction with a series of high school students participating in the *Commonwealth Scientific and Industrial Research Organisation (CSIRO) Student Research Scheme*. In that work, Magnusson investigated what use participants made of DNA profiling evidence which implicated the accused and had a 1 in 5, 1 in 20, or 1 in 200 chance of matching another member of the general public. These numbers reflected the relatively limited discriminating power of DNA profiling at that time, compared with current methods.

Earlier research by Magnusson also investigated the utility of having a mock judge give a brief explanation of statistics and DNA profiling evidence to one half of the respondents.¹⁵⁷ Despite expectations that differences between the two groups of respondents might be observed if only because “an explanation often involves explaining one seemingly incomprehensible incantation with another”,¹⁵⁸ the results actually strongly suggested that the explanation made no quantitative or qualitative difference to the responses.¹⁵⁹ For this reason, no explanation of the statistical aspects of DNA evidence was given to any respondents in the current study.

The research in this chapter used the same delivery method and a slightly modified scenario and survey form, as was used by Magnusson in the earlier research.

2.1.6 The Prosecutor’s Fallacy and Ways of Expressing DNA Profiling Results

When DNA profiling evidence is given in court, the way in which the results are expressed is no trivial matter. Examples of acceptable methods include:

“The DNA profile of the blood stain on the shirt was from a [male/female] and matched the DNA profile of [the accused]. The chance of a second

¹⁵⁶ E.A. Magnusson, unpublished results (as at 2006).

¹⁵⁷ Magnusson, E.A. unpublished results (as at 2004), briefly referred to in Magnusson, E. A. (1994). Reasonable Doubt, Legal Doubt & Scientific Doubt. *The Australian Journal of Forensic Sciences*, 26(8-14), 8.

¹⁵⁸ Justice Crispin, K. (1992). Coping with Complexity. *Australian Journal of Forensic Sciences*, 24(3), 74.

¹⁵⁹ Personal communication to the author from A/Prof Eric Magnusson, School of Chemistry, University of New South Wales at the Australian Defence Force Academy, October 2002.

person, unrelated to [the accused], having the same DNA profile as that of this blood stain is less than one in [figure].”¹⁶⁰

or

“The DNA profile obtained from the [crime scene sample] matched the DNA profile obtained from the blood sample labelled [suspect’s name]. The donor of the blood sample [suspect’s name] is not excluded as a possible source of the blood from the [crime scene sample]. I estimate that the chance of finding a second [male / female] with the same DNA profile in the [specified] population would be less than one in [figure].”¹⁶¹

or

“The probability of the DNA evidence is approximately [figure] times greater if the DNA came from the accused than if it came from another [female / male] chosen at random from the [specified] population.”¹⁶²

or

“The donor of the blood sample in the bag labelled “Suspect 1” could not be excluded as the source of the biological material in the blood found at the scene. The combination of the above types [identified at a certain number of loci] would be expected to occur in approximately one person in every [figure] in the specified population”.¹⁶³

or

“I have considered two propositions: the majority of the DNA on the [crime scene sample] originated from the donor of the swab labelled [suspect’s name]; or the DNA on the [crime scene sample] originated from a [male / female] selected at random from the [specified] population. I estimate that the DNA profile obtained from the [crime scene sample] is approximately [figure] times more likely to have been obtained if [suspect’s name] is the source of the DNA, than if a [male / female] selected at random from the [specified] population is the source.”¹⁶⁴

The articulation chosen in this research was:

“The odds that a person drawn by chance from the Australian Caucasian population will have DNA which matches the DNA in samples [from the crime scene], are calculated to be approximately 1 in [4000 or 400,000]”.

¹⁶⁰ Personal communication to the author from Dr Laszlo Szabo, Section Head, DNA Profiling Section, Forensic Science Service Tasmania, by email, 26 July 2004.

¹⁶¹ Adapted from a personal communication to the author from Dr Henry Roberts, Forensic Scientist, Biological Examination Branch, Victoria Police Forensic Services Centre, Forensic Services Department, by email, April 2000.

¹⁶² Victoria Forensic Science Centre, Australia “DNA Profiling at the Victoria Forensic Science Centre”, VFSC website 2000.

¹⁶³ Victoria Forensic Science Centre, Australia “DNA Profiling at the Victoria Forensic Science Centre”, VFSC website 1999.

¹⁶⁴ Adapted from a personal communication to the author from Dr Henry Roberts, Forensic Scientist, Biological Examination Branch, Victoria Police Forensic Services Centre, Forensic Services Department, by email, April 2000. Note the clear enunciation of the propositions which comprise the Likelihood Ratio.

The “Prosecutor’s Fallacy”¹⁶⁵ has been identified as a grave misinterpretation of statistics which incorrectly asserts, (in the case of a DNA profile), that the odds that the DNA found at the crime scene came from the accused person are “[figure] to one”. For example:¹⁶⁶

1. Only one person in a million will have a DNA profile which matches that of the crime stain.
2. The accused has a DNA profile which matches the crime stain.
3. Ergo there is a million to one probability that the accused left the crime stain and is guilty of the crime.

In this research, such a fallacy would incorrectly suggest that the odds were “4000 [or] 400,000 to one” that it was the accused’s DNA at the crime scene.¹⁶⁷

For the sake of brevity in this document, the expression of many of the odds ratios has been abbreviated, for example as 4,000:1. This may resemble the *Prosecutor's Fallacy*, but note that the full, correct expressions of odds ratios have been used in the actual survey documents and the research.

2.2 OBJECTIVES

This mock jury research had the following objectives:

- To determine whether respondents could differentiate between inculpatory and exculpatory evidence.
- To determine the extent to which respondents comprehended basic statistics, including whether respondents were able to distinguish between low (4,000:1), high

¹⁶⁵ Balding, D. J., & Donnelly, P. (1994). The Prosecutor's Fallacy and DNA Evidence. *Criminal Law Review*, 1994, 711; Thompson, & Schumann. (1987). Interpretation of Statistical Evidence in Criminal trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy. *Law and Human Behaviour*, 11, 167.

¹⁶⁶ *R v Doheny and Adams*, UK Court of Appeal (Criminal Division) July 31 1996 (95/0185/W2) at 4, per Lord Justice Phillips, Jowitt and Keene JJ; (1997) 1 Cr App R 369 at 372.

¹⁶⁷ The *Defence Counsel's Fallacy* is that the prior odds of everyone who might match the DNA having left the crime stain are equal (even though none of those people, except the accused, had access to the crime scene, for example.) Henderson, J. (2002). The Use of DNA Statistics in Criminal Trials. *Forensic Science International*, 128, 183 at 184; Croucher, J. S. (2003). Assessing the Statistical Reliability of Witness Evidence. *Australian Bar Review*, 23, 1 at 2.

(400,000:1) and very high (4,000,000:1) odds ratios associated with DNA profiling evidence.

- To determine whether respondents are able to analyse statistical evidence in a Bayesian framework, given evidence presented in such a manner.
- To determine an approximate threshold at which respondents were satisfied that the evidence met the “beyond a reasonable doubt” standard.
- To determine whether the high odds ratios typically encountered in DNA evidence would result in a correspondingly high rate of guilty verdicts, all other things being equal.

2.3 METHOD

2.3.1 Participants

As was the research initiated by Magnusson in the mid-1990s, this research was conducted in conjunction with a series of high school students participating in the *CSIRO Student Research Scheme*. The students involved in the research in 2000 were Troy Lawrence (Melba High ACT), Jyotsna VEDI (Mount Stromlo High ACT) and Christopher Weekes (Chisholm High ACT). These students approached their high schools and requested permission for this research to be conducted with the participation of their fellow students. In order to increase the sample size and diversity of the respondent pool, a further school was also contacted (Liverpool Girls High School) and allowed its students to participate in this research.

The mock jurors were 571 volunteers associated with Chisholm High ACT, Melba High ACT and Liverpool Girls High NSW. The participant pool included the school students to whom the survey materials were distributed (each student received a large single envelope, see “Stimulus Materials” below), and was presumed to include parents, siblings, friends and associates of these students. Each envelope that was returned with surveys in it was counted as a “family group”, because although the surveys in that envelope may have been completed by people who were not technically related to each

other, the fact that they were returned by an individual student in the one envelope meant that each respondent bore some relationship to that student. Almost half of the volunteers were over 18 years of age and therefore *prima facie* eligible for jury duty.

2.3.2 Procedure

Stimulus Materials

Envelopes containing one audio cassette tape, one instruction sheet and four survey forms were distributed to individual students in year groups at schools selected for participation. (The fact that each envelope was known to contain four surveys enabled a response rate to be calculated.) Each survey was a three page questionnaire consisting of both closed and open-ended questions (see Appendix A). Most answers were closed-ended, so as to encourage respondents to answer by making the answering as simple and convenient as possible.

The format of the questionnaire followed that used by Magnusson and was deliberately kept as simple as possible, with the questions in one column and space for answers in an adjacent, shaded column. The language used in the surveys was also deliberately kept simple, so as to be comprehensible both by the adult respondents and the children. The complexity of the language was assessed in a small pilot test conducted on the three *CSIRO Student Research Scheme* students, who were year ten students (15-16 years of age) at the time. They listened to the cassette tape, completed the surveys and provided feedback on both the transcript and the survey forms, as a result of which, no significant changes were made.

The cassette tapes were of approximately six minutes duration and contained a concise recitation of the facts of the case and the DNA profiling evidence. The other elements of a jury trial (including participation of legal counsel, direct evidence from witnesses, and other evidence) were excluded so as to minimise confusion, boredom and unnecessary complications which may otherwise be present in a real trial. The cassette tape transcript contained:

- A brief introduction to the research project:

This tape was prepared in the School of Chemistry at the Australian Defence Force Academy. My name is Rhonda Wheate and I am assisted by three final year science students, who are participating in the CSIRO School Science Research Scheme this year – Troy Lawrence, Jyotsna Vedi, and Chris Weekes.

The project is about how well juries understand forensic science in criminal courts, and what we can do to improve their comprehension. Almost anybody can be called for jury service, so we are surveying a large group of Australians to see which ways of describing scientific results are the easiest to understand.

We are very grateful to you for listening to the tape and answering the questionnaires we've prepared. You are anonymous to us, but your answers will be very valuable and we hope the research will ultimately improve the criminal justice system in this country. The forensic science community listens very carefully to the recommendations made from this kind of study.

- Simple instructions:

Here's the story: The superior court of the ACT is in session. The case is The Crown v Jones.¹⁶⁸ We would like you to be the jury in this trial. Assume that the trial is almost over and that you are about to listen to the summary of the evidence given by Mr Justice James.

When the summary is finished, stop the tape and discuss the evidence amongst yourselves. Then fill in page one of your survey forms.

Then listen to the next part of the tape, discuss the new evidence and write your own opinions on page two of the survey form.

Please also fill out page three of the survey. This information will be very helpful for our research and no names are needed.

- A brief facts scenario:

Members of the jury. You have heard the evidence. John Jones, a Caucasian male, has been charged with breaking the window of a pawn shop and stealing a TV set belonging to Mr Brown, pawn-broker, on Thursday January 30, 1999 at about 10 o'clock in the evening. Mr Brown's pawn-shop is situated at 25 Main St, Sydney.

¹⁶⁸ Criminal cases in Australia are generally brought on behalf of the Crown.

John Jones has pleaded not guilty. He blames another person for the robbery. You heard Detective Watson give evidence that fresh blood was found on the broken window in Brown's shop within minutes of the burglary. Bloodstains were also found on the TV set when it was found abandoned in the park, two days later. The prosecutor has put it to you that this blood came from the person who broke the window; that he cut himself and left bloodstains both on the window and on the TV set.

You have heard the record of interview between Detective Watson and John Jones. The accused has admitted that the stolen TV set was his property before he pawned it, and that he was angry that he was being charged \$20 a week interest on the loan. He insists that the TV set is still his, but denies that he carried out the burglary.

Detective Watson gave evidence that some of the fingerprints found on the TV set matched those of John Jones and some the pawn-broker.

- A short recital of the DNA evidence:

You also heard that the accused allowed a doctor to take a DNA sample and give it to the police. They took it to the forensic science laboratory, where Dr Kary Mullis carried out 7 different DNA tests on it. The same 7 tests were also carried out on the blood stains from the broken window and from the TV set. You heard Dr Kary Mullis, the DNA profiling expert, give evidence that the DNA sample "JJ", from John Jones (the accused) matches the DNA in sample "BW" from the window and the DNA in sample "TV" from the TV set, in all 7 tests.

Dr Mullis also told you about the test results from DNA sample "OP", from the other person who was accused of the robbery by John Jones. The DNA in this sample did not match the DNA from the broken window in all seven tests.

*Finally, Dr Mullis reported the results of DNA tests collected over a number of years from more than 2000 people from all over Australia. These were his exact words: "The odds that a person drawn by chance from the Australian Caucasian population will have DNA which matches the DNA in sample "BW" and sample "TV", are calculated to be approximately **1 in - - - [4000 or 400,000].**"*

- An instruction about the appropriate standard of proof in criminal trials:

Ladies and gentlemen you must not convict John Jones unless you are sure beyond reasonable doubt that he stole the TV set. John Jones has a clear motive to steal the set, which he considers his property, and could have stolen it, but if that were the only evidence, I would have to direct you to acquit him.

Clearly the scientific evidence is crucial. You must decide if the DNA test results strengthen the case against the accused, enough to prove it beyond reasonable doubt.

- Final instructions:

Members of the jury, please consider your verdict. Write your individual answers on jury sheet number 1. Exact answers are not required, just put down the answers that are about right in your opinion. Your opinions are important to us.

- Both tapes also contained “recall evidence” using the number 4 million:

The Crown v Jones case is being re-tried before Mr Justice James.

Members of the jury. Additional forensic evidence has been obtained and the case has come back to court for your consideration. Dr Mullis has carried out three extra tests on the blood samples from the window and on the DNA from the accused. His evidence is that in all 10 tests, Jones’ DNA still matches the DNA from the window.

The forensic scientist reports the results of the extra tests on the 2000 people referred to before. Here are his exact words:

*“The odds that a person drawn by chance from the Australian Caucasian population will have DNA which matches the DNA in sample “BW” and sample “TV”, are now calculated to be approximately **1 in 4 000 000.**”*

Ladies and gentlemen of the jury, please consider the evidence again in light of this new information. After discussion, please write down your individual answers to the questions on jury sheet number 2. After that, would you kindly fill out page 3, and thank you very much indeed for participating in this research.

Students were directed to listen to the tape with their family, discuss the evidence and then individually fill out the survey forms. These instructions were repeated on a written sheet included in the envelopes. Students returned the envelopes, tapes and survey forms to their schools, which passed them on to the researchers for analysis.

Additional Questions, Including Language Considerations

The surveys were first distributed at Chisholm High School and Melba High School in the Australian Capital Territory (ACT). Six months later, surveys were distributed at

Liverpool Girls High School, in south-western Sydney, NSW. In the latter case, two additional questions were inserted on page three of the survey:

- *What language do you mostly speak?*
- *Have you ever served on a jury?*

The first additional question was included because when the survey was being prepared for NSW, it became evident that the specific region being surveyed (the south-western part of metropolitan Sydney) had a highly diverse multicultural community with a large proportion of new or recent immigrants. Therefore, the survey for Liverpool Girls High School was adapted by the addition of a question seeking to determine which language the respondents spoke most at home. It was reasoned that this factor might influence the way in which the survey stimulus materials were understood and the questions answered.

In comparison, investigation in the ACT revealed that “most people in Canberra either speak English or are very proficient in the use of English”,¹⁶⁹ and “Canberra does not contain within its suburbs particular geographic concentrations or enclaves of people who speak particular languages (in contrast to some areas in other metropolitan cities)”.¹⁷⁰ This was reflected by the seemingly relatively homogeneous composition of the student bodies at Melba and Chisholm High Schools, so it was decided not to resurvey those schools with the additional question included.

The second additional question was included to determine whether the experience of having served on a jury would influence the responses given.

2.3.3 Analysis

Variables

The independent variable was the figure quoted for the initial DNA profiling evidence: Approximately half of the respondents heard DNA profiling evidence using the number

¹⁶⁹ Chief Minister's Department. (2003). *A Social and Demographic Profile of Multicultural Canberra*. Australian Capital Territory: Department of the Chief Minister of the Australian Capital Territory.

¹⁷⁰ *Ibid.*

4 000 (blue/pink coloured survey forms), the other half heard DNA profiling evidence using the number 400 000 (yellow survey forms).

“The odds that a person drawn by chance from the Australian Caucasian population will have DNA which matches the DNA in sample “BW” and sample “TV”, are calculated to be approximately 1 in - - - [4000 or 400,000].”

All respondents heard the additional DNA profiling evidence quoting the new figure of 4 million.

“The odds that a person drawn by chance from the Australian Caucasian population will have DNA which matches the DNA in sample “BW” and sample “TV”, are now calculated to be approximately 1 in 4 000 000.”

Coding and Analysis

Each envelope returned with completed surveys was given a code number. The individual survey forms within that envelope were then given a further code number. This maintained anonymity for the respondents, but, importantly, allowed a response rate to be estimated. Results were entered into and analysed using *SPSS Version 10.0*.

“Yardstick Questions” - Objectively Correct or Incorrect Answers

Some survey questions were designed to test the ability of respondents to correctly comprehend and assess the DNA profiling evidence. These questions had an objectively correct answer. These are henceforth called “yardstick questions”, and are listed (with the correct answer shown) below:

- *Question a:* Do the blood tests completely prove John guilty? [No]
- *Questions b:* What about the other suspect? What do the tests prove about him? [Tests prove blood isn't his]
- *Question c(i):* Assume that without the DNA evidence, there's a “fifty-fifty” chance (1:1) that John is guilty. If a juror decides that this is enough to declare that John is guilty, in what percentage of cases does this mean that an innocent person is convicted? [50%]

- *Question d:* Assume the odds are 1:1. Do the odds get bigger or smaller when the DNA evidence is considered? (“Bigger odds” means a bigger chance that John is guilty. Eg 50:1) [Get bigger]
- *Question e:* When the DNA evidence is taken into account, the odds that John is guilty rise from 1:1 to about 4,000:1 (or 400,000:1). Does this calculation seem about right to you? [Yes]
- *Question i:* Originally the odds were 1:1. With the new DNA evidence the odds become about 4 million:1 that John is guilty. Does this calculation seem about right to you? [Yes]

Opinion-Based Questions

The following questions were not considered to have objectively right and wrong answers, but were designed to elicit an opinion from the respondents. Where a specified range of answers was given to respondents, this is indicated in square brackets.

- *Question f:* If juries always say “guilty” with odds like these, then in one case out of (4,000 or 400,000) they would be declaring an innocent person guilty. Is this acceptable to you? [Yes, No]
- *Question g:* What odds would be acceptable to you? [1 case in ...]
- *Question h:* If you were a one-person jury, would you declare John guilty now? [Yes, No]
- *Question j:* If juries always say “guilty” with odds like these, then in one case out of 4 million, they would be declaring an innocent person guilty. Is this acceptable to you? [Yes, No]

- *Question k:* The risk of declaring an innocent person guilty can never be completely removed. In your opinion, what is the biggest risk a jury should take in reaching a verdict about a serious crime? [1 case in ...]

2.4 RESULTS and DISCUSSION

2.4.1 Sample Size

In total, 571 individual surveys were completed and returned for analysis. Of these, 48% (n = 276) were completed by adults and the remaining 295 responses were completed by respondents less than 18 years of age.

2.4.2 Response Rate

The number of family groups (that is, groups whose completed surveys were returned in the same envelope) was as follows:

Liverpool Girls High School n = 104

Melba High School n = 82

Chisholm High School n = 20

Given that the following number of envelopes were distributed at each school:

Liverpool Girls High School n = 150

Melba High School n = 100

Chisholm High School n = 60

The response rate was calculated as the following:

Liverpool Girls High School 69%

Melba High School 82%

Chisholm High School 33%

For an average response rate of 61%.

2.4.3 School of Origin

Most responses came from Liverpool Girls High School (61%, n = 348), followed by Melba High School (32%, n = 181) and Chisholm High School (7%, n = 42).

When only the adult respondents were considered, the order of contributions was the same, namely: Liverpool Girls High School (59%, n = 162), followed by Melba High School (35%, n = 97) and Chisholm High School (6%, n = 17).

2.4.4 Summary of Respondents

The table below summarises the number and type of respondents who heard each kind of evidence.

Group of Respondents	% who heard the 4,000 evidence (n)	% who heard the 400,000 evidence (n)	Group as a% of All Respondents (N)	Total Number
All Respondents	51% (290)	49% (281)	100% (571)	571
Adults	49% (136)	51% (140)	48% (276)	571
Minors	52% (154)	48% (141)	52% (295)	
English-Speakers*	48% (202)	52% (217)	73% (419)	568**
Non-English-Speakers (NES)	57% (85)	43% (64)	26% (149)	
Chisholm High	43% (18)	57% (24)	7% (42)	571
Melba High	50% (91)	50% (90)	32% (181)	
Liverpool Girls High	52% (181)	48% (167)	61% (348)	

* Here and henceforth assumed to include all respondents from Melba and Chisholm High School.

** Three respondents from Liverpool Girls High did not answer the question about their language.

2.4.5 Responses to Substantive Questions

Respondents were told that DNA testing showed that the blood found on the broken window and the television set matched that of the accused, John Jones. In addition, however, this statement was qualified with additional information that others in the Australian Caucasian population might have DNA which matched those samples. Thus, this question tested whether respondents treated the initial information as definitive, or whether they understood the limits to its conclusiveness.

Fundamentally, this question tested whether respondents understood that although the tests matched the blood of the accused to the crime scene, they *did not prove* that the accused was *guilty of the crime*. This threshold distinction was intended to be fairly obvious, and was intended to be made more obvious by the use of capital letters on the survey form (“COMPLETELY PROVE”). Reassuringly, the majority of adults in the 4,000 and 400,000 groups found that the blood tests were not conclusive proof of John Jones’ guilt (58%, n = 79 and 57%, n = 80, respectively). The majority of children in the 400,000 group also answered the question correctly (55%, n = 77).

2.4.6 Do the blood tests **COMPLETELY PROVE** John guilty? [Yes, No] (Qu. a)

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	42% (57)	58% (79)	0% (0)	100% (136)
<i>4,000 odds minors</i>	53% (81)	47% (73)	0% (0)	100% (154)
<i>400,000 odds adults</i>	42% (58)	57% (80)	1% (2)	100% (140)
<i>400,000 odds minors</i>	45% (64)	55% (77)	0% (0)	100% (141)
<i>English-speakers</i>	42% (174)	58% (244)	0% (1)	100% (419)
<i>NES</i>	56% (83)	43% (65)	1% (1)	100% (149)

Nonetheless, in all of those groups, around 40% of respondents thought that the blood tests were complete proof of guilt, and in the case of the non-English speaking respondents, 56% of the group answered the question incorrectly. This suggests that these respondents placed great emphasis on the DNA profile “match”, and, in fact, that

the results were sufficient to put the prosecution's case beyond a reasonable doubt. This is of some concern, given that the other evidence in the case was equivocal and the DNA profiling statistics at that stage were comparatively weak. In a real jury, this situation might be helped by two things:

- Refutation from the defence, to the effect that the DNA profiling method cannot provide a definitive match and therefore cannot, of itself, completely prove that Jones was guilty; and
- Discussions during deliberations, in which jurors who correctly understood the limitations of the evidence may be able to persuade jurors who misinterpreted the evidence.

A further avenue for research would be to test the first option, by providing half of the mock jurors with a defence view and gauging whether this made any difference to the results. Option two might also be further explored, as it is unlikely that the full effect of jury deliberations were experienced in this research, because the juries consisted of very small groups of family members and friends – it is unlikely that such small groups would provide the diverse range of ages, education and experience more likely to be encountered in a real jury.

This question also goes to the issue of when respondents would be satisfied that the evidence meets the standard of “beyond a reasonable doubt”, which is the standard to which the prosecution must persuade the fact-finder of the accused's guilt, before a conviction can be justified.¹⁷¹ Research in other jurisdictions has long shown that the concept of “reasonable doubt” is amorphous, highly subjective and significantly affected by any attempt to explain it in other terms.¹⁷² The degree of proof required depends on such things as the age, occupation, and gender of the respondent, and also the nature of the crime;¹⁷³ an early survey of New York Federal District Judges¹⁷⁴ showed that whilst judges required the probability of guilt to be 0.92 before they would

¹⁷¹ See, for example, *Woolmington v DPP* [1935] AC 462 at 481, *R v Dickson* (1983) VR 227, and *Criminal Code* 2002 (ACT) s 57.

¹⁷² Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622.

¹⁷³ Horowitz, I. A., Willging, T. E., and Bordens, K. S. *The Psychology of Law* (2nd ed). New York: Addison Wesley Longman, 1997, 271.

¹⁷⁴ Simon, R.J., and Mahan, L., (1971) “Quantifying Burdens of Proof: A View from the Bench, the Jury and the Classroom” *Law and Society Review* 5:319 at 328.

convict for murder, on average jurors required a probability of only 0.86. Likewise, for burglary, the judges required a probability of guilt of 0.89, whereas the jurors required only 0.79 to justify a conviction.

In this initial stage of the research the DNA profiling figures used were relatively weak. Modern DNA profiling techniques are able to provide results which show that the chance of a given profile occurring in a person chosen at random from a specified population is one in many *millions* or *billions*. Thus, figures of “1 in 4,000” and “1 in 400,000” are comparatively very weak. Nevertheless, a large proportion of respondents to Question A were prepared to deliver a verdict of guilty on the basis of this evidence. Such a result reflects a common lamentation from some scientists that “most people would be prepared to send a person to gaol on evidence less statistically significant than a scientist requires to publish a research paper.”¹⁷⁵

The very low figures for missing (unknown) answers to Question A, suggest that the respondents were fairly confident of their answers. Note that respondents were not given an “I don’t know” option – this was to deliberately encourage an answer. There are two ways to view this: either that it forced respondents to guess, or that it forced respondents to try harder and to come to an answer where they otherwise may have taken the “easy option” and said “I don’t know”.

Finally, this question might better have been phrased as “the DNA tests” rather than “the blood tests”, as the latter might be associated with blood typing (O, A, A+ et cetera) rather than DNA profiling.

¹⁷⁵ Selinger, B. (1986). Expert Evidence & the Ultimate Question. *Criminal Law Journal*, 10, 246.

2.4.7 What about the other suspect? What do the tests prove about him? [Tests prove blood isn't his OR tests prove nothing] (Qu. b)

Group of Respondents	Response			Total (N)
	Tests prove blood isn't his (n)	Tests prove nothing (n)	Unknown (n)	
4,000 odds adults	65% (88)	29% (39)	6% (9)	100% (136)
4,000 odds minors	60% (92)	34% (52)	6% (10)	100% (154)
400,000 odds adults	58% (82)	36% (50)	6% (8)	100% (140)
400,000 odds minors	60% (84)	38% (54)	2% (3)	100% (141)
English-speakers	65% (273)	32% (132)	3% (14)	100% (419)
NES	48% (71)	42% (63)	10% (15)	100% (149)

Apart from the DNA profiling results, the evidence in relation to the other suspect was deliberately very brief; respondents were given no information, for example, as to why the accused was blaming the robbery on this other person. This question was designed to identify whether respondents could recognise exculpatory evidence.

The transcript stated that “the DNA in [the other person’s] sample did not match the DNA from the broken window *in all seven tests*”. Some respondents may have reacted simply to the “did not match” aspect of this sentence, thereby justifying the correct answer (that “the tests prove that the blood isn’t his”). This is sufficient recognition that although DNA profiling evidence can not provide a definitive match, it can comprehensively exclude a person.

Other respondents may have recognised the subtle implication that although the samples did not match *in all seven tests*, they it may have matched in six or less tests. In order to give the correct answer, these respondents then needed to recognise that *any* mis-match rendered the results exculpatory.

Either way, these two types of respondents would have given the correct answer.

In all but the non-English speaking category, the majority of respondents (~60%) answered correctly. In comparison, in the non-English speaking category answers were almost evenly split between correct (48%, $n = 71$) and incorrect (42%, $n = 63$), and there was a comparatively large proportion of respondents (10%, $n = 15$) who did not give any answer to this question. This suggests that for the benefit of jurors who do not speak English as their first language, DNA profiling evidence that exculpates potential suspects needs to be explained, so as to avoid uncertainty as to the import of the evidence.

2.4.8 Consideration of Questions A and B Together

The question which was most poorly answered in the entire survey was Question A (*Do the blood tests COMPLETELY PROVE John guilty?*), with 45% ($n = 257$) of respondents not answering correctly. This was followed by Question B (*What about the other suspect? What do the tests prove about him?*) which was not answered correctly by 39% ($n = 223$) of respondents. These questions both dealt with the difference between exculpatory and inculpatory evidence: The DNA profiling results totally exculpated the other suspect, but whilst the results could implicate Jones, they could not *identify* him. Nevertheless, many respondents did not appear to recognise this, and in terms of Question A, were prepared to convict Jones outright. This misinterpretation of the power of the DNA profiling evidence may reflect a wider community perception that DNA profiling technology infallibly identifies individuals.

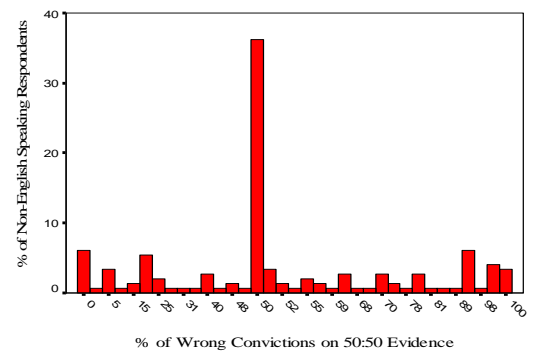
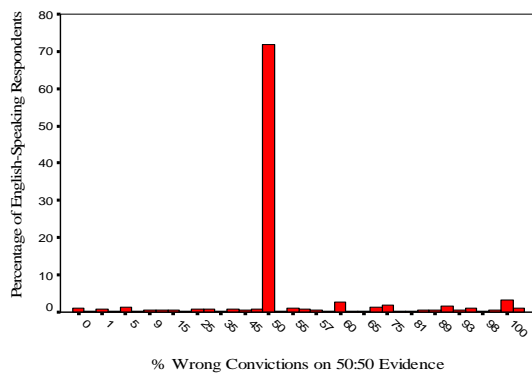
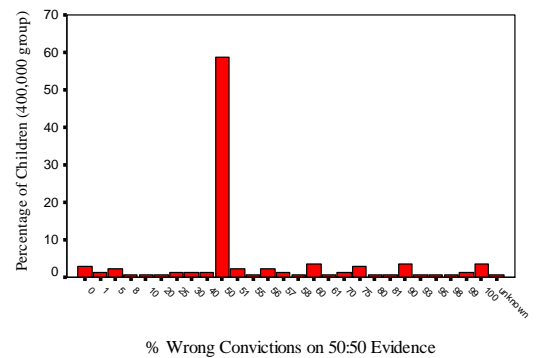
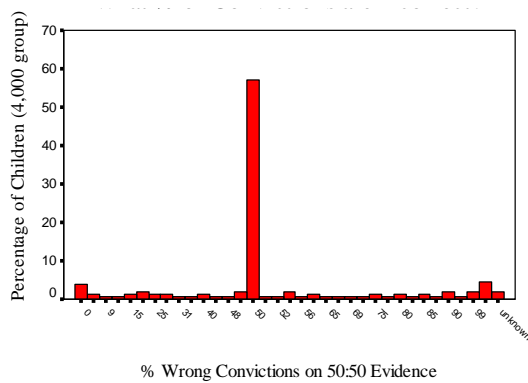
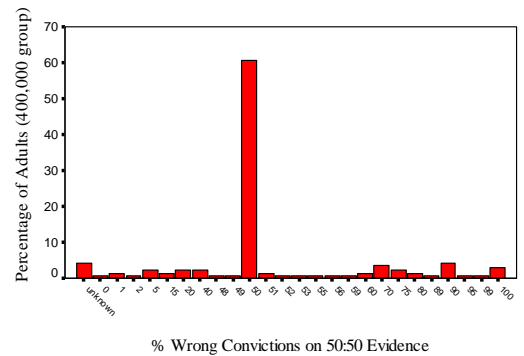
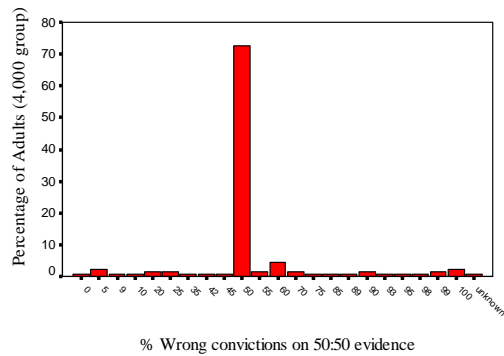
Interestingly, of those who did not answer Question A correctly ($n = 262$), most of them went on to answer Question B correctly (59%, $n = 154$). Unfortunately, these respondents may have been saying that *because* the DNA profiling evidence completely proved Jones guilty, it also meant that the blood at the crime scene could not belong to the other suspect. Thus, they were able to pick up a comprehension score point, only because of their earlier error and misconceptions.

As for those respondents who incorrectly answered Question B, by failing to recognise that the DNA profiling evidence totally excluded the other suspect; perhaps they were reluctant to totally exclude the other suspect when there was a prospect that more evidence might be forthcoming. This includes a group of respondents ($n = 109$) who thought that while the DNA profiling did not necessarily prove Jones guilty, nor did it

necessarily exclude the other suspect. These latter respondents may be termed risk-averse: not willing to risk a wrong conviction but also unwilling to recognise the import of evidence which positively excluded another suspect's involvement.

2.4.9 Assume that without the DNA evidence, there's a "fifty-fifty" chance (1:1) that John is guilty. If a juror decides that this is enough to declare that John is guilty, in what percentage of cases does this mean that an innocent person is convicted? [%]
(Qu. ci)

	Response		For all Responses in that Group			
Group of Respondents	50% (n)	Unknown (n)	Mean	Std Deviation	Minimum	Maximum
<i>4,000 odds adults</i>	73% (99)	1% (1)	52.4	18.2	0	100
<i>4,000 odds minors</i>	57% (88)	2% (3)	53.0	23.2	0	100
<i>400,000 odds adults</i>	61% (85)	0% (0)	50.2	22.1	0.001	100
<i>400,000 odds minors</i>	59% (83)	1% (1)	52.8	22.0	0	100
<i>English-speakers</i>	72% (301)	1% (5)	52.8	18.9	0.001	100
<i>NES</i>	36% (54)	0% (0)	51.4	26.7	0	100



The majority of respondents (57-73%) were able to answer this question, except for the non-English speaking group, most of whom answered incorrectly (66%). Some respondents were clearly confused by the mathematics, giving answers like “0.001, 0.004, 0.25” (n = 5), and others like “100” (n = 19).

This question was designed to see whether respondents could convert odds to percentages. In hindsight, it was an unnecessarily complicated way of doing so. It would have been preferable to phrase the question something like this:

“Assume that without the DNA evidence, there’s a fifty-fifty chance that John is guilty. If you told the judge that even without the DNA evidence, your verdict was “guilty”, what is the chance that you’d be wrong?”

This way of phrasing the question is preferable, because it does not require respondents to extrapolate from the current case (the “John Jones” scenario) to give an answer about *all* cases in general. For jurors in real cases are never asked to consider the repercussions of their decisions on other cases; in fact they are usually instructed to base their decisions solely on the evidence before them and not to let outside factors influence their verdict. Any broader considerations (such as general deterrence or similarity in sentencing) are a matter solely for the judge.

For these reasons, although at least a quarter of adult mock jurors could not correctly convert an odds statement into a percentage in this survey, and whilst for non-English speakers the failure rate was even higher, the results were likely to have been compromised by the nature of the question.

2.4.10 Is this acceptable to you? [Yes, No] (Qu. cii)

Results for this question were given only for those respondents who answered the previous question correctly (n = 302), because this question was designed to see whether respondents understood the implications of their previous answer (that is, that a rate of 50% for wrong convictions was unacceptable).

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	11% (11)	89% (88)	0% (0)	100% (99)
<i>4,000 odds minors</i>	21% (18)	78% (69)	1% (1)	100% (88)
<i>400,000 odds adults</i>	6% (5)	92% (78)	2% (2)	100% (85)
<i>400,000 odds</i>	17% (14)	81% (67)	2% (2)	100% (83)

<i>minors</i>				
<i>English-speakers</i>	9% (26)	90% (272)	1% (3)	100% (301)
<i>NES</i>	41% (22)	55% (30)	4% (2)	100% (54)

Approximately 90% of adult respondents (n = 166) did not think that a rate of 50% for wrong convictions was acceptable, nor did 80% of the children who responded (n = 136). When non-English speakers were considered separately though, the correct answer to Question C(i) was given by only 55% of those respondents (n = 30); 41% (n = 22) of the non-English speaking respondents thought that a 50% wrong conviction rate was acceptable. This result may only be tentatively interpreted, given the far smaller sample of non-English speakers (n = 54) for this question; however, it is to be hoped that if real jurors were prepared to take a 50:50 risk that their decision was wrong, other jurors who were more risk-averse would intervene. A criminal justice system in which the standard of proof is “beyond a reasonable doubt”, could not function justly if jurors and juries were prepared to gamble that half of their decisions were incorrect.

2.4.11 Assume the odds are 1:1. Do the odds get bigger or smaller when the DNA evidence is considered? (“Bigger odds” means a bigger chance that John is guilty. Eg 50:1) [Get bigger OR Stay the same OR Get smaller] (Qu. d)

This question introduced the Bayesian concept of prior odds being combined with additional information to give a new result. The prior odds were set at 1:1, which in effect asked respondents to assume that all of the other evidence in the case was equivocal and therefore that their decision would rely on the DNA profiling evidence.

	Response				
Group of Respondents	Odds get bigger (n)	Odds stay the same (n)	Odds get smaller (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	82% (112)	10% (13)	3% (4)	5% (7)	100% (136)
<i>4,000 odds minors</i>	78% (120)	12% (19)	6% (9)	4% (6)	100% (154)
<i>400,000 odds adults</i>	74% (104)	11% (15)	13% (18)	2% (3)	100% (140)
<i>400,000 odds minors</i>	76% (108)	13% (18)	10% (14)	1% (1)	100% (141)
<i>English-speakers</i>	83% (346)	8% (36)	7% (30)	2% (7)	100% (419)
<i>NES</i>	65% (97)	20% (29)	10% (15)	5% (8)	100% (149)

Interestingly, slightly *more* respondents in the 4,000 group (80%) thought that the DNA profiling increased the odds of guilt than did respondents in the 400,000 group (75%). Although these results were not significantly different (5%), one might have expected that the 400,000 odds for the DNA profiling evidence would have made a greater impact than the 4,000 odds evidence, prompting more respondents in the 400,000 group to recognise that the balance now tipped in favour of Jones’ guilt. The explanation may lie in the fact that a comparatively large proportion of the 400,000 respondents thought

that the “odds get smaller” (12%), whereas only 5% of the 4,000 group chose this answer. This may suggest that a proportion of the 400,000 group were confused by the concept of bigger v smaller odds, and these people answered consistently, though incorrectly.

The proportion of respondents who (also incorrectly) answered that the odds “stayed the same”, was approximately the same for both the 400,000 (12%) and 4,000 (11%) groups. Clearly these respondents did not grasp that the DNA profiling evidence had an impact on the case, to the extent that it implicated Jones in the crime, or perhaps they were unable to combine the concepts of prior and posterior odds to come to the correct result. In either case, these respondents were not capable of synthesising a rational statistical result from the DNA profiling evidence.

Overall, 83% of the English-speaking respondents answered this question correctly, whereas only 65% on non-English speakers did. Nevertheless, it is worth noting that more of the non-English speaking respondents answered this question correctly than any other of the objective questions in the survey. This may be because the question was intrinsically less difficult, not requiring a calculation, but rather a “gist” of what effect the DNA profiling evidence had had on the case. Or perhaps these respondents were assisted by the explanation of “bigger odds” in the question itself; if “50:1” was considered to be bigger odds, then 4,000 or 400,000 must also be considered bigger odds.

2.4.12 When the DNA evidence is taken into account, the odds that John is guilty rise from 1:1 to about 4,000:1 [or 400,000:1]. Does this calculation seem about right to you? [Yes, No] (Qu. e)

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	68% (92)	31% (43)	1% (1)	100% (136)
<i>4,000 odds minors</i>	62% (96)	37% (57)	1% (1)	100% (154)
<i>400,000 odds adults</i>	68% (95)	32% (45)	0% (0)	100% (140)
<i>400,000 odds minors</i>	66% (93)	34% (48)	0% (0)	100% (141)
<i>English-speakers</i>	71% (298)	29% (121)	0% (0)	100% (419)
<i>NES</i>	52% (78)	47% (70)	1% (1)	100% (149)

Earlier versions of this survey asked respondents to actually calculate the new odds, however the range of answers given was so broad, and the question clearly caused so much mathematical angst, this it was decided to instead give the respondents a calculation and ask them to agree or disagree with it. Also, although the new odds would technically be 3,999:1 or 399,999:1, it was decided to eliminate exact mathematical precision in favour of a general sort of answer that more respondents would be likely to understand. Thus the wording of the question was adapted to “from 1:1 to *about* 4:000:1 [or 400,000:1]” to reflect the approximate nature of the figures.

The majority of respondents in both the 4,000 and 400,000 groups answered this question correctly (65% and 67% respectively), and only two respondents did not answer the question at all. As for the 33-35% of respondents who thought that the calculation seemed incorrect, they may have given that answer for these reasons:

- They recognised that the odds were actually 3,999 or 399,999:1 and did not see the word “*about*” in the question;
- They did not recognise that the DNA profiling evidence increased the odds in favour of guilt;
- They did not believe or accept the DNA profiling evidence;
- They were confused as to which way the odds were written (for example, they may have mistakenly thought the odds should be 1:4,000 or 1:400,000); or
- They did not believe that the DNA profiling evidence, despite its statistical nature, could be so directly applied to the question of guilt.

This last explanation ties in with some judicial views that even purely statistical or mathematical evidence should not be combined with other evidence in a purely mathematical manner.¹⁷⁶

¹⁷⁶ *R v Milat* (1996) 87 A Crim R 446 and *R v Doheny and Adams*, July 31 1996 (95/0185/W2) at 6; 1 Cr App R 369 at 372 per Lord Justice Phillips, Jowitt and Keene JJ.

2.4.13 If juries always say “guilty” with odds like these, then in one case out of 4,000 [or 400,000], they would be declaring an innocent person guilty. Is this acceptable to you? [Yes, No] (Qu. f)

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	38% (52)	61% (83)	1% (1)	100% (136)
<i>4,000 odds minors</i>	30% (46)	69% (107)	1% (1)	100% (154)
<i>400,000 odds adults</i>	45% (63)	53% (74)	2% (3)	100% (140)
<i>400,000 odds minors</i>	44% (62)	56% (79)	0% (0)	100% (141)
<i>English-speakers</i>	40% (168)	59% (249)	1% (2)	100% (419)
<i>NES</i>	37% (55)	62% (92)	1% (2)	100% (149)
<i>4,000 odds “Correct” Adults*</i>	33% (11)	67% (22)	0% (0)	100% (33)
<i>400,000 odds “Correct” Adults*</i>	40% (6)	60% (9)	0% (0)	100% (15)
<i>4,000 odds “Incorrect” Adults*</i>	40% (41)	59% (61)	1% (1)	100% (103)
<i>400,000 odds “Incorrect” Adults*</i>	46% (57)	52% (65)	2% (3)	100% (125)

* Here and henceforth based on the ability to correctly answer all of the yardstick questions

This question addresses two issues: The risk that respondents are prepared for juries to take when it comes to wrongly convicting an innocent person; and the point at which respondents are reasonably prepared to find that the evidence proves guilt beyond a reasonable doubt.

The majority of jurors, in both the 4,000 and 400,000 groups, did not find it acceptable that in one case in 4,000 or 400,000 (respectively), an innocent person would be found guilty. The results were slightly stronger for the 4,000 group (65% compared with 55% for the 400,000 group), which is to be expected, as one wrong conviction in 4,000 cases is far more serious than one wrong conviction in 400,000 cases.

Of greater interest was the comparison between the results of the “correct” adults and those of the “incorrect” adults. The former group consist of those jurors who correctly answered all of the yardstick questions. These jurors demonstrated that they were able to recognise inculpatory versus exculpatory evidence, distinguish between low and high odds associated with DNA profiling statistics, and comprehend evidence in a Bayesian framework by recognising the changes wrought by additional evidence. Overall, these respondents would be jurors who would likely be able to better comprehend DNA profiling evidence in a real trial, assess its significance and come to a reasonable verdict on this basis. The “incorrect” jurors, in comparison, did not answer all of the yardstick questions correctly, though they may have answered some of them correctly. This demonstrated inability to consistently recognise exculpatory evidence and/or comprehend and utilise statistical information, provided an interesting point of comparison for those questions which relied on the respondents’ opinions (rather than a correct or incorrect answer). Question F is one such question.

On average, 64% of the “correct” adult respondents ($N = 48$) did not think it acceptable that 1 in 4,000 or 400,000 cases result in a wrong conviction. There were no correct adult jurors who did not answer this question. In contrast, only 56% of the “incorrect” adult respondents ($N = 228$) thought that this risk was unacceptable, and 2% of incorrect adult jurors did not answer this question. These results suggest that those adults who were not able to fully comprehend the DNA profiling evidence were more likely to accept that other juries may declare an innocent person guilty. In other words, the more

respondents understood about the evidence, the less willing they were to accept that mistakes could be made, and that innocent persons could be convicted of a crime.

2.4.14 What odds would be acceptable to you? [1 case in _____] (Qu. g)

Although this was an open-ended question, individual responses have been grouped for the convenience of showing them in table-form. The commentary after the table does, however, refer to specific results (which fall within the data groups actually shown).

	Response						
Group of Respondents	0 (n)	1 - 1,000 (n)	1,001 - 100,000 (n)	100,001 - 1 million (n)	>1 million (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	13% (18)	19% (25)	26% (35)	13% (18)	7% (10)	22% (30)	100% (136)
<i>4,000 odds minors</i>	8% (12)	18% (29)	25% (38)	10% (15)	6% (10)	33% (50)	100% (154)
<i>400,000 odds adults</i>	5% (7)	14% (19)	7% (10)	27% (38)	11% (15)	36% (51)	100% (140)
<i>400,000 odds minors</i>	4% (6)	21% (30)	8% (11)	22% (31)	10% (14)	35% (49)	100% (141)
<i>English- speakers</i>	8% (35)	18% (74)	18% (76)	23% (95)	9% (40)	24% (99)	100% (419)
<i>NES</i>	5% (8)	20% (29)	12% (18)	5% (7)	6% (9)	52% (78)	100% (149)
<i>“Correct” Adults</i>	13% (6)	6% (3)	23% (11)	36% (17)	8% (4)	14% (7)	100% (48)
<i>“Incorrect” Adults</i>	8% (19)	18% (41)	15% (34)	17% (39)	9% (21)	33% (74)	100% (228)

Question G was designed to test respondents’ tolerance for incorrect verdicts. The concept was introduced progressively: Having heard the DNA evidence and been asked to interpret it, respondents were then asked to consider how convictions on the basis of

DNA profiling evidence might be incorrect (because a DNA profile might match more than one person). Then they were asked to consider whether an incorrect verdict could be tolerated on the given facts, and finally, what sort of threshold for incorrect verdicts would be acceptable to them in general.

This question prompted a very high non-completion rate; almost one third of respondents (31%) did not give an answer and for non-English speaking respondents the rate was more than half (52%). Thus, the following conclusions are tempered by the small sample of respondents.

Within the 4,000 odds group, there were three significant responses from the adults; respondents who would accept one wrong conviction in 4,000 cases (15%, $n = 16$), one wrong conviction in one million cases (13%, $n = 18$) and those respondents who would not accept any wrong convictions at all (13%, $n = 18$). The remainder of respondents in this group gave answers ranging up to one wrong conviction in one thousand million (1 billion) cases, and the overall distribution was also reflected in the responses from the children in the 4,000 odds group.

In the 400,000 odds group there were two significant responses from the adults; those who would accept one wrong conviction in 400,000 cases (8%, $n = 11$) and those who would accept one wrong conviction in one million cases (19%, $n = 27$). The children in this group reflected a similar response.

These results suggest that some respondents' preparedness to take risks *in general*, may be directly influenced by the DNA profiling statistics that they are given in a specific case. The fact that the "400,000 odds" group generated a preparedness to accept one wrong case in 400,000, and the "4,000 odds" group generated a preparedness to accept one wrong case in 4,000, even though the latter is significantly less acceptable in public policy terms, is indicative of this.

The explanation that exposure to particular statistics generates a corresponding use of those numbers as justification for behaviour in general, does not, however, explain the attraction of the number 'one million', which a sizeable cohort of respondents in both the 4,000 and 400,000 odds groups chose for this question. More than one third of the

“correct” adults (37%, n = 15) also nominated one wrong conviction in one million cases as being acceptable to them. Perhaps respondents were prepared to accept one wrong conviction in a *million* cases because one million is a figure which, while extremely large, is nevertheless in common usage (in Australian vernacular, the expression “one in a million” is commonly used to indicate rarity). Nevertheless, given the high number of non-responses to this question, further research would be needed to justify any further comment.

AFTER THE “NEW EVIDENCE” (4 million)

2.4.15 *If you were a one-person jury, would you declare John guilty now? [Yes, No] (Qu. h)*

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	74% (100)	24% (33)	2% (3)	100% (136)
<i>4,000 odds minors</i>	74% (113)	25% (39)	1% (2)	100% (154)
<i>400,000 odds adults</i>	80% (112)	19% (27)	1% (1)	100% (140)
<i>400,000 odds minors</i>	72% (102)	27% (38)	1% (1)	100% (141)
<i>English-speakers</i>	80% (333)	19% (81)	1% (5)	100% (419)
<i>NES</i>	62% (92)	38% (56)	1% (1)	100% (149)
<i>“Correct” Adults</i>	88% (42)	12% (6)	0% (0)	100% (48)
<i>“Incorrect” Adults</i>	74% (170)	24% (54)	2% (4)	100% (228)

Recall Question A: *Do the blood tests COMPLETELY PROVE John guilty? [Yes, No]*

	Combination of Responses for Questions A and H					
Group of Respondents	Guilty (A & H) (n)	Guilty (A) Not Guilty (H) (n)	Not Guilty (A & H) (n)	Not Guilty (A) Guilty (H) (n)	Unknown (A &/or H) (n)	Total (N)
<i>4,000 odds adults</i>	35% (47)	5% (7)	19% (26)	39% (53)	2% (3)	100% (136)
<i>4,000 odds minors</i>	42% (64)	10% (15)	15% (24)	32% (49)	1% (2)	100% (154)
<i>400,000 odds adults</i>	38% (53)	3% (4)	15% (21)	42% (59)	2% (3)	100% (140)
<i>400,000 odds minors</i>	39% (55)	6% (9)	21% (29)	33% (47)	1% (1)	100% (141)
<i>English-speakers</i>	37% (156)	3% (13)	16% (67)	42% (177)	2% (6)	100% (419)
<i>NES</i>	41% (61)	15% (22)	22% (33)	21% (31)	1% (2)	100% (149)

Question H came after all respondents heard the 4 million odds, and it represented the final part of the Bayesian-type framework. Having first heard that the other evidence in the case was equivocal and then having heard the initial DNA profiling evidence, respondents were now asked to re-analyse their views in response to additional, stronger, DNA profiling evidence.

In stark contrast to the previous question, this question had a very high response rate (99%). The majority of respondents (across all categories) answered in the affirmative;

they would find the accused guilty of the burglary on the basis of the new DNA profiling evidence. Thus it seems that the threshold at which respondents were satisfied that the evidence met the “beyond a reasonable doubt” standard had been reached by the new DNA profiling evidence.

There are several points to note about these results: First, this question provided a partial measure of consistency: Would those respondents (n = 260) who had found the accused guilty on the basis of the initial DNA profiling evidence (Question A) maintain their verdict after the new evidence? 84% (n = 219) reaffirmed their earlier view, whilst 14% (n = 35) now said that they would *not* find Jones guilty.

Note that there is some difficulty comparing the results of Questions A and H, as the former had an objectively right answer (the blood tests did not COMPLETELY PROVE that Jones was guilty) whereas the latter was a matter of opinion. It is possible that respondents who correctly answered that the DNA tests did not *completely prove* Jones guilty may nevertheless have been prepared to deliver a verdict of guilty on the basis of that evidence, however, that question was never specifically asked of them. Clearly, in hindsight it would have been better to ask Question A as it was, but to also ask “If you were a one person jury, would you declare Jones guilty?” (on the basis of the 4,000 or 400,000 evidence.) This would have enabled a direct comparison to be made with the responses given in Question H.

Secondly, what of those respondents (n = 309) who did not find the accused guilty on the initial evidence:¹⁷⁷ Would the new DNA profiling evidence alter their verdict? For two thirds of such respondents (n = 208, 67%), the new DNA profiling evidence was sufficient to bring about a verdict of guilty. However, 32% (n = 100) maintained that they would not find the accused guilty even with the new DNA profiling statistics. This provides an interesting point about risk-taking behaviour.

Some respondents were prepared to convict Jones on the fairly weak initial evidence, and maintained this verdict when given stronger evidence (“GG”). Other respondents would not convict on the weak evidence, but were persuaded to convict when the DNA

¹⁷⁷ Admittedly, they did not declare him innocent, either.

profiling statistics became stronger (“NG”). A third group of respondents would not convict Jones under any circumstances in this scenario; even with the stronger DNA profiling evidence (“NN”). This leads to questions about risk-taking behaviour: What can be determined about these groups of people, when it comes to taking the risk of delivering a wrongful verdict and convicting an innocent person?

In this survey, respondents were asked specifically about the risks they were prepared to take (Questions G and K). Taking the most significant results for each of the three groups (GG, NG and NN), by correlating the results of Questions A and H (horizontal) and Questions G and K (vertical):

	Verdicts					
Question	GG		NG		NN	
	[x] cases	% of respondents	[x] cases	% of respondents	[x] cases	% of respondents
1 wrong conviction in [x] cases would be acceptable (Question G)	0	9%	0	11%	0	20%
	4,000	13%	4,000	8%	1	7%
	400,000	10%	100,000	7%	50	7%
	1,000,000	10%	400,000	9%	10,000	9%
			1,000,000	22%	1,000,000	9%
					10,000,000	5%
					100,000,00	5%
1 wrong conviction in [y] cases would be acceptable (Question K)	0	5%	0	9%	0	14%
	1	7%	4,000	6%	1	8%
	100	6%	400,000	5%	50	10%
	1,000,000	10%	1,000,000	20%	4,000,000	8%
	4,000,000	15%	4,000,000	11%	10,000,000	14%
	10,000,000	7%	10,000,000	5%	100,000,000	10%

It can be seen that in the NN group, 20% of respondents were not prepared to accept *any* chance of a wrongful conviction; this explains their refusal to convict on DNA profiling evidence which was not absolute. This low-risk-taking behaviour was not as strong in the GG and NG groups (9% and 11% respectively). Similarly, the NN group were prepared to accept fewer wrong convictions from other juries.

Finally, which respondents were most and least likely to convict the accused in this scenario? The highest rate of conviction was from the “correct” adults (88%), none of whom failed to answer the question. The lowest conviction rate was from the non-English speaking respondents (62%), followed by the 4,000 group minors (72%) and the “incorrect” adults (74%). These results might lend support to a common criticism of juries faced with complex evidence: That a jury “confused and unsure of the facts, acquits a substantial proportion of defendants who are most probably guilty of the charges brought”.¹⁷⁸ Closer examination of the literature (rather than media reports or political statements), however, shows that this criticism of juries tends to be based merely on anecdote and conjecture rather than empirical data. Where actual research has been conducted, the results suggest that even where jurors fail to completely understand the evidence, they are not adverse to delivering a conviction.¹⁷⁹ Research into Hong Kong juries with respect to difficult commercial fraud cases, revealed that although a greater understanding of the trial and a propensity to convict were directly related, convictions were also delivered by juries even where some jurors reported significant levels of misunderstanding or confusion about the complex evidence.¹⁸⁰ Amongst those jurors who reported difficulty in following the evidence, almost 80% were on juries which delivered a verdict of guilty.¹⁸¹ This was also the case in the current research: Even amongst the group of “incorrect” adults and those who did not speak English as their primary language, (two groups which clearly did not appear to fully understand the DNA profiling evidence), most of those respondents would have found the accused guilty.¹⁸²

¹⁷⁸ Duff, P., & Findlay, M. (1997). Jury Reform: of Myths & Moral Panics. *International Journal of the Sociology of Law*, 25, 363.

¹⁷⁹ Ibid.

¹⁸⁰ Duff, P., Findlay, M., Howarth, C., & Tsang-fai, C. (1992). *Juries: A Hong Kong Perspective*. Hong Kong: Department of Law City Polytechnic of Hong Kong.

¹⁸¹ Ibid.

¹⁸² This trend was also noted (with some alarm) by Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

2.4.17 Originally the odds were 1:1. With the new DNA evidence the odds become about 4 million : 1 that John is guilty. Does this calculation seem about right to you? [Yes, No] (Qu. i)

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	76% (103)	21% (29)	3% (4)	100% (136)
<i>4,000 odds minors</i>	70% (107)	27% (42)	3% (5)	100% (154)
<i>400,000 odds adults</i>	78% (109)	21% (29)	1% (2)	100% (140)
<i>400,000 odds minors</i>	71% (100)	28% (40)	1% (1)	100% (141)
<i>English-speakers</i>	80% (333)	18% (77)	2% (9)	100% (419)
<i>NES</i>	58% (86)	41% (61)	1% (2)	100% (149)

This question provided a point of comparison with the responses in Question E (the same question, but asking about the 4,000 or 400,000 odds). 84% (n = 316) of respondents who correctly answered Question E also correctly answered Question I. These respondents may have guessed the right answer both times, or may have chosen their responses with wisdom, but most importantly, they were consistent in their approach, irrespective of the actual numbers used in the statistical evidence. This may demonstrate an ability to combine evidence in a manner consistent with Bayes' Theorem, by recognising the shift in the probability of guilt, given new information. The fact that this operation was performed consistently by a large proportion of respondents is thus significant.

In comparison, 16% (n = 60) of those who correctly answered Question E did not correctly answer Question I. This gives some indication of how a proportion of

respondents could not maintain a consistent approach towards the mathematical questions. If, by the time they reached question I, they had changed their minds about the calculations, they had the option of turning back to question E and altering their earlier answer, however, they did not do so.

Some respondents who answered Question E incorrectly ($n = 195$), later answered the same question correctly (Question I, 53%, $n = 103$). This may be because both questions put forward a proposition, and having been presented with virtually identical propositions twice, some respondents may have simply “given in” and assented to it the second time. Less likely is the possibility that respondents who could not accept odds of 3,999:1 or 399,999:1 being rounded up to 4,000:1 or 400,000:1, found the idea of rounding more palatable when it came to sufficiently large numbers, where the distinction between 399,999,999:1 and 4 million:1 is less statistically significant.

Almost half of the initially incorrect respondents answered both E and I incorrectly (47%, $n = 92$), the reasons for which were discussed in the section relating to Question E.

2.4.18 If juries always say “Guilty” when the odds are like these, then in one case out of 4 million, they would be declaring an innocent person guilty. Is this acceptable to you? [Yes, No] (Qu. j)

This question mimicked an earlier one (Question F) in which respondents were asked about wrongful convictions in “one case in 4,000” or “one case in 400,000”. The odds of a wrongful conviction in Question J were significantly more palatable, and this was reflected in a higher positive response rate from all groups of respondents.

Not surprisingly, the biggest shift towards a positive response came from the 4,000 odds group, with a 19% ($n = 55$) increase in the number of respondents answering “yes”. In comparison, in the 400,000 odds group, where the number of wrongful convictions was reduced only from one in 400,000 to one in 4 million, the shift towards “yes” was correspondingly small (11%, $n = 32$).

If juries always say “Guilty” when the odds are like these, then in one case out of 4 million, they would be declaring an innocent person guilty. Is this acceptable to you?
[Yes, No] (Qu. j)

	Response			
Group of Respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>4,000 odds adults</i>	59% (80)	38% (52)	3% (4)	100% (136)
<i>4,000 odds minors</i>	47% (73)	50% (76)	3% (5)	100% (154)
<i>400,000 odds adults</i>	61% (85)	37% (52)	2% (3)	100% (140)
<i>400,000 odds minors</i>	50% (71)	48% (67)	2% (3)	100% (141)
<i>English-speakers</i>	59% (248)	38% (161)	2% (10)	100% (419)
<i>NES</i>	39% (59)	58% (86)	3% (4)	100% (149)
<i>“Correct” Adults</i>	75% (36)	23% (11)	2% (1)	100% (48)
<i>“Incorrect” Adults</i>	57% (129)	41% (93)	2% (6)	100% (228)

Of more significance, however, is the fact that the 4,000 odds and the 400,000 odds groups both, on average, answered the question the same way. Most people (children and adults) in both groups said “yes” (n = 290, 53% and n = 281, 56% respectively), and in both groups a similar proportion said “no” (n = 290, 44% and n = 281, 43% respectively). This means that irrespective of the strength of the earlier DNA profiling evidence they were given, the majority of respondents in this research felt that 4 million was at, or had surpassed, the point at which the risk of a wrongful conviction was acceptable. This prompts the suggestion for further research to:

- Determine whether 4 million was the minimum threshold, or whether respondents would have been similarly willing to convict with odds of one, two, or three million (et cetera); and
- Determine what impact exceedingly large DNA profiling statistics could have on jurors' confidence in their verdicts and preparedness to risk a wrongful conviction.

Significant differences were again apparent between the English and non-English speakers, and between the “correct” and “incorrect” adult respondents. The non-English speakers were the most conservative: Unlike all other groups of respondents, the majority of non-English speakers (58%) did not believe that one wrongful conviction in 4 million was acceptable. In direct contrast, the majority of the English speaking respondents (59%) were prepared to accept such odds. This suggests that if jurors find evidence difficult to comprehend and utilise, they tend to be more conservative in finding guilt, whereas jurors who have a better grasp of the meaning and import of the evidence are less reluctant to convict and take a risk that the conviction might be unjustified. This hypothesis is borne out by the comparison of “correct” and “incorrect” adult respondents: Adults who fully comprehended the yardstick questions were far more likely to accept the risk of one wrongful conviction in 4 million (75%) than were the adults who did not fully comprehend the evidence (57%). Further research could delve into the interesting question of whether certain jurors are reluctant to take the risk of a wrongful conviction because they do not understand the evidence, or rather because they are merely conservative and personally risk-averse.

2.4.19 The risk of declaring an innocent person guilty can never be completely removed. In your opinion, what is the biggest risk a jury should take in reaching a verdict about a serious crime? [1 case in _____] (Qu. k)

Although this was an open-ended question and the mathematical calculations were carried out using the actual figures nominated by respondents, individual responses have been grouped for convenience, as shown below:

Group of Respondents	Response						Total (N)
	0 (n)	1 - 1,000 (n)	1,001 - 100,000 (n)	100,001 - 1 million (n)	>1 million (n)	Unknown (n)	
<i>4,000 odds adults</i>	9% (12)	15% (20)	15% (20)	12% (16)	25% (34)	25% (34)	100% (136)
<i>4,000 odds minors</i>	7% (10)	14% (21)	15% (23)	10% (15)	22% (34)	33% (51)	100% (154)
<i>400,000 odds adults</i>	2% (3)	21% (29)	6% (9)	15% (21)	24% (34)	31% (44)	100% (140)
<i>400,000 odds minors</i>	3% (4)	25% (35)	6% (9)	15% (21)	16% (22)	36% (50)	100% (141)
<i>English-speakers</i>	6% (23)	19% (81)	12% (50)	15% (65)	24% (103)	23% (97)	100% (419)
<i>NES</i>	4% (6)	16% (24)	8% (11)	5% (8)	14% (21)	53% (79)	100% (149)
<i>“Correct” Adults</i>	7% (3)	10% (5)	21% (10)	31% (15)	21% (10)	10% (5)	100% (48)
<i>“Incorrect” Adults</i>	5% (12)	20% (44)	8% (19)	10% (22)	25% (58)	32% (73)	100% (228)

This question was closely aligned to Question G (*What odds [of a wrongful conviction] would be acceptable to you?*) in order to see if respondents would answer questions about wrongful convictions consistently. Nonetheless, Question K also differed in several respects.

First, Question K started with a preamble sentence which articulated the unfortunate truth that wrongful convictions can never be entirely avoided. If anything, such a concession might be expected to make respondents more tolerant of wrongful convictions in Question K than they were in Question G. In fact, the opposite occurred.

For the 4,000 odds group, the average number given in Question K (5,400 million) was approximately 30 times larger than that given in Question G (160 million). That is, the respondents were less tolerant of wrongful convictions than they were before. Similarly, in the 400,000 odds group, respondents were initially prepared to accept (on average) one wrongful conviction in 7 million cases, but by Question K were prepared to accept only one wrongful conviction in 37 million cases. It is difficult to rationalise these results. Perhaps the numbers increased because the DNA profiling statistics had increased and thus introduced the respondents to very large numbers. Perhaps the respondents were feeling more secure about the DNA profiling results (reflected in a higher conviction rate in Question H) and thus felt secure in demanding a higher standard from juries than they had previously.

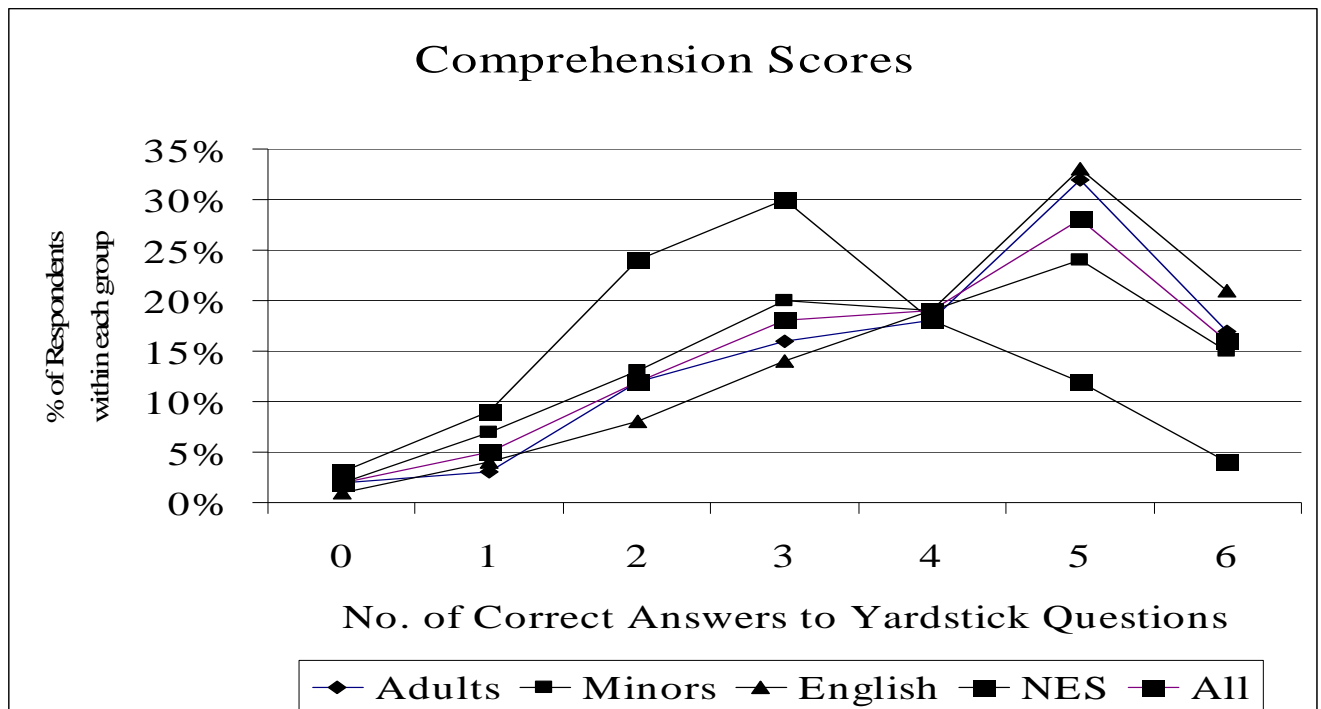
Question K also differed from Question G in that the latter question asked respondents about themselves. In contrast, Question K asked the respondents about what *other juries* should do. This was designed to see if respondents would expect more from themselves or from others. As is evident from the results discussed in the paragraph above, the respondents clearly expected much more from others.

As had Question G, Question K prompted a very high non-completion rate; almost one third of respondents (32%) did not give an answer and for non-English speaking respondents the rate was more than half (53%). The “correct” adults had the highest response rate, with only 10% of them not answering this question. Nevertheless, the relatively high non-completion rate makes it difficult to draw strong conclusions from this question.

2.4.20 YARDSTICK QUESTIONS AND COMPREHENSION SCORES

Each yardstick question was assigned one point for a correct answer and zero points for an incorrect answer. The comprehension score for each respondent was the total number of questions answered correctly.

	Comprehension Score (No. of Correct Responses to Yardstick Questions)								
Group of Respondents	0	1	2	3	4	5	6	Total% (N)	Median & Mean
<i>All Adults</i>	2% (6)	3% (8)	12% (34)	16% (43)	18% (50)	32% (87)	17% (48)	100% (276)	4 4.09
<i>All Minors</i>	2% (6)	7% (21)	13% (37)	20% (59)	19% (56)	24% (71)	15% (45)	100% (295)	4 3.80
<i>English-Speakers</i>	1% (6)	4% (15)	8% (34)	14% (58)	19% (79)	33% (140)	21% (87)	100% (419)	5 4.28
<i>NES</i>	3% (5)	9% (13)	24% (36)	30% (44)	18% (27)	12% (18)	4% (6)	100% (149)	3 3.03
<i>All Respondents</i>	2% (12)	5% (29)	12% (71)	18% (102)	19% (106)	28% (158)	16% (93)	100% (571)	4 3.94



Although there were six questions which had objectively right and wrong answers, and it is clear that only a small proportion of respondents could answer *all* six of those questions correctly, it is also clear that the *majority* of respondents could answer *most* of the questions correctly. In fact, 81% of all respondents could answer three or more yardstick questions correctly and the proportion was slightly higher for English-speaking respondents (87%).

It is also clear from the graph of the results, that the group of respondents who did not speak English as their primary language had a different profile of responses to other participants. Where the peak comprehension score for all other groups of respondents was five correct answers, the non-English speakers peak score was three and their comprehension scores fell rapidly after that point. This indicates that language skills play an important role in the correct comprehension and utilisation of evidence, in particular, complex evidence involving statistical results. The question which attracted the least correct responses from the non-English speakers was Question C(i), which required mathematical manipulation of odds in a specific case (50:50) to a percentage in cases overall (50%). Most non-English speakers were not able to do this (64%, $n = 95$) compared with a failure rate of only 28% ($n = 117$) for English-speaking respondents.

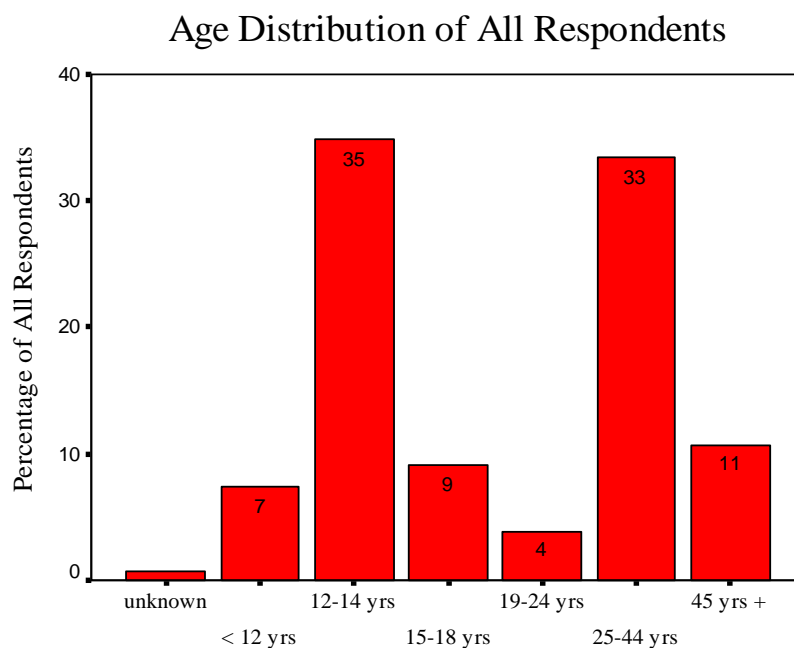
This question featured not only mathematical complexity, but also lingual and conceptual complexity, as it required respondents to extrapolate from the John Jones case to all cases in general. The poor results for non-English speakers indicates that language skills are critical; when jurors are faced with complexity from multiple sources (lingual, mathematical, et cetera), comprehension is likely to be severely reduced, in a manner not endured by English-speaking jurors.

These results raise the issue of jury deliberations, and whether deliberations may have an important role to play in terms of jury and juror comprehension. For although many jurors may be able to cope with some statistical evidence, the pattern of correct and incorrect answers in this research shows that most respondents had at least some difficulty in understanding all aspects of the statistical evidence. If jury room discussion occurs, it is possible that these random misconceptions and errors could be cleared up, by discussion amongst a pool of jurors, each of whom understood (and misunderstood) a different aspect of the evidence. This feature of the results could clearly bear further research.

2.5 DEMOGRAPHICS OF RESPONDENTS

2.5.1 Age Distribution (All Respondents)

Your age group? [12-14, 15-18, 19-24, 25-44, 45+] (Qu. 1)



2.5.2 Age Distribution (“Correct” Respondents)

Your age group? [12-14, 15-18, 19-24, 25-44, 45+] (Qu. 1)

Given the age distribution of all respondents (shown in 2.5.1 above), the age distribution of those respondents who answered all of the yardstick questions correctly, was as follows:

Age Group	No. of All Respondents	No. of “Correct” Respondents	“Correct” Respondents as% of Their Age Group
< 12 yrs	42	2	5%
12-14 yrs	199	32	16%
15-18 yrs	52	4	7%
19-24 yrs	22	1	5%
25-44 yrs	191	33	17%
≥ 45 yrs	61	13	21%
Unknown	4	0	0%
Total	571	85	15%

Given that this research was conducted through junior high schools, it is not unexpected that over one third of respondents were between 12 and 14 years of age (35%). Usefully, however, almost half of the respondents (48%) were of an age that would enable them to serve on a jury (≥ 18 years), thus rendering their responses more directly comparable to real jurors.

Although an average age could not be calculated (as respondents indicated their age within a range, rather than as a specific value), it is noted that in earlier work in NSW, the age range which dominated amongst actual serving jurors was 25-54, which is the same age range which predominated in the research in this chapter.¹⁸³ Thus the results for mock jurors discussed here are representative of actual jurors, at least in terms of the age of adult respondents.

¹⁸³ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

When respondents ages were correlated with their ability to correctly answer the yardstick questions, it became apparent that the highest proportion of correct respondents came from the 45+ years age group (21%, n = 13), closely followed by the 25-44 years age group (17%, n = 33). Of the remaining respondents who were eligible for jury duty (those in the 19 – 24 years of age group), the proportion of correct respondents as a percentage of this age group was exceedingly small (5%, n = 1). This suggests that the older respondents were more capable of comprehending and utilising the statistical evidence in this research, although the comparatively small number of respondents aged between 19-24 years may have affected this result.

A similar correlation of age and comprehension of a legal trial was also conducted on real jurors in NSW. Findlay found that jurors' (self-reported) understanding of the trial increased with their age.¹⁸⁴ Whilst that result must be tempered with the fact that the jurors were self-reporting (and not having their comprehension objectively measured), in the current research the same result was reached, using an objective measure: comprehension scores were indeed proportionately higher amongst older respondents. This provides another interesting measure of how well the results from this mock jury research may apply to actual jurors and also confirms earlier research which was conducted on real jurors.

2.5.3 Education Level (Adult Respondents)

Results are reported for adult respondents only, as minors are likely to have not yet finished their education, (rendering these questions inapplicable).

A two-fold measure of education was chosen, focusing on the number of years of high school completed and any subsequent tertiary qualifications held by respondents. Respondents were not asked for their occupation, as space on the survey form was limited. In hindsight, information about the respondents' occupations may have proved useful, because in NSW¹⁸⁵ and the ACT,¹⁸⁶ when jurors are called to court for jury duty, their names and their occupations are made available to legal counsel and it is possible that future research may have enabled a direct comparison to be made between

¹⁸⁴ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

¹⁸⁵ *Jury Act 1977* (NSW) s 28.

¹⁸⁶ *Jury Act 1967* (ACT) s 27.

the respondents in this survey and real jurors. Failing this, information about the occupation of respondents in this research would have at least made it possible to compare the current results with earlier survey work on real jurors in NSW.

How many years of high school? (Qu. 3)

Years of High School Completed	% of All Adults (n)	% of “Incorrect” Adults (n)	% of “Correct” Adults (n)	% of Adult English-Speakers (n)	% of Adult NES (n)
0	5% (15)	6% (15)	0% (0)	3% (6)	11% (9)
1	1% (3)	1% (3)	0% (0)	1% (2)	1% (1)
2	1% (4)	2% (4)	0% (0)	0% (0)	5% (4)
3	6% (16)	6% (13)	6% (3)	6% (12)	5% (4)
4	25% (70)	25% (58)	25% (12)	29% (55)	19% (15)
5	10% (28)	10% (23)	10% (5)	11% (22)	7% (6)
6	51% (140)	49% (112)	58% (28)	50% (97)	52% (42)
% of Adult Respondents	100% (276)	83% (228)	17% (48)	70% (194)	29% (81)
Av. No. of Years of High School	4.78	4.69	5.21	4.90	4.48
Std Deviation	1.62	1.70	1.03	1.40	2.02

2.5.4 Where did you finish your formal education?

[School, Trade course or apprenticeship, TAFE¹⁸⁷ college, University] (Qu. 4)

Highest Level of Formal Education	% of Total Adults (n)	% of “Incorrect” Adults (n)	% of “Correct” Adults (n)	% of Adult English-Speakers (n)	% of Adult NES (n)
<i>School</i>	42% (116)	44% (101)	31% (15)	43% (84)	40% (32)
<i>Trade or apprenticeship</i>	3% (8)	3% (6)	4% (2)	4% (7)	1% (1)
<i>TAFE college</i>	23% (64)	24% (54)	21% (10)	22% (42)	26% (21)
<i>University</i>	28% (76)	25% (57)	40% (19)	27% (53)	28% (23)
<i>Unknown</i>	4% (12)	4% (10)	4% (2)	4% (8)	5% (4)
Total (N)	100% (276)	100% (228)	100% (48)	100% (194)	100% (81)

Nevertheless, information from the existing questions about high school and tertiary qualifications provided a clear indication of which respondents were most likely to comprehend the statistical evidence in this research. Not unexpectedly, the adults who answered all of the yardstick questions correctly were more educated, having spent a greater period at high school and featuring a higher rate of university education than those adults who did not answer all of those questions correctly. In particular, it is of note that 15% more of the “correct” adults had attended university than had the “incorrect” adults.

An interesting point to emerge from the education data is the similarity between the education of the non-English speaking and English speaking respondents. Although the

¹⁸⁷ “Technical and Further Education” tertiary institution.

average number of years spent at high school was not substantially different for the non-English speakers (4.48 years) compared with the English speakers (4.90 years), in terms of tertiary education, the results for trades/apprenticeships, TAFE colleges and university did not differ by more than 4%. That is, the non-English speaking respondents appeared to have similar education rates to the English-speaking population, suggesting that the disparity in comprehension scores may be due to the language barrier rather than a deficit in education. It is also possible that the non-English speaking respondents who studied at a tertiary level did so at foreign institutions where English was not the primary language, thus accounting for the lower comprehension scores in this survey, despite a high level of education. Overall, this data indicates that if actual prospective jurors were to be screened before being selected for jury duty, their language skills, rather than their education per se, would be more pertinent to their ability to comprehend difficult (especially statistical) evidence.

2.5.5 Language Profile

What language do you mostly speak? (Qu. 2)

Results are reported for all of the respondents (adults and minors) from Liverpool Girls High only, as this question was not asked in the ACT. Percentages are quoted to one decimal place so that responses of less than 1% ($n \leq 3$) can still be shown.

If all respondents from Chisholm and Melba High Schools are assumed to speak English as their main language, then the total proportion of English speaking respondents (including adults and minors and all English-speakers from Liverpool Girls High School) is 73% of the sample ($n = 419$).

What language do you mostly speak? (Qu. 2)

Language Spoken Most By Respondents	% of Total Respondents from Liverpool Girls High (n)	Language Spoken Most by Respondents (cont.)	% of Total Respondents from Liverpool Girls High (n)
Arabic	2.0% (7)	Lebanese	2.0% (7)
Arabic/English	1.4% (5)	Macedonian	0.3% (1)
Arabic/Lebanese	0.3% (1)	Mandarin	1.4% (5)
Balinese	0.6% (2)	Pashto	0.3% (1)
Bengali	0.3% (1)	Pashto/English	0.6% (2)
Bosnian	4.9% (17)	Persian	0.6% (2)
Bosnian/English	0.3% (1)	Portuguese	1.1% (4)
Cambodian	2.3% (8)	Samoan	1.1% (4)
Chaldean	0.3% (1)	Samoan/English	0.3% (1)
Chinese/English	0.3% (1)	Serb Bosnian	0.3% (1)
Croatian	1.4% (5)	Serb/English	0.6% (2)
English	56.3% (196)	Serbian	11.5% (40)
Ghana	0.3% (1)	Serbian/Croatian	0.6% (2)
Greek	0.6% (2)	Timorese	0.3% (1)
Hindi	1.1% (4)	Turkish	0.6% (2)
Hindi/English	0.6% (2)	Urdu/English	0.3% (1)
Indian	0.3% (1)	Vietnamese	2.6% (9)
Kurdish	1.1% (4)	Unknown	0.9% (3)
Laotian	0.6% (2)	Total (N)	100.0% (348)

2.5.6 Language Profile (“Correct” Respondents)

Assuming that all respondents from Melba and Chisholm High Schools spoke English as their main language, English was the language spoken by the majority of those respondents who answered the yardstick questions correctly.

Language Spoken Most	% of “Correct” Adult Respondents (n)	% of “Correct” Minor Respondents (n)
English	98% (47)	90% (40)
Laotian	2% (1)	0% (0)
Lebanese	0% (0)	2% (1)
Mandarin	0% (0)	2% (1)
Pashto / English	0% (0)	2% (1)
Serb / English	0% (0)	4% (2)
Total (N)	100% (48)	100% (45)

It is evident from the vast range of languages nominated by respondents from Liverpool Girls High School that it was pertinent to add to this survey a question about language. Even accounting for those respondents who nominated English in addition to another language, there were still 28 other languages spoken by respondents from Liverpool Girls High School. This represented the polar opposite of the sample from Melba and Chisholm High Schools, which typify the fact that “most people in Canberra either speak English or are very proficient in the use of English”,¹⁸⁸ and “Canberra does not contain within its suburbs particular geographic concentrations or enclaves of people who speak particular languages (in contrast to some areas in other metropolitan cities)”.¹⁸⁹

Overwhelmingly, those respondents who were able to answer all of the objective questions correctly were also those who spoke, or were assumed to speak, English as their primary language. Thus it is not only the evidence itself which may present

¹⁸⁸ Chief Minister's Department. (2003). *A Social and Demographic Profile of Multicultural Canberra*. Australian Capital Territory: Department of the Chief Minister of the Australian Capital Territory.

¹⁸⁹ Ibid.

problems for jurors, but a more fundamental threshold must first be crossed: the language barrier. Jurors who are not familiar with the English language to the extent that they use it in preference to other languages, seem largely unable to adequately deal with complicated statistical evidence.

Whether this manifests itself as a problem in real juries is difficult to determine. Only two of the adult respondents (3%, N = 81) from Liverpool Girls High who did not speak English as their primary language reported that they had served on a jury. No further information about the particulars of their jury service was forthcoming, however, neither of these respondents were in the group of “correct” adults in this survey.

What is known about the lingual capabilities of real jurors is that the system relies largely on self-reporting. In NSW, the starting premise for eligibility for jury duty is any person who is listed on the state electoral roll.¹⁹⁰ Among other requirements, voters who are unable to read, speak or understand English are ineligible to serve as jurors.¹⁹¹ When a potential juror is notified that they have been selected for inclusion on the draft jury roll, they or a “responsible person” may indicate (in writing) the nature of their language difficulty.¹⁹² In NSW, the Office of the Sheriff receives these notices and if the difficulty is assessed to be genuine, a further form may be completed, and the person’s name removed from the draft roll. If the Sheriff doubts the verity of the claim, the person may be called up to the Sheriffs Office or have their application reviewed by a Magistrate. In the ACT, provision is also made for judges to discharge persons summoned as jurors, if the judge is satisfied that that person has an insufficient understanding of the English language;¹⁹³ however, all persons who are summonsed for jury duty must first attend court before they can be formally excused or discharged from serving.¹⁹⁴ Whilst this system may go some way towards identifying language comprehension problems amongst jurors, it is possible that jurors who fail to alert the authorities to their difficulties may remain quiet and unidentified on jury panels.

¹⁹⁰ *Jury Act 1977 (NSW)* s 5, *Juries Act 1967 (ACT)* s 9.

¹⁹¹ *Jury Act 1977 (NSW)* Schedule 2 Part 11, *Juries Act 1967 (ACT)* s 10(c).

¹⁹² Which may be difficult, if they have difficulty understanding the instructions.

¹⁹³ *Juries Act 1967 (ACT)* s 16.

¹⁹⁴ *Juries Act 1967 (ACT)* s 13.

It is noted that although only one “correct” adult (2% of all correct adults) nominated a language other than English as their main language, there were slightly more “correct” children ($n = 5$). Although the sample size is extremely small, these results suggest that these children were more adept at handling statistical evidence in English than their parents. This bodes well for the future of competent juries, as presumably these children will not lose their ability to work with and utilise English as they become adults.

2.5.7 Adult Respondents’ Familiarity with Statistics and Betting Language

Results are given for only the adult respondents, as most minors had only recently commenced their first year of high school and so could not be expected to have properly studied statistics yet.

Do you remember studying probability or statistics at any time? (Qu. 5)

Group of Respondents	Response			Total (N)
	Yes (n)	No (n)	Unknown (n)	
<i>All Adults</i>	54% (149)	44% (120)	2% (7)	100% (276)
<i>“Incorrect” Adults</i>	51% (117)	46% (105)	3% (6)	100% (228)
<i>“Correct” Adults</i>	68% (32)	32% (15)	2% (1)	100% (48)
<i>Adult English-speakers</i>	55% (107)	42% (81)	3% (6)	100% (194)
<i>Adult NES</i>	51% (41)	48% (39)	1% (1)	100% (81)

Are you familiar with betting language? (For example, 50:1 odds) (Qu. 6)

Group of Respondents	Response				Total (N)
	Not very familiar (n)	A bit familiar (n)	Very familiar (n)	Unknown (n)	
<i>All Adults</i>	22% (62)	44% (120)	33% (90)	1% (4)	100% (276)
<i>“Incorrect” Adults</i>	22% (51)	44% (100)	32% (74)	1% (3)	100% (228)
<i>“Correct” Adults</i>	23% (11)	43% (20)	34% (16)	2% (1)	100% (48)
<i>Adult English-speakers</i>	19% (38)	45% (87)	35% (68)	1% (1)	100% (194)
<i>Adult NES</i>	30% (24)	41% (33)	27% (22)	2% (2)	100% (81)

It is notable that 68% (n = 32) of “correct” adults could recall studying statistics or probability, compared with only half of the “incorrect” adults (51%, n = 117). At its highest, this may suggest that meaningful exposure to mathematical concepts (in the sense that such exposure is *remembered*), prior to hearing statistical evidence, assists in a juror’s ability to comprehend and utilise that evidence. On the other hand, it may also only mean that those adults who correctly answered all of the yardstick questions were perhaps more comfortable with mathematics in the first place, and more likely to remember having studied statistics and probability in the past. In either case, a prior knowledge of statistics and probability self-evidently helped in successfully utilising the mathematical evidence.

In contrast, there was no significant difference between the “correct” and “incorrect” respondents when it came to familiarity with betting language. This question was designed to determine whether the mock jurors who may not have had a formal education in mathematics nevertheless may have been familiar with statistical notions through other means, such as gaming. If there had been such a group, and this group had

successfully answered the yardstick questions, then it would disprove the need to ensure real jurors have high levels of formal education when hearing complex cases. In this case, an informal familiarity with statistical concepts would have been enough. As the results show, however, the incorrect respondents were about as familiar with betting language as the correct respondents, (as approximately 75% of each group were at least “a bit familiar” with betting language).

Not surprisingly, given that betting language may differ between cultures, the non-English speaking respondents were slightly less comfortable with betting language, with 30% (n = 24) of such respondents reporting themselves as unfamiliar with the language, compared with only 19% (n = 38) of the English speakers. Nevertheless, given that a knowledge of betting language did not seem to improve the comprehension scores of other respondents, there is no suggestion that non-English speakers would themselves improve their utilisation of statistical evidence by becoming more familiar with gaming.

More importantly, real jurors are never asked about their prior knowledge of such matters, even in cases where evidence is likely to be mathematical and/or complex. This sort of information goes well beyond the scope of juror selection in all jurisdictions of Australia, where only a juror’s name and (possibly) occupation are made known to legal counsel and the court.

2.6 RESPONDENTS’ EVALUATIONS

2.6.1 *Were the questions clear? (Qu. 7)*

Respondents were surveyed as to whether they thought the questions were clear. This simplistic way of asking respondents to self-report any difficulties resulted in the majority of respondents replying that the questions were indeed clear. As expected, most of those who were able to answer the yardstick questions correctly were also those who found the questions to be clear (85%, n = 41). Nevertheless, even most of the “incorrect” adults found the questions to be clear (74%, n = 168), which suggests that they *thought* they had understood more than they actually *did* understand. This is an obvious danger with self-reporting, in that respondents would naturally like to think that they comprehended the information and satisfactorily handled the survey requirements.

Were the questions clear? (Qu. 7)

	Response			
Group of respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>All Adults</i>	76% (209)	21% (58)	3% (9)	100% (276)
<i>“Incorrect” Adults</i>	74% (168)	23% (52)	3% (8)	100% (228)
<i>“Correct” Adults</i>	85% (41)	13% (6)	2% (1)	100% (48)
<i>Minors</i>	59% (174)	36% (105)	5% (16)	100% (295)
<i>English-speakers</i>	66% (276)	30% (128)	4% (15)	100% (419)
<i>NES</i>	70% (104)	23% (35)	7% (10)	100% (149)

The respondents who did admit to finding the questions less clear were the children, 36% (n = 105) of whom reported that the questions were not clear. Given that the children’s responses to the substantive questions generally matched the adults responses, it can be implied that the adults either had to explain the questions to their children, or the children simply mimicked the substantive answers given by their parents.

Interestingly, slightly more of the non-English speaking respondents (70%, n = 104) thought the questions were clear than did the English-speakers (66%, n = 276), which is a surprising result, given that the non-English speakers had more difficulty answering the questions correctly. Given that the sample sizes are sizably different (n = 419 compared with n = 149) and that the non-English speakers may have thought that although the questions were clear, they were still *difficult*, a further question may have been justified: “Did you find the questions difficult? If so, why?”.

2.6.2 Imagine you had to serve on a jury in a criminal trial. If the evidence was given in words like those on the tape, would you be able to understand well enough to make a good decision? (Qu. 9)

	Response			
Group of respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>All Adults</i>	72% (197)	25% (70)	3% (9)	100% (276)
<i>“Incorrect” Adults</i>	68% (155)	28% (64)	4% (9)	100% (228)
<i>“Correct” Adults</i>	88% (42)	13% (6)	0% (0)	100% (48)
<i>Minors</i>	54% (159)	41% (121)	5% (15)	100% (295)
<i>English-speakers</i>	65% (273)	32% (134)	3% (12)	100% (419)
<i>NES</i>	56% (38)	38% (57)	6% (9)	100% (149)

If the adult respondents are considered in their totality, most of them felt confident that they would be able to make a good decision on the basis of DNA profiling evidence such as they heard on the tape, if they were on a real jury (72%, n = 197). This differs somewhat from the ability of most of those adults to correctly answer the yardstick questions (17%, n = 48). This result highlights the difficulty of having respondents self-report on their ability to cope with complex evidence. For despite their inability to differentiate between inculpatory and exculpatory evidence, recognise the effect of DNA profiling evidence on an otherwise equivocal prosecution case, and comprehend the statistics associated with DNA profiling evidence, most respondents who have taken the time to sit through a (mock) trial and subsequent deliberations, tended to think that their time was ably spent – that is, that they understood what they were doing and performed reasonably well (72%, n = 197).

Reassuringly, however, there was some relationship between confidence and ability – those respondents who answered all of the yardstick questions correctly were also those most confident in their ability to successfully handle the evidence (88%, n = 42) compared with the “incorrect” adults who were generally less confident (68%, n 155), and the non-English speaking respondents who were significantly less confident (56%, n = 38). This may have a positive affect in deliberations, if the more able jurors were also more confident in interpreting and utilising the evidence and were able to express this to other jurors.

2.6.3 Think of cases that depend a lot on forensic science evidence. What do you think is the percentage of the time that juries convict the wrong person? (Qu. 10)

[1% or less 1-5% 5-10% 10-20% More than 20%]

	Response						
Group of respondents	≤ 1% (n)	1-5% (n)	5-10% (n)	10-20% (n)	≥ 20% (n)	Unknown (n)	Total (N)
<i>All Adults</i>	28% (76)	25% (69)	13% (35)	14% (40)	12% (34)	8% (22)	100% (276)
<i>“Incorrect” Adults</i>	20% (46)	27% (61)	13% (31)	18% (40)	14% (32)	8% (18)	100% (228)
<i>“Correct” Adults</i>	63% (30)	17% (8)	8% (4)	0% (0)	4% (2)	8% (4)	100% (48)
<i>Minors</i>	12% (34)	30% (89)	21% (61)	20% (60)	14% (41)	3% (10)	100% (295)
<i>English-speakers</i>	24% (102)	30% (124)	15% (65)	15% (61)	10% (42)	6% (25)	100% (419)
<i>NES</i>	5% (8)	23% (34)	20% (29)	26% (39)	22% (33)	4% (6)	100% (149)

This question was designed to explore the level of confidence respondents felt about juries in general, given that juries are sometimes called to deliver verdicts on the basis of complex scientific evidence, a process which may result in wrongful convictions.

Infamous Australian cases such as those against *Alice Lynne (Lindy) Chamberlain*,¹⁹⁵ *Alexander McLeod-Lindsay*¹⁹⁶ and *Edward Charles Splatt*,¹⁹⁷ where scientific evidence was crucial to the prosecution and where convictions delivered via jury verdicts were later overturned, were considered to be significant. Nonetheless, respondents showed an overwhelming confidence in the jury system and cases that depend a lot on scientific evidence. More than half of all adult respondents (53%, n = 145) thought that less than 5% of all such jury cases resulted in wrongful convictions and two-thirds of adults (66%, n = 180) thought the figure was less than 10% of all cases. Only 12% (n = 34) of adult respondents thought that at least 20% of cases decided by juries, in which forensic scientific is important, are wrongly decided.

These results mirror research in other jurisdictions, in which prospective and former jurors and the community at large have expressed a high level of confidence in the jury system, even where they were largely ignorant of the jury's function.¹⁹⁸ In one such Russian survey for instance, "the general view of respondents was that the form of trial most likely to bring about a just result was a judge sitting with a jury" (compared with a trial by judge alone).¹⁹⁹ This was despite concerns by those in government and the judiciary, as to the ability of Russian jurors to cope with trials which might be "too scientific" or complicated.²⁰⁰

2.6.4 Have you ever served on a jury? (Qu. 11)

Note that this question was asked only of respondents from Liverpool Girls High School.

This question was added to the survey before it was administered at Liverpool Girls High School, and showed that very few of the respondents from that school had ever

¹⁹⁵ See The Hon. Justice Morling, *Royal Commission of Inquiry into Chamberlain Convictions*, Commonwealth, 1987.

¹⁹⁶ See The Hon. Justice Loveday, *Royal Commission of Inquiry into the Conviction of Alexander Lindsay*, 1991.

¹⁹⁷ See The Hon. Justice Shannon, *Royal Commission Report Concerning the Conviction of Edward Charles Splatt*, South Australia, 1984.

¹⁹⁸ Duff, P., Findlay, M., Howarth, C., & Tsang-fai, C. (1992). *Juries: A Hong Kong Perspective*. Hong Kong: Department of Law City Polytechnic of Hong Kong.

¹⁹⁹ Duff, P., & Findlay, M. (1997). Jury Reform: of Myths & Moral Panics. *International Journal of the Sociology of Law*, 25, 363.

²⁰⁰ Ibid.

served on a jury. (Adults who reside in Liverpool and are enrolled on the electoral roll are eligible for jury duty in Liverpool District Court.)

Have you ever served on a jury? (Qu. 11)

	Response			
Group of respondents	Yes (n)	No (n)	Unknown (n)	Total (N)
<i>All Adults</i>	6% (10)	91% (148)	3% (4)	100% (162)
<i>“Incorrect” Adults</i>	5% (8)	92% (139)	3% (4)	100% (151)
<i>“Correct” Adults</i>	18% (2)	82% (9)	0% (0)	100% (11)
<i>Minors</i>	2% (4)	95% (176)	3% (6)	100% (186)
<i>Adult English-speakers</i>	10% (8)	90% (72)	0% (0)	100% (194)
<i>Adult NES</i>	2% (2)	94% (76)	4% (3)	100% (81)

Earlier (mainly American) research has indicated that jurors who have previously served on a jury, may tend to be slightly more inclined towards conviction when serving on subsequent juries.²⁰¹ This relationship is affected, however, by whether the evidence they heard in previous cases was strong or weak, compared with the evidence in the current case.²⁰² Due to the very small number of respondents with prior jury service in the current research, and the lack of further details about that prior experience, no conclusions about the verisimilitude of the previous research can be drawn. One thing that is shown is the existence of false positives – note that four minors reported having served on a jury, despite the minimum age for jury duty in New South Wales being 18 years of age.

²⁰¹ Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622.

²⁰² Ibid.

2.6.5 Any comments? (Qu. 12)

DNA Profiling Evidence
<ul style="list-style-type: none"> • DNA gives good results (×1), DNA good (×1), DNA testing has great merit (×1) • DNA is a must (×1) • Can't convict on DNA alone (×1) • [Questions] g/k whole population (×1) • Convicting wrong person less with DNA (×1) • DNA should be used with all tests (×1) • All DNA tests should be carried out (×1), Need to be careful – do DNA testing many times (×1) • Guilty: DNA matches (×1) • Not enough info about DNA (×1) • Max time for tests should be 4 months (×1) • Test both the same to keep it fair (×1) • Statistics / odds are confusing (×2) • Should be easier to understand (×1)
Verdicts
<ul style="list-style-type: none"> • [Questions] g/k person innocent, not guilty (×8) • [Question] g / not guilty [Question] k / guilty (×1) • [Questions] g/k none acceptable (×1) • Verdict 100% sure no doubts (innocent) (×1) • Bad to convict innocent person (×1) • Guilty. Blood on knife/window was his (×1) • Guilty (×1) • Not guilty (×1) • 50% chance to give wrong decision (×1) • Innocent should never be convicted (×1) • Jury wrong (×3) • Hard to understand right way to convict (×2) • Morally difficult decision (×1)

DNA profiling generated several comments (n = 16, 3%), many of which strongly endorsed the value of this kind of evidence. As one respondent noted, “*DNA is a must*”, and another respondent was prepared to convict solely on the basis of the DNA profiling evidence “*Guilty: DNA matches*”. This was tempered, however, by the respondent who commented that “*[I] can’t convict on DNA alone*”, which may refer to the paucity of other evidence in this case, or to the fact that DNA profiling is of itself incapable of proving guilt or innocence, as the results are statistical and not an absolute identification, or, more simply, that there may be innocent explanations for the DNA of the accused being present at the crime scene.

Some comments showed misconceptions about the nature of DNA testing – “*DNA should be used with all tests*”, “*All DNA tests should be carried out*”, “*Test both at the same time to keep it fair*” and “*Need to be careful – do DNA testing many times*”. The latter comment seems to suggest that this respondent may have believed that the more times DNA testing is carried out the more accurate it becomes. This is the kind of misconception which could easily cause enormous confusion amongst a jury in a real court, if they were not explicitly disabused of the notion, or if the Crown and defence were minded to cloud the issue by arguing about the appropriate number of loci to be tested, the appropriate databases from which to draw statistics and so forth.

One response obliquely raised the spectre of DNA profiling results and absolute identification. The comment “*g/k whole population*” refers to the two questions which asked respondents what level of wrongful convictions would be acceptable to them (“1 case in _____”). This response has been included in the “Comments on DNA Profiling” table because as this respondent did not put a number in answer to either Question G or Question K, their comment might suggest that they would like DNA profiling which identifies *the one person in the whole population* who could have provided the DNA sample in question. Other respondents expressed disappointment that the DNA profiling evidence was not clearer (“*Should be easier to understand*”) and concern that the “*statistics / odds are confusing*”. This is not surprising given the community expectations as to straightforward DNA profiling evidence and the manner in which such evidence is commonly portrayed in the media and fiction (as absolute identifications).

Many respondents used the “comments” section to indicate whether or not they would find the accused guilty or innocent. Interestingly, the comments often linked the verdict to Questions G and K, which is surprising, given that neither question asked for a verdict, but rather asked respondents what level of wrongful convictions would be acceptable to them (“1 case in _____”). These two questions appear to be the most controversial in the survey, as they attracted the most comment and by far the highest non-response rates (up to 53%, whereas most other questions had single-digit percentages of non-responses).

The comments provided a mix of verdicts, however, the majority of respondents who did provide a comment would have found the accused not guilty (“*Verdict 100% sure no doubts (innocent)*”), and were to some extent critical of the hypothetical jury in the survey, which (hypothetically) was prepared to accept 1 in 4,000 or 400,000 or 4 million wrong convictions (“*Jury wrong*”). Many jurors expressed the difficult moral aspect of delivering a verdict, including the principle that “*innocent[s] should never be convicted*”. This provides a lesson in the relative nature of morals, however, as the juror who expressed this sentiment also wrote that 1 wrong conviction in 1,000 cases would be acceptable to them (Question G), and later revised this to 1 wrong conviction in 5,000 cases (Question K). Another juror was less indecisive, viewing the evidence uncritically and unequivocally: “*Guilty. Blood on knife / window was his*”. This response is instructive for two reasons: (a) There was no knife in this scenario and (b) this juror ignored or failed to understand the significance of the statistical qualifications on the DNA profiling (and, not surprisingly, scored only two comprehension points).

A few comments were received about juries in general, including two which pointed to the difficulties ordinary people may have understanding complex evidence. Where one respondent noted that understanding the language was crucial to understanding difficult concepts, another cryptically suggested that “educated people on juries” were perhaps necessary.

Finally, the respondent who commented that (s)he had been “convicted for something [(s)he] didn’t do”, was nevertheless prepared to convict the accused in this scenario, even stating that the initial blood tests completely proved John Jones was guilty.

2.7 REFLECTIONS ON THE SURVEY ITSELF

2.7.1 Delivery Method

Mock jurors were recruited through the selected school students at Melba, Chisholm and Liverpool Girls High Schools. This approach had the advantage that no mock jurors were paid for their participation (thus eliminating both an expense and a self-selecting mechanism) and it is likely that this method resulted in a broader range of mock jurors than the multitude of mock jury studies which use only university students.²⁰³

A disadvantage of the recruitment method was that the respondents were mostly children and parents of high-school-aged children. This resulted in a large concentration of 12-14 year old respondents, and a second large group aged between 25-44 years old. This might have made the pool of mock jurors less representative of the general population than would have been preferred, and rendered a large part of the results inapplicable to real juries (as the minimum age for jury service in Australia is 18 years). Nonetheless, this method was more likely to result in a broader range of respondents in terms of important factors²⁰⁴ such as education, occupation, socio-economic background and life experience, than methods using only university students (a method which is not uncommon in mock jury research).²⁰⁵

The results for respondents who were less than 18 years of age were included in this research because (a) in the near future these respondents will be old enough to qualify for jury duty and (b) it provided an interesting point of comparison to see whether children automatically answered the questions in the same way as their parents or older respondents did. Further discussion about the age distribution of the respondents is found below.

An enormous advantage of the delivery mechanism was that it allowed the expert evidence to be communicated without the usual complicating factors related to expert

²⁰³ Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622.

²⁰⁴ Shuman, D., Champagne, A., & Whitaker, E. (1996). Juror Assessments of the Believability of Expert Witnesses: A Literature Review. *Jurimetrics*, 36, 371.

²⁰⁵ Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622.

witnesses:²⁰⁶ Qualifications, communication skills, appearance and personality, impartiality and familiarity with the evidence, (all of which may vary enormously from real trial to trial), were effectively eliminated by having all mock jurors hear evidence given in summary form by a single person's voice (the mock judge).

A potential disadvantage of the delivery mechanism was that although an oral explanation of the research was given at each high school, only the students were present to hear this. Parents and friends (the other mock jurors) had written instructions and the brief taped instructions which accompanied the survey. All instructions were written in simple language, however, and it is noted that very few questions were asked by students when given the opportunity at the end of the oral session.

It is noted that the (family) groups of respondents in this research each completed the survey in their own (home) environment. This meant that the conditions for all respondents were not identical. Nevertheless, due consideration has to be given to the fact that even if real jurors were surveyed instead of mock jurors, the conditions in each jury room can widely vary, including the lighting, noise, privacy, space, smoking area availability and comfort of furnishings and facilities,²⁰⁷ all of which may also influence jurors responses to survey questions.

An advantage of having the stimulus material delivered by audio cassette tape²⁰⁸ was that respondents were free to rewind the tape and listen to all or part of it again. Although this was not expressly mentioned in the instructions, it is possible that some groups replayed the evidence. This is analogous to having a real judge (in an actual trial) read back sections of the court transcript – which is often what occurs when the jury asks a question.

²⁰⁶ Shuman, D., Champagne, A., & Whitaker, E. (1996). Juror Assessments of the Believability of Expert Witnesses: A Literature Review. *Jurimetrics*, 36, 371.

²⁰⁷ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

²⁰⁸ Audio and videotaped stimulus material have been used in the majority of mock jury studies since 1985 (Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622).

2.7.2 Facts Scenario

The facts scenario, including the DNA profiling evidence, was closely based on earlier work by Magnusson, and so was not extensively tested prior to being administered to the 571 respondents. In an attempt to do more than simply rely on the earlier work, the three CSIRO students involved in this specific research were asked to do the survey and assess its comprehensibility. They reported that the language was sufficiently clear and the survey form sufficiently easy for them to respond to, and, at the time, this was considered sufficient for the survey to be administered. In hindsight it would have been preferable to have the survey and transcript assessed by a language expert so that any shortcomings might be properly addressed before it was administered.

The reference to a “Caucasian” database pertains to how DNA profiling statistics are calculated. The frequency with which a particular DNA profile might appear within a community is highly dependent on which community is being discussed.²⁰⁹ The reference to a “Caucasian” DNA database is common and acceptable in Australia, however, where it has been established that separate databases for three broad racial groups (Aboriginals, Caucasians and Asians) provide sound and statistically reasonable results.²¹⁰

The transcript also refers to some fingerprints found on the television set, which were reported to match the fingerprints of the accused and of the pawn-broker. This additional information was included so that respondents knew that there *was* other evidence in the case, but that it was equivocal. If the television set had originally belonged to the accused, then the fact that his fingerprints were present, was to be expected. This evidence was designed to reinforce for the respondents that prior to the DNA profiling evidence being considered, there was a 50:50 chance that the accused was guilty.

²⁰⁹ Krane, D.E., Allen, R.W., Sawyer, S.A., Peteov, D.A., and Hartl, D.L., (1992) “Genetic Differences at 4 DNA Typing Loci in Finnish, Italian and Mixed Caucasian Populations” *Proceedings of the National Academy of Sciences of the USA*, 89: 10583, cited in Balding, D. J. (2000). *Interpreting DNA Evidence: Can Probability Theory Help?* In J. L. Gastwirth (Ed.), *Statistical Science in the Courtroom* (1 ed., Vol. 1, pp. 443). New York: Springer-Verlag.

²¹⁰ Ayres, K. L., Chaseling, J., & Balding, D. J. (2002). Implications for DNA Identification Arising from an Analysis of Australian Forensic Databases. *Forensic Science International*, 129, 90.

The facts scenario deliberately involved a burglary and not a more serious offence. The possibility of using a scenario involving murder or sexual assault was mooted, however, a burglary was chosen because (a) the research was being conducted through school children who ought not be unnecessarily exposed to violent scenarios; and (b) it is likely that respondents would react differently to the evidence if the repercussions of a guilty verdict were more serious.²¹¹ An interesting avenue for further research would be whether Australian respondents would require stronger DNA profiling evidence for crimes which carried a higher penalty, a phenomenon which has been demonstrated in other jurisdictions.²¹² Burglary was considered to be sufficiently serious that DNA profiling evidence would be used in a real prosecution, however not so serious that respondents' emotional or moral perspectives might interfere with their choice of verdict.

2.7.3 Sample Size and Response Rate

A significant sample size was achieved by delivering the survey through participating schools. Time and funding limits precluded surveying further schools, although clearly it would be possible to achieve a even more diverse mock juror sample by surveying more schools, particularly over a larger geographical and demographical area.

The average response rate of 61% reflected the high level of enthusiasm encountered at the schools, particularly at Liverpool Girls High School where the teaching staff were extremely co-operative and enthusiastic about the research. The greater proportion of responses from Liverpool Girls High School also reflected the larger number of students at this school, compared with the smaller schools at Chisholm and Melba.

It is noted that the population of respondents who completed the surveys was self-selecting, and that this may have some affect on the results. For example, it may be hypothesised that more conservative people would complete the survey, as they might feel more obligated to participate in school activities, may be more interested in law and order issues, and, as parents concerned about crime levels and punishment, might have been more likely to convict or at least lean towards the prosecution case. Self-selecting

²¹¹ Horowitz, I. A., Willging, T. E., and Bordens, K. S. *The Psychology of Law* (2nd ed). New York: Addison Wesley Longman, 1997, 270.

²¹² Simon, R.J., and Mahan, L., (1971) "Quantifying Burdens of Proof: A View from the Bench, the Jury and the Classroom" *Law and Society Review* 5:319 at 328.

populations are a given in this type of research, however, which was completely voluntary.

2.7.4 Variables

The DNA profiling statistics in this research (4,000 and 400,000) were very low compared with the results currently routinely reported by forensic laboratories. For example, the FBI no longer reports actual figures where the number is greater than 1 billion; in these cases the laboratory declares a match. Most Australian laboratories have not adopted this approach. They routinely report the actual numbers (for example, where there are nine loci matching in both the crime scene and suspect's samples the smallest number the Victoria Forensic Science Centre can give is 98 million and case results are usually in the billions).²¹³

Nevertheless, this research used low numbers so as not to overwhelm the mock jurors with seemingly unassailable DNA profiling evidence. Where numbers in the order of billions are used, anecdotal evidence suggests some jurors compare the numbers with the population size of Australia and find the DNA profile results incredulous: "How can a forensic biologist calculate that the odds of a match are one in five billion, when the population of Australia is only about 20 million?" This "dilemma" is in fact a misunderstanding of how DNA profiling statistics are calculated. The figures are based on the multiplication of probabilities for a match at each loci typed. As more sites are typed along the DNA double-helix, the figures (presuming a match is found at each locus) grow incredibly large. This does not mean that the statistical outcome is nonsensical because it may be larger than the population of an entire country, but rather that the particular combination of results at all of those loci is rare.

Thus, for the purposes of this research, an additional potential source of complication was removed, by using statistics that were perhaps less modern than they might have been, but were nevertheless sufficiently compelling for the objectives of the research, without being overwhelming.

²¹³ Personal communication to the author from Dr Henry Roberts, Forensic Scientist, Biological Examination Branch, Victoria Police Forensic Services Centre, Forensic Services Department, by telephone, 3 October 2002.

2.8 CONCLUSIONS

2.5.1 General

Recruitment of mock jurors through high schools was successful, in that a large number of respondents from a diverse range of educational, ethnic and other backgrounds were studied, and the method lends itself to repetition at other high schools to achieve even larger sample sizes and diversity. The use of a written survey with mostly closed-ended answers and a scenario provided by cassette tape also produced a satisfactory response rate for most questions and for the survey overall.

When faced with questions of evidence which objectively had a right and a wrong answer, most respondents were capable of answering most questions correctly. Importantly, however, very few mock jurors could totally and consistently comprehend and utilise the statistical evidence presented in this research. Furthermore, the ability to understand mathematical evidence was significantly compromised if the mock jurors did not speak English as their primary language. Language skills play an important role in the comprehension of complex evidence.

Given the extremely small number of respondents who reported having previously served on a jury, no conclusions could be drawn as to whether this affected how they comprehended or utilised scientific evidence.

2.5.2 To determine whether respondents could differentiate between inculpatory and exculpatory evidence (*Questions A and B*).

It can be concluded that most respondents were capable of recognising that DNA profiling evidence can not completely prove that a suspect is guilty. A significant proportion of respondents, however, failed to recognise this and would have found the accused guilty on the basis of the DNA profiling evidence alone. Those adults particularly likely to overestimate the power of the DNA profiling evidence were those who did not speak English as their primary language, those who had fewer years of high school education, and those who had not attended university.

All categories of respondents performed better in recognising that if two blood samples did not have a matching DNA profile, they could not have originated from the same source. Nevertheless, a significant cohort of respondents who on average had spent fewer years at high school, were less likely to have attended university, were far less likely to recall studying probability or statistics in the past or to consider themselves very familiar with betting language, were also significantly less confident in their ability to understand DNA profiling evidence well enough to make a good decision. These mock jurors were significantly less likely to comprehend the exculpatory nature of DNA profiling evidence, particularly if English was not their primary language.

These conclusions indicate the need for further research, to determine the extent to which case presentation and jury deliberations are able to overcome the significant difficulties that jurors with poor English skills, in particular, may have with comprehending that DNA profiling evidence is able to discriminate between possible sources of a biological sample, but not actually conclusively identify a particular source. Care needs to be taken in the presentation of DNA profiling evidence, that the term “match” is explained, so that jurors comprehend that the “match” refers only to the particular loci typed, and that the possibility exists (however small) that the samples may not match at other loci.

2.5.3 To determine the extent to which respondents comprehended basic statistics, including whether respondents were able to distinguish between low (4,000:1), high (400,000:1) and very high (4,000,000:1) odds ratios associated with DNA profiling evidence (*Questions A, C(i), E, H and I*).

Almost three quarters of English-speaking mock jurors demonstrated comprehension of basic statistics, by converting simple odds into percentages. In contrast, respondents who did not speak English as their primary language were significantly hindered in their ability to perform this simple calculation. This indicates that language can be a threshold problem, before any difficulties with the mathematics itself are even approached. In the presentation of statistical evidence therefore, it can not be assumed that jurors will be able to comprehend and cope with what seem to be very basic concepts and calculations. If the concepts and calculations are to be relied upon, it may

be necessary to do the calculations for the jurors and present the concepts in extremely simple language. The best way of presenting such material bears further research.

Respondents presented with very weak DNA profiling evidence (4,000 odds) recorded the same rate of conviction as those respondents presented with stronger DNA profiling evidence (400,000 odds). When both groups were presented with the strongest DNA profiling evidence in the survey (4 million odds), the increase in the rate of convictions was approximately the same for both groups. This suggests that the mock jurors had a baseline reaction to DNA profiling evidence, which was not affected by the strength of the evidence itself. The addition of stronger DNA profiling evidence simply persuaded more mock jurors to convict the accused. It bears further investigation as to whether this reflects an assumption held by the general public that DNA profiling evidence is *prima facie* extremely probative, reliable and important.

It also suggests that jurors are impressed by additional results and DNA profiles of increasing strength. When jurors were given additional information (stronger DNA profiling results), the majority correctly recognised the improvement and this was reflected in a higher rate of conviction. This probably means that as forensic laboratories test more and more loci along the DNA double-helix, and the resultant odds make it less and less likely that a crime scene sample belongs to someone other than the suspect (for example), jurors are increasingly likely to accept the DNA profiling results as a unique identification.

2.5.4 To determine whether respondents could analyse statistical evidence in a Bayesian framework, given evidence presented in such a manner (*Questions D, E and I*).

The majority of mock jurors in this study were able to intuitively combine evidence and update the probability of a person's innocence or guilt. Specifically, almost all English-speaking adult respondents recognised the impact of DNA profiling evidence on the case against the accused, even when it was expressed in statistical terms. Those respondents who did not speak English as their primary language were significantly less likely to recognise the "gist" of DNA profiling evidence, in that only two-thirds of such respondents recognised that the evidence strengthened the case against the accused. This

result however, is still a noteworthy indicator that most jurors are able to assess existing evidence (the prior probability), combine it with new evidence (in this case, DNA profiling results provided the likelihood ratio), and arrive at an appropriate answer (the posterior probability), if the process is couched in suitably simple language.

In terms of assessing evidence in a Bayesian framework not only intuitively, but in statistical terms, most jurors were capable of recognising the correct result. Although respondents were not asked to calculate posterior probabilities, the majority of English-speaking respondents appeared to be able to recognise the correct calculations, and just over half of the non-English speaking respondents were also able to do so. From these results it can be concluded that language is the most significant barrier to jurors being able to analyse statistical evidence in a Bayesian framework, rather than the Bayesian concept itself.

2.5.5 To determine the threshold at which respondents were satisfied that the evidence met the standard of “beyond a reasonable doubt” (*Questions C(ii), F, G, H, J, and K*).

Starting with the least persuasive evidence: Almost all English-speaking mock jurors recognised that evidence which gave only a 50% chance of guilt, did not meet the standard of “beyond a reasonable doubt”. (This was reassuring, but expected, as the result included only those jurors who had correctly answered a previous question, which required them to convert odds to percentages.) Jurors who did not speak English as their primary language, in contrast, were almost equally divided as to whether 50% was an acceptable threshold at which an accused could be pronounced guilty. This result, however, is tempered by the small number of respondents included in this particular question.

Given stronger evidence (of one in 4,000 or one in 400,000 chance of a wrong conviction), and the opportunity to convict, most respondents were still unconvinced that the evidence was strong enough to risk a wrong conviction. This applied to all demographics, irrespective of their language or whether they correctly understood the statistics in the rest of the survey. Clearly, the evidence had not persuaded most mock jurors that the guilt of the accused was beyond a reasonable doubt. This result was

largely verified by a direct question about whether the accused could be found guilty on the basis of the 4,000 or 400,000 DNA profiling evidence, to which the majority of respondents had replied “no”. The only group for which this did not hold was the non-English speaking jurors, most of whom answered that the results “completely proved” the guilt of the accused. This conflict indicates the confusion of this group of respondents, who showed less comprehension of the statistics related to DNA profiling evidence, for the duration of the survey. Otherwise, it can be concluded that whilst DNA profiling evidence may be important, it is not so overwhelming that jurors will automatically convict on this basis.

The question as to when the threshold of “beyond a reasonable doubt” had been met for the majority of mock jurors, proved an interesting one. For when the strongest DNA profiling evidence was provided (4 million) (evidence which was nevertheless still well below current DNA profiling capabilities), the majority of English-speaking respondents were satisfied that the evidence placed the guilt of the accused beyond a reasonable doubt. Respondents who did not speak English as their primary language were less convinced, although a majority of them would still have convicted. Notably, mock jurors who demonstrated the best comprehension of the DNA profiling evidence, were more likely to convict than were those adults who did not comprehend all of the evidence. These results were verified when respondents were asked about the risk of wrongly convicting one person in 4 million; the English-speakers confirmed that this risk was satisfactory; whereas the non-English speakers found it unacceptable; and the respondents who had correctly understood the statistical aspects of the evidence were more likely to find the risk acceptable than were those who had not understood all of the statistical evidence.

Approaching “beyond a reasonable doubt” from the perspective of the risk of a wrongful conviction, mock jurors who demonstrated a good understanding of statistics and spoke English as their primary language were more prepared to risk a wrongful conviction.

Overall, from these results it can be concluded that the standard of proof “beyond a reasonable doubt”, will not be automatically met by DNA profiling evidence of any strength. Mock jurors demonstrated that although DNA found at a crime scene may

match that of the accused at all of the loci studied, the strength of the evidence, including the likelihood of a wrongful conviction on its basis, were important factors in determining whether a verdict of “guilty” would be delivered.

2.5.6 To determine whether the high odds ratios typically encountered in DNA evidence would result in a correspondingly high rate of guilty verdicts, all other things being equal.

It can be concluded that mock jurors are not necessarily overwhelmed by DNA profiling evidence to the extent that they feel compelled to automatically convict on this basis. Nevertheless, DNA profiling results of remarkably low statistical significance are still sufficient to cause most mock jurors to deliver a conviction. This suggests the need for careful explanation of DNA profiling results, so that even if juries are still inclined to convict on relatively weak results, they nevertheless do so on the basis of proper comprehension of the evidence.

CHAPTER 3

AUSTRALIAN FORENSIC SCIENTISTS

- A VIEW FROM THE WITNESS BOX -

*“Dialogue between lawyers and forensic experts should be encouraged in order to ... achieve the establishment of a degree of understanding that is appropriate for the criminal justice system”*²¹⁴

3.1 INTRODUCTION

3.1.1 Science and the Law

Science may be characterised as an attempt to observe nature and methodically formulate theories which explain those observations, or to “find truth through the scientific method”.²¹⁵ This is not to suggest that science has a monopoly on truth or that science is necessarily impartial, objective or neutral. Many factors, such as:²¹⁶

social and economic pressures; institutional politics; diverse funding arrangements; shifting hierarchies and reward structures; ethical considerations; competition - whether financial, personal or disciplinary; a range of techniques, instruments and methods; different levels of relevance and potential application; complex relations with other professions; sensitivities to public concerns, especially around risk; changing public perceptions and levels of trust; and differing employment opportunities

shape the nature and content of the current “truth” in science. Nevertheless, science has, at its heart, the quest “to know” (*scire* in Latin).²¹⁷

Another forum in which the quest “to know” is paramount, is the law.²¹⁸ “Law” is derived from the Old English word *lagu*, literally meaning “something laid down or

²¹⁴ Wood, J. ‘Forensic Science From the Judicial Perspective’ (2003) 35(1) *Australian Journal of Forensic Sciences* 115-132 at 121.

²¹⁵ Walsh, S. J. (2005). “Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature.” *Forensic Science International* **155**: 51 at 54 citing Thompson, W. C. (1997). “A Sociological Perspective on the Science of Forensic DNA Testing.” *University of California Davis Law Review* **30**: 1113.

²¹⁶ Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131 at 134.

²¹⁷ Online Etymology Dictionary: www.etymonline.com.

²¹⁸ Jasanoff, S. (2005). Law’s Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S51.

fixed”.²¹⁹ Interestingly, the etymology of each word hints at the problems that law and science face when they intersect.²²⁰

“...[L]aw finds facts in order to settle disputes, whereas science makes claims to extend previous lines of inquiry and enable new ones to take shape.”²²¹

Science which pertains to legal trials (“forensic” science)²²² plays an invaluable role in modern legal processes, particularly in criminal trials where evidence linking the accused to the crime may be viewed as highly valuable, significant or probative. However, the courts cannot be a forum for ultimately determining the merits of scientific theories, applications or developments. Whereas the time frame for science to prove or disprove a theory is virtually endless²²³ and the frame of reference is open-ended,²²⁴ legal trials work on a tighter schedule and are framed specifically by the facts of the individual case.²²⁵ From the principles laid down by statute or in common law, criminal trials must proceed on what has been “fixed”, and, in the interests of the community and of the accused, be brought quickly to a resolution.²²⁶

This system requires advocates to assemble their case, marshal their witnesses and forge ahead in presenting their argument to the court.²²⁷ This provides a very narrow opportunity for them to fully assess, comprehend or utilise scientific evidence, or for scientific experts to assist in this process.²²⁸

²¹⁹ Online Etymology Dictionary: www.etymonline.com.

²²⁰ Walsh, S. J. (2005). "Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature." *Forensic Science International* **155**: 51.

²²¹ Jasanoff, S. (2005). Law's Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S52.

²²² From the Latin *forensis* (of a forum, place of assembly). Online etymology dictionary: www.etymonline.com.

²²³ Compare the “earth as the centre of the universe” theory at the time of Aristotle (4th century BC) and Ptolemy (c. 90- c. 168) with the vastly different heliocentric model later proposed by Copernicus (1473-1543) and Galileo (1564-1642).

²²⁴ Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Forensic Science International*, 159, 148 at 157.

²²⁵ Jasanoff, S. (2005). Law's Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S52; Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 56.

²²⁶ For a discussion of how law nevertheless shares many similarities with science, see Jasanoff, S. (2005). Law's Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S51.

²²⁷ Poole, D. (1994). The Expert and the Advocate. *Forensic Science International*, 68, 75 at 75.

²²⁸ In some cases, there is a significant “gap between the putative reality and the legal outcome.” For example, in the Azaria Chamberlain case, Mrs Chamberlain was eventually pardoned but “we still don’t

The crux of the matter is that if two experts vehemently disagree about the conclusions that should be drawn from the same data, one view or the other must prevail in court so that the primary dispute can be concluded. In reality, both experts may be entirely, objectively, justified in their views,²²⁹ but only time will eventually tell whether one or both views was in fact scientifically correct or incorrect.

In this context, in an attempt to assist the court in determining whether expert evidence should even be admitted into trials, other jurisdictions have established particular tests.²³⁰ In the USA, *Frye* set the standard of admissibility for expert evidence as “general acceptance” within the relevant scientific community.²³¹ In *Daubert*,²³² based on the Federal Rules of Evidence²³³ it was held that before admitting expert evidence, a judge must assess whether the expert opinion is not only relevant, but is based on scientifically valid methodology. Factors bearing on this include (the court was at pains not to provide an exhaustive list) whether the methodology rests on scientific methods and has:

- Been peer reviewed and published;
- Been and can be tested (falsifiability²³⁴);
- A known or potential error rate; and
- Widespread acceptance within the relevant scientific community.

know what [really] happened [regarding the actual cause of damage to Azaria’s jumpsuit or her death]”. Edmond, G. (1998). Azaria's Accessories: The Social (Legal-Scientific) Construction of the Chamberlains' *Guilt and Innocence*. *Melbourne University Law Review*, 22, 396 at 438.

²²⁹ Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy at 3; Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131 at 136.

²³⁰ Some jurisdictions have avoided establishing particular tests, too. See Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Forensic Science International*, 159, 148 at 155-6 for a discussion of (the lack of) admissibility rules in UK law.

²³¹ *Frye v. United States*, 293 F 1012 (1923); 54 App. D. C. 46, 47, 293 F. 1013, 1014.

²³² *Daubert v. Merrell Dow Pharmaceuticals* (92-102), 509 U.S. 579 (1993).

²³³ Federal Rules of Evidence (US) Rule 702: “Testimony by Experts: If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.”

²³⁴ Karl Popper, *The Logic of Scientific Discovery*, 1959.

Australian courts are not bound by the *Frye* or *Daubert* tests,²³⁵ relying instead on the common law²³⁶ and a more general rule for admission of expert evidence: A witness is allowed to express their opinion - for example about the results of scientific tests or the conclusions to be drawn from those results - if that person has specialised knowledge based on the person's training, study or experience.²³⁷ In the New South Wales Supreme Court, Court of Appeal, Heydon JA specified that in order for evidence that has been tendered as "expert evidence" to be admissible:²³⁸

1. It must be agreed or demonstrated that there is a field of "specialised knowledge";
2. There must be an identified aspect of that field in which the witness demonstrates that by reason of specified training, study or experience, the witness has become an expert;
3. The opinion proffered must be "wholly or substantially based on the witness' expert knowledge";
4. So far as the opinion is based on facts "observed" by the expert, they must be identified and admissibly proved by the expert, and so far as the opinion is based on "assumed" or "accepted" facts, they must be identified and proved in some other way;
5. It must be established that the facts on which the opinion is based form a proper foundation for it; and
6. The opinion of an expert requires demonstration or examination of the scientific or other intellectual basis of the conclusions reached: that is, the expert's evidence must explain how the field of "specialised knowledge" in which the witness is expert by reason of "training, study or experience", and on which the opinion is "wholly or substantially based", applies to the facts assumed or observed so as to produce the opinion propounded.

Challenges to scientific evidence in Australia have shifted in the decades since "forensics" became a fundamental ingredient of any prosecution. For instance, in the

²³⁵ American research suggests *Daubert* may be realistically beyond the capabilities of many judges anyway, apart from offering them a pseudo-scientific front for making discretionary decisions about the admissibility of scientific and technical evidence. See Jasanoff, S. (2005). Law's Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S53 and the findings of Gatowski, S. I., Dobbin, S. A., Richardson, J. T., Ginsburg, G. P., Merlino, M. L., & Dahir, V. (2001). Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-*Daubert* World. *Law and Human Behaviour*, 25(5), 433.

²³⁶ The Australian High Court has not yet delineated a clear position for the reception of expert evidence at common law and some common law rules have been specifically abolished by the various *Evidence Acts*. Compare *HG v R* (1999) 197 CLR 414; 160 ALR 554; *R v Gilmore* [1977] 2 NSWLR 935; *R v Pantoja* (1996) 88 A Crim R 554 and *Osmond v R* (1998) 197 CLR 316; 159 ALR 170, as discussed in Justice Wood, J. (2003). Forensic Sciences From the Judicial Perspective. *Australian Bar Review*, 23, 1 at 14.

²³⁷ See for example the *Evidence Act* 1995 (NSW) s79.

²³⁸ *Makita (Australia) Pty Ltd v Sprowles* [2001] NSWCA 305 at [85]; (2001) 52 NSWLR 705 at 743.

field of DNA profiling, significant legal challenges to the admissibility of the evidence have been mounted,²³⁹ but in Australia at least, profiles generated from the *ProfilerPlus* system²⁴⁰ are routinely admitted as evidence, and the debate now centres elsewhere.²⁴¹

3.1.2 How Much Scientific Evidence is “Enough”?

The introduction of DNA profiling technology²⁴² generated a new level of expectation as to what forensic science could provide in criminal cases.²⁴³ Public interest in “forensics” and the potential for scientific endeavour to uncover hitherto unknown information about crimes, crime scenes and suspects exploded in a proliferation of media coverage, entertainment and legal debate.²⁴⁴

Concurrently, the workload of forensic laboratories involved in establishing databases, developing protocols and procedures for sample collection, handling, testing and analysing DNA was immense and has not decreased over time.²⁴⁵ In fact, some laboratories report that due to the massive workload associated with DNA sampling for current and past crimes,²⁴⁶ some cases are inevitably arriving at court without all of the possible forensic work having been completed.²⁴⁷ This situation is not ideal, but is a

²³⁹ *R v Tran* (1990) 50 A Crim. R 233; *R v Lucas* (1992) 2 VR 109; *R v Jarrett* (1994) 62 SASR 443; and *R v Karger* (2002) 83 SASR 135.

²⁴⁰ Justice Wood, J. (2003). Forensic Sciences From the Judicial Perspective. *Australian Bar Review*, 23, 1 at 3; Walsh, S. J., Ribaux, O., Buckleton, J. S., Ross, A., & Roux, C. (2004). DNA Profiling and Criminal Justice: A Contribution to a Changing Debate. *Australian Journal of Forensic Sciences*, 36, 34 at 36.

²⁴¹ Walsh, S. J., O. Ribaux, et al. (2004). "DNA Profiling and Criminal Justice: A Contribution to a Changing Debate." *Australian Journal of Forensic Sciences* 36: 34 at 35; Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 58; Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at 270.

²⁴² Jeffreys, A. J., A. Wilson, et al. (1985). "Individual Specific "Fingerprints" of Human DNA." *Nature* 316: 75; Jeffreys, A. J., V. Wilson, et al. (1985). "Hypervariable Minsatellite Regions in Human DNA." *Nature* 314: 67; Gill, P., A. Jeffreys, et al. (1985). "Forensic Application of DNA "Fingerprints"." *Nature* 318: 577.

²⁴³ Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 53.

²⁴⁴ Ibid.; ABC Radio National. (2005). *The Science Show - The Truth About CSI* (9 April). ABC Radio National 9 April [2005, 19 May] at 1.

²⁴⁵ ABC Radio National. (2005). *The Science Show - The Truth About CSI* (9 April). ABC Radio National 9 April [2005, 19 May] at 1.

²⁴⁶ Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at footnote 9.

²⁴⁷ For “a black day in the history of the administration of justice in Queensland” see *R v Button* [2001] QCA 133.

natural result of finite funding and resources available to cater for incoming cases and past cases.²⁴⁸

Nor is the phenomenon unique to Australia. In Canada it has been noted that:

---[T]he desirability for increased training, education, monitoring and supervision, proficiency testing, the increased documentation of scientists' work and their contacts with others, and more complete and accurate report-writing...[though of] critical importance, they can also result in increased backlogs, since they take away from the time that scientists otherwise have to conduct casework. ...[I]t takes a lot of time to write reasonably full reports; if those kinds of reports are desired, sufficient resources have to be put into a laboratory to allow scientists the time to write them. ...[A] critical mass of expertise and resources must be maintained at a laboratory in order to do trace work properly, and it must be accepted that an analyst may have to spend months on one case.²⁴⁹

Thus time and money are not the only factors which influence the quality and quantity of forensic work which is carried out in any particular case. Further to this, is the necessary recognition that realistically, cases and the work done in support of those cases must of necessity be prioritised. This prioritising occurs from the time of the initial investigation, continues through the analysis of the forensic samples, and occurs at an organisational and laboratory-bench level.

Although resources are a significant issue in this equation, it is a fact of life that no government is going to write a blank cheque and that some degree of case prioritisation will always be a necessary element in the management of cases. --- [F]orensic scientists have to make decisions about what is examined and what is not examined in almost every case - this is based on information available and professional judgement. Dare I say it, experience does count. If the judgement of the scientist were to be constantly questioned to the point of undermining their credibility then the very real danger is that they (particularly crime scene examiners) would simply collect everything. This would have the inevitable consequence of creating the forensic equivalent of "gridlock" which would not serve the justice system well.²⁵⁰

²⁴⁸ Some commentators suggest this heightens the risk of fabrication or tampering with DNA profiling results to meet the expectations of police, courts and juries: Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at 280.

²⁴⁹ Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences, Recommendation 33 at 399.

²⁵⁰ James Robertson, Personal communication, 16 May 2006 by email.

In this environment, the view of forensic scientists, who are effectively the intermediaries between forensic science organisations and the courtroom, is a perspective from which insight can be drawn about how forensic services might better be understood and utilised.

3.1.3 Beyond Admissibility: Testing the Evidence

Forensic science must be relevant to the context in which it is conducted (that is, scientific work conducted for the purposes of the court), and as an extension of this, it must be relevant to either or both of the prosecution and defence case theories. This may be termed the *adversarial strength* of the evidence. As a necessary background to this, the science itself must also be inherently reliable, valid, and appropriate for the chosen purposes. This may be termed the *scientific strength* of the evidence. If either of these strengths is lacking, the deficiency needs to be disclosed, assessed, and if necessary, the evidence ought not be used.

In cases where scientific strength has been unknown, ignored or neglected, miscarriages of justice are apt to follow.²⁵¹ An unfortunate example of misusing and overstating the results of a presumptive test occurred in *R v Chamberlain*²⁵² where a presumptive test for foetal blood was misinterpreted to conclude that foetal blood had in fact been found, in great quantities, in the car of the accused. That led to the following conclusions:²⁵³

Preliminary tests should only be used to guide scientists in the direction of further testing. The use of such results in evidence in court should be minimal. Even accompanied by statements that the test is non-conclusive will not remove the aura of scientific accuracy that surrounds scientific tests. Scientists sometimes do not know the specificity limits to the tests they use. Lawyers need to be aware not only to challenge an expert's credentials and expertise, but also to seek independent expert advice to gauge the reliability of test results.

²⁵¹ Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S109; Johnson, P. (2004). The Sally Clark Case: Another Collision Between Science and the Criminal Law. *Australian Journal of Forensic Sciences*, 36, 11.

²⁵² Bourke, J. (1993). Misapplied Science: Unreliability in Scientific Test Evidence. *Australian Bar Review*, 10, 123 at 129.

²⁵³ Bourke, J. (1993). Misapplied Science: Unreliability in Scientific test Evidence PART 2. *Australian Bar Review*, 10(3), 183 at 187.

An appreciation of the limits of what can be concluded from a presumptive test (that is, *nothing*, unless conclusive tests are then carried out) is obviously necessary for the pursuit of justice in court. It is insufficient for the expert witness alone to know the difference between presumptive and conclusive tests - it is necessary for the lawyer drawing evidence from the witness to also fully comprehend the difference - otherwise the judge of the facts (particularly a jury) is susceptible to accidentally misinterpreting the significance of the results of a merely presumptive test. The jury ought to have been enlightened about the scientific deficiencies in the method; if they had known the full extent of the limitations of the presumptive ortho-tolidine test and the fact that the manufacturer of the subsequent tests had not ever intended it to be used for this purpose, their view of the positive result for foetal blood may have been severely diminished and the adversarial strength of that result for the prosecution may also have been (rightly) diminished.

In another high profile example, the *Morin* case in Canada, it was recommended that:²⁵⁴

Evidence of a preliminary test, such as an 'indication of blood,' does not have sufficient probative value to justify its reception at a criminal trial as circumstantial evidence of guilt.

[I]t is no answer to say that the limitations of this evidence were explained to the jury (which they were). It is equally no answer to say that this evidence has little probative value by itself, but becomes significant when taken together with the other evidence (which was the approach advocated by the Crown). The trial judge's rulings on admissibility demonstrated his view that this evidence acquired heightened probative value, when considered together with the other evidence against Mr. Morin. With respect, I disagree. The simple answer is that the evidence was valueless in proving that [the victim] was in the [car of the accused] and ought not to have been admitted.

Absent special circumstances, evidence of preliminary testing results such as 'indications of blood' has insufficient probative value to justify its reception as circumstantial evidence of guilt in a criminal case. The emergence of such evidence in notorious miscarriages of justice or potential miscarriages of justice is not co-incidental.

Nor is it the entire answer to the problem to suggest that prosecutors and defence counsel need to seek more information about the scientific evidence they use.²⁵⁵ It must

²⁵⁴ Excerpted from Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences at 327.

also be noted that that scientific results may be manufactured, contaminated, falsified or overstated.²⁵⁶ As one senior Crown counsel said to the Commission into the *Morin* case:

I must say, this Inquiry has opened my eyes, and has quite frankly horrified me to realize how vulnerable we all are, Crown and defence, to the experts. We have no way of really being able to second-guess their testing, or even, quite frankly, to really understand its deficiencies, and to think that experts would not reveal to us significant data is really quite scary. I hope and trust this is isolated, but it really means that we, then, are the victims; we, Crown or defence, can become the victims of the experts.

.....

Well, we have to be wary now. We weren't wary before. We have to be wary now; our new directive represents progress on this regard. We have to make it crystal clear to the expert that we're not asking for anything more or less than the truth and objectivity.

Even without deliberate foul-play by forensic scientists, the nature of *forensic* science - the collecting of samples from real crime scenes and from suspects, rather than using flawless, research-quality samples - means that other factors influencing the quality of the scientific work inevitably come into play. Harking back to the *Chamberlain* case, it has been said:²⁵⁷

Lawyers must refrain from concluding, when ignorant of scientific philosophy, principles, and processes, that scientific malpractice is the cause of any problem. Inaccuracy may result from procedural flaws and less than ideal sample quality. Inaccuracy may be caused by poor application of scientific principles, using preliminary tests to express firm conclusions. Inaccuracy may also result from procedural flaws, which are in no part due to poor sample quality.

Thus, there is a danger in scientific evidence being presented in cases where the internal scientific strength of the evidence is weak. In an ideal world, forensic scientists would have the will and opportunity to give full disclosure about the limitations of, and issues with, their evidence,²⁵⁸ prosecutors would be knowledgeable enough to recognise poor evidence and either properly explain it in court or exclude it from their brief, and if this

²⁵⁵ Inadequate defence resources may also play a critical role in the quality and quantity of evaluation of scientific evidence. Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S110.

²⁵⁶ Ibid.

²⁵⁷ Bourke, J. (1993). Misapplied Science: Unreliability in Scientific Test Evidence. *Australian Bar Review*, 10, 123 at 126.

²⁵⁸ Dutton, G. (1998). The Importance of Being Impartial. *Association of Firearm and Toolmark Examiners Journal*, 30(3), 523.

failed, the defence would be knowledgeable enough to detect the flaws and appropriately expose them in court.

3.1.4 Science and the Legal Profession

“Obviously a barrister cannot be expected to dash out and do a quick PhD in immunochemistry merely because the brief contains some mention of blood tests, but one can absorb something of that narrow sliver of the scientific knowledge necessary to arrive at a reasonable understanding of each test or observation.”²⁵⁹

Expert witnesses exist to provide the court with information which will assist the triers of fact in adjudicating a case. In theory at least, the more qualified and experienced the expert, and the more comprehensive their tests and results, the more assistance they will be able to provide. The ability of an expert witness to communicate their findings, however, including any reservations they may have about them, is significantly influenced by the lawyers who examine and cross-examine them in court.²⁶⁰

How well is scientific evidence examined and cross-examined in Australian courts? Is it communicated ably and helpfully to the finders of fact (judges or juries)? According to surveys of the bench, judges and magistrates believe improvements could be made.²⁶¹ The view from the witness box, that is, the views of forensic scientists, the people called upon to develop, use and explain scientific methods, procedures and techniques, have never been comprehensively canvassed, prior to the research reported in this chapter. In addition, there is a dearth of scientific literature directed at scientists or lawyers, to help the two communities bridge the gap in communication and better understand how science and law can interact.²⁶² Nevertheless, forensic science has much to contribute to

²⁵⁹ Justice Crispin, K. (1992). Coping with Complexity. *Australian Journal of Forensic Sciences*, 24(3), 74 at 75.

²⁶⁰ Litigation Lawyers Section. (1997). Expert Evidence - Proposal in the Federal Court. *Litigation Lawyer*, 31(April/May), 21 at 21; and, as lawyers have remarked, the final call on how a case is presented must be made by the advocates, after all; “Cases cannot be run by committee.” Poole, D. (1994). The Expert and the Advocate. *Forensic Science International*, 68, 75 at 76.

²⁶¹ Freckelton, I., Reddy, P., & Selby, H. (2001). *Australian Magistrates' Perspectives on Expert Evidence: A Comparative Study - Summary of Key Findings and Outcomes*. Melbourne: Australian Institute of Judicial Administration at 1.5.

²⁶² Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 52 reports that approximately only 1.3% of articles in five major forensic periodicals have been directed at legal or legal-DNA issues since 1990.

any discussion as to how scientific evidence is²⁶³ and ought to be characterised and presented in court.²⁶⁴

3.1.5 Forensic Science and the Prosecution

Experts are called to court to answer the questions. They are not given *carte blanche* to expound upon their methods, findings or conclusions; nor should they be, as the purpose of the court is to determine a case, not to provide a forum for scientific ideas, debates or developments. It is imperative, however, that the prosecution is sufficiently knowledgeable about the evidence that it can be adequately and clearly expressed through examination-in-chief and re-examination. As has been noted in other jurisdictions:

“Lawyers can no longer afford to hold empirical science as essentially a *terra incognita*, an unknown area they are determined never to set foot on if they can avoid it.”²⁶⁵

Prosecutors are in the difficult position of having to utilise and present evidence which may be well outside of their own academic experience or expertise.

“Most lawyers do not have basic knowledge of research methods or procedures such as the formulation and testing of hypotheses, the systematic recording of data, the requirement to replicate research results, and standardised forms of analysis.”²⁶⁶

Their ability to successfully communicate the content and significance of scientific evidence may be limited not only by their own background, but hampered by short trial preparation times; court protocols and rules of evidence which restrict the evidence which can be adduced and the way it can be delivered;²⁶⁷ the background knowledge of members of the judiciary who must preside over the delivery of expert evidence; an unknown knowledge-level amongst jurors; and limited opportunities for communication

²⁶³ This contribution, though naturally limited to the perspectives of just one group within the justice system (Edmond, G. (2003). *After Objectivity: Expert Evidence and Procedural Reform*. *Sydney Law Review*, 25(2), 131 at 144-5), is nevertheless valuable.

²⁶⁴ Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 54.

²⁶⁵ Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Ibid.*, 159, 148 at 156, citing the Dutch legal psychologist HFM Cronbag.

²⁶⁶ Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Ibid.*, 67, 79 at 84.

²⁶⁷ Justice Goldring, J. (2003). An Introduction to Statistical 'Evidence'. *Australian Bar Review*, 23, 1 at 8.

between juries and the court if the former need further explanation or clarification of scientific evidence.

A prosecutor's knowledge must include more than "knowing the results". Scientific "results" consist of a number of important elements. Often they may be bare numbers associated with the results (for example, a quantity of white powder found at a suspect clandestine laboratory may weigh 8.765 kilograms and may consist of 1% pure methamphetamine.) The true significance of the results may not lie solely in the numbers themselves, however, but in what they signify in context. (For example, the co-offender who is accused of possessing only 0.2345 kilograms of white powder from the same laboratory may actually deserve a more severe punishment if the proportion of methamphetamine in their sample is 55%). Thus, it would be important to understand *which* numbers are significant (that is, the percentages in combination with the gross amounts) and how this ought to be presented so that the trier of fact understands which numbers are significant. (Furthermore, it may be the case that neither of these suspects deserve a harsher penalty than the third person in the laboratory, who was found to not have any methamphetamine per se, but rather possessed a large quantity of precursor material, which if treated in a manner likely to occur in that laboratory, would have yielded 100 kilograms of pure methamphetamine product - more drug than was possessed by the other two suspects combined.)

Thus the significance of the results does not lie in the bare numbers, but rather in the additional knowledge the expert witness may be able to provide about what is actually important and about the context of the situation. If lawyers know about only the bare bones of the results, and do not understand what the results really *mean*, they have denied themselves the opportunity to fully and properly present their case.

A different kind of failure to completely understand the results may arise if lawyers do not appreciate the scientifically significant parts of the results. For example, the fibres found in a suspect's car may "match" the fibres of a victim's clothing. On its own, this result may seem extremely persuasive and significant. The scientific significance of this part of the results would be severely diminished, however, if that particular type of fibre is used in 95% of clothing manufactured in Australia and in 50% of car upholstery. What may be significant in the opinion of the expert witness, is that the tensile strength

of both sets of fibres is exactly the same, which would not be expected unless they were produced at the same time on the same manufacturers equipment et cetera, or that the discoloration of both sets of fibres appears to be perfectly matched. This latter information may or may not be included in an expert's report, however, it is vital if the lawyer is to understand, and communicate, the significance of the results beyond the fact that the fibres "matched".

It has been suggested that formalised training for lawyers is a necessary step in ensuring that expert evidence is properly presented and tested, thereby minimising the risk of miscarriages of justice such as *R v Chamberlain* reoccurring:²⁶⁸

It is not suggested that lawyers be educated on the intricacies of each and every test: that is impractical and unnecessary. The education content should provide an introduction to scientific concepts and a reference point for further inquiry, much as legal education provides its undergraduates.

Educational programs need to reach as many lawyers involved in the criminal process as possible. The issue should be a component of the undergraduate law degree subject of Evidence, and a variety of seminars, conferences and short training courses made available to groups of barristers, Legal Aid Commission solicitors, and barristers and solicitors for the Crown.

This is a plausible and worthy suggestion, however, aside from general information and training, it is clearly vital for lawyers to acquire knowledge about the relevance of the results in the context of each case, in order to avoid misunderstandings or misuse of forensic science in court. This sort of case-specific information is available from the expert who will be called to give the evidence in court; it is called a pre-trial conference. Unfortunately, preliminary investigations for this chapter suggested that the forensic science community in Australia suffers from a dearth of pre-trial contact with legal advocates. Further investigation was warranted to determine whether this was a widely-held view and whether more could be done to persuade advocates to engage more thoroughly in pre-trial preparation with their expert witnesses for criminal trials.

²⁶⁸ Bourke, J. (1993). Misapplied Science: Unreliability in Scientific test Evidence PART 2. *Ibid.*, 10(3), 183 at 192.

3.1.6 Forensic Science and the Defence

“Arguably the best defence barrister I ever faced ... would, after implying that the witness was biased, ask an apparently unrelated question which seemed out of context and then, with a sequence of questions, create a logical trap that ended in the expert having to choose between denying an obviously true fact and contradicting a previous answer ... Even knowing his technique, I have never successfully avoided it.”²⁶⁹

Advocates for the defence in a criminal trial have the responsibility of ensuring that the case against the accused is thoroughly tested and questioned. This includes the right to thoroughly test and question witnesses called by the prosecution,²⁷⁰ including an examination of whether or not the witness’ evidence is biased.²⁷¹ This is an important part of the criminal law, because ultimately the prosecution case must be proved beyond a reasonable doubt, and if it is so proven, the accused is found guilty. Lesser standards of evidence are insufficient, because the implications of a guilty verdict can be so profound. In this context, effective cross-examination is the lynchpin in the “check and balance” ideology of the adversarial system,²⁷² and is fundamental to the just operation of the legal system.²⁷³

In pursuit of their goals, the defence are entitled to question and probe scientific evidence and the expert who presents it to the court, but face similar obstacles to the prosecution in their comprehension and use of scientific evidence.²⁷⁴ In addition, for the defence, “access to an independent laboratory equipped to carry out testing and provide expert evidence on a Crown case can not be taken for granted because it is not

²⁶⁹ Lawrence, C. (2002). *Differences Between Adversarial and Inquisitorial Legal Systems*. Unpublished manuscript, Hobart. at 1.

²⁷⁰ Largely unfettered by the rules and requirements, such as full disclosure, which affect the prosecution. Poole, D. (1994). The Expert and the Advocate. *Forensic Science International*, 68, 75 at 76.

²⁷¹ Justice Wood, J. (2003). Forensic Sciences From the Judicial Perspective. *Australian Bar Review*, 23, 1 at 15.

²⁷² Particularly because criminal trials call for a modification of a purely adversarial system to address the rights of the accused (who need prove nothing). See Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy at 11 and footnote 28 for further references; also *R v Carroll* (2002) 77 ALJR 157; (2002) HCA 55 at [21].

²⁷³ Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 84; Litigation Lawyers Section. (1997). Expert Evidence - Proposal in the Federal Court. *Litigation Lawyer*, 31(April/May), 21 at 22.

²⁷⁴ See Haesler, A. (2005). *DNA for Defence Lawyers*. Lawlink. Available: http://www.lawlink.nsw.gov.au/lawlink/pdo/ll_pdo.nsf/vwPrint1/PDO_dnaforlawyers [2005, 12 January] for a rare and excellent discussion of DNA evidence by a defence lawyer, from the defence perspective.

guaranteed”²⁷⁵ and may not be affordable.²⁷⁶ In this context, skilful cross-examination which raises a reasonable doubt in the mind of the fact-finder, may be achieved through well-informed comprehension of the issues. Cross-examination designed to bewilder and confound, however, may also be sufficient to raise a doubt in the mind of the fact-finder and render a verdict of not guilty. In the latter case, the veracity and significance of the scientific evidence may be the primary casualty.

Another outcome of vigorous cross-examination may be an attack on the credibility of the scientific witness. Standard rules of practice for advocates in the conduct of criminal trials include the following:²⁷⁷

Responsible use of privilege

21.1 A practitioner must, when exercising the forensic judgements called for throughout a case, take care to ensure that decisions by the practitioner or on the practitioner’s advice to invoke the coercive powers of a court or to make allegations or suggestions under privilege against any person:

- (a) are reasonably justified by the material then available to the practitioner;
 - (b) are appropriate for the robust advancement of the client’s case on its merits; and
 - (c) *are not made principally in order to harass or embarrass the person;*
- and*

21.4 A practitioner must not cross-examine so as to suggest criminality, fraud or other serious misconduct on the part of any person unless:

- (a) the practitioner believes on reasonable grounds that the material already available to the practitioner provides a proper basis for the suggestion; and
- (b) *in cross-examination going to credit alone, the practitioner believes on reasonable grounds that affirmative answers to the suggestion would diminish the witness’s credibility.*

Unfortunately, in instances where the evidence is complex, and may be beyond the comprehension of lawyers, judges or juries in the limited time-frame available in court, it may be easier for legal counsel to only assail the credibility of the witness rather than to properly probe the evidence. This is a charge that has been raised as a point of concern by judges, one of whom declared that “I find that most barristers when faced

²⁷⁵ Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 84.

²⁷⁶ Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S108, S110.

²⁷⁷ (*Emphasis added*). Law Society of the Australian Capital Territory Professional Conduct Rules September 2003. See also the Law Society of New South Wales Professional Conduct and Practice Rules, and the NSW Barristers Rules (made under the Legal Profession Act 1987) and the Victorian Bar Inc. Practice Rules, Rules of Conduct and Compulsory Continuing Legal Education Rules.

with a charlatan are not prepared for a boot-and-all cross-examination.”²⁷⁸ The implications of this are two-fold, as witnesses may be unduly personally or professionally harassed on the stand,²⁷⁹ when really, adequate attention ought to be paid to testing the content of their results and opinions. In such cases, the unsatisfactory result may be that the expert is attacked and the evidence is left largely unexamined.²⁸⁰

Ideally, this would be rectified by the defence consulting their own experts, however, in Australia the pool of experts available outside of government and/or police funded organisations is not large.²⁸¹ Defence counsel in criminal trials who seek to oppose the prosecution’s scientific evidence are forced to consult within the existing government/police bodies (clearly an unsatisfactory solution which has obvious tensions for the scientific organisation), consult with experts from a government/police organisation in another state or jurisdiction (which may incur delay), or import expertise from overseas (which may incur considerable expense and delay).²⁸² For this reason, it is not common for the defence to marshal their own panel of expertise, but more common for them to rely on probing the prosecution’s witnesses through cross-examination.

In other jurisdictions the need for more extensive services outside of government/police confines has been noted, and failing this, the need for protocols to ensure defence access to scientific opinion is realistically available.²⁸³ The Morin Commission in Canada recommended:²⁸⁴

²⁷⁸ Freckelton, I., P. Reddy, et al. (1999). Australian Judicial Perspectives on Expert Evidence: An Empirical Study. Melbourne, Australian Institute of Judicial Administration at 37.

²⁷⁹ Asche, A. (2002). The Expert Witness, *The Psychologists of the Northern Territory* (pp. 5). Darwin at 2.

²⁸⁰ It has been quietly suggested that “Not all barristers are good cross-examiners...” Ibid. at 4.

²⁸¹ Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 84. Even in jurisdictions where the pool of defence experts is larger (for example, the USA), limited financial resources and constrained legal rights to re-examine or view scientific results may preclude the engagement of independent experts. Also Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S108-110.

²⁸² Justice Kirby, M. (2000). DNA Evidence: Proceed With Care. *Australian Journal of Forensic Sciences*, 33, 9; Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at 276.

²⁸³ Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S111.

²⁸⁴ The Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences, Recommendation 27 at 380.

Defence access to forensic work in confidence

(a) The Centre of Forensic Sciences, in consultation with other stakeholders in the administration of criminal justice, should establish a protocol to facilitate the ability of the defence to obtain forensic work in confidence.

(b) The Centre should facilitate the preparation of a registry of duly qualified, recognized, independent forensic experts. This registry should be accessible to all members of the legal profession.

The Commission recognised that not only did the scientists at the Centre of Forensic Sciences (CFS) need to be made aware of their duty of impartiality, but that there were several problems with the suggestion that defence teams should simply access CFS scientists on a confidential basis. Perceived problems included:²⁸⁵

- Resource issues which could be expected to arise from increased use of the Centre by the defence;
- Morale issues arising out of the prospect of one Centre scientist testifying ‘against’ another;
- Difficulties in preserving confidentiality, particularly where two scientists from the same section are working on the case, one for the prosecution, the other for the defence;
- The inability of one scientist in a section to seek guidance from another, due to confidentiality issues, undermining the movement to increased monitoring and supervision and less isolation; and
- Concerns that the scientist’s work may uncover evidence relevant to another case in which he or she is involved at the instance of the authorities (for instance, DNA results exculpate the client/accused on this case, but not on another case within the Centre).

In Australia, forensic organisations face similar complications. The Morin Commission reconciled these difficulties with the recommendation that for the CFS:²⁸⁶

The scientist’s conduct should be in keeping with his or her role as an independent, non-partisan expert witness. This also means that the Centre should encourage its scientists to be fully accessible to the defence, upon request.

²⁸⁵ The Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences at 381.

²⁸⁶ The Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences at 385.

Thus, the situation remains largely unresolved. In practice, in significant cases where the challenge to scientific evidence is thorough, broad-ranging and extensive, experts may simply be recruited from overseas.²⁸⁷ The impact of this situation on Australian forensic scientists has not, until now, been researched.

Another issue regarding expert witnesses and one that is particularly pertinent in cases involving opposing expert witnesses, is that of bias and independence. Bias on the part of expert witnesses can lead to spectacular miscarriages of justice.²⁸⁸ This situation is not unique to Australia. In Canada, the Morin Commission noted the effect of prejudiced expert evidence with reference to earlier warnings as to the implications:²⁸⁹

For the future it is important to consider why the scientists acted as they did. For lawyers, jurors and judges a forensic scientist conjures up the image of a man in a white coat working in a laboratory, approaching his task with cold neutrality, and dedicated only to the pursuit of scientific truth. It is a sombre thought that the reality is sometimes different. Forensic scientists may become partisan. The very fact that the police seek their assistance may create a relationship between the police and the forensic scientists. And the adversarial character of the proceedings tend to promote this process. Forensic scientists employed by the government may come to see their function as helping the police. They may lose their objectivity.

In this context, the role of the defence in knowledgeably testing the expert and the expert's evidence is crucial,²⁹⁰ and realistically, the training, attitude and performance of experts within the existing pool of forensic scientists are also vital.

²⁸⁷ *R v Karger* (2002) 83 SASR 1; (2002) 83 SASR 135 and *R v Jarrett* (1994) 62 SASR 443.

²⁸⁸ Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S111.

²⁸⁹ The Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences at p267, citing *R. v. Ward*, [1993] 1 WLR 619 (CA). per Glidewell L.J.

²⁹⁰ Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 82.

3.1.7 Forensic Science and the Judiciary

The collective beliefs and approaches of judges and magistrates towards expert evidence in Australia were collected in a pair of surveys conducted in 1999 and 2001.²⁹¹ These works were unique in surveying a large proportion of the Australian judiciary and magistracy and determined that the primary concerns of judges and magistrates related to perceived partisanship and bias by experts, the ability (or inability) of experts and legal counsel to present expert evidence adequately, and the role of courts in evaluating conflicting opinions.²⁹²

As a central theme of the judges' and magistrates' responses related to partiality on the part of experts, much attention was devoted to suggestions to remedy the perceived bias. These included: A comprehensive mandatory witness declaration, accreditation of experts by appropriate professional bodies, and greater use of expert referees and assessors. A secondary concern of the judicial respondents was how expert evidence is presented, and how this presentation could be more effectively conducted. Other observers noted the difficulties faced by judges and magistrates called to adjudicate on complicated scientific and technical matters:

...[T]he results [of the judges' and magistrates' survey] explode the myth that judicial appointment and service are enough to convert a lay person, inexpert in scientific and technological disciplines, overnight into a highly perceptive and informed decision-maker, able in every case to determine accurately the true or preferable expert opinion from one that is more suspect. On the contrary, as a result of the survey, it is clear that improvements are needed in relation to expert evidence and its evaluation in courts of law.²⁹³

To date, recommendations have focussed on what *witnesses* and *advocates* could do to improve the way expert evidence is presented in court. As to whether more could be done *from the bench*, much remains to be seen. In Freckelton's work, it was reported that "significant numbers of judges are prepared to contemplate ways of making the

²⁹¹ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration; Freckelton, I., Reddy, P., & Selby, H. (2001). *Australian Magistrates' Perspectives on Expert Evidence: A Comparative Study*. Melbourne: Australian Institute of Judicial Administration.

²⁹² Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration.

²⁹³ Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy at 7.

issues in dispute clearer for fact-finders and ... to take a more interventionist role in facilitating or orchestrating the achievement of such clarity”.²⁹⁴ Measures included: Using independent referees, calling court-appointed experts, having expert assessors advise the judge, or having multiple related experts present evidence at the same time. The judges who responded to Freckelton’s survey purportedly “demonstrate[d] a readiness ... to canvass practical and cost-neutral changes which will address the challenges posed by complex and conflicting expert evidence.”.²⁹⁵

3.1.8 Forensic Science and the Jury

In Australia, nothing is known about a juror’s education, political, religious or social views and nothing is formally solicited in court.²⁹⁶ Potential jurors are not required to provide details other than their name and occupation to the court:²⁹⁷ This information is provided to trial lawyers just prior to the commencement of a trial, and questioning of the potential jurors is not permitted, even in aid of jury selection.²⁹⁸ Jurors are selected on the basis of their name, occupation and appearance. The latter is believed to play some part in the “peremptory challenges” made by the prosecution and defence when selecting a jury. These challenges occur after the name of the potential juror is called by the Judge’s associate, and before that potential juror has made their way from the public gallery to the jury box.²⁹⁹ No reason needs to be given for the challenges, which are believed to be made on the basis of the gender, appearance and apparent age of the potential jurors.³⁰⁰

In this context, lawyers, witnesses and the trial judge must gauge the comprehension of the jury, and each juror, by making their own observations during jury selection and the trial. Although some research has investigated the level of “scientific literacy” of the

²⁹⁴ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 117.

²⁹⁵ Ibid at 118.

²⁹⁶ Potential jurors are asked only if they know the accused (who is present in court), or the name of the Complainant or any of the witnesses (whose names are read from a list), before they are selected for jury duty.

²⁹⁷ See, for example: *Juries Act* 1967 (ACT) ss 27(3)(a), 29(2).

²⁹⁸ Unlike in other jurisdictions such as the United States of America, where potential jurors may be scrutinized and questioned to determine their characteristics and views, prior to any jury selection. Wolf, R. V. (1998). *The Jury System*. Philadelphia: Chelsea House Publishers at 48; Judicial Council of California. (2002). *A Guide to California Jury Service*. Judicial Council of California. Available: <http://www.courtinfo.ca.gov/jury/index.htm> [2002, June 20] at Step 1: Selection of a Jury <http://www.courtinfo.ca.gov/jury/step1.htm>.

²⁹⁹ *Juries Act* 1967 (ACT) s 35.

³⁰⁰ Anecdotal evidence from members of the bar in the ACT, VIC and NSW.

general public in the United States and in Europe, little or nothing is known about the scientific literacy or competency of Australian voters when they are selected to sit on a jury.³⁰¹ This may have a dramatic impact on the ability of jurors to comprehend, assess and use the complex scientific evidence they may hear in court.

As communicators of science, forensic experts have some appreciation of how their work can be explained and whether listeners are generally able to understand it. Their view on whether juries are able to comprehend and properly use the evidence may be weakened by the fact that as witnesses they are not allowed to approach jurors or juries and often do not find out the result of cases in which they have given evidence, however, as regular participants in the court process (many of whom have accumulated decades of experience in the witness box), their view of where juries may have difficulty in understanding expert evidence is valuable (and at least as legitimate as the views of other participants - such as judges - which have been collected in other forums.³⁰²)

3.1.9 Forensic Scientists as “Expert” “Witnesses”

Expert evidence is called to court to assist the triers of fact (jury or judge) with areas in which they could not reasonably be expected to have personal expertise. The expert witness is both an expert (in their own field) and a witness (an assistant to the court).

As experts within their own discipline, Australian forensic scientists accrue many hours in study, training, accreditation, proficiency testing and finally, in appearing in court as expert witnesses.³⁰³ Members of the forensic science community are required to adhere to the strictest scientific principles in the conduct of their collection, testing and analysis of results, but are also required to be cognisant of their role within a broader context; the

³⁰¹ Miller, J. D. (1998). The Measurement of Civic Scientific Literacy. *Public Understanding of Science*, 7, 203; Field, H., & Powell, P. (2001). Public Understanding of Science Versus public Understanding of Research. *Public Understanding of Science*, 10, 421.

³⁰² For example: Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 118.

³⁰³ Interesting comparisons can be made with the accreditation, quality assurance and independence measures that appear to be lacking in other jurisdictions: See Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 at S112 about these issues in an American context.

legal system in which their work will be tested, discussed, questioned and ultimately accepted or rejected.³⁰⁴

As assistants to the court, the role of the expert witness is also circumscribed by the rules of evidence,³⁰⁵ and also by the behaviour of the parties themselves.³⁰⁶ An expert may answer only those questions which are asked, and may give evidence only in response to those questions.³⁰⁷ Where an expert feels that their evidence has been improperly expressed - for example, if the strengths or weaknesses of their evidence have been neglected or overly emphasised - the expert does not have the right to spontaneously rectify the injustice. This is of some concern in all adversarial jurisdictions, where it is the responsibility of the parties and not the court, to adduce all relevant evidence before the trier of fact.³⁰⁸ It is also of concern to expert witnesses, who would be neglecting their duties as experts in their field and as witnesses for the court, if they allowed their evidence to be overly distorted by either neglect or over-emphasis in a trial.

To avoid this, in other jurisdictions it has been suggested that at the completion of an expert's evidence, the judge ought to ask the expert whether they have anything to add to or comment on about the evidence they have just given. By careful observation the judge is able to exercise their traditional right to address the witness directly and enquire as to whether the true import of the expert evidence has been frustrated:³⁰⁹

Where expert evidence is disputed, the trial judge should ask expert witnesses before they leave the witness box whether there is anything else

³⁰⁴ For example, through collaborative tests to improve the provision and presentation of scientific evidence in court: Taroni, F., & Aitken, C. G. (2000). DNA Evidence, Probabilistic Evaluation and Collaborative Tests. *Forensic Science International*, 108, 121.

³⁰⁵ Justice Goldring, J. (2000). DNA Evidence - The Way Forward? *Judicial Officers' Bulletin*, 12(7), 49 at 9.

³⁰⁶ Lucas, D. (1989). The Ethical Responsibilities of the Forensic Scientist: Exploring the Limits. *Journal of Forensic Sciences*, 34, 719.

³⁰⁷ Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 56.

³⁰⁸ See for example, in Canada: From the Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences, Recommendation 12 at 349.

³⁰⁹ From the Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences, Recommendation 12 at 349, quoting David Butt, an appellate Crown attorney with the Ministry of the Attorney General.

that they wish to say. The question should be put in the absence of the jury but, if the evidence is admissible, it should then be put before the jury.³¹⁰

This option has not been adopted in Australia, however, and judges are reported to feel constrained when it comes to intervening in proceedings by questioning expert witnesses or further, by calling witnesses themselves.³¹¹ Indeed, in other jurisdictions the obligation to rectify the problem has been placed elsewhere. In Canada it has been recommended that it be the duty of the witness themselves to draw any concerns to the attention of either the Crown or defence, as they are the only party in a position to know whether the evidence has been properly given or not. If drawn to the attention of the Crown, immediate disclosure (presumably to the defence and to the court) is required.³¹²

In Australia, most court guidelines for expert witnesses specify that the expert has an overriding duty to the court and not to the party which called them,³¹³ but fall short of directing the expert to draw their concerns to the attention of the Crown, defence or court.

Training for expert witnesses on how to present their evidence effectively in court is provided on an ad hoc basis by various organisations around Australia. For instance, the National Institute of Forensic Science conducts expert evidence workshops in all states and territories, in which small groups of forensic scientists are tutored by practising advocates, members of the judiciary and other members of the legal profession, to better present their evidence in court.³¹⁴ Other organisations provide in-house training programs³¹⁵ and training sessions are occasionally provided at conferences and other scientific gatherings.

³¹⁰ Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO Recommendation 298.

³¹¹ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 101.

³¹² From the Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences, Recommendation 12 at 349.

³¹³ See, for example: Federal Court of Australia Practice Direction: Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia, (1998, 2004). Guideline 1 - General Duty to the Court.

³¹⁴ In 2006 those workshops are being held in Darwin, Brisbane, Sydney and Hobart.

³¹⁵ In Queensland, for example, systematised and comprehensive training is now available to forensic scientists employed at the John Tonge Centre, however this programme is the most extensive of its kind in Australia.

If finders of fact (judges or juries) are to be provided with expert evidence which is useful to their deliberations, that evidence must be well presented. A significant factor in the presentation of the evidence is the confidence and capabilities of the expert witness, however, a fundamental complement of this is the availability of presentation aids.

The results of investigations preparatory to the survey in this chapter suggested that Australian experts are sometimes frustrated by the way that their evidence is utilised in court, although the degree to which the evidence is just poorly presented, or actually misrepresented, was not clear.

3.2 AIM

Notwithstanding the interesting and important intersection of science and law in the role of expert scientific witnesses, the experiences of forensic scientists have never before been collected and reported in Australia.

This chapter reports on an Australia-wide survey which aimed to elicit detailed information from forensic experts about their perception of the Australian legal system and its use of forensic science, particularly in relation to the criminal law. Of particular interest were the experiences of practitioners dealing with legal counsel, opposing legal counsel, opposing expert witnesses and once in court, dealing with the practical and legal restrictions on fully communicating their work to the decision-maker (be that judge or jury).

Overall, the literature from other jurisdictions³¹⁶ and indications from the judiciary in Australia suggest that deficient advocacy, the nature of the jury and the nature of criminal law trials can be serious impediments to jurors' (and judges') comprehension of scientific and/or complex evidence.³¹⁷ What is missing from the analysis in the Australian context is information from forensic scientists themselves. As witnesses who have conducted the tests, collected the results and formed the conclusions and opinions,

³¹⁶ For example, see Roberts, P. and Willmore, C. *The Role of Forensic Science Evidence in Criminal Proceedings*, HMSO, London, 1993 at 124, cited in Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 36.

³¹⁷ Ibid at 37.

these participants in the trial are in a prime position to tell whether scientific evidence is generally examined and cross-examined properly in court. Although they are not privy to what happens to the evidence in the mind of judges and jurors, they are at least qualified to provide a unique and important scientific perspective.

Forensic scientists provide a fresh and hitherto untapped source of information about how science is currently utilised and how it can be better communicated to decision-makers (both judges and jurors), so that the legal system can more fully utilise the powerful information provided by modern forensic science.³¹⁸

3.3 METHOD

3.3.1 Apparatus

A draft survey was prepared and administered to the Biology Supervisors Advisory Group (BioSAG) in Adelaide 2001. This group is one of six Specialist Advisory Groups (SAGs) established by the Senior Managers of Australian and New Zealand Forensic Laboratories (SMANZFL):

- Biology SAG
- Criminalistics and Documents SAG
- Field and Identification Sciences SAG
- Toxicology SAG
- Illicit Drugs SAG
- Electronic Evidence SAG

These groups consist of the most experienced specialists from the laboratories who participate in SMANZFL, and meet at least annually to provide SMANZFL with recommendations on technical issues, research and development, training systems, quality management, legislative and policy issues.

The purpose of the draft questionnaire was to determine whether the questions allowed the respondents to provide the kind of information which, from informal discussions, it had become apparent that forensic scientists were keen to share with the legal

³¹⁸ *If there is a problem with the presentation and use of scientific evidence in Australian criminal trials, empirical evidence is needed before procedural reforms can be proposed or justified* Edmond, G. (2003). *After Objectivity: Expert Evidence and Procedural Reform. Sydney Law Review*, 25(2), 131 at 163.

community. The BioSAG sample was chosen because its relatively small size (approximately 12-20 respondents) and its members' extensive experience in presenting comparatively difficult evidence (DNA profiling and statistics) in court.

On the basis of the draft questionnaire, the final survey was organised into seven related parts, in which questions were grouped so that the process of collecting evidence, dealing with legal counsel before and during the legal proceedings, interacting with the judge, jury and other forensic experts, and finally, commenting on forensic science and expert evidence were in a logical order:

1. Respondent's details (explicitly optional)
2. Instructing solicitors and barristers
3. Presenting evidence in court
4. The judge
5. The jury
6. Other forensic experts
7. Expert evidence in general

3.3.2 SAMPLING

3.3.2.1 Public v Private Organisations

The survey in this research was designed to be able to be completed by all forensic scientists³¹⁹ irrespective of their source of employment. This included those working as uniformed police officers (for example, in NSW, QLD, TAS, VIC and WA)³²⁰ and those in laboratories specifically removed from the state government policing portfolios (for example, the laboratory in SA).

As discussed, however, in terms of the criminal law, Australia does not currently have the large number of non-government or non-police based expert witnesses, so because of the extremely limited sample size, no specifically "defence" experts were surveyed

³¹⁹ Current estimates put the size of the Australian "forensic science" community at approximately 3,000 personnel, including crime officers who attend only volume crime matters. Personal communication, Anna Davey, National Institute of Forensic Science, 15 June 2006, by email.

³²⁰ It is noted that in many of these jurisdictions there are other forensic science bodies which are also state-funded but not within the ambit of the police/justice portfolios (for example, the NSW state government funds both the police forensic services officers and the Division of Analytical Laboratories (DAL), which also conducts a large proportion of the state's forensic work).

for the research in this chapter. The following organisations participated in the survey reported in this chapter:

- Australian Federal Police Forensic Services,
- Chemistry Centre of Western Australia,
- Forensic Biology PathCentre, QEII Medical Centre, Perth,
- Forensic Science Service Tasmania,
- New South Wales Division of Analytical Laboratories,
- New South Wales Police Forensic Services Group,
- Northern Territory Police Forensic Services,
- Queensland Health Scientific Services Forensic Sciences,
- Queensland Police Services Forensic Service,
- South Australian Forensic Science Centre,
- South Australia Police Forensic Services Branch, and
- Tasmania Police Forensic Services,
- Victoria Forensic Science Centre
- Victoria Major Fraud Group,
- Victorian Institute of Forensic Medicine,
- Western Australia Police Forensic Branch, and
- Westmead Hospital Department of Forensic Medicine Institute of Clinical Pathology and Medical Research.

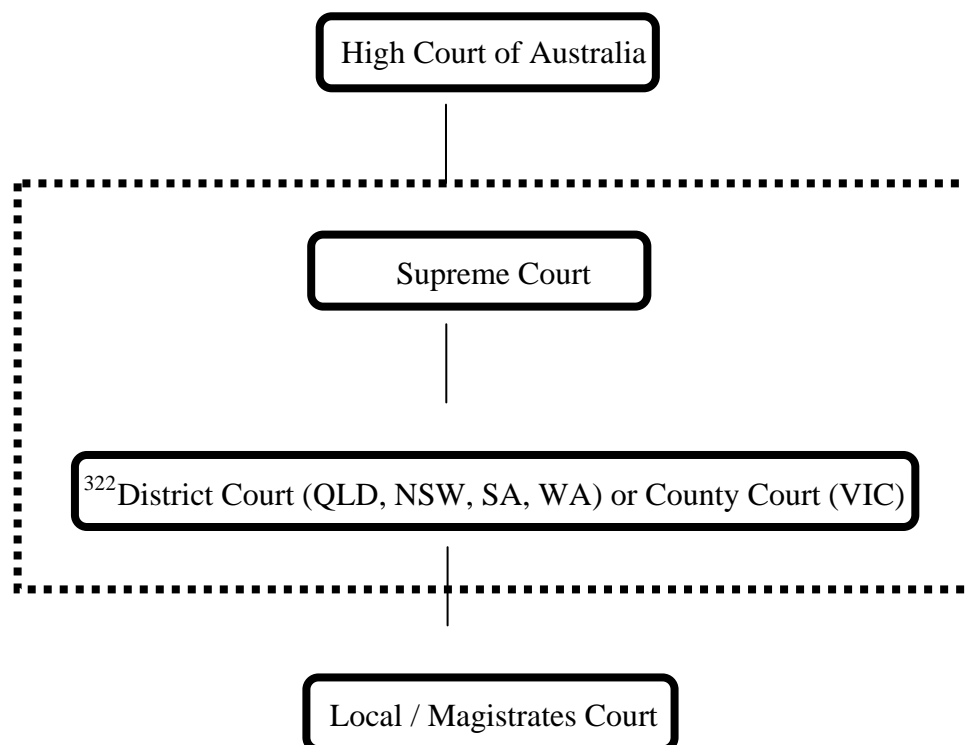
3.3.2.2 District, County and Supreme Court Experience

The use and scrutiny of scientific evidence varies depending, *inter alia*, on the level of court in which the evidence is brought. The diagram below illustrates a simplified court hierarchy for Australia.³²¹ Generally the Supreme, District and County Courts (enclosed with dashed lines) provide the best opportunity for forensic science to be led and challenged, as the High Court deals mostly with appeal matters (without hearing witnesses) and the forensic science heard in the Magistrates and Local Courts is not dealt with or challenged in depth.

³²¹ Courts not directly relevant to criminal law matters (such as the Family Court, Drug Courts, et cetera) have not been included.

Furthermore, the Supreme, District and County Courts are able to empanel juries, which may also hear any forensic science called. For these reasons, forensic scientists who had given evidence in the Supreme, District or County Courts were preferred as respondents, in comparison with those potential respondents who had only given evidence in the Local or Magistrates Courts.

Simplified Court Hierarchy in Australia



3.3.2.3 Inclusion of Experts in Fraud Investigation

“The issue relating to complexity and incomprehensibility of evidence has been raised in two criminal trial contexts in particular - trials involving significant amounts of accounting and commercial evidence beyond the normal experience of lay people, and trials which are determined in good part on the basis of complicated scientific evidence such as DNA typing.”³²³

³²² ACT, NT and TAS do not have a court in this level.

³²³ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 29.

Initially the scope of this project included only the traditional forensic sciences such as fingerprinting, DNA profiling, toxicology and so on. Apart from sharing a common relevance to the criminal law, however, these areas of forensic science also share a certain level of complexity and technical knowledge. In fact, it is the technical and complex aspects of traditional forensic science which may present great difficulty to jurors (and even judges) in court. For this reason, documenting the experiences of experts who are called to present difficult and/or technical evidence seemed particularly significant.³²⁴

Thus, when at the commencement of this research, the Major Fraud Group of the Victoria Police indicated a very strong interest in participating in this project, it proved appropriate to include the experiences of a group of experts who were consistently called to present often complex and technical evidence of financial transactions which are beyond the common experience of most jurors. In addition to the technical difficulty of this evidence, fraud investigations also often result in volumes of documents through which a judge and jury must plough. This added level of difficulty provides an interesting backdrop against which witness impressions of juror comprehension, attention spans, and general capabilities can be investigated. For all of these reasons, survey results from the Victoria Police Major Fraud Group were included in this research.³²⁵

³²⁴ Especially in light of historical material such as Lord Roskill's *Fraud Trials Committee Report*, HMSO, London, 1986 which investigated, *inter alia*, the ability of jurors to cope with complex accounting evidence adduced to prove fraud in criminal trials.

³²⁵ For the sake of simplicity, the phrase "forensic scientist" is deemed to encompass all of the types of expert witnesses surveyed in this chapter.

3.3.3 PROCEDURE

Permission from the University of New South Wales Human Research Ethics Committee (HREC 01164 - 2001) and the Victoria Police Research Coordinating Committee was granted for this research.

Small groups of potential participants (3-20 people) were visited at their workplace and given a brief verbal introduction to the project and survey instrument. Any questions arising from this material were answered at that time.

In some instances participants completed the survey form immediately whereas other surveys were completed within a fortnight of the introduction and returned by mail.

All data was transcribed into Microsoft Word before being cross-checked with the original completed surveys and entered into SPSS Statistical Software (Version 10.0) for analysis.

3.4 RESULTS AND DISCUSSION

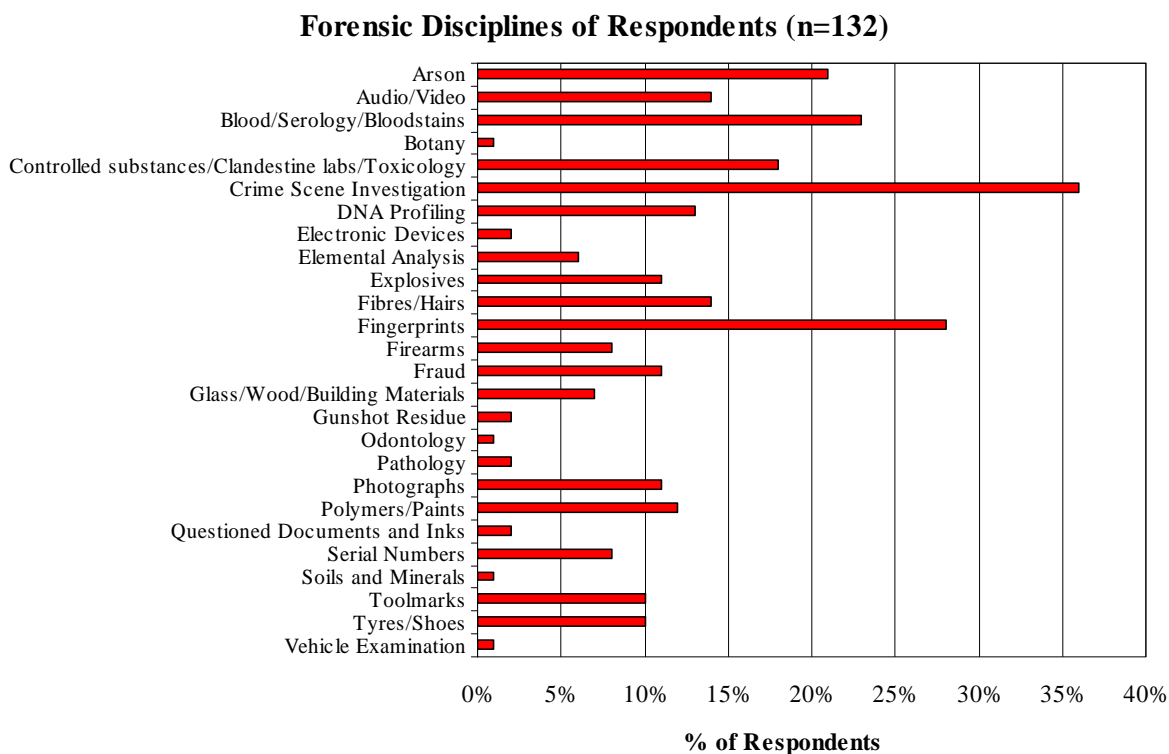
3.4.1 Demographics

Completed surveys were returned by 132 respondents, from 17 organisations from all seven states and territories of Australia.³²⁶ Of those who responded to the question about gender (n=115), women comprised 21% (n=24) of the group and men 79% (n=91).

³²⁶ It is not possible to calculate a legitimate response rate, as many surveys were circulated by the organizations themselves and the numbers distributed were not recorded.

3.4.2 Forensic Disciplines

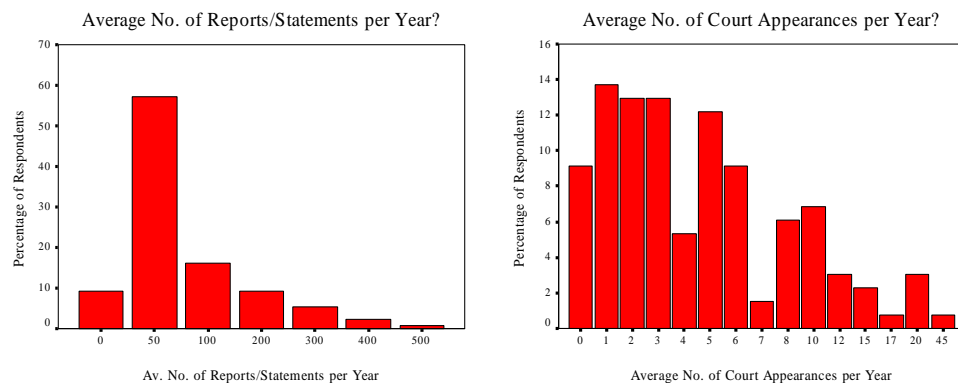
Respondents were asked to nominate forensic areas in which they have been or are employed and to indicate how long they had worked in each of these areas.



A wide range of disciplines were covered, with many respondents having multiple areas of expertise (hence the sum of the figures above is more than 100%), giving a broad coverage as to how different types of scientific evidence are prepared and presented in Australian courts.

3.4.3 Court Experience

To ascertain the level of court experience held by the respondents, they were asked how many times they had appeared in court as an expert witness over a one-year period and how many reports they would have written in that time. To correct for any short-term deviations in work patterns, respondents were asked for their average number of court appearances and reports/statements, per year, over the last five years.



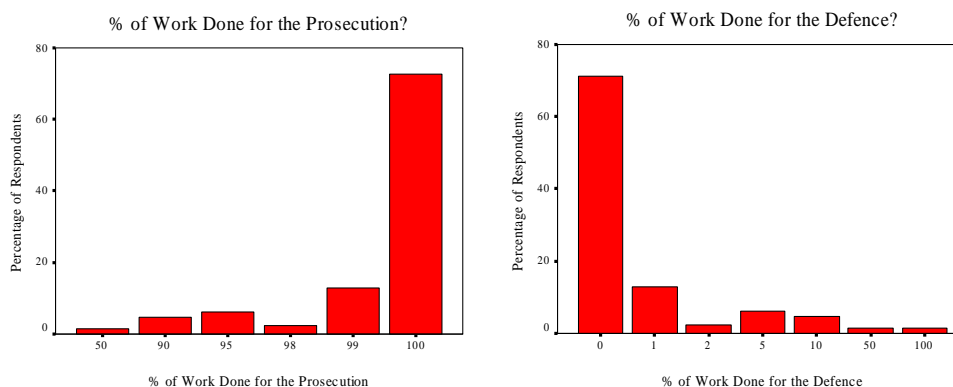
The results for the average number of reports/statements were grouped for simplicity as shown in the graph, meaning that 57% of respondents had written *up to* 50 reports per year, 16% of respondents had written *up to* 100 reports per year, and so on. The results indicate that most respondents have written at least 50 reports/statements per year, over the past five years.³²⁷

As shown in the graphs, some respondents had not written reports/statements or appeared in court over the past five years. The opinions of these respondents were included in the survey results, despite the fact that they now occupy managerial positions, as they had valuable previous experience in presenting scientific evidence in court.

³²⁷ Legal proceedings including the prosecution of summary offences, guilty pleas, full-scale trials et cetera.

3.4.4 Work for Prosecution and Defence

Given that the respondents were drawn from state-funded organisations, it was important to determine the degree to which their work was provided for the police / crown / prosecution or for the defence.



Not surprisingly, the vast majority of respondents worked solely for the prosecution at the time of the survey. As government and/or police employees, the respondents naturally provide services to the prosecution to assist in the identification, apprehension and prosecution of suspects.

Some experts took the opportunity at this point to indicate their knowledge of their duty as professional expert witnesses; that is, their duty to the court rather than to the side that calls them to court. These respondents answered “100%” to both questions or 50% to both questions (n=4, 3%); that is, all of their work is provided for the prosecution AND the defence, because in actual fact their work is provided to the court. These respondents were making the point that as non-partisan experts, they do not view themselves as tools for one side or the other in a criminal prosecution, but rather as impartial providers of results which may help one side more than the other, but are not directed in any sense towards that aim. This concords with the guidelines provided by some Australian courts,³²⁸ which remind experts that their duty is always to the court and not to the party who calls them as a witness.

³²⁸ See for example Federal Court of Australia Practice Direction: Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia, (1998, 2004). Guideline 1 - General Duty to the Court.

ANALYSIS OF SUBSTANTIVE SURVEY RESULTS

The responses to each question have been grouped according to themes, and presented as dot points beneath each question. Each question and its answers have been boxed to distinguish them from the discussion.

3.4.5 *Interactions Between Scientists and Lawyers – Pre-Trial*

Q: What is the most common question(s) that instructing solicitors or barristers should ask you, but don't, BEFORE you go to court?

Responses:

What are the results of your work? (n=35, 27%), including:

- What do your results mean?
- What are the important parts of your results?
- What are the scientifically significant parts of your results?

Do you have any concerns about the results or conclusions? (n=16, 12%)

- Are there any other explanations which could reasonably fit the results, including explanations which might be used by the defence and/or indicate that the accused was innocent?
- How confident in the results are you?
- Were the results abnormal or striking?
- Do you have complete confidence in the results and are you satisfied with any weaknesses?

What are your qualifications, training and experience or accreditation (n=13, 10%), including an explanation of what this means (if necessary)?

Issues of presentation (n=8, 6%) including:

- How would you like to present your evidence?
- Are you aware of court procedures?
- Are you confident about giving this evidence?

What were the other influences on your work? (n=6, 5%) including:

- What is the basis of your opinion?
- What factors influenced your conclusions?
- How much of the other evidence did you know about when performing your own tests or forming your own conclusions?
- Have you discussed the tests, results or conclusions with your peers?

What are the steps and procedures for your work? (n=5, 4%) including:

- Who performed these steps?
- What are the standard procedures?

All questions which the solicitor or barrister intended to ask in court. (n=3, 2%)

A relatively large number of respondents reported that they were satisfied by what is or is not asked of them by solicitors or barristers before court³²⁹ (n=12, 9%), however, another group of respondents would have liked to have been asked *any* questions at all before they went into court (n=7, 5%). Other respondents noted that different questions were required for each case (n=2, 2%), and although pre-trial conferences with instructing solicitors or barristers are rare, they are very useful when they do occur (n=2, 2%). Some respondents did not have enough court experience to answer this question (n=3, 2%), whilst other respondents simply did not respond (n=19, 14%).

If it can be assumed that lawyers (be they barristers or solicitors) arrive at court having done the best preparation possible, given the time and resource restraints which affect every profession, then it is of some concern that their expert witnesses do not think the lawyers have a grasp of the forensic results. These results correlate with other research which indicates that judges have on occasion questioned the ability of advocates to examine and cross-examine expert witnesses adequately.³³⁰

³²⁹ Almost all of these responses came from experts employed by the Victoria Forensic Science Centre, who reported a relatively high level of satisfaction (compared with other jurisdictions) at the frequency of pre-trial consultations that usually accompanies their court appearances.

³³⁰ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 36: Respondent judges had often (36%, n=85) or occasionally (60%, n=143) encountered a failure by advocates to pose appropriate examination-in-chief questions to expert witnesses.

Reasons for which lawyers may not ask forensic witnesses what the results are before they go into court, may include:

- The lawyer has read the witness' report and thinks it sufficient for their purposes;
- The lawyer has dealt with this kind of evidence before and thinks their knowledge sufficient;
- There was insufficient time for the lawyer to contact the witness before the trial to discuss the results;
- The evidence is not perceived to be crucial to the case, and/or the lawyer will not be relying heavily the results, or intending to draw very much from the witness; or
- The lawyer does not expect much contention over the results, including close examination from the opposing side.

As the responses to this question and to the questions below indicate, as valid as the reasons for not asking the witnesses about their evidence *before* going into court may be, the fact remains that lawyers may be under-utilising a valuable resource. The ramifications of failing to ask the questions listed in this set of responses become obvious when expert witnesses describe their experiences in court (below) and will be further discussed at that point.

Evidence for the Court

“A [good] scientist sees their role to factually reveal any evidence; be it strong, weak, incriminating or exculpatory.”³³¹

Many respondents were at pains to point out that although they are most commonly called to court by the prosecution, their evidence does not always solely support the prosecution case. There may be problems with the size or quality of the sample available for testing, or anomalous results, or the type of sample may be at the edge of what the laboratory apparatus was designed to test, or there may be explanations for the results which are consistent with the accused being innocent. Forensic experts would

³³¹ Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 56.

appreciate the opportunity to discuss these issues with lawyers, before they are called in to court.³³²

“I would like the prosecutor ... to be aware of my isolation and complete lack of knowledge about the [rest of the] case. I only carry out scientific tests on selected items and usually am unaware of the chain of evidence, the evidence against the suspect and other testing that has been done. The prosecutor should only refer to items in my statement and use my item numbers, not anything else. For example, “item 26 the green socks”, not “the green socks found by X in the car of Y”.”³³³

Respondents were also keen to point out that the conclusions at which they arrive are based on their training, education and experience. Where they had been told about other issues in a case, or had been made aware of factors outside their own area of expertise (such as whether other evidence had been collected which implicated the suspect, or whether the suspect had a prior criminal record), the experts would prefer that the advocates were aware of this, prior to appearing in court. If there were factors which influenced the expert’s opinion, or the results or tests had been conducted in discussion with other experts, respondents suggested that the lawyer calling them to court should be aware of this, so that if necessary, it could be explained in court.

It is not an answer to this concern to suggest that all of this information should be included in an expert’s report.³³⁴ Certainly, the report should be comprehensive, and particularly because it is also used by the defence, it should be candid and not hide any shortcomings of, or alternative explanations for, the results. It is impossible, however, to address in a report every conceivable issue which might arise in the adversarial

³³² This is particularly pertinent when research suggests that judges often (n=35, n=84) or occasionally (58, n=137) encounter cross-examination which they believe fails to make expert witnesses accountable for their evidence. Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 37.

³³³ Comments given in the context of another question (n=2, 1%).

³³⁴ Despite guidelines such as “There should be included in or attached to the report (i) a statement of the questions or issues that the expert was asked to address; (ii) the factual premises upon which the report proceeds; and (iii) the documents and other materials which the expert has been instructed to consider” in the Federal Court of Australia Practice Direction: Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia, (1998, 2004). and the other similar guidelines that exist in all levels of Australian courts, respondents suggest that advocates are often not fully aware of what the expert has or has not been told prior to giving their evidence.

process,³³⁵ and whatever is included in an expert's report needs to be properly read and comprehended.

It is fundamental that pre-trial meetings, where all issues can be canvassed (and possibly resolved), should be held between the prosecution and the expert and even between the expert and the defence. Such meetings would also give the scientists time in advance of the trial to fully consider the issues.³³⁶ Respondents in this survey were at pains to report that lawyers from both the prosecution and defence are not utilising their expertise and asking questions before court - in other words, failing to conduct pre-trial conferences which would better inform the lawyers of any areas in which the results may be weak or may be reasonably used by the opposing side. It was noted by these respondents that it is not possible to canvass all of these issues in the written report, but that they could easily be clarified in a brief discussion prior to going to court. Some Victorian respondents reported that where pre-trial consultations were not possible, other communications could nevertheless assist:

“I always try to arrange a meeting prior to court to clarify any issues prior to getting in the box. However, in previous years a fundamental grasp of terminology used by technicians was sadly lacking [in advocates]. We compiled a list of terms commonly used, plus case law notes, and faxed these to prosecutors prior to court.”³³⁷

This proactive measure by forensic scientists appears to have had the desired affect of improving the correct use of terminology and jargon in this discipline in this jurisdiction. Similar measures in other disciplines and jurisdictions should be investigated, to determine whether this could improve the use and presentation of scientific evidence in court, although it is noted that services do already exist which provide legal practitioners with up-to-date information on all aspects of forensic science, should they wish to access it.³³⁸

³³⁵ Dr James Robertson, cited in Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences at 335.

³³⁶ Dr James Robertson, cited in Commission of Proceedings Involving Guy Paul Morin, Chapter II: Forensic Evidence And The Centre Of Forensic Sciences at 335.

³³⁷ Comment from a Victorian fingerprint expert.

³³⁸ Freckelton, I., & Selby, H. (1993-). Expert Evidence. Sydney: Law Book Company.

Understanding Qualifications and Expertise

“‘Expert’ should be a term only for someone with many years experience. Using the term for everyone (even with only two years experience) gives the impression we are all superhuman and don’t make mistakes (however small).”³³⁹

‘Forensic science’ is multi-disciplined. [Advocates] don’t understand that there are numerous disciplines and that we are not masters of all of them.”³⁴⁰

“At times I have been contacted by other ‘experts’ just before they go into court, to advise *them* on *their* evidence (in relation to drug levels I have reported). Perhaps the wrong expert is being called to court.”³⁴¹

Experts have a specific knowledge base; questions asked outside this area should not be asked or answered.³⁴² Many responds suggest, however, that lawyers are unfamiliar with experts’ qualifications, training, experience and accreditation, before the expert is called into the witness box. This can lead to several unattractive prospects in court:

- The expert is not given sufficient credit for their expertise, in which case the jury may undervalue their evidence;
- The expert is called upon to answer questions outside their field of expertise. If they answer the questions, they are in breach of their duty to the court and may also have answered incorrectly, thus misleading the court. If they do not answer the questions, the jury may incorrectly assume that the expert is incompetent or evasive, or that the lawyer asking the questions is incompetent or evasive.
- The lawyer, in misunderstanding the witness’ expertise (by either overrating or undervaluing it) may ask inappropriate questions, but also fail to ask appropriate ones. For example, if the lawyer does not understand what it means for a witness to undergo “accreditation”, they may fail to highlight for the jury that this witness has been independently tested and found to be knowledgeable, competent and capable with regard to a certain set of skills. Likewise, a failure to impart to the jury that the witness undergoes regular intensive training to update their skills, may render the evidence less credible or persuasive than it might otherwise have been.

³³⁹ Comment from a Western Australian crime scene examiner.

³⁴⁰ Comment from a Tasmanian electronic devices expert.

³⁴¹ Comment from a Queensland toxicologist.

³⁴² See for example *Evidence Act* 1995 (Cth) s79.

Failure to understand which expert performed which part of the testing or analysis may create problems in failing to call the correct witness to give evidence at all. This seemed to be a particular problem for crime scene examiners, who noted that they are often asked questions about testing procedures in their laboratory, and were then forced to explain to the prosecutor that those steps were actually always performed by someone else. Equally, crime scene examiners noted that it is a tactic sometimes used by the defence to discredit witnesses, by asking them about procedures beyond their field of expertise and then belittling them for not having that knowledge. If prosecutors are knowledgeable about standard procedures and which experts perform them, it would better enable them to call the right witnesses, ask the right questions in examination-in-chief, and (if necessary) re-establish the expertise and credibility of their witnesses in re-examination by clarifying what they actually know.

Thus, a lawyer's understanding of their witness' expertise (including qualifications, training, experience and accreditation) enables them not only to avoid asking the wrong questions of that witness, but also enables them to ask the right questions to highlight the veracity and value of the evidence.

Means of Presentation

As a matter of professional courtesy, some respondents would appreciate the opportunity to discuss how their evidence will be presented in court. Not all experts are familiar with court procedures and court facilities; a brief discussion with instructing solicitors or barristers prior to court would assist in this area. This discussion may also be fruitful in producing better ways to present evidence to juries, particularly if the expert is aware of how their colleagues in other jurisdictions present similar evidence (for example by using visual aids). This prospect is further discussed below.

3.4.6 Presenting Evidence in Court

Q: What is the most common question(s) that barristers should ask you, but don't, IN COURT?

Responses:

The strength of the evidence (n=18, 14%)

- How appropriate, good or reliable is the method?
- How reliable are the results or conclusions?
- What could a negative result indicate?
- Are these results abnormal or striking?
- Are there any innocent explanations, and how did you evaluate these?

Details of the expert's qualifications, training, experience or accreditation (n=13, 10%)

A brief summary and explanation of the results (n=9, 7%)

Clarifying the results (n=9, 7%), particularly after cross-examination, and relating to:

- The results, methods and processes actually used; and/or
- The actual opinion of the expert witness.

Any additional influences on the expert and their evidence (n=9, 7%) including:

- What factors (including any personal factors) influenced your conclusions?
- How much of the other evidence in the case did you know about when performing your own tests or forming your own conclusions?
- Were there any other samples, results, matches, tests or relevant information?

Matters of procedure and best practice (n=7, 5%) including:

- What were the steps taken to obtain the results, conclusions or opinions?
- Who performed these steps?
- What is the standard procedure?

- What controls are in place?
- Continuity of samples or exhibits?

The basis of the discipline (n=7, 5%) including:

- Methodology and/or
- Terminology and jargon.

The significant parts of the evidence, as opposed to insignificant, unimportant or confusing details (n=6, 5%)

One practitioner noted that different questions are required in court for each case (n=1, 1%), whilst other forensic scientists reported that they did not think barristers commonly missed questions that ought to be asked in court (n=12, 9%). Some experts had insufficient court experience to answer this question (n=4, 3%), while others did not respond (n=37, 28%).

Strength of the Evidence

Respondents have indicated that at times, the evidence they are able to give in court is not truly representative of the results or their meaning. This manifests in two ways:

- The scientific evidence appears weaker than it was, because the prosecutor did not ask questions (or re-examine) in such a way that the appropriateness and reliability of the method/results was communicated to the court. Similarly, the prosecutor did not explain the significance of a negative result (or did not raise the fact that a negative result had been found, despite the fact that a negative result may actually have bolstered the prosecutions case or at least been consistent with it).
- The scientific evidence appeared to be stronger than it was, because the prosecutor did not ask or explore abnormal or striking results, or was unaware (through not having asked the witness beforehand) of how the results could be consistent with innocence.

Aside from assessing the credibility of the expert witness, the primary duty of the jury is then to assess the strength of the evidence. Their task is made more difficult if lawyers (particularly) prosecutors do not address this in questions to the expert.

Bearing in mind that expert witnesses in Australia are not obliged to draw the attention of the court to evidence that is incomplete or may have been misunderstood, and that the high pressures and strained atmospheres of criminal trials are not conducive to witnesses interrupting proceedings to volunteer more information at the end of re-examination, the fact that respondents have noted that more questions could and should be asked, suggests that information is available from experts which lawyers are not drawing upon, to their own detriment in trying to persuade a jury.

Adducing Qualifications

In Australia, when an expert witness is called to the stand and their qualifications are adduced, it is possible for the opposing side to “stipulate”; that is, they agree to accept the witness as an expert, negating the need for the witness’ credentials to be explored in court. Whilst this may save time, and enable the court to come more quickly to the evidence itself, it also denies the jury the opportunity of hearing what actually qualifies the witness as an expert. Without knowing the level of education, training and experience a witness possesses, it is more difficult for a jury to assess the credibility, reliability and knowledge that informs the evidence.³⁴³ Experts are themselves aware of this, and would like lawyers to ask them for their credentials in court, even if both sides accept that they are experts, so that they set a benchmark on which the jurors can assess the expert evidence.

In addition, respondents indicated that if they were asked more questions about their education, training and experience in court, it may avoid later questions being asked which are outside their field of expertise. Furthermore, if those questions were nevertheless still asked, the jury would also have a greater understanding of why the expert would not and could not answer them.

Methodology and Results

A recurring theme in the responses to this survey was the failure of lawyers to re-examine their expert witnesses. Many respondents reported that in cases where the defence had raised issues (included red-herrings) which appeared to persuade jurors or at least raise doubt about the expert’s evidence, the prosecution often failed to return to

³⁴³ See *Chapter 4: Survey of Real Jurors* for further discussion of this point.

the expert in order to clarify the evidence. This was attributed to a failure by prosecutors to comprehend the evidence fully (for example by meeting the expert and asking questions prior to court), but also a failure by prosecutors to recognise that experts were capable of rebutting defence suggestions and defending their own opinions, provided the prosecution gave them the opportunity, by re-examining them.

Issues such as continuity of exhibits, the use of controls and blind samples, the existence of standard procedures, the demarcation of roles amongst forensic disciplines, and protocols for peer review were all matters which some respondents felt are not adequately addressed in court and were certainly not adequately clarified in re-examination. Whether or not this ultimately detracts from a case is not entirely relevant - what is more important in this context is that the expert evidence, which has been carried out for the court, may be presented poorly, if not by design, then by default.

Communicating Terminology and Jargon

“The defence continually used terms from other forensic disciplines - not fingerprints. This caused great confusion in the court.”³⁴⁴

Concurrent with failing to understand the limits of a witness' expertise, is poor knowledge of the terminology used in a forensic discipline. Without the tools of language to properly describe what the expert has found, lawyers are naturally incapable of asking meaningful questions, truly comprehending the expert's answers, or rebutting mistakes made by the opposing side. Whilst experts may endeavour to minimise the jargon they use in court (discussed below), it is inevitable and sometimes necessary for particular terms to be used to describe particular things, so that the results are not misunderstood or misrepresented. In recognition of this, it is imperative for lawyers to have an understanding of the methodology and terminology used in forensic disciplines; a knowledge which cannot be imparted solely by reading an expert's report, but can certainly be improved by consulting with the experts prior to going to court.

³⁴⁴ Comment from a Victorian fingerprint expert.

Q: What kinds of things do instructing solicitors and/or barristers commonly misunderstand or misinterpret, about your discipline?

Responses:

The discipline itself (n=31, 24%), including:

- Jargon;
- Background/fundamental principles;
- Important details about the discipline; and/or
- Limits of the discipline (for example, conclusions).

Principles of collection and examination (n=21, 16%), including:

- Role of different staff,
- Lab procedures,
- Time involved, and/or
- Apparatus used.

Significance of the evidence (n=16, 12%), including:

- Lack of evidence not necessarily equal to lack of involvement or innocence,
- Presence of evidence not necessarily equal to guilt on the part of the accused, and/or
- Similar results may have different meanings in different cases.

Qualifications, training and experience of the expert (n=15, 11%), including:

- Training required to perform the job,
- Value of experience and opinion,
- Likelihood of lies and/or forgery, and/or
- Limits of personal expertise.

Scientific complexities (n=13, 10%), including:

- Errors,
- Complexities of discipline,
- Confidence limits/levels of certainty/ranges,
- Statistics/probability/averages,

- Conservative results, and/or
- Disagreement within the profession.

Technical judgements (n=7, 5%), including:

- Not all items collected are examined,
- Different procedures used for different samples, and/or
- Different between forensic and research samples.

Weight of the evidence (n=3, 2%), including:

- Presumptive versus conclusive tests, and/or
- Appropriateness (validity) and reliability of the method.

A small proportion of respondents had never experienced a problem with solicitors/barristers commonly misunderstanding the scientific discipline in court (n=5, 4%), whilst a few practitioners had insufficient experience to respond (n=3, 2%). Others remarked that something new was misunderstood each time (n=2, 1%). No response was also recorded for this question on some surveys (n=16, 12%).

Q: Do lawyers' misunderstandings/misinterpretations of your discipline come out in court (either directly or indirectly)?

Responses:

Yes (n=77, 59%), including:

- Poor questions (incorrect, unhelpful for accused, stupid, poorly worded, confusing, lacking suitable depth);
- Omission of questions (can be seized upon by opposition);
- Failure to address scientific issues (use of unwarranted generalisations, specific words used out of context, improper inferences);
- Evidence (or parts of it) is given insufficient weight;
- Unprofessional attitude (belittling the witness – for example, about their limit of expertise); and/or
- Complicated science becomes more complicated under the rules of evidence.

No (n=19, 14%)

Sometimes (n=14, 11%)

No response (n=22, 17%)

Principles of a Scientific Discipline

“For things like flammable fluid analysis and paint, where opinions are given, I think the expectation of a definite match is too high. We need to explain opinions like “can not exclude” or “likely to have originated from the same source”. If the prosecution doesn’t understand why we can’t say two things are definitely from the same source, even if they are indistinguishable, the jury doesn’t have a chance. The same goes for drug levels - pharmacologists discuss ranges and average responses, not absolutes.”³⁴⁵

“I think a lot of negative results are misunderstood - for example, not detecting an accelerant at a fire doesn’t mean one wasn’t used, not detecting gunshot residue doesn’t mean the person could not have fired a gun, not detecting semen doesn’t mean there wasn’t any sexual intercourse, and fingerprints won’t *always* be left on a surface.”³⁴⁶

Respondents have persistently indicated that they do not believe sufficient preparation is done by lawyers, with regard to the expert evidence, prior to going to court. Irrespective of whether or not this is objectively so, it is undeniable that there are certain things which cannot be addressed by lawyers simply reading an expert’s report prior to attending court. Most importantly, the fundamental principles of a scientific discipline, which ultimately define what the limits of the discipline are and what conclusions can and cannot be drawn, are not the sort of thing likely to be expounded in the average report. Nor is a report likely to include any more than a basic indication of the jargon essential to the discipline. For these reasons, it is necessary for lawyers (at least from the perspective of forensic scientists) to seek further information.

It is ingenuous to expect lawyers to undertake further education in every scientific discipline that they come across, nor is it necessary. The obvious resource for lawyers, the source of case-related and general knowledge about any particular forensic discipline, are the expert witnesses themselves. If more consultation occurred prior to going to court, lawyers and experts could better convey the principles and limits of the

³⁴⁵ Comments given in the context of another question (n=3, 2%).

³⁴⁶ Comments given in the context of another question (n=10, 8%).

discipline, the role of different experts (especially where scientific tests are conducted by a team of experts), the limitations of specific apparatus and whether a lack of evidence in a particular case was consistent with innocence or guilt.

Several respondents noted that some lawyers are not familiar with basic scientific concepts which significantly impact on the weight of particular types of evidence. The most obvious example of this is the failure to distinguish between presumptive and conclusive tests. The former tests are tools designed to narrow the scope of possibilities, and require further testing to determine the results conclusively (for example what a substance actually is). The nature and impact of the *Chamberlain* case is a salutary lesson as to what can happen if basic scientific concepts are not understood by counsel properly or communicated to factfinders properly.³⁴⁷

Aside from pre-trial consultation being important for imparting crucial background knowledge about relevant forensic disciplines and principles, respondents point out that it is necessary to address the significance of the results in each case, *individually*. Lawyers who may be applauded for acquiring a general knowledge about a scientific discipline are still susceptible to other traps: Namely, the failure to recognise that similar results may have different meanings in different cases.³⁴⁸ If a lawyer fails to consult the expert in DNA profiling in their current case, because the lawyer has previously tried a few cases with DNA profiling evidence, they may misapprehend the difference between current and old techniques (for example, a match in mitochondrial DNA testing is very different in significance to a match in nuclear DNA testing, although the procedures, technology and statistical principles may be similar.) Similarly, where gunshot residue is found in two cases, but in one case the suspect was transported in a police car and in the other case the suspect was not, the presence of the residue may have a significantly different value, despite the results being ostensibly the same.

³⁴⁷ Bourke, J. (1993). Misapplied Science: Unreliability in Scientific Test Evidence. *Australian Bar Review*, 10, 123; Bourke, J. (1993). Misapplied Science: Unreliability in Scientific test Evidence PART 2. *Australian Bar Review*, 10(3), 183.

³⁴⁸ Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51 at 56.

Principles of Collection and Examination

“They believe us to be more highly trained than we are. They commonly refer questions to Scene of Crime officers that should be asked of other expert witnesses (for example, fingerprint experts). The defence usually uses it as an opportunity to belittle the witness - “So all you did was collect the samples...””³⁴⁹

The field of “forensic science” consists of highly specialised disciplines; it is not usually the job of the crime scene examiner (who collects the evidence) to then analyse the samples and write a report on the results. Nevertheless, many respondents in this survey report that they are constantly asked questions in court that belie lawyers’ poor knowledge of the demarcation of forensic work.

Whilst this may be a legitimate defence tactic in trying to discredit an expert witness by implying that they are not very knowledgeable or that their very limited field of knowledge is unimpressive, it is not an approach which could be recommended to the prosecution for use on its own experts. As reported in other chapters, the following exchange between a prosecutor and a forensic scientist:³⁵⁰

Crown: And the tests that you did in relation to the items you collected included tests for human blood and for semen?

Forensic Scientist: No, I didn’t carry out any tests. My job as a crime scene examiner is only to collect items from the crime scene. I am not trained to then test those items. That is done by someone else back at the lab.

may demonstrate to a jury that:

- The prosecutor is ill-informed about who performed which tasks before the case was brought to court. This suggests that the prosecutor has not prepared properly for the case and depending on the severity of the lapse, may generate confusion amongst the jury as to which witnesses are able to give evidence about important facts.
- The witness has a limited field of expertise. While this is objectively admirable (because no witness can legitimately be an expert in everything), it can generate frustration within a jury when a witness is unable to help them discover the vital facts which they need to decide the case. This is exacerbated in cases where none of the witnesses are able to give the jury enough scientific evidence to categorically

³⁴⁹ Comments given in the context of another question (n=5, 4%).

³⁵⁰ Examined in *Chapter 4: Survey of Real Jurors*.

identify whether the accused is innocent or guilty. At the very least, it does not bolster the credibility of expert witnesses to have the side which called them ask inappropriate questions, which serve to remind the jury that the witness' expertise is limited.

In a time-poor environment, it is also critical for lawyers to appreciate what forensic procedures are relevant to their cases, which procedures have in fact been conducted, and why. Knowledge of the apparatus required, the time involved and the role of different staff is a precursor to this awareness. Real forensic science differs from the approach popularised on television (where all resources are available for every case, so that every conceivable type of forensic procedure is carried out in every case, and quickly), and in reality, lawyers need to be cognisant of what has been done (and why) so that it can be properly presented to either judge or jury.³⁵¹

Improved communication between experts and lawyers would improve the ability of legal counsel to identify which expert performed which tasks within a forensic investigation. This would improve the presentation of the evidence in court, by ensuring that the right questions are asked of the right witnesses and that the limits of a witness' expertise are recognised but not unnecessarily emphasised.

Qualifications, Training and Experience

A corollary of understanding more about each forensic discipline is appreciating the value of an expert's qualifications and experience. It was notable across all institutions surveyed that forensic practitioners were keen to point out that not only were qualifications and ongoing accreditation and training important, but that experience in a forensic field (and especially experience over several related fields or over long periods of time) adds a critical dimension to their ability to draw conclusions from their results. Respondents suggest that lawyers commonly misunderstand that many forensic fields rely not only on standardised procedures, close documentation and independent peer review (all of which minimise the likelihood of false testimony or outright forgery), but also on the experience and opinion of the forensic scientist. The latter is crucial in

³⁵¹ "I feel it is very important to explain in court why some techniques are chosen over others (we call it "harvesting"), otherwise the judge or jury would have to guess or take the defence's word for it." (Comment given by a respondent in the context of another question (n=1, 1%).)

helping expert witnesses determine whether similar results have different meanings in different contexts, and whether the presence or absence of evidence is indicative of guilt or innocence.

An aspect of this relates to technical judgements. Forensic practitioners are called upon to make technical judgements at all points in the process of collecting, testing and interpreting evidence. Practical considerations such as laboratory resources are an obvious factor in these decisions, however more advanced judgements are required when scientists assess which samples to collect, what procedures are appropriate for which samples, and how the samples relate to one another (and how this affects the interpretation of that evidence). It is exceedingly unlikely that this sort of information can or should be included in an expert's report. Not only would it be extremely time consuming to include it, but it is the kind of information which can be far more easily communicated in a discussion between the expert and legal counsel. Knowledge of the technical judgements actually made by the expert - and why they were made in a particular way - provides crucial insight into the strength and significance of the evidence, and ultimately how the evidence supports or fails to support prosecution/defence hypotheses. It greatly impacts upon how an expert is able to testify in court and how an informed lawyer would elicit information from that expert in court. Eliciting this information might also go some way in ameliorating judges' concerns that at times expert opinions are presented without the corresponding bases of those opinions being presented too. As members of the judiciary have noted, "where the bases had not been properly proved [it is more often] the fault of counsel, not so much of the witnesses."³⁵²

Impact in Court

More than half of the respondents to this survey indicated that lawyers' lack of comprehension about forensic science has a detrimental impact on what occurs in court. Poor comprehension of how forensic science is organised, how forensic practitioners are trained, the fundamental principles of forensic disciplines, and the significance of results, have created a situation in which lawyers are not utilising expert evidence effectively. Not only are poor questions asked of expert witnesses, but misuse of

³⁵² Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 36.

scientific concepts, jargon and results reportedly leads to evidence itself being misrepresented, omitted and even misused. Failing to ask questions which convey the truth and significance of forensic results does a disservice not only to the expert witness, but more importantly, fails to deliver to the judge or jury accurate, reliable, comprehensible information which can be used to deliver a sound verdict. More needs to be done at the pre-trial stage to ensure that legal practitioners are cognisant of the background and case-related context of the scientific evidence they propose to call in court. The short answer to accomplishing this is increased consultation with the relevant forensic experts.

Q: Please describe your best experience as an expert in court?

What made it so good? Does this happen often? Was it due to a particular prosecutor, defence lawyer, judge or case?

Responses:

Expert was able to properly communicate the evidence (n=24, 18%), because:

- Sufficient time and information to prepare solid casework, all necessary tests, helpful visual aids et cetera prior to going to court,
- Prosecutor led well and “closed gates” which limited attacks from the defence,
- Prosecutor was confident in the witness’ ability,
- Witness was allowed to freely explain the evidence in as much detail as necessary,
- Witness was allowed to use visual aids / prepared summaries, and/or
- Witness was able to give good, clear, concise answers on the day.

Interaction between expert and defence counsel made it the best (n=23, 17%), because:

- Defence had pre-trial conference with witness and was interested in learning;
- Defence asked appropriate questions in court;
- Defence was not looking for loopholes;
- Witness could answer all the defence’s questions and challenges;
- Defence was unprepared/unfamiliar with area/statement et cetera; and/or
- Defence did not ask any questions (that is, there was no cross-examination).

Interaction between expert and the prosecutor made it the best (n=22, 17%), because:

- Prosecutor had pre-trial conference with witness and was interested in learning;
- Prosecutor understood area and issues (including the witness' qualifications);
- Prosecutor understood the witness' statement;
- Prosecutor asked good questions in examination-in-chief;
- Prosecutor objected appropriately when the witness was being cross-examined;
- Prosecutor clarified well in re-examination;
- Prosecutor could cross-examine opposing experts well; and/or
- Prosecutor was professional, enthusiastic, courteous, helpful, supportive.

Interaction between expert and the judge made it the best (n=19, 14%), because:

- Judge intervened at inappropriate, repetitive or harassing questions;
- Judge complimented the witness (for example, on how they gave evidence);
- Judge's body language showed understanding of evidence;
- Judge asked relevant questions of the witness;
- Judge asked the jury if they had any questions;
- Judge clarified the evidence for the jury; and/or
- Judge recognised expertise (and identified non-experts).

The nature of the case and/or the evidence made it the best (n=11, 8%), because:

- Interesting or challenging evidence;
- Feature of evidence – it allowed the witness to come to positive conclusion or couldn't be challenged by any of the defence witnesses;
- Witness' evidence was crucial or greatly enhanced case;
- High profile case; and/or
- Reverse onus legislation (fraud, Victoria).

Positive interaction between the expert and the jury (n=4, 3%), including:

- Rapport established (for example, spelling names for court reporter; used humour to deal with jargon); and/or
- Jury appeared to understand (jury body language et cetera).

Unusual pre-trial preparation made it the best (n=2, 2%), because:

- With prosecutor and defence at same time; and/or
- With all other expert witnesses at same time.

Other responses included:

- Trial actually went ahead (n=1, 1%);
- Witness didn't have to attend court (n=1, 1%);
- Haven't had a 'best' experience (n=5, 4%);
- Insufficient experience to answer (n=4, 3%); and/or
- No response (n=16, 11%).

Q: How often does [a “best” experience] happen? (n=53)

Responses:

Rarely (n=28, 53%), including:

- Only when using novel processes;
- Only in important cases;
- Only when judge controls counsel or self-represented accuseds; and/or
- Witness just seized the chance during cross-examination..

Other responses included:

- Occasionally or sometimes (n=9, 17%);
- Frequently (n=7, 13%);
- Only once (n=5, 9%);
- Most of the time or more often than not (n=3, 6%); and/or
- More often now than it did previously (n=1, 2%).

Q: Was your best experience due to a particular prosecutor, defence lawyer, judge or case? (n=59)

Responses:

Due to the lawyers or the parties themselves (n=34, 58%), including:

- Good prosecutor (prepared);

- Good defence lawyer (not inappropriately combative);
- Poor defence lawyer (for example, annoyed the jury);
- Co-operation between the prosecutor and defence lawyer - their maturity reduced the time spent in court; and/or
- The accused was self-represented.

The remainder were due to:

- The judge (n=14, 24%);
- The case itself (n=9, 15%); and/or
- No particular party (n=2, 3%).

“[In my best experience] the prosecutor was particularly enthusiastic, had an excellent grasp of the science and statistics, presented the case with a pre-planned strategy, had a great sense of ‘theatrics’, and totally demolished the imported expert, using data and questions prepared with our help.”³⁵³

“I find the prosecutors who hold a briefing before court, with all involved, have a better grasp of it all and things tend to run smoother once everyone knows what everyone else’s involvement was...Not a lot of prosecutors have briefings before court, but it eliminates most of the questions I would have faced during cross-examination”³⁵⁴

Positive experiences in court had occurred for the vast majority of respondents, and aside from cases for which the experts were given sufficient time to properly prepare their evidence or the evidence was very strong or crucial to the case (obvious sources of satisfaction), the most common source of satisfaction appeared to be positive interaction with the legal players in the court. Not only do experts recognise the ability of prosecutors to greatly influence whether the court experience is good or not, but defence counsel were also marked out for special comment. Experts appreciate the opportunity to interact with prosecutors and defence counsel in a positive manner, pre-trial. Conferences, particularly those which led to appropriate questions in court, were a source of satisfaction for witnesses. Where lawyers were interested enough in the scientific evidence to seek more information *before* going to court, prosecutors were able to not only ask the right questions but also to better cope with arguments from the defence, and the defence lawyers were better able to identify areas of contest and areas

³⁵³ Comments given in the context of another question (n=2, 2%).

³⁵⁴ Comments given in the context of another question (n=2, 1%).

of agreement so that unnecessary time was not wasted in court on non-contentious issues or loopholes. This pre-trial consideration greatly enhances and adds to the ability of witnesses to communicate their evidence.

Interestingly, many responses reflect the vulnerability of expert witnesses to attack in court, or to things happening in the proceedings in a way which is beyond their control. Expert witnesses are largely powerless when it comes to determining how their evidence is presented. They are permitted only to respond to questions that are asked, and do not have any legal or practical prerogative to correct things if proceedings are occurring poorly. Thus, it is perhaps not surprising to find that their best experiences in court often occur when those who are in control - the judge, prosecutor and defence lawyer - behave in a way which assists the expert in communicating their evidence properly and with dignity. In cases where the prosecution controls what happens to the witness, by asking good questions, by preventing the defence from asking bad questions, and by clarifying things in re-examination, expert witnesses reported a high level of satisfaction. Similarly, “good experiences” with judges occurred when the judge was able to control proceedings by intervening when appropriate; to ask questions, clarify the evidence, or prevent the defence from harassing the witness.

The fact that more than half of the respondents reported that these “best times” occur rarely is indicative that more could be done to improve the utilisation of expert evidence in Australian courts. If pre-trial conferences are encouraged, if advocates (on both sides) are better informed about the scientific evidence they must adduce or examine, if judges are encouraged to control proceedings so as to ensure that forensic experts are given the opportunity to present their evidence fairly and comprehensibly,³⁵⁵ then the “best experiences” of scientific experts in court may occur more often, to the benefit of juries, judges and the legal system as a whole.

³⁵⁵ Without suggesting that judges ought to do the job of the prosecution or defence for them.

Q: Please describe your WORST experience as an expert in court?

Has anything been done to rectify (any problems)?

How do you think other parties at the court (judge, lawyers, jury) reacted?

Did you share this experience with your colleagues/supervisor?

Responses:

Interaction between the expert and the defence made it the worst (n=66, 50%), because:

- Expert's credibility was attacked by the defence, including accusing the witness of lying, making up answers, tampering with evidence, perjury;
- Defence did not want to understand witness' evidence or area of expertise (for example, pushed for (impossible) definitive answers);
- Defence used pre-trial conference information as ammunition for asking poor questions;
- Defence was rude, loud, sarcastic, offensive or gleeful;
- Defence deliberately generated confusion (for example, mis-identifying samples, using incorrect terminology);
- Defence asked irrelevant, rambling or repetitious questions;
- Accused was self-represented; and/or
- Negative interaction with accused or the accused's family outside court.

Interaction between the expert and the prosecution made it the worst (n=17, 13%), because:

- Prosecutor was unprepared, disinterested, or hadn't read the witness' statement;
- Witness was called at short notice or had no pre-trial conference;
- Prosecutor didn't understand witness' qualifications or area of expertise;
- Prosecutor led evidence poorly in examination-in-chief;
- Prosecutor used inappropriate terminology;
- Prosecutor did not object to inappropriate cross-examination or adequately re-examination to clarify evidence;
- Prosecutor did not cross-examination opposing witnesses well;
- Prosecutor appeared to annoy judge and bewilder jury; or

- Witness was asked to give partisan evidence (pre-trial).

The evidence in the case made it the worst (n=13, 10%), because;

- Questions by prosecutor or the defence focussed on irrelevant points or technicalities to the extent that the real evidence did not come out;
- Questions by prosecutor or the defence were outside witness' area of expertise;
- Witness was confined to yes/no answers, to detriment of whole truth;
- Witness was questioned inappropriately about tests not done;
- Evidence was insignificant or there was no cross-examination by the defence; and/or
- Misunderstanding about the evidence (for example, prosecutor misunderstood the evidence, or the court thought two witnesses disagreed, but they actually did not).

The expert himself/herself contributed to making it the worst (n=13, 10%), because:

- First time as expert witness;
- Witness was unable to give clear, concise answers on day;
- Witness gave an incorrect answer (apologised and explained, but ...) or label/charts/graphics were incorrect (witness explained, but error was exploited by the defence);
- Insufficient tests/training/review done by witness (for example, due to budget constraints, oversight, poor notes);
- Witness' laboratory acted for both prosecutor and the defence;³⁵⁶ and/or
- Supervisor was present and reviewing witness' performance.

Time issues made it the worst (n=10, 8%), because:

- Having to go to court at all;
- Inconvenience in getting to court or long delays once at court;

³⁵⁶ As noted in the *Morin* Report, a situation in which one laboratory performs work for the prosecution and for the accused can create difficulties. Reporting a similar situation in this survey, a West Australian scientific expert wrote "My worst experience was a situation in which our laboratory agreed at short notice to undertake an examination for the defence in a case I was appearing in as a witness for the prosecution. Various problems arose due to the conflict of interest and non-disclosure-by-the-defence type issues. Luckily, there was no jury in this trial. This case was the subject of a review by our laboratory."

- Having to give evidence in case that witness was not involved in or had done long ago; and/or
- Long time spent in witness box – exhaustion.

Interaction between the expert and the judge made it the worst (n=9, 7%), because:

- Judge did not understand witness' area of expertise;
- Judge asked poor or unreasonable questions;
- Judge was inappropriately argumentative with or critical of witness or witness' evidence (including embarrassing the witness);
- Judge constantly interrupted witness (for example, to take notes); and/or
- Judge did not disallow/react to irrelevant, repetitious or abusive questions or attacks by counsel. Allowed because witness is an "expert" and not a lay witness.

Interaction with the jury made it the worst (n=2, 2%), because:

- Jury seemed bored, blank faced, disinterested; and/or
- Jury seemed confused

Interaction with opposing witnesses made it the worst (n=2, 2%) because the expert:

- Was incompetent, unqualified or unethical; and/or
- Gave the defence ammunition for poor/inappropriate questions.

Q: Has anything been done to rectify any problems [from your "worst" experience]? (n=32)

Responses

No (n=22, 69%)

- Happens regularly;
- Witness still frank and honest about admitting errors;
- Nothing can be done about it because of the legal system; and/or
- Due to budget restraints in witness' organisation.

Yes (n=10, 31%)

- Colleagues warned about particular lawyer/judge;
- Lawyer was moved to another jurisdiction or job;
- Employer now gives more time to investigate/test and prepare for court;
- More training for witnesses;
- Increased use of visual aids in court; and/or
- Witness modified own behaviour in court (for example, looks at jury not the defence or uses more notes).

Q: How do you think other parties reacted [to your “worst” experience in court]? (n=19)

Responses:

- Oblivious to the problem (n=5, 26%);
- Jury “switched off” (n=4, 21%);
- Frustrated (n=3, 16%);
- Aware that the defence was being selective et cetera (n=3, 16%);
- Did not think the problem was a problem (n=2, 11%); and/or
- Aware of witness’ stress (n=2, 11%).

Q: Did you share your worst court experience with colleagues or supervisors? (n=35)

Responses:

Yes (n=33, 94%)

- Debriefed or warned colleagues so as to rectify problem (for example, incorrect labels/graphs);
- Discussed in team; and/or
- Confided in mentor.

No (n=2, 6%)

“The most important thing an expert witness must maintain is his lack of bias. A lot of the court system does not understand what is involved in “objective” forensic examination; independent checking by others, peer review, performance reviews, external testing.”³⁵⁷

“I strongly believe there should be a forensic provider separate to police – without the constraints placed upon it by the police services. I may be employed by [the police] but the government provides my salary irrespective of “which way” my evidence goes. Also, jurors probably perceive experts who give evidence in uniform as biased towards prosecutor.”³⁵⁸

“As confessional evidence becomes less trusted, the importance of ethical and correct forensic science becomes paramount. *Chamberlain* had a bad affect on our credibility and public confidence - both need to be maintained. Giving evidence is a game, but the expert must be totally objective and impartial and do the best job they can in the interests of justice.”³⁵⁹

Half of all respondents reported having been so badly affected by negative interactions with opposing (defence) lawyers that the experience constituted their “worst experience” in court. Attacks on the credibility of the witness, including assertions that the witness had “made up” their results to bolster the case of the prosecution were particularly strongly described by respondents, and equally strongly denied (as they were in court). Experts employed by police-based organisations provided many of these comments,³⁶⁰ however, the results were certainly not confined to these experts. Scope exists for further empirical investigation into the effect of a witness’ employer (particularly the police) on the perception of that witness by the jury, beyond the research which has been conducted with mock juries elsewhere.³⁶¹

This was matched by the ire of respondents who felt that insufficient support was available from prosecutors who failed to use re-examination to clarify the qualifications/training/peer review/professional independence/good standing et cetera held by the witness. Prosecutors who failed to object to unfounded personal attacks on

³⁵⁷ Comments made by a Victorian forensic biologist.

³⁵⁸ Comments made in the context of another question (n=10, 8%).

³⁵⁹ Comments made in the context of another question (n=4, 3%).

³⁶⁰ Consistent with views already expressed within forensic science literature, for example Lucas, D. (1989). The Ethical Responsibilities of the Forensic Scientist: Exploring the Limits. *Journal of Forensic Sciences*, 34, 719; Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 83.

³⁶¹ Starrs, J. (1991). The Forensic Scientist & the Open Mind. *Journal of Forensic Sciences*, 31(2), 111

the witness during cross-examination by the defence, were well-noted contributors to respondents' worst experiences in court.

“[It is] personal assassination...Being accused of making up answers to suit the police case; (a bit difficult since I didn't know what that was). The offender was the defence barrister...It happens fairly regularly. The judge will often intervene if it gets too heated.”³⁶²

Another source of unpleasant experiences for expert witnesses in court evolves from the manner in which they may be questioned by the defence. Gleeful, rude, loud, sarcastic and offensive behaviour from defence counsel, alleging incompetence or criminality on the part of the expert witness, however, is not necessarily against the law and does not breach practising rules for barristers and solicitors. It is the prerogative of legal counsel to robustly defend their client, and to this end, expert witnesses called by the other side are not immune from robust attack.

Preparation and Presentation

Nevertheless, it seems that more could be done by the prosecution to improve the reception of scientific evidence in court: Worst case scenarios for expert witnesses commonly involve poorly prepared prosecutors, whose inadequate pre-trial preparation of the scientific evidence manifests in a poor presentation of the evidence in court. Where prosecutors are unduly unfamiliar with scientific evidence, their ability to adduce the evidence accurately and comprehensively from their witness is matched by their inability to protect the witness from unreasonable attacks from the defence and to ameliorate the affects of a strong defence by successful re-examination. The upshot of these failures is that the court is deprived of the full benefit of evidence it is entitled to expect, unless the following occurs:

“[I appeared as a forensic biologist] in a case where statistical evidence was presented *very* poorly due to awkward leading by the prosecution. The prosecutor's misunderstanding and poor knowledge of the area compounded the problem. Everyone reacted with confusion and frustration. I saw every jurors' face cringe with confusion. I requested permission to appear the following day to clarify my initial responses. Upon re-examination the evidence was more understandable.”³⁶³

³⁶² Comment made by a New South Wales forensic pathologist.

³⁶³ Comment made by a South Australian forensic biologist.

Red Herrings, Smoke and Mirrors

The complexity of modern forensic science means that there is scope for confusion if it is not carefully explained and presented in court. Even if a prosecutor prepares well, and enables the witness to properly and clearly describe their results, there is always an opportunity for the defence to honestly fail to comprehend or to deliberately obfuscate the evidence for the judge or jury. In either case, the finders of fact may find themselves confused, and perhaps sufficiently confused so as to raise a reasonable doubt as to the guilt of the accused.

This is not to suggest that anyone other than the prosecution and defence are in the best position to know what is and what is not relevant to the case. Whereas a forensic scientist may know the intricacies and internal worth of their own evidence, it can not be denied that individual witnesses are unlikely to know the actual importance of their evidence in the case overall; hence, what may seem like a useless and confusing line of questioning to a witness may have a broader purpose within the framework of the case, and be known only to the side asking those questions. Nevertheless, questions by either party which focus on aspects of the scientific evidence which the expert (with all of their expertise and experience) know to be irrelevant to the veracity of the results are not of this ilk. These questions, mostly designed to impugn the credibility of the witness and/or create confusion in the minds of jurors, are what contribute to many of the worst experiences of respondents to this survey. These sorts of questions can be controlled only if the prosecutor has a good grasp of the forensic discipline and the judge is aware of what is being attempted. Without one or both of these factors, jurors are liable to be left confused or doubtful over aspects of scientific evidence which were raised primarily to confuse them and/or to discredit the witness.

Judicial Impact

In a small proportion of answers, the worst experiences recalled by respondents related to their interaction with the judge. Criticisms of the bench related firstly to the apparent inability of some judges to comprehend the evidence or the scope of the witness' expertise. The situation places the expert in an embarrassing position; they do not want to lecture the judiciary, nor are they always able to rely on the prosecution to assist them by asking helpful questions. In these cases, the expert can only persist in answering

questions to the best of their ability, bearing in mind that everything is recorded on the transcript (which will be available to the judge for scrutiny at a later time).

“Judges, and even the police, expect answers to be generated in a very short time span. That is ‘plug it into the machine and get the answer’. [They have] no real concept of the preparation and work [required] for analyses.”³⁶⁴

Where respondents referred to criticisms made by the judiciary, the responses mostly referred to judges asking witnesses why certain evidence had not been obtained, or, when it had been obtained, why it had not been tested/analysed and adduced in court. Aside from cases where evidence had been mistakenly overlooked, these cases highlight the unfortunate fact that despite the existence of many varied and powerful forensic techniques, limited resources often make it difficult for forensic service providers to utilise all of the techniques all of the time. In the context of individual court cases, where the judge may be of the view that more ought to have been done or that further scientific evidence must be provided, it is unfortunate that where particular tests have not been conducted because of budgetary or staffing restraints, it is inevitably the expert witnesses (and not those responsible for primary funding/staffing decisions) who are called to account. In these situations, the witness is at the mercy of the legal players in the field; the judge who may direct that more evidence be collected, the prosecution who must decide how to proceed in those circumstances, and the defence, who may choose to insist upon or alternatively forgo waiting for the additional evidence.

Outcomes

Whilst some of the factors which contribute to experts’ worst experiences in court may not be able to be rectified, it is nevertheless reassuring that knowledge of these bad experiences is often shared with the colleagues of the witness. This at least ensures that others in the forensic community are aware of problems which may arise in court when they are attempting to give their evidence, and provides some opportunity for them to prepare for those things which can be prepared for (including learning to cope with attacks on their credibility, standing firm when challenged about the limits of their expertise, answering questions about parts of their discipline or evidence that may seem

³⁶⁴ Comments made in the context of another question (n=3, 2%).

irrelevant to them, and double-checking their evidence to ensure that errors are rectified before going to court.)

Q: Do you think the scientific/technical merits of your work are adequately discussed in court?

Responses:

Yes (n=51, 39%)

- Generally the salient points are expressed and explained at some stage;
- Depends on counsel. Good barristers (usually seniors) will know how to lead well; and
- Try to discourage too much detail, to minimise confusion. “Keep It Simple, Stupid” principle (KISS). No need to show off or waffle on – depends on the witness. More important to get the results across than the method.

No (n=47, 36%)

- Would help if at least the prosecutor understood the results and significance (need pre-trial conferences). Dissatisfying to leave court feeling something important was left out;
- Lawyers have vested interest in specific answers and/or irrelevancies. Impatient with technicalities;
- Could be done more thoroughly (for example, open questions and more time). Difficult under existing conditions. Little effort is made to understand evidence, even if jury clearly doesn’t understand it or why it was done that way. More discussion would be helpful for jury and more interesting;
- Unnecessary fear/avoidance of jargon, instrument names, qualifications, experience;
- Other evidence is usually more crucial (scientific evidence only supportive);
- Exacerbated by pleas of guilty – court given no chance to become familiar with the evidence over time; and/or
- Need only appear confident and knowledgeable – court is a theatre.

Other (n=24, 19%)

- Yes and no – sometimes not addressed when necessary and ignored when important;

- Court is not a showcase for science. Any science that gets to court should already be suitable and of high quality. Court is not competent to assess it otherwise;
- What the jury hears is minimal, but probably sufficient. No need to add to confusion by raising things not in issue. Almost impossible to fully explain it to a lay jury in one sitting;
- Usually the problems arise with continuity, or interpretation/significance et cetera, not the fundamental scientific aspects of the evidence or findings of fact;
- Sometimes the prosecutor understands the evidence sufficiently to cover it adequately, but it is usually the defence who is inclined to go into detail, by attacking methodology (not results), credibility, qualifications, bias, confidence; and/or
- Counsel may not wish to deal with it – for example, it gets excluded in “deals” between counsel or not relevant to the whole brief.

No experience (n=3, 2%)

No response (n=7, 5%)

Q: For those who thought scientific evidence is adequately discussed in court; did they think any more could be done? (n=51)

No (n=36, 71%), because:

- Usually satisfied all important issues raised and explained (by pre-trial conferences and KISS), despite the defence’s attempts to complicate issues;
- It is good for the court to understand your qualifications and experience and satisfying to give evidence for a good barrister who knows how to lead you well; and/or
- Counsel knows entire brief and thus the importance of each aspect of the evidence. Expert witnesses are bit players only.

Yes (n=3, 6%), because:

- Prosecutor can make things worse – a little knowledge can be dangerous. Scientific evidence is usually only corroborative anyway;
- Adequate discussion is Important. If full process not disclosed, leaves important gaps and appears unprofessional.

Other (n=2, 4%), because:

- I try to use simple terminology and avoid confusing jargon. Parties seem happy with this;
- Jurors not qualified – may waste time to try to teach them everything, rather than accept the facts from the expert; and/or
- No response (n=10, 20%).

Q: For those who thought scientific evidence is NOT adequately explained in court; did it bother them? (n=47)

Responses:

Yes (n=28, 60%), because:

- Lack of recognition for the expertise, qualifications, time, energy and commitment of the investigators for the community Makes job very frustrating and dissatisfying;
- Over-simplifies and demeans the value of forensic science – evidence could be significant (and persuasive) if presented effectively. Could easily be alleviated by pre-trial conferences with the prosecutor and the defence;
- Setting out fundamental principles would clear up juror misconceptions and avoid later confusion. Misunderstanding (accidental or deliberate) is too easy;
- Counsels' focus on irrelevant or minor details mean the jury can get incorrect or incomplete information – how can they make an informed decision about the weight of the evidence? The accused may be acquitted on this;
- Exacerbated by trial tactics for example, guilty pleas, deals between the prosecutor and the defence, deliberately closed questions. Court does not hear the complete details, but then again lawyers have an overview of the whole case and important issues; and/or
- Means experts have little experience when they are finally challenged about their evidence.

No (n=13, 28%), because:

- Court is not the place to debate science. Provided I'm 'morally certain' of my work, I'm happy and don't care if it is debated or not. Implies that evidence is just accepted without a doubt;
- Pragmatic view - witnesses cannot be concerned about the perversity of legal process or lack of knowledge by lawyers. Worrying causes stress, which harms future work. Poor examination means less time spent in court;
- My area of expertise is pretty limited; and/or
- Too much detail can be confusing.

Other (n=6, 13%), because:

- Yes and no – too little science can dilute the evidence but a poor prosecutor who attempts the science can totally lose the jury;
- Lawyers understand techniques/procedures but overgeneralise about experience/qualifications/merit et cetera. Experience is not recognised or is taken for granted; and/or
- In most cases explanations are not required – evidence is just accepted or non-contentious. If I thought something should be raised I would draw it to the court's (or prosecutor's) attention.

Q: For those who responded with "other" as to whether scientific evidence is adequately explained in court; did it bother them? (n=34)

Responses:

No (n=16, 47%), including:

- Prosecutor has the big picture and their own reasons for focusing on certain things. Not realistic to expect to discuss everything. Up to court to decide what is relevant and focus on that; and/or
- Provided there's a pre-trial conference and the prosecutor's fully informed, I'm happy. We use the best techniques possible. It is amazing how little some prosecutors know.

Yes (n=6, 18%)

- Very dissatisfying to know that important, relevant information was not expressed, because the prosecutor didn't lead it and you didn't feel right about volunteering;
- The defence looks for loopholes instead of truth. Creates confusion – also, complainants get angry when the accused is not convicted; and/or
- Makes process uncertain and wastes my time (in laboratory and in court) and court's time.

Other (n=2, 7%)

- There are lots of grey areas – but people want yes/no answers;
- Means jury has to make decisions based on poor information;
- No response (n=7, 21%); and/or
- Insufficient experience (n=3, 9%).

Q: There are two aspects of expert evidence

(A) How it supports the prosecution or defence case

(B) How good it really is (in terms of technique, strength, appropriateness etc)

In your opinion, which part(s) usually come out in court?

1. A

2. B

3. A and B

4. Neither A or B

Responses:

- (A) How it supports the prosecution or defence case (n=61, 46%);
- (B) How good it really is (technique, strength, appropriateness etc) (n=11, 8%);
- (A) and (B) (n=51, 39%);
- Neither (A) nor (B) (n=5, 4%); and/or
- No response (n=4, 3%).

Q: Do you think both parts (A) and (B) should come out in court? Why?

Responses:

Yes (n=97, 74%), because:

- Full disclosure is fair to the defence (legal justice) and avoids bad science (scientific justice);
- Puts the evidence into perspective - otherwise the prosecutor uses (A) and the defence tries to undermine (B). Helps to have both sides equally. Develops whole picture;
- Both important for determining weight and significance of evidence. Good (B) supports (A);
- Allows witness to pre-empt and explain issues, and demonstrate professionalism, impartiality, accuracy and reliability of self and of work;
- Allows jury to know enough to confidently form an opinion and make better decision based on evidence (for example, techniques may have improved over time et cetera); and/or
- Both important, but must be presented without unnecessary time wasting, scientific detail or confusion for jury.

No (n=17, 13%), because:

- Court not appropriate place to determine scientific truth. If the technique is proven, shouldn't waste time and/or risk confusing jury;
- Expert should present only (B). (A) is for the judge/jury;
- Judge and jury want only the "bottom line" (all else is grey area and confusing). Lawyers just want evidence to support own side; and/or
- (A) is just the end product of (B).

Other (n=10, 8%), because:

- Depends on case. If evidence is crucial, (B) is discussed more. Most cases are straightforward;
- Depends on the prosecutor – an ill-informed prosecutor can do more harm than good, trying to adduce both (A) and (B). Pre-trial conference helps;
- Flip side of (A) is being able to explain why evidence doesn't support the other side. This may require an explanation of (B); and/or
- Court is not a showcase for science. "How good it really is" should only come out if the science is bad. Lawyers judge what is relevant.

No response (n=8, 6%)

“Forensic science and the law seem like two opposing dichotomies. Forensic science is interested in the actual truth, whereas the defence is interested only in their client. The current adversarial system does not seem capable of accepting scientific evidence rationally. On a case-by-case basis the consistency of decisions is poor: Evidence leading to an acquittal in one case could result in a conviction if there is a different judge/jury/defence counsel/prosecutor.”³⁶⁵

Almost half of the respondents to this question reported that what is usually drawn forth in court is how well their expert evidence supports the prosecution or defence case. This is not surprising in an adversarial setting, where the advocates are propounding their own case theory, which they want to prevail over that of their opponent. Scientific evidence lends weight to a case. The danger lies, however, in *only* this part of the evidence being disclosed to the triers of fact (particularly when the triers of fact are jurors). If there are issues to do with the internal scientific strength of the evidence, especially deficiencies which may be sufficient to raise a reasonable doubt in the mind of jurors as to the guilt of the accused, then this is crucial information which must be relayed to the triers of fact for the just conduct of any trial.³⁶⁶ Prosecutorial codes and guidelines in Australia require prosecutors to disclose not only the material favourable to their case, but all of the material relevant to the matter at hand.³⁶⁷ These provisions fail, however, if the prosecution is not sufficiently knowledgeable about the expert evidence to know the extent or significance of any deficiencies in the scientific strength

³⁶⁵ Comments made in the context of another question (n=4, 3%).

³⁶⁶ See Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107 for cautionary tales about the dangers of scientific evidence not adequately examined before and during criminal trials.

³⁶⁷ See for example; Office of the Director of Public Prosecution, Australian Capital Territory, *Guidelines for Prosecutors*, pursuant to the *Director of Public Prosecutions Act 1990* s 12, Guideline 6 “It is not a legitimate forensic tactic for the prosecution to engage in “trial by ambush” and there is a general duty to disclose the whole of the prosecution case to counsel for the accused. This duty is subject only to any overriding demands of justice such as the need to prevent risk to the lives or safety of potential witnesses. Even then it will usually be possible to apprise the defence of the general nature of the Crown case even if such details as the names and addresses of particular witnesses are withheld.” See also the Victorian Bar Incorporated, *Practice Rules, Rules Of Conduct & Compulsory Continuing Legal Education Rules, Prosecutor’s Duties*: 134 “A prosecutor must fairly assist the court to arrive at the truth, must seek impartially to have the whole of the relevant evidence placed intelligibly before the court, and must seek to assist the court with adequate submissions of law to enable the law properly to be applied to the facts.”

of that evidence.³⁶⁸ This is clearly an issue which could easily be resolved by properly consulting with the expert before taking the evidence to court.

Likewise, it is crucial for the defence to have a thorough understanding of the evidence, not only in terms of its likely adversarial impact but in terms of its scientific strength.³⁶⁹ In this survey, only a small number of respondents reported that *only* the adversarial strength of scientific evidence was brought out in court, to the exclusion of the scientific strength of that evidence.

Some respondents noted that the prosecution and defence fall naturally into particular roles; the prosecution asserts the adversarial strength of scientific evidence and the defence looks for flaws in the scientific basis of the same evidence. In such cases, the very essence of the adversarial system relies on a knowledgeable defence being able to recognise the scientific flaws in the evidence, expose those flaws, and therefore diffuse the false persuasiveness of the evidence for the jury. This presupposes, however, that the defence have researched their brief to the extent that they are knowledgeable about the background scientific issues related to the evidence in the trial, and, that the defence has access to experts sufficiently so that they can consult on the evidence and seek expert advice as to its scientific strength. In Australia, the results of this survey suggest that in fact, not only are the defence limited in where they can access their own experts, but the time frame in which cases are prepared for trial does not support thorough knowledge about scientific evidence being acquired by counsel.

The responses to this survey suggest the system is time poor. Forensic scientists are time poor in being unable to adequately discuss their results, conclusions and concerns with the prosecution or defence. The prosecution is time poor in being unable to meet with their expert witnesses and adequately canvass the evidence before it is presented in court. The defence is time and resource poor in being able to access the experts and scrutinise the evidence sufficiently before having to cross-examine the experts in court.

³⁶⁸ Abraham, W. (2006). Difficulties in Using Expert Evidence - *R v Karger* - A Case Study, *10th Annual Conference of the International Association of Prosecutors*. Paris at 7, 9.

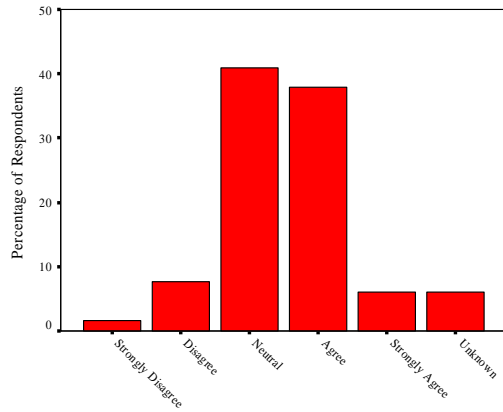
³⁶⁹ As discussed, this is partly a question of resources available to the defence, however, the danger in not properly examining scientific evidence is the high risk of allowing serious miscarriages of justice to occur. See Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107.

In such a situation, the responses to this survey indicate that the defence are more likely to descend into confusion in an attempt to limit the adversarial strength of expert evidence. Where coherent arguments cannot be levelled at the underlying scientific strength of the evidence, defence counsel may resort to confusing the issue with irrelevant, jargon-laden, faulty arguments which blow alleged flaws in the scientific evidence out of all objective proportion. In these cases, it is a significant danger for the prosecution to neglect their own comprehension of scientific evidence and rely too heavily on the fact that scientific evidence is adversarially strong and juries find it persuasive. A poorly prepared prosecution is unable to combat a well-prepared attack from the defence - even if the attack consists mostly of irrelevancies and red-herrings couched in technical-sounding terms. Poorly prepared prosecutors are unable to cut through confusing arguments and propositions to clarify the strength, suitability and validity of scientific results, to the detriment of evidence which may be utterly scientifically sound and ought to have been useful for the jury in deciding upon a verdict.

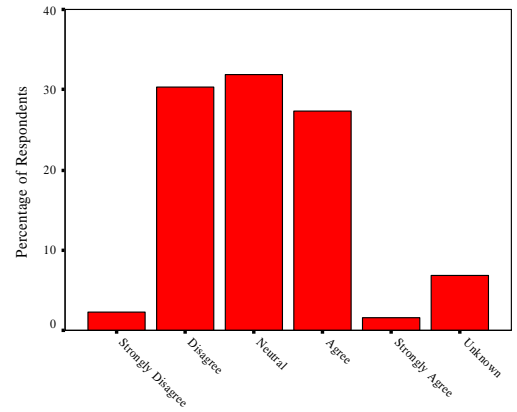
Reassuringly, a large proportion of respondents believed that both the adversarial strength of the evidence *and* how scientifically strong the evidence actually is, were the parts which usually come out in court. When questioned further, most respondents also believed that both parts *should* come out in court, mostly because this was fair to the accused (who, after all, has the right to have the case against them proved, rather than bearing the onus of having to prove their own innocence).

Examination-in-chief and Cross-examination

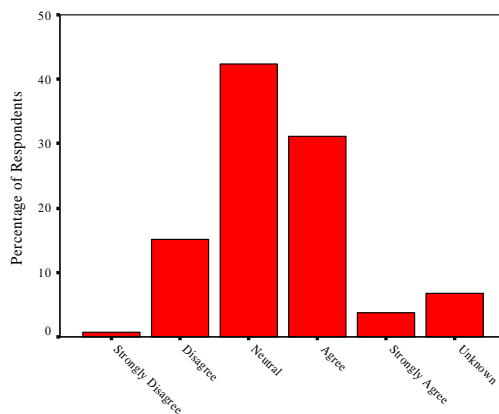
Examination-in-chief
is well-structured and logical



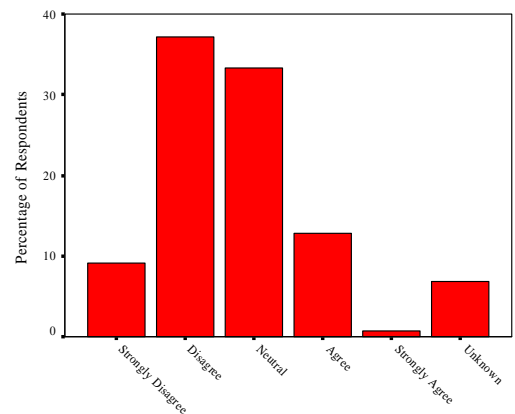
Cross-examination
is well-structured and logical



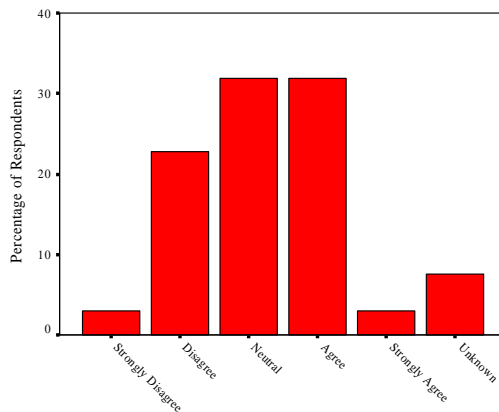
Examination-in-chief questions
are relevant and sensible



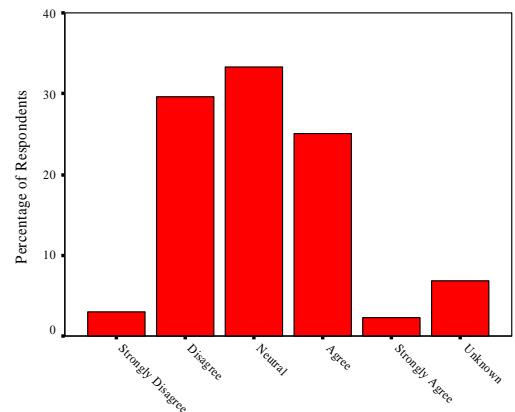
Cross-examination questions
are relevant and sensible



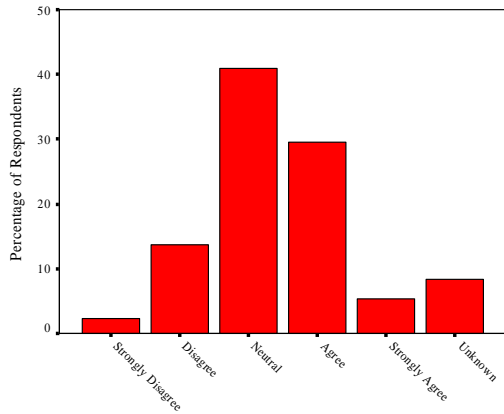
Examination-in-chief questions show
that barristers understand your evidence



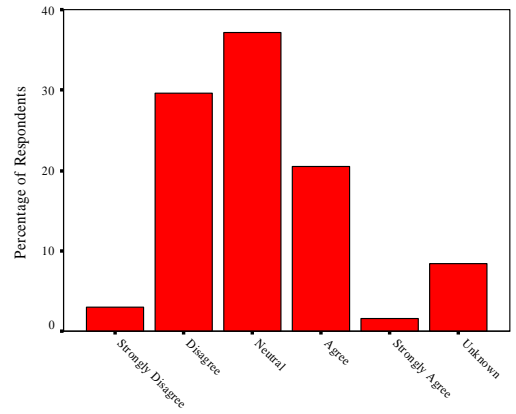
Cross-examination questions show that
barristers understand your evidence



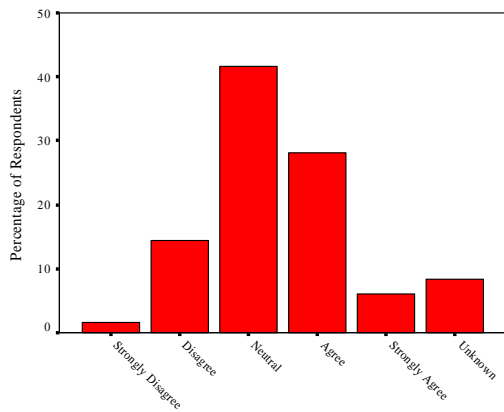
*Jurors appear to be able to follow the **examination-in-chief***



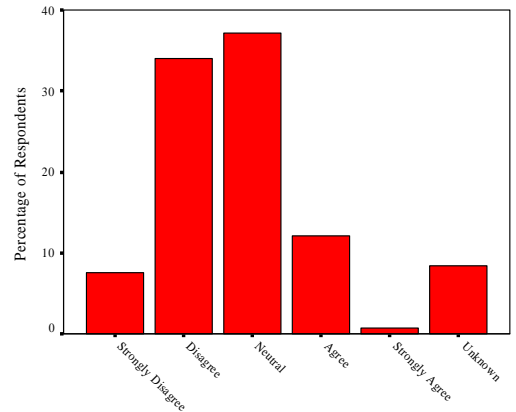
*Jurors appear to be able to follow the **cross-examination***



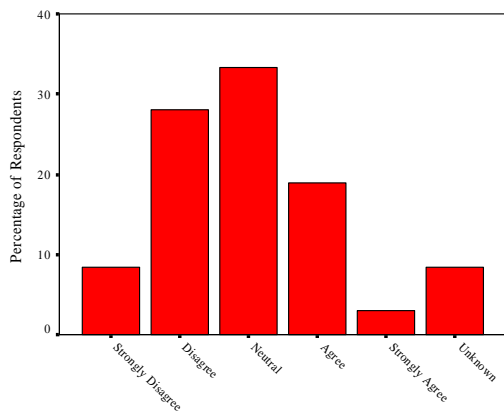
***Examination-in-chief** questions appear to help the jurors*



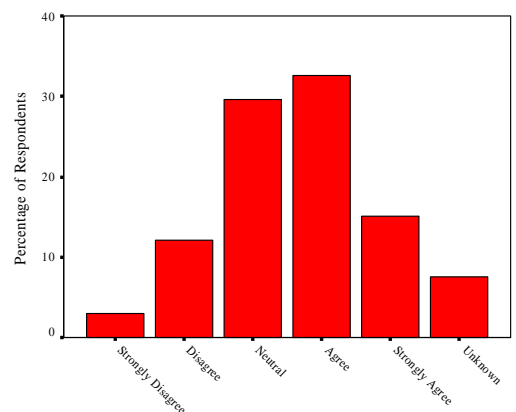
***Cross-examination** questions appear to help the jurors*



***Examination-in-chief** questions appear to confuse the jurors*



***Cross-examination** questions appear to confuse the jurors*



Q: Are there any other comments you would like to make about examination-in-chief in general?

Responses:

About the prosecutor (n=49, 37%)

- Depends on the prosecutor and also on the witness' relationship with the prosecutor. Often see good results from experienced prosecutors in higher courts. Prosecutors are usually more logical and structured than the defence is in cross-examination. This helps to settle the witness.
- If a pre-trial conference takes place, relevant evidence is presented. Better conferences (even 10-15 minutes in duration) result in a better standard of question. Without a pre-trial conference there are vague questions and diluted evidence. Even the same evidence may require different questions in different cases. Is it professional snobbery to not consult the expert witness prior to attending court?
- Prosecutors are rarely well-prepared and rarely understand the evidence fully. They rely too much on the expert witness winging it. Wrong questions or no questions at all are asked due to prosecutors' lack of knowledge. Sometimes this is recovered in re-examination, but sometimes this simply leads to confusion (even of their own witness.) There is a tendency to leave details or whole issues out and rely on the defence to raise them.
- Prosecutors often misunderstand the witness' limit of expertise or knowledge about other parts of the case. Leads to poor questions and different views on what needs to be presented and emphasised.
- Some prosecutors lead too closely (which restricts the truth or whole evidence) and others are too vague: "tell the court what you did/saw". Witnesses would prefer some structure but with scope for witness to add detail.

About presentation of the evidence (n=15, 11%)

- Questions need to first establish experience and credibility of the witness, then be structured and logical. Helps the jury accept the witness then understand the evidence and its significance.

- Rules of evidence and presentation leave jury with confusing and incomplete bits and pieces – examination often seems directed at the judge (maybe so he can explain it to jury?).
- Rarely varies from the written order of the report/statement, even where emphasis would help a lot to clarify key issues. Sometimes seems waste of time to actually call witness.

About the jury and/or the witness (n=4, 3%)

- Witness should explain and expand as required; they have the evidence and must communicate it to the court. This comes with poise, confidence and experience in court.
- Sometimes would bore jury if every little detail was examined; at other times the jury is fascinated.

No response (n=64, 49%)

Q: Are there any other comments you would like to make about cross-examination in general?

Responses:

Tactics of the defence (n=46, 35%)

- Where the evidence is strong, the defence attacks the witness (that is, “the man not the ball”). This is extremely intimidating. Police are often targeted for this.
- Attempts to create doubt by confusing jury ("muddying the water") are an art form for defence counsel. Is this ethical? May be a legally legitimate tool, even if not scientifically relevant.
- Best cross-examiners cause sound evidence to be lost in arguments about red herrings, trivialities, side-line issues, evidence out of context and/or deliberate misunderstanding of results, ridiculous hypothetical scenarios, limited answers et cetera; such attacks are often informed by imported ‘experts’.
- The defence clutches at straws and goes on fishing expeditions. Often seem to be filling in time (to earn the brief fee?). The lines of challenge are predictable.

- Questions appear sporadic, random, irrelevant, marginalised, poorly structured. There appears to be no apparent theory from the defence.
- The defence often (deliberately) misunderstands the limits of the witness' expertise and/or knowledge about the rest of case. Makes the witness seem lacking if they are asked about what they didn't do or know, rather than what the witness did do or know.
- The defence tries to create the impression that the scientific evidence is not relevant – that it should be disregarded by the jury.

Depends on the defence (n=20, 15%)

- Some defence counsel are well prepared (for example, they hold pre-trial conferences), others are not. Quality varies more than for prosecutors.
- Few defence counsel are knowledgeable enough to ask well-structured and informed questions. Most are poorly prepared. Pre-trial conferences with the expert witness would help their case.
- The defence is often better prepared and researched than the prosecution. Defence ask more probing, specific questions. Prosecutors could learn from this – or pre-empt the questions in examination-in-chief.

Role of other players (n=7, 5%)

- Essential that the prosecutor understands the expert evidence, otherwise the defence questions are not objected to or are left unaddressed in re-examination.
- Pre-trial discussion between the prosecutor, the defence and the expert witness would narrow the issues, and shorten court-time. Lawyers not interested in this option.
- Judges should exercise more control over cross-examination.
- Lack of structure makes inexperienced witnesses nervous and mistake-prone. This can be rectified by experience, poise, confidence and giving full, frank, well-considered answers to jury, not to the defence.
- Cross-examination just as biased towards the defence as examination-in-chief is biased towards the prosecution.

No response (n=59, 45%)

Given that the overwhelming majority of respondents to this survey conduct the majority (or all) of their work for the prosecution, results about examination-in-chief were taken to pertain to questions by the prosecution, and results about cross-examination were taken to pertain to questions by the defence. The responses to these questions also resulted in a high proportion of “neutral” answers (the midpoint on the Likert scale³⁷⁰), which in many survey forms were followed up with comments to the effect of “the examination and cross-examination I have experienced ranges from very good to very poor, so in many questions I have given a neutral response”.³⁷¹ To draw the most from the responses, most of the following discussion concentrates on those answers that were not neutral. While they were fewer in number, they give some illumination as to why forensic scientists are satisfied with some aspects of their court presentations and dissatisfied with others.

Structure, Logic, Relevance and Sense in Examination Questions

Well-structured and logical examination-in-chief sets the scene - tells the story³⁷² - for the jury. If witnesses are questioned in a manner which elicits relevant facts in a logical, sensible sequence, jurors are more easily able to comprehend the case theory, remember the evidence, and construct their own internal version of events.

In cross-examination the intention of the questions may be entirely different to that of examination-in-chief. Where a prosecutor is obliged to relay all of the facts in a case, the defence bears no such onus and may use cross-examination to elicit concessions from expert witnesses, to cast doubt on the veracity or significance of the expert witness, the methods used by the witness, the results recorded by the witness and the conclusions drawn from those results. In an attempt to cast reasonable doubt on the prosecution case, the defence may explore seemingly random lines of questioning; the rationale may include testing the witness, exploring hypothetical scenarios, confusing the jury, or it may be sheer personal habit.

³⁷⁰ Likert, R. (1932). *A Technique for Measurement of Attitudes*. New York: Archives of Psychology.

³⁷¹ See O'Muircheartaigh, C., Krosnick, J. A., & Helic, A. (2000). *Middle Alternatives, Acquiescence, and the Quality of Questionnaire Data*. Chicago: University of Chicago at 1 for a discussion of the value including a middle alternative in questions using a Likert scale.

³⁷² Hastie, R. (Ed.). (1993). *Inside the Juror: The Psychology of Juror Decision Making*. New York: Cambridge University Press.

The structure and logic of examination-in-chief scored better than did the relevance and sense of the questions. This may be because (as one respondent noted), some prosecutors stay close to the structure and content of the expert's report, perhaps without comprehending the full meaning of it, or being able to identify the truly significant parts of the evidence. This would result in well-structured examination, but a failure to highlight the parts most relevant and significant to the case at hand.

In comparison, cross-examination rated poorly for relevance and sense, but marginally better for structure and logic. On the basis of comments in later questions, it would seem that many expert witnesses react strongly to cross-examination which consists of hypothetical questions, in which the scenarios are *possible* but highly *improbable*. These questions seek concessions from the expert by either diluting the strength of their original findings or providing alternative explanations (however unlikely or insensible) for the results. Either course may be sufficient to cast reasonable doubt on the prosecution case, but the tactic tended to raise the ire of a range of expert witnesses in this survey, many of whom questioned whether the defence really did understand the evidence or was more interested in misunderstanding it so as to cast aspersions on the expert's inability to answer their poor questions.

Questions and Jurors

Two things must be remembered about the responses to these questions. Firstly, the respondents to this survey were invariably called to court by the prosecution, so, although they may be highly qualified, well-trained professionals, who are both willing and able to provide evidence for the defence, and are entirely objective and unbiased, nevertheless, the evidence they are called to give in court usually tends to support the case of the prosecution. For this reason, such witnesses would understandably be frustrated by attempts by the defence to discredit, marginalise, misunderstand or dispute that evidence.

Secondly, evidence is called to court to assist the triers of fact (for our purposes, the jury) in reaching a sound verdict. Naturally the prosecution would seek to communicate the evidence in a manner which assists jurors' understanding, however, the purpose of the defence (to ensure that any flaws in the prosecution case are recognised and examined) may not assist jurors' understanding. This is reflected in the responses to this

survey. Predictably, respondents report that examination-in-chief appears to help the jury, as they are able to follow the questions, mostly without confusion. In comparison, cross-examination is not as easy to follow, does not seem as helpful to the jury and seems more likely (than examination-in-chief) to confuse them.

Commentary on Examination-in-Chief

“Prosecutors who get the witness to read the report out make it VERY boring for the jury. It is much better to summarise the findings and elucidate important facts. Much depends on the lawyers – jurors can understand basic principles and handle scientific evidence, unless the issues are clouded by the poor performance of the prosecutor or by confusion being created by the defence.”³⁷³

It is not necessarily poor examination-in-chief for a prosecutor to lead a witness directly through their statement. However, it is poor examination-in-chief if the prosecutor leads the witness directly through their statement without comprehending it, highlighting the significant results or drawing forth enough commentary to ensure that the jury understands the results and their significance. This does a disservice to the jury (in not assisting them to identify what is important and to understand it), a disservice to the expert (in not utilising their expertise) and a disservice to the court (in not properly preparing the case so that the implications of the evidence - both good and bad - are properly understood and communicated to the trier of fact).³⁷⁴

It is not necessarily poor examination-in-chief to allow the witness to explain their evidence in their own words, rather than restricting them to a recitation of the report. However, it is poor examination-in-chief not to recognise that the expert witness may have virtually no knowledge of the facts of the case or the broader context of their evidence, and thus they may need guidance in court to assist them in directing their evidence to the jury in ways that are relevant and helpful. It is not reasonable for prosecutors to assume that expert witnesses will be able to spontaneously adapt to whatever prosecutorial style is forthcoming and be able to express the results relevantly, sensibly and helpfully. As various respondents noted, the solution lies in having a defined structure for examination-in-chief, but providing scope for the expert to add

³⁷³ Comments made in the context of other questions (n=4, 3%).

³⁷⁴ Abraham, W. (2006). Difficulties in Using Expert Evidence - *R v Karger* - A Case Study, *10th Annual Conference of the International Association of Prosecutors*. Paris at 6,7.

detail where it is required to adequately explain something, clarify a misconception or indicate a point of significance.

It is not reasonable to expect every prosecutor to have an in-depth knowledge of all aspects of the evidence which they will call from all witnesses in any particular case. Nor is it reasonable for examiners-in-chief to assume that the same type of evidence will require the same questions in every case, or that if they fail to comprehend or raise important issues in examination-in-chief that the defence will raise them later. Evidence which was not comprehended by the prosecutor (or the jury) during examination-in-chief may not always be recovered during re-examination. To assist prosecutors in comprehending the expert evidence and knowing what is significant and what is not, a pre-trial conference with the expert may be the solution. This need not be an in-depth multi-hour exploration of every nuance of a discipline. A concentrated 15 minute consultation - prior to attending court - is reportedly all that it would take for many prosecutors to dramatically improve their understanding of what their expert and their evidence can provide.

Commentary on Cross-Examination

By far the most strongly expressed comment about cross-examination regarded the way in which expert evidence can be so easily exploited to create confusion in the minds of jurors. Respondents were exceedingly frustrated not only by the way in which the defence is able to raise extremely unlikely hypothetical scenarios, trivialise significant results and accentuate side-issues and irrelevant points, but also by the fact that often these strategies are successful. Their success was attributed not only to the inherent complexity of the evidence, but more often to the inability of poorly-prepared prosecutors to adequately lead the evidence, address difficult issues and set a firm foundation in the mind of the jury. A further inability by the prosecution to recover the initiative in re-examination (by either asking appropriate questions or by asking any questions at all) exacerbates the experts' frustration.

As for the examination-in-chief, respondents noted that all counsel (both prosecution and defence) would greatly benefit from pre-trial consultations with the expert witness. In this way, the prosecution would understand the evidence sufficiently to present it properly and to adequately address attacks from the defence, and the defence would

comprehend the evidence sufficiently to know either what to accede to or what to address in court.

Examination-In-Chief and Cross-Examination Overall

The upshot of poor examination-in-chief, cross-examination and re-examination is that, combined with the rules of evidence (which are necessarily restrictive to protect the rights of the accused), the jury may be left with a dismal indication of the content, strength, relevance and significance of expert evidence which was gathered and analysed precisely to give them assistance which they would not otherwise have been able to gain for themselves. At the very least, this is a waste of resources, but where legal counsel fail to properly discharge their duties in respect of expert evidence, it “is a recipe for miscarriage of justice in any court”.³⁷⁵

Overall, respondents answers suggest that many of the problems they report with questions in court could be easily rectified by pre-trial conferences between the expert and either or both of the prosecution and defence.

Q: From your position in the witness box, do you think the judge usually understands the evidence you give?

Responses:

Yes (n=98, 74%)

- Judge will ask good clarifying questions if unsure or if s/he thinks the jury may be unsure (better than barristers sometimes);
- Most have a reasonable understanding; they hear that kind of evidence frequently and know what weight to give it;
- Usually very acute, astute and good listeners; often actively participate; expert can tell by the expression on a judge’s face; and/or
- I make an effort to avoid jargon but also not talk down to the court.

Other (n=20, 15%)

³⁷⁵ Freckelton, I., Reddy, P., & Selby, H. (2001). *Australian Magistrates' Perspectives on Expert Evidence: A Comparative Study*. Melbourne: Australian Institute of Judicial Administration at 4.

- Hard to say/unsure;
- Difficult or impossible to tell: A judge would probably ask questions if necessary; Witnesses do not see the summing up (which would give a better indication), and judges must appear impartial;
- Sometimes yes, sometimes no (it depends on the case, barristers, questions and on the judge's interest, experience and preparation);
- Usually seem to understand better than the barristers do;
- Experienced judges may actually have outmoded knowledge or a biased view about particular evidence;
- Some ask irrelevant questions or allow the defence to ask them – does this show a lack of understanding?
- Irrelevant – I try to direct my evidence to the jury.

No (n=8, 6%)

- The prosecutor does not clarify the evidence enough for any judge to fully understand it;
- No guarantee that judges or lawyers understand what experts do;
- Some (including magistrates) have difficulty understanding complex evidence, statistics and statistical inferences; and or
- Can look disinterested; “switched off”.

No response (n=6, 5%)

Q: Do you think judges could do more to aid the presentation of your evidence? What could they do?

Responses:

Yes (n=53, 40%)

- Insist on pre-trial meetings or more *voir dire*s to sort out issues and impartiality of evidence before a jury hears it;
- Ensure barristers know what they're talking about; for example, demand that the prosecutor is fully prepared and presents evidence fully; prompt both sides to be more thorough;

- Give the expert witness more freedom to expand on answers, use more visual aids; be more flexible about innovative and lecture-style presentations; insist on decent presentation equipment in court;
- Stop ridiculous, confusing, repetitive, intimidating, overly theatrical, or abusive questions (especially from the defence). Repetition and abuse are the big issues;
- Clarify things that might confuse the jury; especially where prosecutor or the defence do not do so (for example, by summarising the gist of the evidence or asking the expert for clarification/layman's explanation in court.) This also gives valuable feedback to the expert too;
- Allow and encourage the jury to ask more questions; actively ask jury if they have any questions; and/or
- Improve jurors' attention (for example, adjournments, more time to think, access to exhibits and summaries of evidence).

No (n=53, 40%)

- Judges seem capable, efficient, helpful, able to cope; they ask good questions when prosecutor and the defence do not;
- Judges need only understand the evidence well enough to sum up for the jury;
- In an adversarial system the judge must not aid or question the witness (otherwise s/he may appear biased, especially to the jury); and/or
- Don't need another person who doesn't really understand, interfering with the evidence.

Other (n=13, 10%)

- Have full confidence in judges; most seem to know what is important;
- Judges need to take a more active and interested role in trial (for example, semi-inquisitorial role, rather than a purely adversarial one);
- Maybe; some judges are better than others; and/or
- Judges need to embrace the use of more technical/presentation aids.
- No response (n=13, 10%)
- Insufficient experience (n=4, 3%)

Expert Witnesses and the Judiciary

Although the attitudes and opinions of the judiciary in regard to expert evidence have been sought and reported,³⁷⁶ the fact remains that judicial perspectives, while valuable, naturally cannot comprehensively cover the field on the operation of expert evidence,³⁷⁷ and, judicial decisions on expert evidence are largely not peer reviewed (apart from appellate review) and are not widely published.³⁷⁸ Thus the survey reported in this chapter taps into a rich source of information as to whether scientific evidence is being properly presented and how it can be improved. By asking forensic scientists for their input, it is possible to investigate whether the scientific aspects of their evidence are being properly (accurately) presented, and whether, from the perspective of the expert witnesses themselves, the evidence could be better presented to judges and jurors.³⁷⁹ To these ends, respondents were asked not only whether judges appear to understand complex evidence, but, more pragmatically, what judges could do to assist the expert witness (and the advocates) to improve the presentation of expert evidence.

“Just prior to me taking my experts examination [an external examination for fingerprint examiners] I was giving evidence on the development of prints and exhibits only. The judge asked how long I had been in the section, knew of the training involved and asked my opinion on an identification. The Judge obviously had knowledge about fingerprint evidence.”³⁸⁰

“I made the mistake of trying to volunteer clarification of information sought by a particularly poor defence question. The judge intervened and (in as many words) instructed me to “let the defence stew in his own juice”.”³⁸¹

Interestingly, a large majority of expert witnesses who responded to the survey in this chapter indicated that judges usually understand expert evidence. Indicia of their understanding included active listening; taking notes, scrutinising exhibits, watching the

³⁷⁶ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration.

³⁷⁷ Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131 at 144.

³⁷⁸ Jasanoff, S. (2005). Law's Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S55 argues that encouraging judges to “think like scientists” merely leads them into conjecture about the practice of science without the disciplining benefits of empirical study or peer review.

³⁷⁹ By no means is it suggested that the view of forensic scientists covers the field in defining the operation of expert evidence, however, theirs is a valuable perspective which has not been empirically studied to date. (In answer to criticisms such as that from Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131 at 145-6.).

³⁸⁰ Comments made in the context of another question (n=2, 1%).

³⁸¹ Comments made in the context of another question (n=2, 1%).

witness, asking questions and looking interested. Even those respondents who were equivocal in their answers (that is, those who chose not to agree with the question, but provided a comment under the heading of “other”), mostly agreed that judges would probably ask questions if unclear about the evidence, or that a judge’s understanding would depend on the case, the advocates, the judge’s own background and the nature of the evidence.

The few negative comments about judges’ understanding of expert evidence were enlightening. Some respondents noted that judges (like other highly intelligent and educated lay people³⁸²) may have difficulty comprehending details of complex expert evidence such as statistics or statistical inferences, or may have preconceived and perhaps outdated views about forensic science,³⁸³ which affect how science is judged and described from the bench.³⁸⁴ This corresponds with Freckelton’s report that some 70% of judge respondents in a recent survey had, on occasion, not understood expert evidence in cases before them, and that 20% often experienced difficulty in evaluating the opinions of opposing experts.³⁸⁵

Contributing to possible judicial misunderstandings and failures to fully comprehend scientific evidence, respondents pointed to advocates who fail to clarify the evidence:

“[After poor examination-in-chief and cross-examination] the judge went over the evidence again and explained fingerprints to the jury. *He* re-examined my evidence.”³⁸⁶

Poor presentation of expert evidence (by lawyers and their witnesses) has been remarked upon by judges in other works: Freckelton *et al*, on the basis of the responses from judges and magistrates, recommended that experts and advocates be trained to

³⁸² Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy at 2.

³⁸³ Jasanoff, S. (2005). Law’s Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49 at S55 suggests that “as members of a highly educated, professional elite in an industrial society, [judges] bring to the bench a variety of understandings inculcated since childhood about the nature of facts, rationality, proof and method in science. These background beliefs provide a resource that judges selectively draw on, particularly when [the law] fails to provide clear guidance about the proper course of action.”

³⁸⁴ Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131 at 137.

³⁸⁵ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration Question 3.7.

³⁸⁶ Comment from a Victorian fingerprint expert.

better deliver complex evidence to the courts.³⁸⁷ For experts this would require the development of highly proficient oral communication skills; for though written reports may be accepted in court, oral evidence is the traditional and dominant mode of expression. For advocates, training would require an appreciation for and improved understanding of other disciplines so that complex evidence can be better presented in-chief and better questioned in cross-examination.

These recommendations find resonance in the results of the present survey. A large proportion of the expert witness respondents suggested the need for greater training for advocates to ensure that they are in command of sufficient knowledge about the expert evidence they expect to call and question in court.

A significant proportion of respondents to the survey in this chapter would welcome changes to improve the use of expert evidence in Australian courts. Suggestions forthcoming from forensic scientists included not only an increased emphasis on having issues delineated before trial, so as to minimise unnecessarily long and complex evidence from being adduced before a jury, but also a suggestion that advocates be pushed to improve their pre-trial preparation, so that issues raised in court could be dealt with more efficiently. This would naturally require the bench to possess a commensurate appreciation of the scientific issues; without an enhanced level of judicial understanding about the true issues with the expert evidence, it would be difficult for judges to know what could and could not be reasonably required of the advocates and witnesses. This may evoke shades of an inquisitorial system, but the degree of “intervention” by judges need not be that significant. Rather, improved judicial understanding of forensic disciplines, through judicial education for example, could generally lift the expectations of the bench about having only the live issues within the scientific evidence contested in court. A well-informed bench can better identify issues of poor preparation by advocates, impartiality of experts, time-wasting, unnecessary questioning, areas of agreement and live issues ripe for contest within the expert evidence.

³⁸⁷ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration at 116.

Short of suggesting any drastic changes to the existing system, some respondents suggested that judges could merely exercise greater control over advocates who unreasonably hector expert witnesses with repetitive and/or abusive questions. These respondents were particularly vehement in their comments. Whilst many noted that they appreciated that in an adversarial system, each side is entitled to behave “adversarially”, and that the defence, in particular, is entitled to strenuously test the prosecution case, nevertheless, these respondents felt that judges sometimes do not exercise reasonable control over advocates who behave in a manner that is persistently and unreasonably rude, aggressive or derisive towards expert witnesses. These respondents would like judges to intervene, particularly where the questioning is repetitious, abusive, or clearly unhelpful to the jury.

In a similar vein, some respondents noted that jurors’ comprehension and use of scientific evidence could be improved by judicial encouragement to ask questions:

“[My best experience in court happened] when the judge asked the jury to “take notes, think about the evidence during a break and ask questions about the evidence after the break.” This only happened once and with one judge. As it turned out, the jury didn’t have any questions.”³⁸⁸

“At the jury foreman’s request, the judge invited the jury to ask questions they still had, following my evidence. So the jury was able to clear up any question in their minds as the result of opposing expert testimony. This was very unusual, but justice was well served.”³⁸⁹

Where it is clear to the witness or judge that the jury is having difficulty comprehending expert evidence during examination-in-chief or cross-examination, it was suggested by many respondents that judges could remind the jury that they are entitled to ask questions. Far from “opening the floodgates” to a torrent of jury questions, in other jurisdictions it has been shown that juries, properly instructed, are able to ask sensible, relevant, fair questions when allowed the opportunity to so do.³⁹⁰ Respondents to this survey have indicated that their experience in court suggests that some juries have had difficulty comprehending aspects of the expert evidence as it is adduced, and that the

³⁸⁸ Comment from a Tasmanian blood and serology expert.

³⁸⁹ Comment from a Tasmanian forensic document examiner.

³⁹⁰ Yarnell, M. A. H. (2005, November 7, 2005). *The Arizona Jury Past, Present and Future Reform*. Paper presented at the University of Canberra School of Law Annual Jury Conference, Sydney.

difficulties could probably have been overcome if the juries were encouraged by the judge to ask questions.

3.4.7 Expert Witness, Expert Evidence and Juries

Q: In your opinion, is it necessary for jurors to have a scientific/technical/medical background to fully appreciate the evidence you give in court?

Responses:

No (n=97, 74%)

- Most people are capable of dealing with most evidence (although some training may be helpful);
- The witness is the expert; pseudo-expert jurors may try to persuade other jurors of their own (possibly incorrect) opinion;
- Need to maintain community representation on juries; and/or
- Juries just need to be given sufficient evidence, sufficiently well presented and clarified.

Other (n=21, 16%)

- It is not essential, but it would help. Would prefer that juries have some technical knowledge (some jurors already have it anyway);
- Jurors need reasonable intelligence, an inquiring attitude, basic education and/or basic English. Realistically, expert evidence may be beyond lay jurors; and/or
- Lawyers still need to ask appropriate questions and/or allow the witness to explain and elaborate on their answers.

Yes (n=7, 5%)

- Would enable evidence to be better targeted at jurors' level (if level was known);
- Necessary, as evidence and its value cannot be explained in detail by lawyers (to jurors.)

No response (n=6, 5%)

Overwhelmingly, expert witnesses who responded to this survey agreed that lay juries are capable of competently comprehending and utilising forensic science.

A few respondents agreed with commentators who have suggested that “the incapacity of even educated people to understand [complex scientific] questions presents serious social consequences for every legal system”³⁹¹, and thought that either the scientific evidence brought to court is already too difficult for lay jurors, or, at the very least that jurors should ideally have some sort of scientific / technical / medical background to assist them in competently using the evidence.

However, the vast majority of respondents cautioned against the need for jury selection on the basis of education or intellectual capacity. More important for expert witnesses who are trying to communicate often complex concepts, results and conclusions, is the need for jurors who are willing to address the evidence with an open and inquiring attitude. Concurrent with this, many respondents pointed out that rather than changing the system of jury selection to improve the “quality” of jurors, simple changes could be made within the existing system (such as requiring advocates to better prepare themselves for expert evidence, encouraging juries to ask questions, permitting experts to use more visual aids³⁹² and explanations, et cetera) to improve the quality of the presentation of expert evidence to ordinary lay jurors.

In this view, the ability of lay jurors to competently deal with expert evidence in the current system is limited not by the nature of the jury, but by the quality of the court system and advocacy through which the expert evidence is filtered. This is interesting in light of results from Chapter Two, which suggest that jurors whose primary language is not English, may face bigger difficulties in coping with complex evidence than do other jurors. Further investigation is warranted to determine whether improving the presentation of complex evidence (using the means suggested by forensic scientists) is sufficient to also adequately improve the comprehension of jurors who do not speak English as their primary language.

³⁹¹ Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy .

³⁹² A suggestion also made by the High Court; see *Butera v DPP* (1987) 164 CLR 180 per Mason CJ, Brennan and Deane JJ at 190, and Gaudron J at 208.

Q: In general, in your discipline, what would you prefer the jury to be told? Why?

**** Background information concerning the techniques/methods used or,***

**** Just enough to understand the results?***

Responses:

Just enough to understand the results (n=73, 55%)

- Established methods/techniques are usually irrelevant and tedious to explain. They should be explained only if controversial, otherwise they can be clarified in re-examination;
- Forensic science is only one part of the total evidence. Don't encourage the jury to become experts; this may also cause unnecessary confusion, doubt, boredom;
- May be more than one expert giving evidence, so there is a risk jurors may confuse different methods from different disciplines et cetera; and/or
- Tricks of the trade make better criminals and provoke more (unnecessary) questions from the defence.

Background information concerning the techniques/methods used (n=40, 30%)

- Jurors are generally capable of understanding this if it is presented properly (in layman's terms), but experts must beware of causing confusion;
- This makes scientific evidence more interesting, understandable (if explained without jargon) and memorable. It also indicates the significance of evidence;
- It is necessary to bridge the gap of misinformation due to ignorance/poor teaching/television; and/or
- Full disclosure - the full picture - means better informed jury decisions and improved confidence in the decision.

Other (n=19, 14%)

- This is difficult to do well – perhaps a standardised handout to take into the jury room would assist?
- Both need to be explained, as the jury needs to understand the results and how they were derived. This removes the “smoke and mirrors” surrounding some forensic disciplines; and/or

- Information about fail-safe checks and balances, or from a defence expert, would be more valuable than general background information.

No response (n=4, 3%)

Respondents to this survey have largely called for greater input into how their evidence is presented and utilised in court. However, this is not to suggest that juries need to hear *more* from forensic scientists, or that the trial process should cater for forensic evidence above all else. In fact, most respondents would prefer that juries be told only enough scientific evidence for them to understand the results. In this view it is not necessary for jurors to be hauled through the details of the techniques, methods, and background information which underlie the scientific evidence. Although these areas may be a rich source of cross-examination material for defence counsel, most respondents argue for a focus on relevant results, with techniques or methods to be raised only if they are in issue. Otherwise, many respondents felt that juries would be unnecessarily barraged by excessive information and details which would often be exceedingly confusing.

Of those respondents who argued that jurors ought to be told background information about techniques or methods used in forensic work, many recognised the risk that in a trial context this information could become extremely confusing. Nevertheless, these respondents believed that juries are entitled to hear about the bases from which expert opinions are derived, if only to dispel the myths and fallacies that surround much of the media-representation of forensic science. Provided this extra information was presented simply and clearly, these respondents felt that jurors would not only be able to make better decisions, but would feel more empowered and satisfied about the quality of those decisions.

Q: Where do you think the potential for error by juries lies?

Responses:

With jurors themselves (n=64, 49%):

- ***Jurors trying to act as experts*** – interpreting the expert evidence to form their own opinion – may involve oversimplifying the evidence or missing vital facts, conclusions or errors. Superficial knowledge of evidence makes for misunderstanding the significance of findings or the appropriate weight of results in the context of the case.
- ***Assessing weight of evidence based on emotion***, including the witness' or the defence's demeanour, confidence, appearance, perceived ethical standards et cetera, rather than on the work done, techniques used, conclusions reached, the lack of bias, et cetera.
- ***Failure to cope with "science"*** - Being fooled by junk science or putting too much emphasis on evidence just because it is 'scientific'; Just believing what they are told, without understanding why – being overawed by forensic science, including not recognising when an expert is out of their area of expertise.
- ***Unrealistic expectations or preconceived ideas*** due to television shows like CSI, Water Rats et cetera. Disregarding an opinion if it is not conclusive, or being surprised that in physiological terms most people are average, not extraordinary.
- ***Personal prejudices*** – for example, being too trusting of authority, or distrustful of police (especially if the expert witness is in uniform), or being hesitant to convict et cetera. Jurors' backgrounds should be checked for basic levels of education and for a criminal record. It should also include a drug test prior to acting as juror
- ***Basic confusion, misinterpretation, or lack of comprehension*** – that is, the evidence is 'over their heads'. Switching off or just dismissing the forensic science because science is assumed to be complicated and confusing. That is, it is too hard or there is information overload (even though the forensic science may be more logical and obvious than other, more subjective evidence.). Also boredom and a failure to ask questions.

With the prosecution, defence and judge (n=35, 27%):

- ***Failure by the prosecutor*** to minimise confusion by examining, re-examining and summing up adequately;
- ***Failure by the expert witness*** to explain their evidence adequately;

- ***Being misled or confused by the defence*** – ridiculous/irrelevant questions or suggestions, red herrings, junk science, minor points, emotional blackmail, theatrics; and/or
- ***Failure by the judge*** – misdirections, difficult directions, or failure to adequately explain court procedures to the jury.

With the scientific experts and their evidence (n=21, 16%):

- ***Complex evidence*** - Evidence itself may not be clear cut (that is the results may not be ‘black and white’). Also includes disagreement between experts or conflict with other evidence.
- ***Rules of evidence*** - Not receiving all of the evidence (for example, due to rules of evidence), or the “beyond a reasonable doubt” std is emphasised, or the evidence is continually interrupted.
- ***Poor delivery*** - Expert unable to explain or clarify the evidence and its significance or may use too much jargon – jury will then ignore it.
- ***Long, drawn-out trials*** - can go for weeks – by the end of the trial jurors may have forgotten much of what was said earlier or suffer boredom, lack of interest. Need to keep good notes.

Other reasons (n=3, 3%):

- No idea; I can not answer this; and/or
- I know I should direct my answers to jury, but find that I consider the prosecutor, defence and judge before them.
- No response (n=9, 6%)

“Jurors need to be able to ask questions in a less formal environment, otherwise everything is so tightly screened by Prosecutor and the Defence that it may not be fully understood by jurors, so they start guessing what you meant, or dismiss it altogether.”³⁹³

“Juries don’t receive all of our evidence. Some of it is removed for any number of reasons, resulting in a fragmented, difficult to understand presentation [and then] minimal clarification occurs, particularly in re-examination.”³⁹⁴

³⁹³ Comments made in the context of another question (n=2, 1%).

³⁹⁴ Comments made in the context of another question (n=2, 1%).

“Everyone thinks it’s like it is on TV. Most assume that being a forensic biologist means you play with dead people. Otherwise, they think you’re a ‘science geek’. We can do anything and everything, and all in 60 minutes (without the television ads, of course).”³⁹⁵

“Forensic science is challenging and rewarding, especially court work. It just isn’t that “glamorous”. ”³⁹⁶

A range of responses show forensic scientists’ preoccupation with jurors being unable to comprehend either the meaning or the significance of scientific evidence. Reasons for this include pre-existing conditions (juror bias for or against prosecution/defence or for or against science itself, juror preconceptions about CSI-type evidence), but also point to the vagaries of the trial process (poor delivery by the prosecution/defence/judge/expert, the confines of the rules of evidence, and delays or constant interruptions) and inherent difficulties within the evidence itself (complex concepts, legitimately conflicting expert views, and limits on the kind of “conclusive” results that are scientifically valid).

Nevertheless, when asked about their confidence in jury performance with expert evidence, many respondents tended towards a positive view. (Approximately a third of respondents professed a neutral view - their subsequent comments revealed that in their experience, the performance of a jury with expert evidence depended on all of the circumstances of the trial and was not predictable or controllable by the expert witness.) The remainder of respondents tended towards a positive view, being confident or very confident of jury performance with expert evidence. These experts viewed jury performance with scientific evidence as being hampered mostly by poor presentation; a failure by the prosecution to adequately lead the witness or a failure by the witness to clearly give their evidence. Confusion generated by the defence was also a significant factor for these respondents, who noted that a focus on irrelevant questions or minor points seemed capable of distracting and confusing jurors to the extent that the scientific evidence would have to be re-explained (not always successfully) in re-examination.

For those respondents who were less than confident or not confident at all, their main concerns seemed to be with jurors who had unrealistic expectations of forensic science.

³⁹⁵ Comments made in the context of another question (n=2, 1%).

³⁹⁶ Comments made frequently, in the context of other questions (n=40, 30%).

They were concerned that the unrealistic expectations could lead either to jurors dismissing evidence that was not conclusive or decisive enough to meet their (television-fuelled) expectations, or, conversely, to jurors taking what the expert had said in court and adding it to their own (television-fuelled) knowledge to become pseudo-experts themselves. In the latter case, respondents feared that this superficially inflated knowledge of the evidence could produce incorrect impressions of the meaning of the results and conclusions, or the weight and significance of the scientific evidence within the case.

3.4.8 Experts and Opposing Experts

Q: Is there a question(s) that lawyers should ask opposing forensic witnesses in your discipline, but don't?

Responses:

Yes, about the opposing witness' expertise (n=20, 15%):

- What are your formal qualifications and training? What is your practical experience in the field (level, duration, currency etc)?
- Is your expertise relevant to forensics and to the particular issues in this case? Also, does your expertise relate to research samples or crime scene samples (often small, degraded, composed of mixtures et cetera)?
- Did you actually attend the scene? Perform the task?
- What workshops, seminars, conferences have you attended? In what capacity (author, presenter, spectator, dissident)?
- If you believe in fingerprint identification is based on a set number of points, how much do you really understand about the biological development of skin on human hands and feet?
- Is your evidence wrong?
- Each case has at least one question that should or could have been asked but was not.

Yes, about the opposing witness' affiliations (n=15, 11%):

- What are your professional affiliations?
- Are you and / or your organisation accredited, registered, proficiency tested, reviewed or assessed? By whom? How often?

- Have these particular results / conclusions been checked by another expert?
- With your expressed opinion, are you in the minority or majority of mainstream science? How many of your peers disagree with your position? (The Crown must present everything but the defence need only present what helps them). How many cases have you been consulted on in which you actually agreed with the prosecution witness?
- Who is paying you? (Are you working without fear or favour?)
- What is the literature to support your views?

Yes, about the opposing witness' methods (n=5, 4%):

- Do you use approved/validated methods and procedure manuals?
- What method/procedure/standard did you use to get this result?
- What quality assurance procedures do you use? Have your methods been tested for errors, false positives, false negatives?

No, because (n=27, 19%):

- Usually don't have opposing experts in court and don't get to see other expert witnesses, even if they are called.
- When opposing experts are used, issues may be discussed pre-trial and if experts agree, lawyers run the case using different angle.
- Opposing witnesses seem to get grilled enough in South Australia.
- Lawyers *want* confusion.

Other comments in general (n=10, 8%)

- Lawyers should make more effort to establish true expertise of expert witnesses – it would give juries a sounder basis on which to judge the 'expert'. Often their precise area of actual expertise is not relevant or appropriate to the opinion they are giving.
- Opposing witnesses need to be qualified as an expert (just like government/police experts) – usually are not though.
- Prosecutors could better use their own expert witnesses to cross-examination opposing 'experts': Opposing experts are rarely challenged, even though their evidence may be questionable.

- Prosecutors could also level the playing field – be as impolite as defence counsel often are. The defence always focus on the negatives and prosecutors always on positive.
- Too many things to mention. Depends on case.
- I have not answered this as it would be inappropriate and unprofessional.
- No response / not known (n=55, 39%)

“[Advocates] should test their qualifications *properly*. There are still charlatans out there who will support the side who is paying them and will therefore inappropriately weight their evidence. Juries will believe a glib “liar for hire” over a more qualified and knowledgeable expert who is not eloquent. Many of these charlatans would not be able to even get a start in the witness box if their dubious and inadequate “qualifications” showed that they were not in a position to offer expert opinions.”³⁹⁷

The pool of “defence experts” (that is, experts who are not currently employed by government or police organisations) is small in Australia. Nevertheless, some respondents to this survey have had experience in criminal courts with opposing expert witnesses. Since the method of testing the veracity and strength of a witness’ evidence is cross-examination, respondents were asked whether there were questions which ought to be asked of opposing experts, that are not commonly asked.

Interestingly, respondents’ concerns about the veracity and strength of opposing expert’s testimony are reminiscent of the admissibility debates which surround the *Frye* and *Daubert* tests in the United States. Whereas *Frye* set the standard of admissibility for expert evidence as “general acceptance” within the relevant scientific community,³⁹⁸ *Daubert*,³⁹⁹ enunciated other factors which would bear on the issue, including peer review and publication, falsifiability, error rates and widespread acceptance.

These factors were noted by respondents who reported that opposing experts appear, at times, to be allowed to give ‘expert’ opinions in areas in which they do not objectively

³⁹⁷ Comment from a Tasmanian firearms and toolmarks expert.

³⁹⁸ *Frye v. United States*, 293 F 1012 (1923); 54 App. D. C. 46, 47, 293 F. 1013, 1014.

³⁹⁹ *Daubert v. Merrell Dow Pharmaceuticals* (92-102), 509 U.S. 579 (1993).

have relevant expertise.⁴⁰⁰ Similar to the approach used in *Daubert*, the respondents who raised these concerns were focused not so much on the opinions and conclusions offered, but on the foundation of the methodology of the science used by experts. Respondents vehemently commented that unless a witness can be shown to have knowledge of and appreciation for the importance of sound methodology, their opinions ought not be admitted in court. Means of testing their suitability as experts included all of the *Daubert* indicia; did the expert use accepted methods that have been published, peer reviewed or accepted within the relevant community? If the methods are novel or not wide-spread, have they been tested for errors? Are they able to be tested and potentially proven false (falsifiability)?

Australian evidence law is not bound by the *Frye* or *Daubert* tests, however, the points noted by respondents in this question may be instructive for lawyers who have failed to consider how the principles underlying those cases could be applied to more thoroughly test the qualifications of witnesses when they are purporting to express an “expert” opinion for an Australian court.

Even if an expert is found to have sufficient specialised knowledge based on their training, study or experience for them to be admitted as expert witnesses in a criminal trial, the responses to this survey suggest that there is scope for advocates to be more rigorous in testing the nature of that expertise, the reliability of their methods and the veracity of their opinions, not least for the benefit of the jury. This is not to suggest that every trial ought to be a free-ranging re-examination of the foundations underlying the science of DNA profiling, fingerprinting, toxicology and so on, as clearly this would usually be an unnecessary, time-consuming and confusing spectacle.⁴⁰¹

Nevertheless, it seems that at least in cases where opposing experts are called, it may be worthwhile for advocates to more thoroughly canvass the nature of the expert’s relevant qualifications, the soundness of the science on which they have conducted their tests,

⁴⁰⁰ See Cooper, J., & Neuhaus, I. M. (2000). The "Hired Gun" Effect: Assessing the Effect of Pay, Frequency of Testing, and Credentials on the Perception of Expert Testimony. *Law and Human Behaviour*, 24(2), 149 for the impact of such experts on jurors.

⁴⁰¹ In Australia, in DNA profiling at least, the debate has moved on from admissibility issues, after extensive challenges in *R v Karger* [2002] SASC 294 for example. Also see Walsh, S. J., Ribaux, O., Buckleton, J. S., Ross, A., & Roux, C. (2004). DNA Profiling and Criminal Justice: A Contribution to a Changing Debate. *Australian Journal of Forensic Sciences*, 36, 34.

and the possibility that the results found and conclusions drawn may not accord with good scientific methodology.⁴⁰² Obviously, such questions require advocates to have specialised knowledge themselves, or, more practically, access to specialised knowledge. Information on these areas might best be sourced from other experts in the relevant field⁴⁰³, and respondents to this survey suggest that they are being under-utilised in this respect.

Q: How do you perceive your own ability to effectively communicate your work to a lay audience (that is a judge or jury)? If you are confident, why? If you are not confident, why not?

Responses:

Confident (n=106, 80%), because:

- ***Good Science*** - Practising good science, knowing the material and the limitations means good results, simple explanations and good presentation in court. Also helps in answering unexpected questions.
- ***Court experience*** - Many years of experience in the field and many appearances in court (including some serious challenges in court over recent years). Have also appeared for both prosecutor and the defence (which helps in understanding of the ‘game’). Being motivated to improve is good - Where I have not been clear on the stand, I have revised my explanations for later cases. Experience helps in all respects.
- ***Life experience*** - Much experience in other (related) fields of science and/or public speaking, lecturing, teaching assists in court presentation.
- ***Simple explanations*** - Scientific area has the potential to be complicated but is easy to explain in layman’s terms. Need to break complex issues down into simple ones or use analogies. If given opportunity to explain (doesn’t always happen – even the prosecutor can ask illogical, irrelevant questions) I can use non-technical terms.
- ***Currency*** - Keep up to date with current procedures, equipment, literature, training, courses, education, qualifications.

⁴⁰² Petterd, C., & Royds, D. (1999). "Independent" Forensic Practitioners - Fact of Fiction? Ibid., 31, 45.

⁴⁰³ This is in no way meant to suggest that “general acceptance” by the relevant peer group is or should be the defining question which determines whether an opinion is admissible or valuable, but rather, that consultation of those in a scientific field will give some indication as to the existence of different schools of thought and to the nature of those differences.

- **Gauge reaction** - Perceive that I am understood and doing a good job – for example, by watching jurors faces to gauge their understanding or by giving my answers directly to the jury, not to the judge or lawyers.
- **External feedback** - Positive feedback to date, from peers and lay people.
- **Presentation** - Give jurors an actual demonstration and/or use many visual aids, diagrams, charts – am now confident they understand what I am talking about.
- **Lay terms** - I do not have many years experience, so I am still able to talk to people, rather than over their heads, that is, give evidence that a lay jury would understand.
- **Enjoyment** - I have confidence in own personal communication skills; I enjoy communicating and my area of expertise is one in which many jurors are interested.
- **Vigilance** - I need to keep reminding myself that things that I think are obvious (after years of experience) may not be obvious to others and that I need to keep relearning what I know. My confidence has improved with recognition that lay jurors are not experts.
- **Context** - I know much more than lawyers. I try to anticipate areas the defence might challenge.
- **Honesty** - Just answering all questions honestly and succinctly/to the point, without waffling or concealing or distorting facts, helps my confidence.

Not confident (n=12, 9%), because:

- **Pre-court** - Confidence levels depend on training (none) and preparation time available before court (usually minimal).
- **Fear of unknown** - Some apprehension - Not knowing the questions which may arise (in cross-examination) puts a witness in a dangerous position. Fear also depends on the opportunity I am given in court to explain my evidence.
- **Lack of experience** - In early years I was nervous, unsure of rules, reluctant to speak up; I mumbled and started over. Others just need more experience in their area and/or in court to feel more confident
- **Role of Prosecutor** - Prosecutors often do not want or allow witnesses to give evidence in layman's terms and given the way most examination is run, I am not confident that juries acquire proper knowledge. Questioning is also constrained by rules of evidence.

- ***Lack of feedback*** - Receive no feedback from jurors – I don't know how much they understood. I would also like feedback from judges.

Other (n=7, 5%), including:

- If a witness is not confident, it leaves room for speculation (by jurors) which inevitably leads to error.
- There is always room for improvement and further practice. It is an ongoing process. Training would help.
- I have been criticised for making layman's terms "too layman's". I guess this may mean the presentation was not professional enough?
- I would feel more confident if lawyers knew more about what we do and how we do it.
- My confidence depends on the depth of the answer required.
- Presentation aids make presenting evidence a great deal easier.
- No response (n=7, 5%)

The overwhelming majority of respondents to this survey reported that they are confident about their own ability to effectively communicate their work to a judge or jury. Necessary elements of confident communication, as derived from these results, include:

- Solid and on-going improvement of knowledge in an area of expertise;
- Experience in giving evidence and familiarity with court processes;
- Opportunity to explain answers, using visual aids if necessary; and
- External feedback from advocates, peers and lay persons.

Where any of these elements are missing, respondents report low confidence in their ability to successfully give evidence. Whilst many laboratories and other organisations go some way to assisting staff in fulfilling their role as experts for the courts, the forensic science community and legal profession may further assist by ensuring that forensic scientists:

- Are adequately qualified in their profession, for example by accreditation, on-going professional development and seminars.

- Are aware of the significance of any training / education / accreditation in which they or their organisations participate.
- Are specifically trained to express their knowledge to a lay audience in layman's terms, without sacrificing the accuracy or validity of the results.
- Are familiarised with court and trial procedures in their jurisdiction. This may require field trips, junior staff accompanying those who give evidence, mentoring, or general training in court protocol and practices.
- Receive on-going feedback on their court performances. (Anecdotal evidence collected during this survey suggests that due to staffing, time and financial restraints, feedback for expert witnesses from their own organisation is sporadic to say the least.)

Although the question did not raise the issue of training, some respondents gave additional comments in relation to this subject (n=5, 4%):

“Training for non-police experts is ‘sink or swim’ – actual training is too time consuming and costly. Many unwritten “rules” or practises are learned by chance. This makes it hard to know the rules and when they apply. For example:⁴⁰⁴

- What are the bases for these rules?
- When is it permissible for a witness to talk with other witnesses about the case?
- What is the status of information which is passed on to a forensic scientist by the other lawyer (the defence), but not by police?
- Do I need an “independent recollection” of my examination at the time, or was this just the preference of the judge on the day?”

“Experts need to be given more training about the presentation of forensic science in court. “Experts” are not experts in public speaking. All areas (the prosecution, defence, judges and scientists) need to work on this to improve understanding, delivery and efficiency of the presentation of expert evidence.”⁴⁰⁵

These comments suggest that despite most respondents' apparent confidence in their ability to present their evidence in court, more could be done to ensure that new practitioners are given specific practical information and training to assist their presentations.

⁴⁰⁴ Comments made in the context of another question (n=3, 2%).

⁴⁰⁵ Comments made in the context of another question (n=2, 1%).

The extra-legal questions (to do with witness-witness interaction and extraneous information from external sources) suggest that scope exists for training with puts the work of the laboratory or scene-based expert in its broader legal context. This type of information could be imparted by national bodies such as the National Institute of Forensic Science or be done in-house by the police/government forensic organisations. In either case, forensic scientists need to know their rights and obligations within the legal system, to ensure that the evidence they present is not tainted by other witnesses or other influences which are unspecified or unrecognised in court.

Q: Do you use visual aids to present your evidence? Why or why not?

Responses:

Yes (n=84, 64%)

- ***Preparation*** - Would like to use more, if more time and money was available. Only use them occasionally, due to a lack of preparation time. It would be good to have a standard video which outlines the general procedure.
- ***Technology*** - There is a trend towards digital techniques (for example, PowerPoint style media or videos) but the basics are still used – hand-drawn diagrams, practical demonstrations, blackboards and whiteboards.
- ***Dangers*** - Debate how much jury should be given – do not want them thinking they can examine the evidence and come to their own conclusions on the basis of our presentations.
- ***Relevance*** - Will use visual aids if given sufficient notice of what the issues in the case are – in these cases giving evidence is a dream. May also provide standard information – for example, a ten minute video about the assembly of chemical apparatus and relevance of this to drug manufacturing.
- ***Facilities*** - Have done so in past, and if asked again, would be happy to comply. Would like to use more visual aids, if more facilities were available in court.

No (n=41, 30%)

- ***Preparation*** - Amount of work required is huge; time restraints are prohibitive. Requests from advocates come in at the last minute, leaving insufficient time to

prepare. The Crown usually doesn't know what it wants and often materials become exhibits and don't get returned for years, if at all. Thus the laboratory loses the physical work put in. There is a high level of risk in taking time to prepare it – even if the witness does get called, the judge may not admit the visual aid into evidence anyway. Each case is different; even though there are potentially helpful aids, there is no way of telling what you might need.

- **Facilities** - Memory capacity of court computers has been a problem. Few courts have the facilities without much prior notice. It is difficult to arrange, particularly the hardware. Also, the laboratory not equipped for it.
- **Dangers** - Reservations about what juries should be shown, lest they become amateur forensic scientists
- **Unnecessary** - Happy to explain without using visual aids. Sometimes analogies work better than illustrations anyway. It has never been thought necessary or relevant and/or I have never been asked.
- **Future** - Would like to and would use (if thought necessary) in future.

Other (n=1, 1%)

- No training is provided.
- No response (n=6, 5%)

Q: What type(s) of visual aid(s) do you use? (n=84)

Responses:

- Posters (n=33, 39%);
- Whiteboards (n=25, 30%);
- Overheads (n=24, 29%);
- Videos (n=24, 29%);
- Photographs (n=23, 27%);
- Computer generated graphics/interactive crime scenes (n=19, 23%);
- Blackboards (n=18, 21%);
- Charts (n=13, 15%);
- PowerPoint® presentations (n=12, 14%);
- Slides (n=8, 10%);

- Flowcharts/graphs/tables (n=7, 8%);
- Diagrams/drawings/plans (n=4, 5%);
- Practical demonstrations (n=2, 2%);
- Scanned documents/document scanner (n=2, 2%);
- Interactive crime scenes (n=1, 1%); and/or
- Physical evidence (n=1, 1%).

“There are so many potentially helpful aids, but without knowing what you will be asked beforehand, it is impractical to take any. Using aids requires more pre-trial preparation than currently exists.”⁴⁰⁶

“Fraud trials usually involve the production of vast amounts of documentary evidence and often involve complex accounting analysis of financial transactions. The whole process of the presentation and production of this evidence needs to be constantly reviewed.”⁴⁰⁷

The use of visual aids for presenting complex evidence is a measure often suggested⁴⁰⁸ but not as commonly available. The overwhelming impression given by respondents (even those who have used visual aids) is that more visual aids would be used if:

- The witness had adequate notice about when they would be required to appear in court and what the issues are;
- Courts were better equipped (not only with hardware such as screens onto which images could be projected, but simply in terms of physical layout - some courts are too small or poorly designed to enable witnesses, jurors, advocates and the judge to view one large screen at the same time as one another);
- Physical visual aids (such as posters or charts) could be returned in a timely manner to the expert witness. In reality, laboratories may need to simply make multiple copies, as aids admitted into evidence may be kept with the case file indefinitely; and
- Standard presentations could be developed and used at short notice. Such presentations would obviously be appropriate only for non-contentious issues (such as short videos which outline general procedures) and may generate unnecessary

⁴⁰⁶ Comments from a Tasmanian forensic biologist.

⁴⁰⁷ Comment from a Victorian fraud investigator.

⁴⁰⁸ *Butera v DPP* (1987) 164 CLR 180 at 190, 208; Abrahams, W. (2006). Difficulties in Using Expert Evidence - *R v Karger* - A Case Study, *10th Annual Conference of the International Association of Prosecutors*. Paris at 22; Gutheil, T. G. (2000). The Presentation of Forensic Psychiatric Evidence in Court. *Israel Journal of Psychiatry Related Sciences*, 37(2), 137 at 141.

disputes in court about admissibility, prejudicial effect on the jury et cetera, if not carefully constructed and vetted before use.

3.5 CONCLUSIONS

*“...if matters arise in our law which concern other sciences or faculties, we commonly apply for the aid of that science or faculty which it concerns, which is an honourable and commendable thing in our law. For thereby it appears that we do not despise all other sciences but our own, but we approve of them and encourage them as things worthy of commendation.”*⁴⁰⁹

The results of this survey of Australian forensic scientists suggest that expert witnesses are at a difficult point in legal history. At a time when the public (including members of the jury) and the legal profession (including the judiciary) have been conditioned to expect great things from “forensics”, forensic service providers are called to simultaneously deliver a broad range of specialised opinions in a forum over which they have little control.

Moving beyond questions of admissibility of expert evidence, challenges to forensic science and expert witnesses now appear to reside more in the effective communication of their expertise and of the veracity of their results to the finders of fact (be that judge or jury). Crucial to this is the *pre-trial comprehension* of that expertise and of the strength of those results, by legal advocates.

The adversarial criminal trial environment currently does not appear to lend itself to thorough comprehension and utilisation of expert evidence by legal advocates before or during proceedings. Evidence of this includes the paucity of pre-trial consultation between advocates and their expert witnesses, culminating in the failure of prosecutors and defence counsel to properly comprehend, adduce or test the scientific evidence heard in court.

The results of this research suggest that greater understanding by legal practitioners of the:

⁴⁰⁹ *Buckley v Rice-Thomas* (1554) 1 Plowden 118; 75 ER 182 at 193, per Saunders J.

- Qualifications, training, experience and accreditation of experts;
- Jargon and terminology (including avoidance of obsolete terminology);
- Bases of expert opinions (both discipline-wide and case-specific);
- Methodology and principles of collection and examination used in each discipline;
- Strength of results, conclusions and opinions of experts;
- Demarcation of roles within forensic science disciplines and different forensic organisations;
- Bases for technical judgements (including the decision not to collect or test items);
and
- Degree to which opposing experts and their opinions could be legitimately challenged

has the potential to produce examination-in-chief and cross-examination which not only accurately conveys the content and significance of forensic testing, but conveys it in a more comprehensible and intelligible manner.

In addition, other elements of the criminal trial process appear to have a varied impact upon the way in which scientific experts are able to effectively present their evidence in court. These include:

- The role of witnesses as passive respondents to advocates' questions,
- The passive role of the judiciary in an adversarial system,
- The nature of jury selection and jury participation during proceedings, and
- A physical environment which often does not facilitate the use of visual aids or novel means of presenting complex evidence.

These factors reportedly diminish the ability of expert witnesses to effectively communicate their evidence, however, the impact appears generally less than that caused by advocates' failures to conduct pre-trial conferences.

Forensic scientists' views on the impact of the judiciary on expert evidence were generally complimentary, especially in recognition of the special role played by judges as impartial adjudicators in an adversarial legal system. The forensic community does however appear to be feeling some pressure from the judiciary to bring additional evidence to court, even where time and budgetary constraints or professional judgements deem this not possible or necessary. The results of this survey also indicate

that respondents' would appreciate increased interference from the bench to ensure that advocates are compelled to properly prepare for expert evidence (on the part of the prosecution) and refrain from inappropriate attacks on the witness (on the part of the defence). Respondents also suggest that judges might also be encouraged to stimulate jury comprehension of complex evidence by encouraging jurors to ask questions if necessary, and by allowing and encouraging witnesses to use visual and other aids when explaining complicated technical concepts.

Overall, forensic scientists report the need for ongoing and improved dialogue between the legal profession and forensic scientific community to ensure that both parties are aware of the lacunae that may exist in the knowledge of each about the other. This includes the need for additional training to ensure that:

- Advocates are aware of the general issues surrounding the use and presentation of scientific evidence,
- The judiciary is aware of up-to-date forensic practices, limitations and developments, and
- Expert witnesses are aware of their obligations to the court and the means by which they may communicate their findings,

so that expert evidence may be better comprehended, better presented and thus better utilised by the criminal justice system. Nevertheless, the primary means of improving the comprehension, presentation and utilisation of forensic science by the legal profession lies in greater pre-trial consultation.

CHAPTER 4

REAL JURORS AND EXPERT EVIDENCE

“[Good communication with the jury] is a field in which anecdote, self-assurance and self-delusion abound, within the ranks of the legal profession and the judiciary.”⁴¹⁰

“[DNA profiling evidence] just takes a drop of sweat”.⁴¹¹

“My hopes of some snippet of scientific brilliance that would assist us to reach a verdict died steadily with each prosecution expert’s frustrated results.”⁴¹²

4.1 INTRODUCTION

Research using real jurors in real trials provides rich opportunities.⁴¹³ For the sheer number of variables which contribute to any trial, such as the location; the nature of the crime; the composition of the jury; the demeanour, experience, circumstances, age and input of the judge, lawyers, the accused and witnesses; media interest in the trial; the nature of the evidence; and so on, create a complex web of factors which determine how evidence is assessed and how a jury will behave.⁴¹⁴

A facet in this multifarious environment is how twelve ordinary citizens cope with expert, scientific evidence: Are they able to comprehend it, use it, or explain it to one another? What do they expect from the experts, from the evidence, from the court? Is juror comprehension of scientific evidence limited by the jurors’ own competence, the ability of the expert witnesses or by the legal system itself?

⁴¹⁰ Justice Eames, G. (2003, 22 January). *Towards Better Direction - Better Communication with Jurors*. Paper presented at the Supreme and Federal Court Judges Conference, Adelaide.

⁴¹¹ A juror who had great expectations of the DNA evidence in a trial studied in this chapter.

⁴¹² A juror’s comment in the telephone interview from Trial One in this chapter.

⁴¹³ Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351; Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 8.

⁴¹⁴ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 4, 5, 8.

In answer to these questions, Australian research has, to date, covered the opinions of magistrates,⁴¹⁵ judges,⁴¹⁶ and scientists⁴¹⁷. Jury comprehension of forensic science was also briefly researched within the broader context of how well juries were managed in NSW.⁴¹⁸ The study of real jurors, however, hearing forensic science in actual trials, is a method of research which has not been well-utilised in Australia,⁴¹⁹ not least because the number of jury cases is relatively small. Approximately 99% of all criminal cases in Australia are prosecuted in magistrates' courts, and over 80% of cases heard in higher courts are heard by a judge alone because the accused decided to plead guilty, which leaves only approximately 0.4% of all criminal cases to be heard through trial by jury.⁴²⁰ For those jury trials, however, the most significant barrier to research is the permission required from the relevant Attorney-General,⁴²¹ to overcome the general prohibition on approaching jurors for the purposes of soliciting, obtaining, disclosing, or publishing protected information.⁴²² Such barriers do not exist in jurisdictions such as the USA, where individual states, courts or judges can give permission for jurors to be recruited for research.⁴²³ Fortunately for Australian research however, the restrictions on access to jurors are not completely prohibitive, as they are in some jurisdictions, such as Canada, where the *Criminal Code* prohibits jurors from disclosing any information that was not heard in open court and researchers from attempting to elicit any information from jurors about other jurors.⁴²⁴

In Australia, even if the prohibition hurdle is surmounted, researchers are faced with the vagaries of the criminal justice trial system. Cases must be found which are relevant to the research objectives, but are then often adjourned, inconveniently timed, or fail to

⁴¹⁵ Freckelton, I., Reddy, P., & Selby, H. (2001). *Australian Magistrates' Perspectives on Expert Evidence: A Comparative Study*. Melbourne: Australian Institute of Judicial Administration.

⁴¹⁶ Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration.

⁴¹⁷ See Chapter 3: *Survey of Australian Forensic Experts*.

⁴¹⁸ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

⁴¹⁹ Freckelton, I. (1994). Expert Evidence & the Role of the Jury. *Australian Bar Review*, 12, 73.

⁴²⁰ Australian Bureau of Statistics. (2005). *Criminal Courts, Australia*: Australian Bureau of Statistics.

⁴²¹ For example, *Juries Act 1967* (ACT) ss 42C(4)(e), 42C(6)(d), 42C(7)(ae).

⁴²² For example, *Juries Act 1967* (ACT) ss 42C, 46A.

⁴²³ Cooper, C. P., & Roter, D. L. (2001). Recruitment of Research Participants from US Jury Pools. *Psychological Reports*, 88(3), 981.

⁴²⁴ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123.

produce a trial because the accused decides to plead guilty.⁴²⁵ Research utilising real jurors and actual cases requires a high degree of flexibility and a good awareness of (and deference to) court procedures in each state and territory.⁴²⁶ Other important factors include avoiding:⁴²⁷

- Burdening or aggravating jurors,
- Disrupting court operations,
- Biasing jurors for or against the accused,
- Utilising the jury pool inappropriately,
- Distracting jurors,
- Breaching jurors' personal confidentiality, and
- Creating an incorrect impression about who sanctioned the research.

Once an appropriate case has been identified and the data from a trial and jury captured, the research methodology itself may be subject to criticism for being based on such a small sample size, for having too many variables which were not (indeed, could not be) controlled and for lacking internal and external validity.⁴²⁸ For by its very nature, research into real juries through case studies comprises of highly individualised trials with a maximum of only twelve jurors deliberating per case,⁴²⁹ which does not equate to significant sample sizes over reasonable time frames. Also, the sheer volume of information generated from a single trial means that from that mass of data, researchers might easily find the explanation that suits their purposes, rather than the real reason for a particular jury's behaviour.⁴³⁰

Nevertheless, case studies are a highly valuable tool if conducted carefully.⁴³¹ Intensive study of actual trials enables the researcher to reveal important factors which often are not evident simply from jury verdicts or from reading trial transcripts (such as the

⁴²⁵ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 8.

⁴²⁶ Cooper, C. P., & Roter, D. L. (2001). Recruitment of Research Participants from US Jury Pools. *Psychological Reports*, 88(3), 981 at 985.

⁴²⁷ Ibid at 984.

⁴²⁸ Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351 at 352.

⁴²⁹ *Juries Act 1967* (ACT) s 31A.

⁴³⁰ Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351 at 352, 357.

⁴³¹ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 4, 5, 8.

nonverbal behaviour of judges and its influence on jurors, the reaction of jurors to witnesses or legal counsel, or the tone of voice used by experts who are reluctantly forced to agree to hypothetical scenarios suggested by opposing legal counsel).⁴³² Case studies also take into account and describe the context in which the jury made their decisions, and illuminate variables which may warrant further study in other forms (such as mock jury research).⁴³³

This study was derived from a need to directly assess what happens when jurors, without technical training, try to understand evidence derived from some of the most advanced and complicated branches of science.⁴³⁴ Often they must decide which interpretation to adopt when given information by scientifically trained witnesses who are forced to give their evidence in response only to questions asked by non-scientist lawyers. Jurors take up this task in forbidding circumstances,⁴³⁵ deprived of teaching and learning methods used elsewhere,⁴³⁶ including some of the tools used by judges adjudicating similar cases.⁴³⁷ So an assessment of how juries currently cope with complex evidence is the first step in enabling the legal and scientific communities to improve the way in which complex evidence is presented and utilised in Australian jury trials. This may also assist in determining whether the “problem” with juries understanding complex evidence is actually a problem caused by jury incompetence, or rather, one caused by incompetent communication with the jury.⁴³⁸ This chapter

⁴³² Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351 at 351.

⁴³³ Ibid. at 354; Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 5.

⁴³⁴ Justice Crispin, K. (1992). Coping with Complexity. *Australian Journal of Forensic Sciences*, 24(3), 74; Duff, P., & Findlay, M. (1997). Jury Reform: of Myths & Moral Panics. *International Journal of the Sociology of Law*, 25, 363; Freckelton, I. (1997, 1997). *Wizards in the Crucible: Making the Boffins Accountable*. Paper presented at the 1st World Conference on New Trends in Criminal Investigation & Evidence, Netherlands; Kaye, D., & Koehler, J. (1991). Can Jurors Understand Probabilistic Evidence? *Journal of the Royal Statistical Society: Series A*, 154(1), 75; Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO.

⁴³⁵ New South Wales Law Reform Commission. (2005). *Report 111 Majority Verdicts*. Sydney: New South Wales Law Reform Commission at 60; Edmond, G., & Mercer, D. (1997). Scientific Literacy & the Jury: Reconsidering Jury "Competence". *Public Understanding of Science*, 6, 329; Shuman, D., Champagne, A., & Whitaker, E. (1996). Assessing the Believability of Expert Witnesses: Science in the Jury Box. *Jurimetrics*, 37, 23; Tipple, S. (1986). Forensic Science: The New Trial By Ordeal? *NSW Law Society Journal*(August), 44.

⁴³⁶ Blackburn, R. (1986) Jury Deliberations. *Reform* 147; Cecil, J., Hans, V., & Wiggins, E. (1991). Citizen Comprehension of Difficult Issues: Lessons from Civil Jury Trials. *American University Law Review*, 40, 727; Cooper, J., Bennett, E., & Sukel, H. (1996). Complex Scientific Testimony: How Do Jurors Make Decisions? *Law and Human Behavior*, 20, 379; Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO.

⁴³⁷ Strawn, D. U., & Munsterman, G. T. (1982). Helping Juries Handle Complex Cases. *Judicature*, 65, 444.

⁴³⁸ Yarnell, M. A. H. (2005, November 7, 2005). *The Arizona Jury Past, Present and Future Reform*. Paper presented at the University of Canberra School of Law Annual Jury Conference, Sydney at 5.

documents a small pilot study of real jurors in two trials in the Supreme Court of the Australian Capital Territory (ACT).

4.2 THE JURY

Jury Selection

Juror research has shown that the composition of a jury (for example, their social and psychological attributes) are often less important to their decisions than the way in which evidence is presented and arguments are made in a trial.⁴³⁹ Nevertheless, the selection of jurors in any particular jury has the potential to greatly influence the outcome in cases where the evidence is ambiguous,⁴⁴⁰ and jury composition may also be a significant factor in the ability of the whole group to cope with complex evidence. The latter is further explored in this research.

The methods of jury selection used in Australia are particular to each jurisdiction, however none of the states or territories allows jurors to be questioned en masse (in *voir dire*s) prior to this selection. Historically, this was not the case.⁴⁴¹ Juries as far back as medieval times were selected on the basis of their personal knowledge; be it of the accused, the crime, the subject matter or all of the above.⁴⁴² Even today, in jurisdictions such as those within the USA, potential jurors may be closely questioned to ascertain their background, beliefs, prior knowledge, education, family background and other information which may be pertinent to their participation in the case.⁴⁴³ Whether or not this produces a “good” jury is still the subject of debate amongst scholars, commentators, politicians and lawyers,⁴⁴⁴ however, in Australia, nothing is known about a juror’s education, political, religious or social views and nothing is formally

⁴³⁹ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 10.

⁴⁴⁰ Ibid. at 10, 13.

⁴⁴¹ Horowitz, M. I. (1999). The National Jury Trials - Innovations. *Federal Lawyer*, 46(1), 30 at 31; Havard, J. (1991). Historical & Comparative Review of the Reception of Forensic Medical & Scientific Evidence under Different Systems of Law. *Forensic Science Reviews*, 3(1), 29.

⁴⁴² Wolf, R. V. (1998). *The Jury System*. Philadelphia: Chelsea House Publishers at 25.

⁴⁴³ Ibid. at 48; Judicial Council of California. (2002). *A Guide to California Jury Service*. Judicial Council of California. Available: <http://www.courtinfo.ca.gov/jury/index.htm> [2002, June 20] Step 1: Selecting a Jury at <http://www.courtinfo.ca.gov/jury/Step1.htm>.

⁴⁴⁴ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 12 cites representative references at footnote 30; see also May, R. (1998). Jury Selection in the United States: Are There Lessons to be Learned? *Criminal Law Review*, April 1998, 270; and Perez-Pena, R. (2000, May 10, 2000). Jurors May Not Use Professional Expertise to Sway Others, Court Says. *The New York Times*, p. 1.

solicited in court.⁴⁴⁵ In the ACT, the name and occupation of each potential juror are the only details given to legal counsel, and this information is not available until the morning of the trial.⁴⁴⁶

The pool of potential jurors is selected at random from the electoral role of the ACT,⁴⁴⁷ and while certain types of people are not qualified to serve⁴⁴⁸ (including undischarged bankrupts, blind, deaf, dumb, mentally or physically incapable people, and those unable to read and speak English); others are exempt from service⁴⁴⁹ (including members of the judiciary, the government and the clergy; practising legal practitioners, doctors, pharmacists, dentists, veterinary surgeons; police officers; and newspaper editors); and others may be excused or discharged from further attendance if they are ill, mentally or physically incapacitated or can show other sufficient cause.⁴⁵⁰

When a jury is being selected for a specific case in the ACT Supreme Court, the prosecution and defence are permitted to challenge the inclusion of certain potential jurors.⁴⁵¹ These “peremptory challenges” must occur after the name of the potential juror is called by the Judge’s associate, and before that potential juror has made their way from the public gallery to the jury box,⁴⁵² (because upon entering the box, that person becomes a juror in the case). No reason needs to be given for the challenge, however each party has only eight such challenges available.⁴⁵³ Once these have been made, the challenging party must then give reasons for any further challenges (“challenges with cause”).⁴⁵⁴ Since neither the prosecution or defence has any more information about the potential juror than their name and occupation⁴⁵⁵, it is rare for challenges with cause to be made. Peremptory challenges are not uncommon, and are

⁴⁴⁵ Potential jurors are asked only if they know the accused (who is present in court), or the name of the complainant or any of the witnesses (whose names are read from a list), before they are selected for jury duty.

⁴⁴⁶ *Juries Act 1967 (ACT)* ss 27(3)(a), 29(2).

⁴⁴⁷ *Juries Act 1967 (ACT)* ss 9, 19.

⁴⁴⁸ *Juries Act 1967 (ACT)* s 10.

⁴⁴⁹ *Juries Act 1967 (ACT)* s 11.

⁴⁵⁰ *Juries Act 1967 (ACT)* ss 8, 14, 16. See also Pelly, M. (2004, 22 July 2004). Please Excuse me from Jury Duty, the Voices tell me my Budgie will be Sick. *Sydney Morning Herald*, 22 July 2004 www.smh.com.au.

⁴⁵¹ *Juries Act 1967 (ACT)* s 34.

⁴⁵² *Juries Act 1967 (ACT)* s 35.

⁴⁵³ *Juries Act 1967 (ACT)* s 34.

⁴⁵⁴ *Juries Act 1967 (ACT)* ss 34, 36A.

⁴⁵⁵ *Juries Act 1967 (ACT)* ss 27(3)(a), 29(2).

believed to be made on the basis of the gender, appearance and apparent age of the potential jurors.⁴⁵⁶

Thus, jurors are chosen for a particular trial on the basis of their eligibility for service, not on the basis of their education, knowledge, abilities or interest in the case. Lawyers, witnesses and the trial judge must gauge the comprehension of the jury, and each juror, by making their own observations during jury selection and the trial. Although some research has investigated the level of “scientific literacy” of the general public in the United States and in Europe, little or nothing is known about the scientific literacy or competency of ACT voters when they are selected to sit on a Supreme Court jury.⁴⁵⁷ This may have a dramatic impact on the ability of jurors to comprehend, assess and use the complex scientific evidence they may hear in court.

Jury Deliberations and Unanimity

*People who could not agree about who should be in government or who should win the grand final are expected to agree on a verdict... Yet juries do agree, day in, day out.*⁴⁵⁸

*...[S]omehow the jury will collectively overcome the deficiencies of its individual members; that in the end, reason will overcome passion and common sense prevail over ignorance.*⁴⁵⁹

Juries in the ACT must come to a unanimous verdict⁴⁶⁰ (although this is not the case in all states and territories of Australia).⁴⁶¹ In the ACT, legislation provides that in criminal trials where six hours of deliberation have occurred, and the Judge (having asked one or more jurors) is satisfied that no agreement is likely to be reached (the jury is “hung”), the Judge may discharge the jury. Such a result means that the trial is adjourned to another date, and if the Crown chooses to proceed, then the accused will be

⁴⁵⁶ Anecdotal evidence from members of the bar in the ACT, VIC and NSW.

⁴⁵⁷ Miller, J. D. (1998). The Measurement of Civic Scientific Literacy. *Public Understanding of Science*, 7, 203; Field, H., & Powell, P. (2001). Public Understanding of Science Versus public Understanding of Research. *Public Understanding of Science*, 10, 421.

⁴⁵⁸ Richter, R. (2005). Twelve Reasons to Cheer. *Sydney Morning Herald*, p. 26.

⁴⁵⁹ Wolf, R. V. (1998). *The Jury System*. Philadelphia: Chelsea House Publishers at 16.

⁴⁶⁰ This is a common law rule which has not been abrogated by the *Juries Act 1967* (ACT).

⁴⁶¹ See New South Wales Law Reform Commission. (2005). *Report 111 Majority Verdicts*. Sydney: New South Wales Law Reform Commission at 21. Unanimous verdicts are required for all criminal offences in Queensland and New South Wales (although legislation is expected to alter this in NSW in 2006). Victoria, Tasmania, South Australia, Western Australia and the Northern Territory allow majority verdicts for some criminal offences.

tried again later, before a different jury.⁴⁶² Due to the expense and inconvenience, and from concern for the accused, it is specified that such a discharge cannot be granted before at least six hours of deliberations have elapsed.⁴⁶³ The length of jury deliberations varies for each and every case and may depend on several factors, not least any expert evidence which may have been adduced for the jury.

In a recent report on unanimous verdicts, the New South Wales Law Reform Commission found that the requirement for unanimity does not necessarily result in a higher incidence of hung juries.⁴⁶⁴ Hung juries have consistently been found to be mostly the fault of evidentiary factors, (such as evidence that is equivocal, ambiguous or equally balanced between favouring the prosecution and the defence), interpersonal dynamics between jurors, and jurors' feelings about the fairness of the law as applied in the trial.⁴⁶⁵ Case complexity may also play a role in creating hung juries, however the literature suggests that the predominant factor in the failure to deliver a verdict is usually weak or ambiguous evidence.⁴⁶⁶

Studies which have not focussed specifically on scientific evidence and complexity have suggested that jury difficulties with complex evidence can be minimised or erased by providing jurors with note-taking material, encouraging jurors to take notes and ask questions, and by providing jurors with written (legal) instructions and directions.⁴⁶⁷ It has also been concluded that requiring a unanimous verdict appears to make juries

⁴⁶² Research in the USA indicates that only a third of such cases are re-tried, more are resolved with a plea agreement between the prosecution and defence (41%) and the remainder are dismissed (26%): Hannaford-Agor, P., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are Hung Juries a Problem?* Williamsburg, VA: National Center for State Courts, National Institute of Justice, at 5.

⁴⁶³ *Juries Act 1967* (ACT) s 38.

⁴⁶⁴ New South Wales Law Reform Commission. (2005). *Report 111 Majority Verdicts*. Sydney: New South Wales Law Reform Commission at 25.

⁴⁶⁵ Kalven, H., & Zeisel, H. (1966). *The American Jury*. Chicago: Chicago University Press at 456; Hannaford-Agor, P., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are Hung Juries a Problem?* Williamsburg, VA: National Center for State Courts, National Institute of Justice, at 84; Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 40.

⁴⁶⁶ Hannaford-Agor, P., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are Hung Juries a Problem?* Williamsburg, VA: National Center for State Courts, National Institute of Justice, at 86; Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 41.

⁴⁶⁷ Hannaford-Agor, P., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are Hung Juries a Problem?* Williamsburg, VA: National Center for State Courts, National Institute of Justice, at 86.

“consider the evidence more carefully and thoroughly” and results in a higher level of juror confidence in the ultimate outcome.⁴⁶⁸

4.3 THE SCIENTIFIC EXPERT

The jury provides a point of fascination for researchers. What is just as interesting as the jury itself however, is how the jury reacts to a scientific expert witness. Forensic scientists train in their particular scientific discipline to ensure that the work they conduct for the court is scientifically sound and legally appropriate. However, the presentation of their work for legal purposes calls into use an entirely different skill set,⁴⁶⁹ and when that work is judged by a body of twelve ordinary citizens, many interesting factors are called into play. These include: The expectations the jury has of an “expert”;⁴⁷⁰ the ability of the expert to meet these expectations in terms of their appearance, their qualifications, their ability to effectively communicate their knowledge and findings; and the way in which their evidence is presented by legal counsel. These factors contribute to the way in which a jury will react to the scientific evidence, their ability to comprehend it, assess it, and finally, to use it in reaching a verdict.

For forensic scientists, the bulk of whose work will be conducted in a laboratory or out in the field, in the company of other forensic scientists, having to appear in court, knowing that their performance will be scrutinised by the jury, may be an onerous task.⁴⁷¹ For unlike lay witnesses, who appear in court merely to recount their version of events, *expert* witnesses are called to not only give their findings, but to also give their expert *opinion*.⁴⁷² Their position as experts may already create expectations in the mind of jurors, not least as to how the expert witness will appear and conduct themselves in court.

⁴⁶⁸ New South Wales Law Reform Commission. (2005). *Report 111 Majority Verdicts*. Sydney: New South Wales Law Reform Commission at 37; Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 41.

⁴⁶⁹ Kogan, J. (1978). On Being a Good Expert Witness in a Criminal Case. *Journal of Forensic Sciences*, 23(1), 190.

⁴⁷⁰ Tanton, R. (1979). Jury Preconceptions & Their Effect on Expert Scientific Testimony. *Ibid.*, 24, 681.

⁴⁷¹ Gutheil, T. G. (2000). The Presentation of Forensic Psychiatric Evidence in Court. *Israel Journal of Psychiatry Related Sciences*, 37(2), 137 at 140; Southeard, G. (1991). Communication in the Courtroom - Clarification or Crucifixion? *Journal of the Forensic Science Society*, 31(2), 275.

⁴⁷² *Evidence Act 1995* (Cth) s79.

Appearance

It has long been known that the physical appearance of a witness can dramatically affect the way in which a jury reacts to that witness, even though physical attractiveness is irrelevant to the question of guilt or innocence.⁴⁷³ This manifests in different ways – unattractive persons are often more likely to be judged as less credible, more likely to be guilty and deserving of a longer sentence (if they are the accused), than are attractive witnesses or accuseds.⁴⁷⁴ (Conversely, some research has shown that mock jurors tend to impose heavier sentences on good-looking fraudsters than on ugly ones, as the attractive swindler is seen to be unfairly playing on their looks to gain victims' confidence.⁴⁷⁵) That performance is often judged on physical appearances is not a new phenomenon,⁴⁷⁶ however, it must be recognised that expert witnesses are not immune from juror expectations as to how a credible, qualified, reliable expert ought to appear.⁴⁷⁷

Confidence, Accuracy and Credibility

*"The plausible, the suave, the glib, the well-spoken and the intelligent...as compared with the unprepossessing, the nervous, the uncouth, the halting, the illiterate and the stupid...The very knowledge of the consequences at stake is likely to multiply the chances of a bad performance."*⁴⁷⁸

Although the former Chief Justice of the Supreme Court of South Australia was referring to the difficulties faced by accused persons giving evidence, the same

⁴⁷³ Gutheil, T. G. (2000). The Presentation of Forensic Psychiatric Evidence in Court. *Israel Journal of Psychiatry Related Sciences*, 37(2), 137 at 140.

⁴⁷⁴ Thomson, D. M. (1985). The Reliability and Contamination of Evidence. In S. Tilmouth & N. Pengelley (Eds.), *Criminal Law Advocacy : papers delivered at the second and third annual conferences of the Legal Services Commission of South Australia, Tanunda 1984* (pp. 56). McLaren Vale: Wakefield Press at 58.

⁴⁷⁵ Sigall, H., & Ostrove, N. (1975). Beautiful but Dangerous: Effects of Offender Attractiveness and Nature of the Crime on Juridic Judgements". *Journal of Personality and Social Psychology*, 31, 410 cited in Thomson, D. M. (1985). The Reliability and Contamination of Evidence. In S. Tilmouth & N. Pengelley (Eds.), *Criminal Law Advocacy : papers delivered at the second and third annual conferences of the Legal Services Commission of South Australia, Tanunda 1984* (pp. 56). McLaren Vale: Wakefield Press at 58.

⁴⁷⁶ Landy, D., & Sigall, H. (1974). Beauty is Talent: Task evaluation as a function of the performer's physical attractiveness. *Journal of Personality and Social Psychology*, 29, 299.

⁴⁷⁷ That is, neat, well-dressed, conservative, calm, serious and so on. Tanton, R. (1979). Jury Preconceptions & Their Effect on Expert Scientific Testimony. *Journal of Forensic Sciences*, 24, 681.

⁴⁷⁸ Dr JJ Bray, cited in Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne at 13 and Thomson, D. M. (1985). The Reliability and Contamination of Evidence. In S. Tilmouth & N. Pengelley (Eds.), *Criminal Law Advocacy : papers delivered at the second and third annual conferences of the Legal Services Commission of South Australia, Tanunda 1984* (pp. 56). McLaren Vale: Wakefield Press.

comments might be made about all witnesses. Confidence and credibility are inextricably tied. For expert witnesses, about whom the jury knows little (except that they are “experts”), it is likely that the importance of a confident approach cannot be overestimated. It may be assumed by jurors that confidence shares an important relationship with accuracy when a witness is giving their evidence: If a witness gives their evidence confidently, then the evidence is likely to be correct and the witness credible. In fact, it has long been known from psychological research that there is “no reliable relationship” between memory accuracy and confidence.⁴⁷⁹ Thus, while it may be intuitively plausible to accept a confident witness as an accurate one, it does not hold true in all cases, and even very inaccurate witnesses may appear confident, and conversely, very cautious witnesses may give very accurate evidence.

Furthermore, psychological studies have shown that although judges and juries rely on the physical performance of witnesses to assess their credibility, not only is there “no consistent evidence that confidence is a predictor of accuracy”, nor is physical attractiveness necessarily related to character or intelligence,⁴⁸⁰ but demeanour and facial cues have been shown to often *reduce* accuracy in detecting deception and judging credibility.⁴⁸¹ So it is entirely possible that the introverted, poorly-presented witness may be more accurate, reliable and trustworthy than the slick, confident, physically attractive expert, however, the latter is likely to be rated more highly for credibility by jurors.⁴⁸²

⁴⁷⁹ Thomson, D. M. (1985). The Reliability and Contamination of Evidence. In S. Tilmouth & N. Pengelley (Eds.), *Criminal Law Advocacy : papers delivered at the second and third annual conferences of the Legal Services Commission of South Australia, Tanunda 1984* (pp. 56). McLaren Vale: Wakefield Press at 61.

⁴⁸⁰ Thomson, D. M. (1984). Towards a More Efficient Judicial System - Observations of an Experimental Psychologist. In M. C. Nixon (Ed.), *Issues in Psychological Practice* (Vol. 1, pp. 107). Melbourne: Longmans Cheshire at 116.

⁴⁸¹ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 21, 51.

⁴⁸² Thomson, D. M. (1984). Towards a More Efficient Judicial System - Observations of an Experimental Psychologist. In M. C. Nixon (Ed.), *Issues in Psychological Practice* (Vol. 1, pp. 107). Melbourne: Longmans Cheshire at 116.

Impartiality

In Australia, as in other jurisdictions,⁴⁸³ although it is not unheard of, it is not common for experts to be called by the defence for ordinary criminal trials; usually experts are called by the prosecution and sourced from government and police laboratories.⁴⁸⁴

Although experts may be called as witnesses by the prosecution, and it has been suggested that the process inevitably “socialises them into feeling as if they are members of the adversary team”,⁴⁸⁵ they are not witnesses *for* the prosecution.⁴⁸⁶ Their duty is solely to the court, not to the party which called them.⁴⁸⁷ This has been spelt out in legislation and practice directions since 2000 but may not be widely appreciated outside the legal profession. For example, the ACT Expert Witness Code of Conduct⁴⁸⁸ states:

General Duty to the Court

2. An expert witness has an overriding duty to assist the court impartially on matters relevant to the expert’s area of expertise.
3. An expert witness’ paramount duty is to the court and not to the person retaining the expert.
4. An expert witness is not an advocate for a party.

This Code of Conduct is in terms identical to that which applies in NSW and other Australian jurisdictions.⁴⁸⁹ Jurors are not likely to be aware of this legal rule before they enter the court, however, nor are they usually made aware of it once they have been empanelled on a jury. Rather, jurors see only that all witnesses are called by one side or

⁴⁸³ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 132; Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO at 154.

⁴⁸⁴ The potential influence or effect of the expert’s employer on the jury deliberations is not studied in this research, however it is addressed in other literature: For example Cooper, J., & Neuhaus, I. M. (2000). The “Hired Gun” Effect: Assessing the Effect of Pay, Frequency of Testing, and Credentials on the Perception of Expert Testimony. *Law and Human Behaviour*, 24(2), 149.

⁴⁸⁵ Saks, M. J. (1990). Expert Witnesses, Non-Expert Witnesses & Non-Witness Experts. *Law and Human Behavior*, 14(4), 291 at 309.

⁴⁸⁶ Starrs, J. (1991). The Forensic Scientist & the Open Mind. *Journal of Forensic Sciences*, 31(2), 111; Madden, B. (2000). Changes to the Role of Expert Witnesses. *Law Society Journal*, June 2000, 50.

⁴⁸⁷ Starrs, J. (1991). The Forensic Scientist & the Open Mind. *Journal of Forensic Sciences*, 31(2), 111; Dutton, G. (1998, December 1998). The Importance of Being Impartial. *Police Association of Tasmania, Association News*, 2, 5; Justice Sperling, H. (2000). Expert Evidence: The Problem of Bias and Other Things. *The Judicial Review*, 4, 429.

⁴⁸⁸ Supreme Court of the ACT Practice Direction Number 3 of 2004, Schedule.

⁴⁸⁹ See, for example, Schedule 7 of the *Uniform Civil Procedure Rules* 2005 (NSW), which applies to criminal trials through the *Supreme Court Rules* 1970 (NSW) s75.3J.

the other and thus they may have incorrect expectations about expert witnesses being confrontational and/or biased, as are many of the witnesses in television dramas.

Since so many trials are carried out using only witnesses called by the prosecution, jurors are not offered an alternative explanation of the scientific evidence or given an opinion by an expert not called by the prosecution. In this environment it is important to determine how experts' bias/impartiality is perceived by jurors, and what affect this may have on the way in which scientific evidence is used by the jury.

4.4 THE EXPERT EVIDENCE

DNA Profiling Evidence

Forensic science has long enjoyed a high profile in the Australian media⁴⁹⁰ and as a source of entertainment. Indeed, public expectation and acceptance that all crimes can be solved by sophisticated scientific geni⁴⁹¹ has even been termed "the CSI effect" after a particularly pervasive American television series,⁴⁹² which may have generated the expectation that no crime should be prosecuted and no accused person convicted unless forensic science supports the case.⁴⁹³ Modern techniques such as DNA profiling⁴⁹⁴ excite a great deal of interest in the general public and so newspaper and television reports, such as the following, are common in the Australian media, particularly in the context of high-profile crimes:

"Almost 100 prisoners are to be charged with hundreds of unsolved crimes as a result of mass DNA testing. The ultra-modern system has linked them to unsolved murders, rapes, assaults, robberies, burglaries and other offences...It takes just seconds for the computer to find if the DNA sample matches DNA found at a crime scene....In fact, when confronted with DNA evidence, many [alleged offenders] simply admit to it."⁴⁹⁵

⁴⁹⁰ Commencing perhaps with the kidnapping and murder of Graeme Thorn and subsequent trial of Stephen Bradley in 1960, Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 79.

⁴⁹¹ Ross, A. (1998). Controversy Corner - The Quest for Truth. *Australian Journal of Forensic Sciences*, 30, 41.

⁴⁹² Starrs, J. (2004). The CSI Effect. *Scientific Sleuthing Review*, 28(3), 1.

⁴⁹³ ABC Radio National. (2005). *The Science Show - The Truth About CSI* (9 April). ABC Radio National 9 April [2005, 19 May].

⁴⁹⁴ Discovered and applied to forensic science only two decades ago: Gill, P., Jeffreys, A., & Werrett, D. (1985). Forensic Application of DNA "Fingerprints". *Nature*, 318, 577.

⁴⁹⁵ news.com.au. (2002). *DNA tests snare 100 prisoners*, [www]. news.com.au. Available: <http://www.news.com.au/common/printpage/0,6093,3640147,00.html> [2002, 23 January].

Even the legal fraternity has been known to publicly exalt the powers of forensic DNA profiling evidence:

“[DNA profiling evidence enables] solving crimes by extremely cost-effective methods and providing the satisfaction to victims and the community of knowing that offenders are identified and dealt with, and the innocent excluded.”⁴⁹⁶

It is reasonable to expect that such high praise for the power of DNA profiling⁴⁹⁷ would perhaps raise a similarly high level of expectation amongst the public, and the literature suggests that jurors may pay inordinate attention to the power of DNA evidence.⁴⁹⁸ Little or no time is taken to examine the limits of DNA profiling or the inability to use DNA profiling in certain circumstances – for example, when no samples could be found, or when viable samples may have deteriorated or been contaminated and rendered unusable.⁴⁹⁹ Instead, the catch-phrase “DNA evidence” is used to encompass the wealth of knowledge and skills that forensic investigators must use to collect DNA samples and turn these into usable, accurate and reliable profiles for presentation in court, with little regard for any limitations. In this environment, the general public, including potential jurors, may have exceedingly unrealistic expectations about what DNA experts and DNA profiling evidence can actually deliver in court,⁵⁰⁰ whilst at the same time having little understanding of how DNA profiling is conducted or what is required for a DNA “match”.⁵⁰¹ Whether these misconceptions and expectations can be addressed in an adversarial system (in which scientific evidence is not always well presented) is an issue which provides a rich opportunity for research.

⁴⁹⁶ Cowdery, N. (2001, June). Getting Justice Wrong. *The Forensic Bulletin*, June, 6.

⁴⁹⁷ Connors, E., Lundregan, T., Miller, N., & McEwen, T. (1996). *Convicted by Juries Exonerated by Science: Case Studies in the use of DNA Evidence to Establish Innocence After Trial*. Virginia: US Department of Justice Office of Justice Programs and National Institute of Justice; Kenefick, K. (2000, August). The Wisconsin Innocence Project. *Profiles in DNA*, 12.

⁴⁹⁸ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 132.

⁴⁹⁹ Despite the power of many other invaluable forensic techniques. Rendle, D. F. (2005). Advances in Chemistry Applied to Forensic Science. *Chemical Society Reviews*, 34, 1021.

⁵⁰⁰ ABC Radio National. (2005). *The Science Show - The Truth About CSI* (9 April). ABC Radio National 9 April [2005, 19 May] at 3.

⁵⁰¹ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 128.

Presenting Real DNA Profiling Evidence

In the ACT, the protocol of the forensic science provider (the Australian Federal Police Forensic Services Division⁵⁰²) is to give a probabilistic result for a DNA profile, rather than to state that “the accused was the source of the DNA sample in question”. Since the FBI has adopted a policy of source attribution,⁵⁰³ however, and television shows dramatising forensic science and criminal trials have followed suit⁵⁰⁴, it is not unreasonable to expect the jurors may also have an expectation that the expert witness will actually positively identify the accused on the basis of a DNA profile.⁵⁰⁵

Attributing a DNA sample directly to a particular accused has long been an area of immense debate within the forensic science community.⁵⁰⁶ A fundamental problem with forensic scientists delivering “source attribution” evidence (that is, giving evidence that a DNA sample can be directly attributed to the accused) is that although the calculations may show that it is *very unlikely* that *anyone else* was the source, that probability never reaches zero.⁵⁰⁷ Thus for a scientist to state that “the accused was the source of the DNA”, rather than state that there is only a very small probability that someone else was the source of the sample, is considered by some to “represent a ‘leap of faith’ rather than a scientifically proven fact.”⁵⁰⁸ On the other hand, others in the field argue that “source attribution of evidence does not require that the profile be unique, but instead that there is reasonable scientific certainty regarding the source of the evidence.”⁵⁰⁹

⁵⁰² Personal communication, Australian Federal Police, Forensic Services, October 2004.

⁵⁰³ Budowle, B., Chakraborty, R., Carmody, G., & Monson, K. L. (2000). Source Attribution of a Forensic DNA Profile. *Forensic Science Communications*, 2(3), 1.

⁵⁰⁴ These shows are often American, for example, CSI, CSI:Miami, CSI:New York, Law and Order, et cetera. Other jurisdictions have also found that jurors are highly dependant on the media for their knowledge about DNA: Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 128.

⁵⁰⁵ Atchison, B. (2003). DNA Statistics may be Misleading. *Law Society Journal*, February, 68 at 69.

⁵⁰⁶ For example, Evett, I. W., Foreman, L. A., Jackson, G., & Lambert, J. A. (2000). DNA Profiling: A discussion of issues relating to the reporting of very small match probabilities. *Criminal Law Review*, [2000], 341; Evett, I. (1983). What is the Probability That This Blood Came From That Person: A Meaningful Question? *Journal of the Forensic Science Society*, 23, 35; Balding, D. J. (1999). When Can a DNA Profile be Regarded as Unique? *Science and Justice*, 39(4), 257; Stoney, D. (1991). What Made us Think we Could Individualize Using Statistics? *Journal of the Forensic Science Society*, 31, 197 See the discussion board at forens@statgen.ncsu.edu for an indication of the current debate conducted on this issue.

⁵⁰⁷ Buckleton, J., Evett, I. W., Curran, J., Champod, C., & Foreman, L. (2002, 28 January). *Source Attribution - Reply to Mary Raidy* (email), [email to forens@statgen.ncsu.edu]. forens@statgen.ncsu.edu [2002, 18 Feb] at 1.

⁵⁰⁸ Ibid. at 1; Balding, D. J., & Donnelly, P. (1994). The Prosecutor's Fallacy and DNA Evidence. *Criminal Law Review*, 1994, 711.

⁵⁰⁹ Budowle, B., Chakraborty, R., Carmody, G., & Monson, K. L. (2000). Source Attribution of a Forensic DNA Profile. *Forensic Science Communications*, 2(3), 1; DNA Advisory Board. (2000).

Thus the merits of source attribution have not been entirely established within the forensic community, and the presentation of DNA profiling evidence currently still differs from jurisdiction to jurisdiction.

This issue has a number of repercussions for how DNA profiling evidence should be presented, and how juries would respond to different expressions of the same evidence. Research has shown (unsurprisingly) that jurors more easily understand statements such as “Based on a blood test, I conclude that the accused is the father [or the person who left the stain at the crime scene et cetera]” than the more accurate, but less opinionated statement: “Based on a blood test that is 99.8 percent accurate, there is a 99.8 percent probability that the defendant is the father [or the attacker et cetera]”.⁵¹⁰ In fact, even the authors of a psychology textbook in which this research was reported, miss the significance of the statistics and mistakenly regard the two statements as being “statistically equivalent”.⁵¹¹

Nevertheless, other research has shown that even though jurors may be confused by numerical data such as probability statements, likelihood ratios and percentages, they tend to believe that evidence that has a mathematical component is more “scientific” and probative, than when the same evidence is presented without the numbers included.⁵¹² While ever this issue is one which confuses learned authors and divides even experienced and well-respected statisticians and forensic scientists, it is unrealistic to expect ordinary lay jurors to grapple well with the issue.⁵¹³

It has been suggested that the way forward may be for forensic scientists to report both the statistical aspect of the evidence (for example: “There is a one in XXX chance that this profile could have come from a Caucasian male within the Australian population”) as well as their opinion about the source attribution (“There is a very slim possibility of

Statistical and Population Genetics Issues Affecting the Evaluation of the Frequency of Occurrence of DNA Profiles Calculated from Pertinent Database(s). *Forensic Science Communications*, 2(3), 1.

⁵¹⁰ Horowitz, I. A., Willging, T. E., & Bordens, K. S. (1997). *The Psychology of Law* (2 ed.). New York: Addison Wesley Longman at 243.

⁵¹¹ Ibid. at 243.

⁵¹² Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 130, 132.

⁵¹³ Even if the expert and lawyers avoid errors such as “The Prosecutor’s Fallacy” when presenting DNA evidence, research suggests there is a danger that the jury will misinterpret DNA evidence inadvertently anyway: Balding, D. J., & Donnelly, P. (1994). The Prosecutor’s Fallacy and DNA Evidence. *Criminal Law Review*, 1994, 711 at 717.

another source, but in my opinion that possibility is not a credible one. I believe it is extremely unlikely to have come from anyone else. Therefore, in my opinion, this is almost certainly the accused's blood").⁵¹⁴ In some ways this conforms with the basis of expert evidence in Australian courts – the *Evidence Act* allows experts to give their “opinion”, whereas other witnesses are allowed to tell only the facts⁵¹⁵ – however this would be a controversial leap for experts who have previously reported only their scientific results and is certainly not universally accepted in forensic science or statistical circles.⁵¹⁶

Finding “Useful” DNA Samples for Profiling

Current methods of DNA profiling do not require vast quantities of sample in order to yield a sound result.⁵¹⁷ Minute amounts of biological material can be used to determine a profile.⁵¹⁸ In some highly publicised cases it has been mentioned that DNA evidence can be derived from as little as “five drops of blood”⁵¹⁹, and while this may be true, it does not address the issue of actually finding samples from which a profile can be determined. While it is true that extremely small amounts of biological material can be used for DNA profiling,⁵²⁰ these samples are also difficult to locate within a real-life crime scene. Thus, however useful DNA profiling may be, and however many witnesses the prosecution may call to give evidence about how the crime scene was thoroughly

⁵¹⁴ Parsons, R., & Lakhkar, B. (2002, 1 February). *Source Attribution - reply to Mary Raidy* (email), [email to forens@statgen.ncsu.edu]. forens@statgen.ncsu.edu [2002, 18 February] at 2.

⁵¹⁵ Under the Cth and NSW *Uniform Evidence Act* 1995 lay witnesses are ruled by s 76 “*Evidence of an opinion is not admissible to prove the existence of a fact about the existence of which the opinion was expressed. Whereas experts fall under section 79: If a person has specialised knowledge based on the person's training, study or experience, the opinion rule does not apply to evidence of an opinion of that person that is wholly or substantially based on that knowledge.*”.

⁵¹⁶ Balding, D. J., & Donnelly, P. (1994). The Prosecutor's Fallacy and DNA Evidence. *Criminal Law Review*, 1994, 711 at 720.

⁵¹⁷ von Wurmb-Schwark, N., Malyusz, V., Fremdt, H., Koch, C., Simeoni, E., & Schwark, T. (2006). Fast and Simple DNA Extraction from Saliva and Sperm Cells Obtained from the Skin or Isolated from Swabs. *Legal Medicine*, 8(3), 177; Divne, A.-M., & Allen, M. (2005). A DNA Microarray System for Forensic SNP Analysis. *Forensic Science International*, 154, 111.

⁵¹⁸ Heyes, R. (2001). Expert Evidence: DNA Profiling. *The Forensic Bulletin*, November 2001, 12 at 12.

⁵¹⁹ Thompson, W. C. (1996). DNA Evidence in the OJ Simpson Trial. *University of Colorado Law Review*, 67(Fall), 827 at 1.

⁵²⁰ von Wurmb-Schwark, N., Malyusz, V., Fremdt, H., Koch, C., Simeoni, E., & Schwark, T. (2006). Fast and Simple DNA Extraction from Saliva and Sperm Cells Obtained from the Skin or Isolated from Swabs. *Legal Medicine*, 8(3), 177; Whitaker, J., Cotton, E., & Gill, P. (2001). A Comparison of the Characteristics of Profiles Produced with the AMPFISTER SGM Plus Multiplex System for Both Standard and LCN STR DNA Analysis. *Forensic Science International*, 123, 215; Divne, A.-M., & Allen, M. (2005). A DNA Microarray System for Forensic SNP Analysis. *Forensic Science International*, 154, 111.

examined for evidence,⁵²¹ extremely small DNA samples may not be actually located for testing.

In addition, even if samples of DNA are sourced at a crime scene, and a DNA profile is determined, the profile may not match with any suspect or victim known to relate to that incident. In these cases, if the matter proceeds to trial, the prosecution is obliged to present the evidence showing that the accused did not match any of the DNA samples taken from the crime scene. Although this evidence does not exculpate the accused – because they may simply have removed all traces of their DNA from the scene – nor does it prove that the accused was present. This conundrum poses a potential source of difficulty for jurors; given the high profile of DNA profiling evidence, it is possible that jurors may be disappointed with forensic experts who failed to find and present “useful” DNA evidence, and with the prosecution for failing to present evidence as important as DNA profiling is perceived to be.⁵²²

4.5 THE COURT PROCESSES

An Adversarial Presentation

“...Jurors are, paradoxically, a lot more intelligent but a lot worse-informed than the court system gives them credit for. The court constantly assumed we knew too much about the process – about the onus of proof on the Crown, about what constitutes evidence and what does not, about how we were to set about our deliberations, about what kind of evidence had been excluded. Jury rooms are hotbeds of rumour, speculations and bullshit. We jurors were almost universally wrong on questions like the amount lawyers get paid, why they do or don’t wear wigs and why they were sending us out of the court every few hours. On the other hand, the court allowed the barristers to run some lines of defence, lasting for days, that were a pure insult to our reasoning abilities and a waste of the community’s money.”⁵²³

In Australia, the court system is “adversarial”, meaning evidence is presented by the witnesses of two opposing parties, and is extracted in a “question and answer” format.

⁵²¹ Justice Wood, J. (2003). Forensic Sciences From the Judicial Perspective. *Australian Bar Review*, 23, 1 at 10; *R v Sing* (2002) 54 NSWLR 31; [2002] NSWCCA 20.

⁵²² Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at 272.

⁵²³ Knox, M. (2002, Friday 1 January). Trial and Error. *Sydney Morning Herald*, p. 15 at 15.

Bearing in mind the rules of evidence⁵²⁴ and the case theory with which they are trying to persuade the jury,⁵²⁵ each lawyer carefully chooses not only their experts,⁵²⁶ but the questions which must be asked and those which ought not be asked.⁵²⁷

The jury listens to the questions and answers to try and extract some meaning from each side of the case: *Does that answer fit with either sides argument? Will this witness know the answer to the question burning in the minds of the jury? Was that question asked in the right way of the right witness?* The quality and quantity of the questions asked can have a significant impact on the quality and quantity of evidence given by each witness.⁵²⁸ Thus, the wording of each question, and the expected response, can provide a mine of information for a jury, or a minefield of opportunities for speculation by a jury looking for answers to their own questions about the case.

Expert witnesses may have the advantage of appearing in court many times, accruing practise at answering questions in a way which conveys their results accurately and comprehensively. Nevertheless, they are still required to answer the specific questions asked, in the order asked, which may not be conducive to giving a jury a good understanding of what the results were, how they were relevant to the case, or how they could be used by the jury to come to a reasonable verdict.⁵²⁹

Experts are also limited by their own expertise: They are allowed to answer questions *only* within their own field of expertise.⁵³⁰ Thus if a lawyer accidentally (or deliberately) asks a question outside that field of knowledge, the expert is obliged to

⁵²⁴ Justice Goldring, J. (2000). DNA Evidence - The Way Forward? *Judicial Officers' Bulletin*, 12(7), 49 at 8.

⁵²⁵ Barrett, D. (1991). Scientific Evidence in an Adversarial System with a Lay Audience: A Problem for Justice? *Journal of the Forensic Science Society*, 31(2), 271.

⁵²⁶ Ragg, M. (1995, June 13 1995). Proof Positive of Negative? *The Bulletin*, p. 14.

⁵²⁷ Although the prosecution bears the burden of having to present *all* of the evidence (even if it is detrimental to their own case), the defence does not share this burden. Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy.

⁵²⁸ This has been characterized by forensic scientists as "The Truth – that part of the truth which I am permitted to give and nothing but the truth". Bush, J. (1987). The Stethoscope & the Scales of Justice - Partners or Adversaries? *The Police Surgeon*, 31, 56 at 59; Liverani, M. R. (1997). Expert Witnesses Tell Lawyers: Manage Us Better. *Law Society Journal*, August 1997, 50.

⁵²⁹ Neuffer, N. L. (2002). Complex Evidence and Communication: The Good, the Bad and the Ugly. *The Practical Litigator*, 13(5), 45; Bird, S. J. (2001). Scientific Certainty: Research versus Forensic Perspectives. *Journal of Forensic Sciences*, 46(4), 978; Freidman, J. (1977). The Scientist As Expert Witness: Why Lawyers & Scientists Can't Talk to Each Other. *Jurimetrics*, 18, 99.

⁵³⁰ *Evidence Act 1995* (Cth) s 79.

state that they can not answer the question as they are not an expert in that field.⁵³¹ This can present difficulties for a jury, particularly if it was a question to which they really wanted to know the answer. Thus frustration may arise when lawyers ask the right questions of the wrong witness, or the wrong questions of the right witness.⁵³²

Juror speculation about what has happened, or what is happening, in court, has the potential to influence later deliberations. Psychological research indicates that not only do we view our experiences through eyes which are coloured by our personal and cultural expectations⁵³³, but we are also susceptible to having our *own memories* distorted by the influence of other people.⁵³⁴ This occurs even when other people may be giving us misleading information.⁵³⁵ Furthermore, the longer the time between the original stimulus (such as the witness giving evidence in court) and the recall period (such as deliberations at the end of the trial), the more likely it is that the information given to us by other people (including the misleading parts) will be incorporated into our “own memory” of the event.⁵³⁶ This process of assessing evidence may influence the way in which expert evidence is used by juries.

Asking Questions

A fundamental tool in the comprehension of information is the opportunity to ask questions.⁵³⁷ Asking questions is particularly useful in respect of subject matter which is new or complex, such as DNA profiling,⁵³⁸ or in unfamiliar environments where the listener (jurors) may feel excluded from the professional alliances between the speakers (judge, prosecution and defence lawyers).⁵³⁹ “Active listening” is a process by which listeners are able to identify where more information is needed, ask the relevant

⁵³¹ Asche, A. (2002). The Expert Witness, *The Psychologists of the Northern Territory* (pp. 5). Darwin at 2.

⁵³² Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO at 160.

⁵³³ Thomson, D. M. (1984). Towards a More Efficient Judicial System - Observations of an Experimental Psychologist. In M. C. Nixon (Ed.), *Issues in Psychological Practice* (Vol. 1, pp. 107). Melbourne: Longmans Cheshire at 110.

⁵³⁴ Ibid. at 110.

⁵³⁵ Ibid. at 111.

⁵³⁶ Ibid. at 111.

⁵³⁷ Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne at 6.

⁵³⁸ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 132.

⁵³⁹ Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269 at 274.

question, absorb the answer, and use the information to inform the remainder of what they hear.⁵⁴⁰ This usually assists comprehension by not only clearing up areas of confusion or misunderstanding,⁵⁴¹ but may also indicate to the speaker areas which may need to be presented more slowly, more quickly, or using a different approach (such as diagrams, charts, written material et cetera)⁵⁴² and tends to increase juror satisfaction in their role in the trial.⁵⁴³ Research indicates that where listeners are able to actively formulate questions, rather than just passively listen to or study information, their recall and comprehension of that information is much higher.⁵⁴⁴

Unfortunately, this is not an approach which is easily utilised or especially encouraged in a court of law.⁵⁴⁵ After a jury has been selected and a trial commenced, jurors are expected to cope with all of the circumstances and intricacies of the case.⁵⁴⁶ They may be provided with note-taking materials to facilitate this, but the jurors' role in the courtroom is essentially passive until they deliver a verdict.⁵⁴⁷ For the purpose of a trial is not solely to inform a jury, nor is evidence presented to 'educate' a jury. Rather, information is presented in an adversarial format and jurors are asked to listen to the evidence, take notes if they want to and then put any questions in writing, which are then given to the Judge for consideration. This is the accepted process for juror questions in the Supreme Court of the ACT and is commensurate with other Australian jurisdictions.⁵⁴⁸ This method efficiently vets juror questions so that inappropriate, irrelevant or otherwise inadmissible questions are not put to witnesses or legal counsel

⁵⁴⁰ Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne at 6.

⁵⁴¹ Heuer, L., & Penrod, S. (1994). Juror Notetaking and Question Asking During Trials. *Law and Human Behavior*, 12(3), 121 at 142.

⁵⁴² Ibid. at 143 suggests that jury questions do not always signal to lawyers that certain issues need more explanation, however it is possible that experts who are asked additional questions by the jury will, in response, give additional information via their answers.

⁵⁴³ Heuer, L., & Penrod, S. (1996). Increasing Juror Participation in Trials Through Note Taking and Question Asking. *Judicature*, 79, 256.

⁵⁴⁴ Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne at 6; Heuer, L., & Penrod, S. (1994). Trial Complexity: A Field Investigation of its Meanings and its Effects. *Law and Human Behaviour*, 18(1), 29 at 49; Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 132.

⁵⁴⁵ Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? www.criminal-courts-review.org.uk, 1 at 47.

⁵⁴⁶ Amar, A. R., & Amar, V. D. (1996). Unlocking the Jury Box. *Policy Review*, 77(May-June), 1 at 4.

⁵⁴⁷ Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? www.criminal-courts-review.org.uk, 1 at 48.

⁵⁴⁸ Oggloff, J., Clough, J., Goodman-Delahunty, J., & Young, W. (2005). *The Jury Project: A Survey of Australian and New Zealand Judges*. Melbourne: Australian Institute of Judicial Administration at 8, 11.

and so that the trial is not interrupted by spontaneous questions from the jury. It has been described as cumbersome, discouraging, inhibited and an “obvious deterrent”.⁵⁴⁹

Not only do questions have to be formulated by the jury as a whole, but there is usually a delay between the question arising (for example during the evidence of a witness) and the question being answered (usually after the court is in recess and the judge and legal counsel have had time to consult). Consultation between judges and legal counsel in Australia does not occur through a sidebar (as in the USA)⁵⁵⁰ but rather, the jury is usually sent out and the question is discussed in a *voir dire*.⁵⁵¹ Psychological research indicates that jurors’ ability to understand, clarify and recall evidence⁵⁵² is impaired by the convoluted way in which they are permitted to ask questions and jurors may also be so intimidated by the circumstances and the process, that questions which arise are simply not asked at all.⁵⁵³

In other jurisdictions where questions are allowed and/or encouraged, research indicates that juries are capable of asking serious, relevant, reasonable questions which are able to be answered within the perimeters of the law and the boundaries of usual court process.⁵⁵⁴ In Arizona for example, a study of 50 civil jury trials concluded that:⁵⁵⁵

[The questions which were asked by the juries and allowed by the judges] were consistent with the observations from previous reports that jurors generally submit appropriate and relevant questions. For example, jurors directed nearly half of their questions to expert witnesses, typically attempting to clarify their testimony or understand the bases for their opinions. The juror questions...ranged from simple questions about

⁵⁴⁹ Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? www.criminal-courts-review.org.uk, 1 at 47,48.

⁵⁵⁰ Diamond, S. S., Rose, M. R., & Murphy, B. (2004). Jurors' Unanswered Questions. *Court Review*, 41(Spring), 20 at 21.

⁵⁵¹ The definition of a *voir dire* in the USA (*a preliminary examination of prospective jurors or witnesses under oath to determine their competence or suitability*) differs from an Australian *voir dire*, which is literally a case within a case, during which the jury is sent out so that issues can be argued without risk of prejudicing them and witnesses may be called in to give evidence.

⁵⁵² Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne at 7.

⁵⁵³ Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? www.criminal-courts-review.org.uk, 1 at 47.

⁵⁵⁴ Heuer, L., & Penrod, S. (1994). Juror Notetaking and Question Asking During Trials. *Law and Human Behavior*, 12(3), 121 at 144-8.

⁵⁵⁵ Diamond, S. S., Rose, M. R., & Murphy, B. (2004). Jurors' Unanswered Questions. *Court Review*, 41(Spring), 20 at 22.

definitions...to more complex attempts by jurors to understand the inferences made by the witness.”

Where scientific evidence is presented, jurors may not only need to ask more questions because the information is novel, technical or complex,⁵⁵⁶ but they may also have additional difficulties when seeking to ask those questions. The nature of the evidence, including the jargon, the conceptual issues and the demarcation between experts as to areas of expertise may all prevent juries from asking the right questions, or from asking any questions about the expert evidence. These issues would intensify in trials where the scientific evidence is complex, lengthy, presented by multiple experts or highly disputed. Thus, it is important to assess how juries utilise the opportunity to ask questions, and so to determine whether questions are indeed an aid to their understanding of scientific evidence.

Note-taking

The opportunity for jurors to take notes has been suggested as a way to enhance their recall and comprehension of evidence, particularly in long or complex trials. Research indicates that although jurors who take notes may do so accurately and may be able to keep up with the pace of the trial without becoming distracted by their note-taking, such jurors do not necessarily experience better recall of the evidence, or greater satisfaction with the results than jurors who did not take notes.⁵⁵⁷ Nevertheless, 75% of jurors who did take notes during criminal trials studied in the USA reported that they relied on the notes during deliberations to a moderate extent or more,⁵⁵⁸ and other jurors report that notes help them keep track of witnesses and evidence, refresh their memories about important dates, record relevant exhibits, concentrate on the evidence,⁵⁵⁹ and remain alert during long trials,⁵⁶⁰ which indicates that note-taking has an important function for some jurors in the course of deliberations. Notes may become particularly important for scientific or technical evidence, where the jury may be presented with facts and

⁵⁵⁶ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 127.

⁵⁵⁷ Heuer, L., & Penrod, S. (1994). Juror Notetaking and Question Asking During Trials. *Law and Human Behavior*, 12(3), 121 at 136.

⁵⁵⁸ Ibid. It is noted that jurors in this study did not rate the evidence as being complex or difficult to understand, which may limit the application of the findings in relation to cases where scientific or complex evidence is presented.

⁵⁵⁹ ABA Section of Litigation. (1989). *Jury Comprehension in Complex Cases: Report of the Special Committee of the ABA Section of Litigation*. Chicago: American Bar Association at 34-5.

⁵⁶⁰ Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? *www.criminal-courts-review.org.uk*, 1 at 47.

figures/statistics/technical concepts relating to an expert's opinions, rather than just the factual evidence typically given by lay witnesses.

In the ACT, jurors are provided with note-taking materials at the commencement of the trial, and replacement materials are available in the jury room throughout the trial and deliberations. Notes made by the jury are usually kept in the jury room when the jury is not in court, however, the materials are not specifically collected from the jury at the end of each day or at the end of the trial. Judicial practice varies, however, juries are often told at the commencement of a trial that the materials are available for their use and that such use is entirely at their own discretion. This is a common practice in Australian courts, although few judges give their juries any guidance as to what to note down or how best to take useful notes during the trial.⁵⁶¹

Access to Trial Transcripts

Not only does the difficulty in asking questions impair a juries' ability to comprehend evidence, it may also lead to a loss of recall of evidence. "Forgetting, as a function of time"⁵⁶² is a well established phenomena and the greater the amount of material, and the more difficult the material, the more rapid the rate of forgetfulness.⁵⁶³

This may be overcome by allowing the jury to ask questions easily, and to receive timely answers, as well as giving them access to trial transcripts.⁵⁶⁴ Although legislation in some Australian jurisdictions enables juries to request a copy of the trial transcript, this ability is in practise curtailed by a judges discretion to refuse such a request.⁵⁶⁵ In the ACT, there is no specific legislative provision enabling jury access to transcripts, instead, juries usually must rely on their own notes and memories, and, if they are unable to recall particular evidence, they must remember what they have forgotten, and ask to have it read out to them from the transcript at a later point (often a much later point) in time.⁵⁶⁶

⁵⁶¹ Oggloff, J., Clough, J., Goodman-Delahunty, J., & Young, W. (2005). *The Jury Project: A Survey of Australian and New Zealand Judges*. Melbourne: Australian Institute of Judicial Administration at 8-9.

⁵⁶² Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne at 7.

⁵⁶³ Ibid. at 7.

⁵⁶⁴ Ibid. at 7,8.

⁵⁶⁵ *Jury Act 1977 (NSW)* s 55C.

⁵⁶⁶ Since the time at which this thesis was completed, it has been reported that in the ACT, as well as a number of other jurisdictions, juries do now have access to trial transcripts in a number of circumstances

Also, if it is accepted that sometimes witnesses may be more confident than they are accurate, and that their appearance may unduly influence the minds of jurors,⁵⁶⁷ it is possible that access to trial transcripts allows jurors to better assess evidence, because it reinforces what was *said* in court, rather than reminding jurors of (the possibly misleading impact) of a witness's appearance and demeanour.⁵⁶⁸ Access to the trial transcript allows jurors to read over what was said and take the time to comprehend the evidence, without the pressure of immediately listening to the next question and answer (as they must in court).

Equally, however, some jurors may use any access to the transcript as an opportunity to mull over what was recorded, possibly reading more into the evidence than what was intended by its delivery in court. In this case, they may actually be mistaken as to the meaning, intention and significance of the evidence, which might have been better explained by a verbal response to their question by the judge, or by submissions made by the prosecution and defence. Overall, access to a trial transcript may assist in the understanding of scientific evidence, however, it is an issue to be approached with caution, as access may create more difficulties than it solves.

Learning Styles

In the context of a trial, jurors may be shown exhibits, documents, photographs and other materials which arise during evidence. The most persistent form of communication between the lawyers, witnesses and the judge, and the jury, however, is verbal/auditory communication. This is not necessarily an optimum way to communicate evidence, particularly complex evidence such as DNA profiling or other scientific evidence, which may contain difficult mathematical or scientific concepts.⁵⁶⁹ Jurors should be recognised as *adult learners*, which means that any jury will comprise

(Personal Communication from Mr Richard Refshauge SC, Director of Public Prosecutions, ACT. February 2007.)

⁵⁶⁷ Thomson, D. M. (1985). The Reliability and Contamination of Evidence. In S. Tilmouth & N. Pengelley (Eds.), *Criminal Law Advocacy : papers delivered at the second and third annual conferences of the Legal Services Commission of South Australia, Tanunda 1984* (pp. 56). McLaren Vale: Wakefield Press at 64.

⁵⁶⁸ Ibid.

⁵⁶⁹ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 133.

not only of “auditory” learners, but of “visual” and “kinaesthetic” learners too.⁵⁷⁰ In fact, some data suggests that the least effective form of communication with many adult learners is auditory, and that if information could be presented visually and perhaps kinaesthetically, the comprehension of complex material (such as DNA profiling) could be greatly enhanced.⁵⁷¹

This is not to suggest that expert evidence needs to be presented entirely in “bells and whistles” or that juries should be invited to physically interact with exhibits or witnesses, but rather that more might be done to recognise that jurors may need more than to *hear* a DNA scientist give expert evidence; they may need to see diagrams, charts or posters, or be given written material about the evidence, in order for them to better comprehend and assess it.⁵⁷² Although individual legal practitioners have identified that a more sophisticated presentation style will emerge in the future, if only because evidence itself is becoming more complex, funding to provide the necessary resources and actions to bring about changes has been slow to arrive.⁵⁷³

Written material for the jury may be in the form of “jury notebooks” which contain information relevant to each trial, including the names and court-room locations of all parties, glossaries of scientific and legal terms, pictures, charts, photographs and whatever other information the lawyers and judge think will assist the jury in recalling and comprehending the evidence and arriving at a reasonable verdict.⁵⁷⁴ This would also reduce the burden on jurors who attempt to take notes throughout a trial, and do so without the benefit of being able to ask witnesses to slow down, repeat what they have just said, or even to spell out difficult words that arise during their evidence.⁵⁷⁵

⁵⁷⁰ Gutheil, T. G. (2000). The Presentation of Forensic Psychiatric Evidence in Court. *Israel Journal of Psychiatry Related Sciences*, 37(2), 137 at 141.

⁵⁷¹ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 130.

⁵⁷² Miskin, C. (1995). Watch His Honour's Light Pen. *New Law Journal*, May 1998, 648; Kessler, J. (1983). The Expert Witness & the Use of Videotape Recordings. *Journal of Forensic Sciences*, 28(2), 518; Barrett, D. (1991). Scientific Evidence in an Adversarial System with a Lay Audience: A Problem for Justice? *Journal of the Forensic Science Society*, 31(2), 271.

⁵⁷³ Cowdery, N. (2003, 11 June). *The Future Legal Environment: Some Thoughts*. Paper presented at the Australian Academy of Forensic Science ACT Chapter, Canberra at 3.

⁵⁷⁴ Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123 at 134.

⁵⁷⁵ Unlike judges and lawyers, who can ask witness to do these things as required; *Ibid.* at 132.

Pre-Deliberation Discussions

Another aspect of jury comprehension relates to the time which is formally set aside for the jurors to meet to discuss, assess and use the evidence they have heard: Deliberations. Although there is no formal rule in the ACT or other Australian jurisdictions which restricts jury discussions to deliberations only, jurors are not permitted the opportunity to meet, prior to the end of the trial, to discuss the evidence.⁵⁷⁶

It has been suggested that it would be useful for juries to be allowed to conduct discussions during a trial, in order to review and clarify the evidence as it goes.⁵⁷⁷ This would provide juries with the opportunity to identify areas of concern, clarify whether additional questions need to be addressed to witnesses just heard, and to collectively recall the evidence in small parts rather than as a “whole trial” experience at the end of the defence case.⁵⁷⁸ This has been trialled in the USA, where juries are also warned that they must not “pre-judge” the outcome of the case before they have heard all of the evidence.⁵⁷⁹ The Arizona research indicates that pre-deliberation discussion is particularly useful in assisting jurors in long, complex trials, particularly where they have heard expert evidence.⁵⁸⁰ In such cases, pre-deliberation discussions are a useful tool for clarifying the evidence, clearing up confusion and bolstering the jury’s recall of the evidence heard so far.⁵⁸¹ Thus, this approach may be useful in an Australian context, in cases where scientific evidence is presented, particularly in long or complex cases.

Passive versus Active Juries

A focus on actively listening juries, who are able to participate in the trial by taking notes, asking questions, and regularly reviewing the evidence through pre-deliberation discussions or via the trial transcript, has been implemented in some jurisdictions⁵⁸² and

⁵⁷⁶ NSW Law Reform Commission. (2005). *Majority Verdicts* (111). Sydney: NSW Law Reform Commission at 75.

⁵⁷⁷ *Ibid.* at 75.

⁵⁷⁸ Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? *www.criminal-courts-review.org.uk*, 1 at 38.

⁵⁷⁹ Diamond, S. S., Vidmar, N., Rose, M. R., Ellis, L., & Murphy, B. (2003). Inside the Jury Room: Evaluating Jury Discussions During Trial. *Judicature*, 87(2), 54.

⁵⁸⁰ Diamond, S. S., & Vidmar, N. (2002). *Juror Discussions During Civil Trials: A Study of Arizona's Rule 39(f) Innovation*. Arizona: The Arizona Superior Court in Pima County and The Supreme Court of Arizona and The State Justice Institute at 65.

⁵⁸¹ *Ibid.* at 103.

⁵⁸² Yarnell, M. A. H. (2005, November 7, 2005). *The Arizona Jury Past, Present and Future Reform*. Paper presented at the University of Canberra School of Law Annual Jury Conference, Sydney; Amar, A. R., & Amar, V. D. (1996). Unlocking the Jury Box. *Policy Review*, 77(May-June), 1 at 6; Amar, A. R.

advocated in others.⁵⁸³ Jury reform in Arizona USA, for example, has reassessed the question of “jury competence” and instead focuses on *communication* with the jury as being the central plank of good jury outcomes.⁵⁸⁴ The question of whether scientific evidence can be better communicated, in such a way that it traverses the difficulties of juror competence, is an important question for lawyers and scientists, as science becomes more complicated and advanced.

At the very least, research to date indicates that more can be done to recognise that jurors are not passive observers and “empty vessels to be filled”⁵⁸⁵ by scientific evidence delivered through lawyers, by scientific expert witnesses. Jurors are adult learners who construct a view of the case by creating a “story” of what has occurred,⁵⁸⁶ and filling in gaps in the narrative⁵⁸⁷ with evidence provided by witnesses, indications given by the judge and lawyers, and, if necessary, information from their personal experience or knowledge. Where this knowledge is often severely lacking or entirely false is forensic science, and that is a problem which can be addressed only by research that reveals what lawyers, judges and expert witnesses can do to provide jurors with evidence that is comprehensible, assessable and useful.

4.6 OBJECTIVES

The research detailed in this chapter represents the initial part of a larger, future study of jury comprehension of expert evidence, the results of which will enable recommendations to be made about:

- (a) The training of experts to maximise their ability to assist criminal courts;

(1995). Reinventing Juries: Ten Suggested Reforms. *University of California Davis Law Review*, 28, 1169.

⁵⁸³ Jackson, J. (1998). Trying Criminal Cases Without Juries. *Medicine, Science and the Law*, 38(2), 112 at 121.

⁵⁸⁴ Yarnell, M. A. H. (2005, November 7, 2005). *The Arizona Jury Past, Present and Future Reform*. Paper presented at the University of Canberra School of Law Annual Jury Conference, Sydney.

⁵⁸⁵ Ibid.

⁵⁸⁶ Pennington, N., & Hastie, R. (1991). A Cognitive Theory of Juror Decision Making: The Story Model. *Cardozo Law Review*, 13, 519; Hastie, R. (Ed.). (1993). *Inside the Juror: The Psychology of Juror Decision Making*. New York: Cambridge University Press; NSW Law Reform Commission. (2005). *Majority Verdicts* (111). Sydney: NSW Law Reform Commission at 69.

⁵⁸⁷ Gutheil, T. G. (2000). The Presentation of Forensic Psychiatric Evidence in Court. *Israel Journal of Psychiatry Related Sciences*, 37(2), 137 at 141.

- (b) The training of lawyers so as to improve their ability to utilise and present expert evidence; and
- (c) Measures open to the courts to help juries to better understand complex scientific evidence.

Thus the objectives of the current study were to determine:

- What expectations jurors have of scientific expert witnesses and of forensic science,
- How scientific evidence is presented and how that presentation is perceived by jurors,
- What use jurors make of aids to their understanding of scientific evidence, and what aids could be used to improve this understanding, and
- How jurors assess, comprehend and use scientific evidence to arrive at a verdict.

The overall objective of the larger research project is to make forensic science easier for Australian jurors to understand, and, at the same time, to make the court process more receptive to complex evidence. Ultimately this should help the legal system make better use of the increasingly complex and specialised expertise now available, not only when jurors are asked to determine its strength but also when they judge the quality of the science that was used to obtain it, to arrive at a sound verdict.

4.7 METHOD

Written surveys and telephone interviews were administered to two juries in cases from the Supreme Court of the ACT.

Five methodological issues were identified and adapted from social science literature about case study methodology⁵⁸⁸ and were addressed in the development of the surveys and method used in this research:

⁵⁸⁸ Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351 at 357; Robertshaw, P. (1998). Method and Ethics in Advancing Jury Research. *Medicine, Science and the Law*, 38(4), 328.

- (1) Questions were formulated in advance, so as to avoid “fishing expeditions” and to meet the requirements of the various Attorneys-General who authorised the research;
- (2) Causal relationships were proposed for relevant variables (jury comprehension, and the reasonable assessment and use of forensic science would be influenced by
 - a. Juror expectations;
 - b. Presentation of forensic science; and
 - c. Juror access to and use of aids to comprehension.
- (3) Data collection protocols were established (that is, proformas were used for trial observations, communication with the jurors, and survey response collection)
- (4) Response error and interviewer bias in collecting telephone survey responses were addressed (through note-taking, and later tape-recording)
- (5) Logical explanations of trial outcomes were developed with reference to the totality of the trials, not just with reference to the “forensic science” bent of this research and plausible rival hypotheses were considered.

Whilst interviewing jurors is by no means a fool-proof method of ascertaining what occurred in their own minds, or within the jury room during deliberations,⁵⁸⁹ it nevertheless provides an invaluable insight into how decisions are made and verdicts arrived at in jury trials. The study reported in this thesis follows from other work done in New South Wales, New Zealand and the United Kingdom which utilised actual jurors or potential jurors, and in some cases actual juries.

The Royal Commission on Criminal Justice (henceforth the Runciman Report)⁵⁹⁰ in 1993 investigated the criminal justice system in the United Kingdom, including an investigation of the use of forensic science and other expert evidence. Juries were not specifically within the terms of reference of the Commission, however, a study of the Crown Court was conducted in which judges, barristers, solicitors, the police, court clerks, the accused and jurors were issued with questionnaires which they completed without direct supervision from the researchers. Questionnaires were distributed to the

⁵⁸⁹ Zander, M. (1998). The Case for Jury Research. *Medicine, Science and the Law*, 38(2), 106 at 110.

⁵⁹⁰ Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO.

jurors by clerks of the court and the response rate for juries overall was exceedingly high (93%).⁵⁹¹ Jurors were asked, *inter alia*, about how well they understood and remembered the scientific evidence and how the evidence was presented and the results were instructive both in terms of question construction and as a source of comparison between the self-reported view of jurors and the views of other participants in the trial (such as the judges and legal counsel). A further study within the framework of the Runciman Report was conducted into The Ability to Challenge DNA Evidence,⁵⁹² however, this work focussed solely on the defence perspective, utilised only written questionnaires and was not linked to specific cases. The survey methods utilised in all parts of the Runciman Report were instructional in the development of the research detailed in this chapter.

A major research project into Jury Management in New South Wales was conducted by Findlay in 1995.⁵⁹³ This comprehensive work examined an extremely wide range of issues, including juror comprehension of complex evidence, aids to juror understanding and issues to do with juror selection. The written surveys administered to jurors (and to others who were called to court as jurors but did not serve), were valuable resources in the construction of the surveys in the present research and the methods employed to ensure that court officers and all relevant parties were aware of the research and the research requirements were also very useful.

The application of the results of the most recent jury research conducted in New Zealand to Australian courts, trials and jurors is a work in progress. The New Zealand research was an extremely broad-ranging survey of jurors covering the gamut of issues to do with, *inter alia*, jury selection and management, comprehension, access to aids to understanding, recall of evidence, and jury decision-making processes and outcomes.⁵⁹⁴ The methodology consisted of a brief pre-trial questionnaire (essentially asking participants what they knew about the cases they might sit on as jurors, and getting permission to call them back after the trial), and a telephone survey form (filled out by

⁵⁹¹ Zander, M., & Henderson, P. (1993). *Royal Commission on Criminal Justice: Crown Court Study (Research Study No 19)* (Royal Commission Research Study No. 19). London: HMSO at 249.

⁵⁹² Steventon, B. (1993). *Royal Commission on Criminal Justice: Ability to Challenge DNA Evidence (Research Study No 9)* (Research Study No 9). London: HMSO.

⁵⁹³ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

⁵⁹⁴ Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission.

trained interviewers) which was quite specific as to when the juror should be prompted or left alone et cetera. The surveys covered a range of issues from juror expectations, juror reaction to all parties in court, juror demographics (including their ethnicity, income, education and primary language), the affect of publicity on jurors and what could be improved about the system. The methodology and survey contents were extremely useful for the development of the current research.

Selection of Trials of Interest

Processes to gain appropriate permission for access to Supreme Court juries were commenced in 2000. Permission was granted by the Attorney-General of the ACT in mid-2001. At this point, a trial for research was identified by the Director of Public Prosecutions and the Supreme Court Registry, which had been briefed to flag cases on the basis that scientific evidence would play a significant role in the determination of the trial outcome.

Although other trials were identified as possible research targets (besides the two eventually studied), in all instances they became unavailable or unsuitable, either because the accused pleaded guilty before a jury was empanelled or because the trial focus was shifted entirely away from scientific evidence. This was a significant problem for conducting the research within a reasonable time-frame, because even once a case was targeted, it was often only on the morning of the trial that the accused would plead guilty, the case would be adjourned to a much later date, or counsel for the prosecution would decide to focus the case on evidence other than the forensic science. It is unlikely, however, that a better system of identifying and studying suitable cases *in real time* could be developed, as it is always the prerogative of the accused to plead guilty at any time up until they are indicted, and it is naturally the prerogative of the prosecution to develop a case theory which is reliant upon, or completely dispenses with scientific evidence, as they see fit, and this may not be fully developed until the trial is about to commence.

It was also anticipated that even if a suitable case was identified and studied, jurors may have been too distraught to participate, or the deliberations might have concluded at a late or inconvenient hour. Fortunately, neither of these problems were encountered in the trials studied.

Trials Studied

Two trials in the Supreme Court of the Australian Capital Territory were studied, both of which involved the same accused. Scientific evidence was given by crime scene examiners and a forensic biologist (DNA expert). The scientific evidence was not overwhelming, which provided an ideal basis for this research because:

“In order to maximise the possibility of detecting the effects of the variables under study, researchers usually aim to [study] cases that are ambiguous, that bring jurors near the midpoint of the scale of voting preferences.”⁵⁹⁵

The jury in the first trial could not come to a unanimous verdict on any of the charges, and so the case was re-tried, before a different Judge, jury and Prosecutor. The evidence in both trials was the same, however, as was the Accused, the defence counsel and all of the witnesses (including the scientific experts).

A larger study is planned for the future, which will include a wide range of scientific evidence, and jurors from some twenty trials, in four jurisdictions (the Australian Capital Territory, New South Wales, South Australia and Victoria (ACT, NSW, SA and VIC, respectively)). Based on response rates from other jury surveys⁵⁹⁶ it is likely that this will result in responses from a total of 100 - 200 jurors, however, it is the preliminary results of the pilot study (23 jurors) that is reported here.

Monitoring the Trial

“The official transcript [did] not convey the sceptical tone that the judge employed in addressing defendants when they denied ... allegations. Nor does anything in the nineteen volumes describe the elaborate shuffling of papers and ordering of clerks and marshals when defence attorneys were scoring points”.⁵⁹⁷

⁵⁹⁵ Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 19.

⁵⁹⁶ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration reported response rate was approximately 10 out of 12 jurors per case; Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission reported findings based on interviews with 6-7 jurors per trial; Zander, M., & Henderson, P. (1993). *Royal Commission on Criminal Justice: Crown Court Study (Research Study No 19)* (Royal Commission Research Study No. 19). London: HMSO reported response rate was 10 out of 12 jurors per case.

⁵⁹⁷ Reported from an intensive examination of the trial of Doctor Benjamin Spock for inciting draft evasion during the Vietnam War. Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351 at 355.

On the basis that attending the entire court proceedings would ensure that non-verbal factors which might contribute to the jurors' behaviour might be observed, both trials were attended in their entirety.⁵⁹⁸

Survey Questions and Format

After considering approaches used recently in jury surveys conducted in New South Wales⁵⁹⁹, Victoria⁶⁰⁰ and New Zealand⁶⁰¹, questions were initially put to jurors, as individuals, in the form of a short, written instrument. This component consisted of an A3-sized, printed answer sheet with mostly closed option questions and a 5-point Likert scale for responses.⁶⁰² The questions were designed to be intelligible to the least educated/least verbal jurors and quick and straightforward to answer. In order to maximise response rates, the questions were restricted to three pages of material printed in large font, enabling jurors to complete them within a comfortable time frame and with minimum assistance.

At the conclusion of each trial, the Judge in each case explained to the jury that some research had been approved by the Attorney-General, and that they were about to be asked to participate in that research, although they were under no obligation to do so. Jurors were then approached as a group in the jury room, under the supervision of the Court Registrar. The survey format (written and telephone questions) was explained and any questions were answered. Written survey forms were then distributed and completed forms were collected immediately. This approach was sanctioned by court officials in NSW, VIC and the ACT who strongly recommended that jurors be approached at a time when the information was still fresh in their minds.⁶⁰³

⁵⁹⁸ Ibid. at 355.

⁵⁹⁹ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration.

⁶⁰⁰ Ibid.; Victorian Department of Justice. (1998). *Report - Survey of Victorian Jurors*. Victoria: Victorian Department of Justice - Criminal Justice Statistics & Research Unit.

⁶⁰¹ The large-scale survey conducted by Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission was particularly instructive.

⁶⁰² See O'Muircheartaigh, C., Krosnick, J. A., & Helic, A. (2000). *Middle Alternatives, Acquiescence, and the Quality of Questionnaire Data*. Chicago: University of Chicago supporting a scale with a middle alternative.

⁶⁰³ Personal communications, 2000-2001.

Jurors were then reminded about the telephone survey and were given a sheet with details of a free 1800 telephone number which, at their convenience, they might call to further discuss their views.

Although this survey consisted of general questions intended to be put to all jurors in all cases surveyed, jurors were asked to focus on the relevant expert witness in their trial (a forensic biologist specialising in DNA profiling).

Telephone Survey

The verbal component of the research consisted of a series of 28 mostly open-ended questions asked of individual jurors over the telephone. This followed work done by Chesterman, in which more detailed and case-related questions were asked in a telephone survey conducted post-trial.⁶⁰⁴ In the research reported in this thesis, jurors telephoned a free-call number and were reminded that their details would be kept confidential and their answers were anonymous. For the first trial, jurors' answers were recorded in shorthand on a prepared answer sheet, but due to a lack of resources were not tape-recorded. For the second trial, however, each juror was asked to consent to having the interview tape-recorded, and in all cases the respondents agreed. Answers were also noted in shorthand on a prepared answer sheet.

Confidentiality

It was essential in this research to guarantee the anonymity of the jurors and of the trials, so as to ensure that the results of this research could not be used, or even be contemplated for use, as a means of appeal or an encroachment on the privacy of the jurors. Consistent with the assurances given to the Attorney-General, jurors' names were not sought or recorded and their participation was entirely voluntary. Anonymity was achieved by allowing jurors to complete the written survey forms with a minimum of personal information (such as their age and occupation, but not their name or address) and by allowing them to call in for the telephone survey, rather than giving their telephone numbers to the researchers to call. The results have also been reported in this chapter such that the jurors' occupations can not be matched with their individual responses.

⁶⁰⁴ Chesterman, M. (2001). *Managing Prejudicial Publicity*. Sydney: Law and Justice Foundation of New South Wales at 239.

4.8 THE TRIALS STUDIED

4.8.1 *Trial One - Facts*

The trials related to sexual assaults against a Complainant, which were alleged to have occurred in her home, on two separate occasions. On the first occasion the Complainant alleged that the Accused (a previous partner) had visited her and sexually assaulted and threatened her (the “first incident”). On the second occasion it is alleged that the Accused entered the home of the Complainant, without permission, one night several weeks after the first incident, and attacked and threatened her (the “second incident”).

Trial One commenced with the arraignment of the Accused, who pleaded not guilty to:

- Sexual intercourse without consent (2 counts).⁶⁰⁵ The second of these two counts was later the subject of a direction to acquit, although the jury was entitled to find that the Accused had *attempted* to commit the offence;⁶⁰⁶
- Aggravated burglary (1 count);⁶⁰⁷ and
- Making a threat to kill (2 counts).⁶⁰⁸ These two charges were dropped at the conclusion of the Crown case, (that is, the jury was directed to acquit), as the Crown conceded that on the evidence adduced during the trial, there was no case to answer in relation to them.

4.8.2 *Trial One - Evidence*

Forensic science played a minimal role in relation to the first incident, as the issue was the consent of the Complainant (rather than the identity of the Accused). In contrast, the

⁶⁰⁵ Crimes Act 1900 (ACT) s 54(1) “A person who engages in sexual intercourse with another person without the consent of that other person and who knows that that other person does not consent, or who is reckless as to whether that other person consents, to the sexual intercourse is guilty of an offence punishable, on conviction, by imprisonment for 12 years.”

⁶⁰⁶ Crimes Act 1900 (ACT) s 298.

⁶⁰⁷ Crimes Act 1900 (ACT) s 94 at the time of this trial: “That the accused entered a building [the home of the Complainant] as a trespasser, with intent to assault [the Complainant] so as to occasion her actual bodily harm, and at the time of doing so, had with him a weapon.”

⁶⁰⁸ Crimes Act 1900 (ACT) s 30 “If (a) a person makes a threat to another person to kill that other person or any third person (i) intending that other person to fear that the threat would be carried out; or (ii) being reckless whether or not that other person would fear that the threat would be carried out; and (b) the threat is made (i) without lawful excuse; and (ii) in circumstances in which a reasonable person would fear that the threat would be carried out; the firstmentioned person is guilty of an offence punishable, on conviction, by imprisonment for 10 years.”

issue in the second incident related to the identity of the offender, so any forensic tests which could shed light on this were crucial.

The DNA profiling which was conducted for the second incident resulted in the following:

1. “A mixed DNA profile that could have come from at least two individuals was obtained from [several areas on a doona cover]. The profile consisted of a major component and a minor component. [Another acknowledged partner of the Complainant, “Mr X”] cannot be excluded as being the major contributor and [the Complainant] cannot be excluded as being the minor contributor.” The Crown did not intend to adduce this evidence at the trial, however, it arose in cross-examination of the Complainant.
2. “A mixed DNA profile that could have come from [the Complainant] and a different unknown male was obtained from [a vibrator and its batteries].”⁶⁰⁹
3. “A mixed DNA profile that could have come from two contributors was obtained from [a pair of boxer shorts] in which [the Complainant] could not be excluded as a major contributor and it could not be conclusively determined whether [Mr X or the Accused] was the other contributor.”

The jury were also told several allegations about the second incident, including that the offender had carried out much of the attack on a plastic sheet; that the Complainant had been forcibly restrained; that alcohol was consumed; and that the Complainant had struck the offender; however, no scientific evidence was given in relation to these events. Photographic evidence was also tendered.

Other evidence relating to the second incident included: Medical reports; blood-stained items; vomit; an alibi; observations of the Accused; implements used by the offender; and circumstantial evidence. Some evidence relating to some items found in the presence of the Accused after the second incident was excluded in a *voir dire*.

⁶⁰⁹ At the commencement of the first trial, the “unknown” contributor had not been identified, although it was thought that the DNA may have belonged to a partner of the Complainant of who was alive at the time of the offence but who had since died and had not provided a DNA sample for forensic testing.

4.8.3 Trial One – Court Processes

A twelve member jury, consisting of six males and six females, was empanelled on the first day of the trial. Witnesses included: Medical practitioners (who described, inter alia, taking swabs from the Complainant's genital area because "scientists would look for the DNA of the perpetrator", and collecting pubic and head hair); family friends, acquaintances, relatives and workmates; the other acknowledged sexual partner of the Complainant; and police officers.

The expert evidence relevant to this research related to the forensic biology. The trial transcript has been edited to remove names of individuals and organisations. Other irrelevant legal sections, speech repetitions, or references to page numbers in the expert's report have also been removed, but are indicated with "---" or "...".} Although lengthy, the evidence of the forensic biologist and the crime scene examiner is reported here, because many of the jurors' comments and reactions relate to the content of this evidence.

The Evidence of the Forensic Biologist

CROWN: Would you tell the court your full name please? – *My name is [deleted].*

And your occupation please? – *I'm a forensic biologist with [organisation].*

How long have you been a forensic biologist with [the organisation] for? – *Just over three years.*

And you have formal qualifications? – *Yes, I have an honours degree from [university].*

And you've completed some other courses as well? -- *That's correct. I've completed courses in statistics and also in blood stain pattern interpretation.*

You've prepared a report in relation to this matter? – *Yes, that's correct.*

Could you have a look at this document please? – *Yes*

Firstly, in your report you documented the receipt by you of a large number of items, is that right? – *Yes, that's correct.*

So you had, when you were preparing the items for examination, a number of items including a swab from the Accused, is that right? – *Yes, that's correct.*

From the Complainant, is that right? – *Yes, that's correct.*

From [Mr X – not the Accused], is that right? – *Yes.*

Now, you did a number of tests for human blood on some items? – *Yes, that's right.*

A semen test on some items? – *That's right.*

And then from some items you obtained a DNA profile? – *Yes, that's right.*

For comparison purposes, is that right? – *Yes, that's right.*

And the test that you did in relation to the items in terms of tests for human blood and semen still allowed you to extract at a later stage the material for DNA analysis, is that right? – *Yes, that's right.*

So in other words, the fact that you tested them once for either semen or human blood or both didn't mean that they weren't still available? – *No. The initial test doesn't affect the DNA analysis at all.*

That's what I wanted to find out. Now, you examined a number of items. I'll take you first to [the vibrator]...That item was a blood-stained yellow vibrator and two batteries? – *Yes.*

At the time you retrieved it from the 'fridge were the batteries inside or outside the vibrator? – *At the time I retrieved it they were separate from the vibrator.*

Now, that particular item had three swabs. Swab "A" was the swab of one battery? – *Yes, that's right.*

Likewise, swab "B" was a swab of the other battery? *That's correct.*

And "C" was a swab of the section of the red/brown stained area on the outside of the vibrator? – *Yes, that's correct.*

Now, in relation to the vibrator and the red/brown stain on the outside of it, you tested that for the presence of human blood...? – *Yes, that's correct.*

And you also did a DNA analysis on each of those three spots that you've told us about, is that right? – *Yes, that's right.*

Now, can you explain to the jury first what DNA is and how it's extracted? – *Okay. DNA is a substance that's contained in all living cells. It's a substance that codes for any individual's characteristics. It's the same in any living cell, so each tissue of the body will have the same DNA present in it. DNA is unique to all individuals except identical twins. In forensic science we look at 10 regions of the DNA, so we don't look at the whole DNA, we just look at smaller regions. One region tells you whether the DNA came from a male, or from a female, and we use the other nine regions to compare between individuals so that we can tell whether it came from the same individual or from a different individual. The DNA is contained within the cell, so in order to look at the DNA you have to first break the cell open, and that's basically done just through a process of immersing the cell in a solution which breaks open the cells, retrieving the DNA. Because there's only a small amount of DNA present, we then need to make more of the DNA, and that's done through a process called amplification. That can then be analysed, and then comparisons made.*

And the profile that comes out of it, what exactly is the profile that you obtain from DNA samples? – *The profile is basically a computer visualisation of the DNA that we're looking at.*

...DNA breaks down, is that right, over time? – *Yes, it's said to "degrade".*

Yes, it degrades. But there are certain things which make it degrade faster, and certain things which make it not degrade as quickly, is that right? – *Yes, that's correct.*

Can you say what they are? – *Yes, certainly. Under the correct conditions, for example under reasonably cool dry conditions, DNA can last for many, many years. However, if there's moisture present, and/or if there's bacteria, also if there's UV light such as sunlight present, then you're going to increase the degradation, which basically means the DNA is broken up and can no longer be analysed.*

Now, so using some specific examples in this case, the batteries for the vibrator, assuming that they were within the vibrator itself, and were enclosed, that is, is that one of the circumstances which would enable the DNA to last for a longer time? – *Yes, I'd certainly expect that on that sort of surface it would last for a very long time.*

You're talking about years? – *Yes, potentially.*

So in relation to the analysis of the DNA from the batteries and in the blood, first of all in relation to the battery "A"...you conducted a trace DNA analysis on the two batteries? – *Yes, that's correct.*

And what's a "trace DNA analysis", please? – *Trace DNA analysis is basically when you look at DNA that's present in a surface just from handling. So rather than there being, say, blood present, or semen, or an actual biological fluid, it's just present, say from you handling a glass if you're touching that surface, and then swab that surface, you can produce a DNA profile from that.*

Now... you say that a DNA profile that could have come from [the Complainant] was detected on the following items; that is, the swab of the batteries, that's "A", and the swab of the area on the outside which you identified as human blood, is that correct? – *Yes, that's correct.*

And in relation to the other battery... you found a mixed DNA profile, is that right? – *Yes, that's correct.*

What's a "mixed DNA profile", please? – *A mixed DNA profile is just a profile where it comes from more than one individual.*

And you could say more about the mixed DNA profile on this battery, "B", in terms of comparison, couldn't you? – *Yes, I compared it to [the Complainant's] profile and found that she could have contributed to that mixture.*

Yes, and were you able to rule out [Mr X] and the Accused as having contributed to that mixed DNA profile? – *Yes, I was.*

Now, one of the other items was a blue doona cover...is that right? – *Yes, that's right.*

Now, in relation to that blue doona cover, there are actually four areas which you tested, areas 15A, B, C and D? – *Yes, that's correct.*

Now, first of all, in relation to 15B, C and D... you detected semen in each of those areas, is that right? – *Yes, that's correct.*

And then you tested the semen – sorry, then you tested all items for DNA analysis, is that right? – *Yes, that's correct.*

Now...in relation to 15A, you found a DNA profile that could have come from [the Complainant], is that right? – *Yes, that's correct.*

And in relation to the other three areas on the doona, that's 15B, C and D, you found a mixed DNA profile? – *Yes, that's correct.*

Now, what do you say in relation to that mixed DNA profile in relation to those three semen-stained areas? – *The profile I found came from at least two individuals. The profile consisted predominantly of one profile, and then what also appeared to be a second profile. [The Complainant] can't be excluded as being a contributor to that major profile, and [Mr X] cannot be excluded as being – sorry, I got that the wrong way around. [Mr X] couldn't be excluded as being the contributor to the major, and [the Complainant] to the minor component of that mixed profile.*

Okay. So whilst 15B, C and D you tested for semen and the test (sic) had come back saying they did contain semen, there was also some other material in those stains. Is that what you're saying? – *Yes, that's correct.*

That would explain [the Complainant] being a ---? – *A contributor.*

And in relation to one of those semen stains, 15B, ... did you find that a DNA profile that could have come from [Mr X] was on that item 15B? – *Yes, that's correct. When we do the semen analysis, an attempt is actually made to separate the stains into the semen component and then to remove any other cells. That process is not always fully successful, so in this case we got a slightly different result from the two where we tried to separate one out and so in one instance we got a mixture of both [Mr X] and some of [the Complainant], and in the other it was just from [Mr X].*

The examination-in-chief was then interrupted by a brief *voir dire* in which it was agreed by both parties to exclude certain DNA evidence which did not link the Accused or the other acknowledged partner to the item in question. The trial resumed with cross-examination by the defence:

DEFENCE: There's a new programme on TV called "CSI". Does it bear any relationship to the truth about what your job's involved in? – *A little perhaps.*

And apart from that it's Hollywood licence as to what happens, correct? – *Certainly. Yes.*

[But the] principle involves that these days we've made massive progress on the forensic investigation for crime, correct? – *Yes.*

In fact, it's gone ahead in leaps and bounds, correct? – *Yes.*

Particularly over the last ten to fifteen years, correct? – *Yes, that's right.*

Now, forensic evidence can consist of many parts. For example, probably one of the oldest is fingerprints. Correct? – *Yes, that would be correct.*

And there's a whole art to interpretation of fingerprints, correct? – *I would say so, yes.*

And I take it that you're aware that fingerprints can last on particular surfaces in fact for many years, correct? – *It's not my area of expertise, but that's my understanding, yes.*

All right. And the thing about fingerprints, I know you say it's not your expertise, but would you dispute that they are individual characteristics pertaining to one individual? – *I wouldn't like to comment on that.*

Okay, all right. Now insofar as other forms of forensic investigation is (sic) concerned, a little bit about a person can tell you an awful lot. One bit of sweat can tell you an awful lot about a person, correct? – *It's not actually the sweat, but ---*

Okay. It's the interpretation of what constitutes the sweat? – *Well, the DNA contained in the sweat, yes.*

All right. So with the minutest (sic) sample of a bodily fluid, a scientist such as yourself can look at that under a microscope and look at its structure and composition, correct? – *It can be analysed, yes.*

It can be analysed and individually profiled, correct? – *Yes.*

In fact, we can say these days with such precision about DNA analysis, we can say there is only one in twenty-eight billion people that would carry that particular DNA profile, correct?⁶¹⁰ – *We always give a statistical probability, yes, that's right.*

But that can be one in twenty-eight billion people, correct? – *Yes, that's correct.*

You can say with that amount of certainty? – *Yes.*

JUDGE: Was that twenty eight?

DEFENCE: That was my next question, your Honour. So if there's one person in Australia that has that DNA, we could say "well, the likelihood of finding the second one with the same DNA profile is so remote as to be virtually negligible", correct? – *It's very small, yes.*

⁶¹⁰ This statistic was quoted (without reference to its source) by the defence counsel, and was again raised by the defence in their closing address. At no time was the jury told that the figure had been calculated by the expert, or how it had been calculated, however the defence consistently used it as if it were a standard, generic figure for all sorts of DNA profiling evidence.

Now, these days also it's not just the bead of sweat that can tell you about a person's profile, it can come from saliva? – *Yes, that's right.*

And again as small as a little drop of saliva is enough to analyse the individual profile of a person, correct? – *Yes, that's right.*

Then you can tell again from the smallest, the minutest (sic) quantity, I'd suggest, from semen, correct? – *Yes, that's correct.*

In fact, you go so far as to say you can even do trace elements. Correct? – *Yes, from trace matter.*

From trace matter. And I take it trace matter is even smaller in quantity than the smallest amount you'd need for an individual profile, correct? – *Well, a "trace" just means there's only a tiny amount there, yes.*

Seen under a microscope basically, correct? – *Well, you probably wouldn't see it under a microscope, yes.*

Sorry? – *You wouldn't be able to see it under a microscope.*

It's that small that you can't even see it under a microscope, is that what you're saying? – *Yes, that's correct. Yes.*

Well, the other day the air conditioning was turned off in here, and let's do an imaginary situation, that I dropped a bead of perspiration on this lectern: Presumably someone could gather that up and do a DNA profile on me, correct? – *If they could locate it, yes, that's right.*

Okay. You can also perform DNA testing on other bodily fluids such as urine, correct? – *We aren't currently doing analysis on urine, no.*

But it is possible to do, correct? – *I believe that there have been instances when it has been performed, yes.*

And without being too gross about this, also, if a person vomits you can test that? – *Possibly. The trouble with vomit is (A) It's very wet, and (B) There's potentially a lot of bacteria present, so it would degrade very, very quickly.*

All right. So then obviously the quicker you get it the better it is for the purposes of testing? – *Yes.*

Now, would you agree with me that the process, being an Honours student, you looked at the evidence extremely carefully – *Yes, that's correct.* – in this case, correct? – *Yes.*

And as you have heard, continuity is not an issue, and what I mean by that is, it's not suggested anyone interfered with the samples, correct? – *Yes, we have protocols in place.*

Now, you analysed an ankle swab [from the Complainant], is that right? – *I'll just have to refer back on that one.*

Thank you? – *Analysis wasn't actually performed on that item.*

Now, as I understand your evidence about the vibrator and the batteries – could the witness please be shown [the vibrator and batteries]? I don't ask you to actually take it out of the bag, just have a look for us. I just want you to accept for the moment those were the things that were tested, all right? – *Yes.*

Given that continuity is not an issue, all right? As I understand your evidence, there's DNA of two persons? – *Yes, that's correct.*

One is [the Complainant]? – *Yes, that's right.*

And the other one you don't know, correct? – *I'll just find the relevant page.*

I think [the Prosecutor] took you through that? – *Okay, yes.*

Unidentified male, correct? – *From an unknown man, yes.*

An unknown man. Now although you say that there can be degradation of DNA, is the reality that you can't say when the DNA went onto the vibrator? – *Yes, that's correct.*

You agree with me there? – *Yes.*

And nor can you say when the DNA went on the batteries, correct? – *Yes, that's correct.*

So for all we know, the male's DNA could have gone on the battery on [the night of the second incident], correct? – *That's possible.*

Or on [the next day], correct? – *Yes.*

And in relation to the degradation of DNA you said what speeds up the process is light such as natural light? – *Sunlight, yes.*

So in relation to the doona cover on which you found the presence of semen which we can safely say belonged to [Mr X], you would agree that that could be fairly recently placed on the doona cover, correct? – *No, that's not correct.*

You can't say when it was, is that correct? – *No, I can't. That's right.*

All right. So you cannot exclude the possibility, would that be more accurate to say, that it was only recently placed on the doona cover? – *It's a possibility.*

This was the end of the cross-examination. No re-examination was conducted.

The evidence of the Crime Scene Examiner (relevant sections only):

CROWN: --- Now, a set of car keys, a telephone wall plug, and a mobile 'phone SIM card were found on the ground next to the front steps of the unit, and you photographed them...is that right? – *That's correct.*

Now, you tested a number of items for fingerprints? *Yes, I did.*

And no usable prints were developed on those items? – *I didn't develop any visible prints on any of those items.*

Okay. Now, you also...chemically treated the vibrator and two batteries which were within the vibrator? – *Yes I did.*

And there were no prints developed on any of these three items? – *That's correct.*

Now, the batteries were secured inside the vibrator and you had to undo it to take out the batteries, is that right? – *Yes, I did.*

Yes, thank you, I have nothing further.

DEFENCE: ...You're a pretty experienced crime scene examiner? – *I have almost three years experience as a crime scene examiner.*

And in that three years you've attended many crime scenes? – *Hundreds and hundreds of crime scenes in that time.*

Including many crime scenes where an alleged sexual assault's occurred? – *I've attended in the region of ten alleged sexual assault crime scenes.*

And you're trained to make an assessment when you go to a crime scene of what it is that's important to photograph, to seize, and to record? – *That's correct.*

Yes, and of course the aim is, at the end of the examination you have noted, photographed, seized, and recorded everything that may be relevant to the investigation? – *That's correct.*

And in this particular case you exercised all of your skill, care and judgement and did exactly that? – *Yes, I did.*

You were very careful and thorough? – *I believe I was, yes.*

Now, the evidence that you're there to collect and to have a look at includes anything which may have fingerprints left on it, that's right? – *That's correct.*

And are you able to say, is it within your area of expertise whether fingerprints in fact have individual characteristics that allow identification of a particular person, potentially? – *Yes. Within my training it's my judgement call whether a fingerprint has enough characteristics to even contemplate.*

Yes, and potentially a fingerprint could identify a particular person as having been at the scene? – *That's correct.*

Now other traces of an assailant that may be left at a scene, and that may identify a particular person, can include saliva or perspiration? – *That's correct.*

Is that right. Semen and blood? – *Yes.*

Urine, tissue samples such as skin? – *Tissue samples such as skin, definitely. I'm not sure of the value of urine.*

Okay. And that sometimes the skin's sometimes referred to as trace DNA? – *If it's visible then that's not specifically trace DNA.*

Okay. So it could be visible or not visible? – *That's correct.*

Now if any of those traces are left behind then it may be possible to connect a particular person again with the scene? -- *That's correct.*

Something else that sometimes occurs that can connect a particular person to a scene; footprints, if a particular footprint is left behind at the scene, for example? -- *A footprint can be compared to a specific shoe to see if that shoe left it there.*

So if someone for example stood in some dirt and then stood on a tile or on a carpet and there was a print that was able to be obtained, that could be useful for that purpose? – *It could be, yes.*

And, in fact, sometimes crime scene examiners take casts of prints in certain circumstances where that's possible, don't they? *Yes, they do.*

Now, another way that a particular person or assailant could be connected to a crime scene is sometimes a person could take away things from a crime scene, that's right, isn't it? – *That's correct.*

And that may link a person back to the crime scene? – *Yes, it may.*

So, for example, carpet is made up of a number of fibres, isn't it? – *Yes.*

And sometimes if a person walks with their shoes across a carpet, fibres from the carpet may be left on their shoes? – *That's correct.*

That's possible, isn't it? – *It is possible, yes.*

Yes. And what forensics can do, is, if there are those traces there, can take those traces of fibre and match them back to the carpet at the relevant scene. That can – it's possible for that to be done, isn't it? – *It is possible, yes.*

Another way that a person may be connected to a crime scene is if, for example, the assailant leaves a trace of something on the victim – the alleged victim? – *That's correct.*

Yes. Or the reverse? – *That's correct.*

So if, for example, an alleged victim scratches the assailant, sometimes remains of skin may be left under the fingernail? – *That sometimes occurs.*

And that can – it is possible for that to be taken, analysed and again connected back to that alleged assailant? – *That can happen, yes.*

And it can also happen in the reverse, where the alleged assailant may scratch an alleged victim and the same thing can be done? – *That's correct.*

No re-examination was conducted with this witness.

A crime scene investigator who photographed an incinerator and the contents of the incinerator which was found in the yard of the Accused after the second incident, gave the following evidence (relevant sections only);

CROWN: --- Now on [date] at about 12:10 pm did you go to [the address of the Accused]? – *Yes I did.*

And you – on the same day, you at the forensic service area...examined some items which you'd collected from the garbage bin. Is that right? – *That's right.*

Now the remaining photos are the ones that you took at [the forensic laboratory]. Is that right? – *That's correct.*

Now photograph number 9 is that the burnt debris collected together? Is that right? – *That's the burnt debris as a whole from inside the bin.*

Yes, and the next photos are the items separated. Is that right? – *Yes, the following photos are the items separated.*

So 10 and 11 are they wire rings, are they not? – *Yes, that's right.*

12 some nails? – *That's correct.*

13 some black fabric-like material? Is that right? – *That's correct.*

14, that's a black sponge-like material. Is that right? – *That's right.*

15 is some debris, with red plastic-like substance? – *That's correct.*

16, some rivets and material, is that right? – *That's correct.*

17, some metal fragments? – *That's correct.*

18, some debris with a fabric-like texture? *That's right.*

And 19, some metal foil? – *That's correct.*

And 20 some fragments of dark coloured material? – *That's correct.*

Yes. Thank you ...

DEFENCE:---You've got an Honours degree, is that right? -- *That's correct.*

...Would it be fair to say that the rate, or the capacity, of items to deteriorate in fire depends upon the heat? – *I'm not actually an expert in that area so I can't really answer that question.*

It's just that some of us might be under the impression that once you burn stuff in an incinerator it disappears for all time and you're just left with a little pile of ashes and no-one can work out what it is, you see. Now would you agree with me that science has moved along in leaps and bounds in terms of forensic investigation

over the last few years? – *Yes, there certainly have been some improvements in techniques, yes.*

And indeed, you actually did some testing on the debris that came out of the incinerator, correct? – *No, I didn't do any testing. I only separated items out of the debris that may have had a particular for. (sic)*

All right. Are you aware that the debris went on to criminalistics? – *Yes, I am.*

What is criminalistics? *It's a division of forensic services that deals with the analysis with chemistry, makeup of items like paint analysis, just sort of your animate chemical analysis.*

All right. And are you aware that indeed it is possible to – well, we know from the photographs you took, that the items, such as the items depicted in photograph 10, were not sufficiently burnt as to avoid analysis of what they were, correct? In other words, we know they're metal rings of some sort? – *That's correct.*

Now, when you look at the next photograph, photograph 11, again whatever it is that is there was not deteriorated sufficiently to avoid analysis about what it is, correct? – *No, that's correct.*

And indeed in photograph 12 we actually see what appear to be nails, maybe some screws, correct? – *Yes, it was what appear to be nails.*

And all of that came out of the incinerator? – *That's correct.*

Again, if we look at photograph 15, there appears to be a lot of red blobs amongst some debris? – *That's correct.*

Are you aware that [another forensic scientist] from criminalistics did some analysis on the debris? – *I'm aware that she looked at the debris, but I'm not sure exactly what she did with it.*

All right. Well perhaps I'll just put it to you, and if I state it unfairly [the Crown] will correct me. "That there was a sample of apparent plastic that was examined under a microscope, however the debris could not be further identified. A comparison sample of the suspect tape is required in order to chemically analyse each of the samples and compare the results". All right, would you accept that from me for the moment as being accurate? – *Yes.*

Is it your understanding, therefore, that it is possible to detect the presence of plastic in debris? – *Chemically?*

Yes? – *I would assume so, but again it's not really my area.*

This was the end of the cross-examination. No re-examination was conducted.

On the final day of the trial proper the jury were directed to acquit the Accused on three of the five charges, and heard the Crown's closing address. The defence closing address

was commenced, then continued the following week, after which the Judge charged the jury with the relevant legal directions:

- The standard of proof (the jury must be satisfied “beyond a reasonable doubt” that each element of the charges had been proven);
- The burden of proof (that is, that the burden of proving the charges beyond a reasonable doubt lies with the prosecution, not the defence);
- The elements of the three remaining charges (sexual intercourse without consent (x2) and trespass with intent to assault (x1));
- An outline of the evidence including reading directly from the transcript;
- That expert witnesses were to be treated like all witnesses – That is, the jury remained the judge of the facts, and need not accept the opinions of the experts;
- The requirement for a unanimous verdict; and
- The ability of the jury to ask questions of the court, provided those questions were written down and handed to the court via the sheriff (jury officer).

These directions were interrupted several times by *voir dres* and the jury did not retire to deliberate on their verdicts until the following day.

4.8.5 Trial One - Deliberations

After several hours of deliberation, the jury sought a copy of the indictment (the document detailing the offences), and a written statement of the elements of the offences. The Judge declined to provide them with either document, but instead explained the charges and their elements, in oral form. The jury again retired to deliberate.

In the evening, the jury were returned to court and asked about their progress.

FOREMAN: ...I believe your Honour that we cannot reach a decision on all three charges.

JUDGE: Tonight?

FOREMAN: Not at all.

JUDGE: Not at all, I see. And that’s the case in relation to each of the three charges, is it?

FOREMAN: That’s correct, your Honour.

JUDGE: ...You feel that you're hopelessly deadlocked, are you, Mr Foreman?

FOREMAN: I believe so, your Honour. We are aware of the implications of this and we have discussed it, but it's just not a unanimous decision amongst those three charges.

JUDGE: All right, and you think that no unanimous decision is likely in relation to any of the three, is that the position?

FOREMAN: I regret to advise that would be correct, your Honour.

The jury were then thanked for their service and formally discharged. They were also informed about this research and invited by the Judge to participate.

The duration of the jury trial was two weeks and two days.

4.8.6 Trial Two - Facts

Trial Two required a fresh indictment, which included only the following charges, to which the Accused again pleaded not guilty:

- Sexual intercourse without consent (1 count);
- Attempted sexual intercourse without consent (1 count); and
- Aggravated burglary (1 count).

The second trial was held within two months of the first, and closely followed it in terms of format and content. The only significant differences between the two trials were as follows:

- In the first trial, a mixed DNA profile had been found on the batteries of the vibrator, and some suggestion had been made that a contributor to that profile may have been another sexual partner of the Complainant. In the second trial, it was revealed in a *voir dire* that this man had been tested and he was not the person whose DNA was on the vibrator batteries.
- Constant reference was made by the defence to what had been said by witnesses in the first trial. Many excerpts from the transcript of the first trial were read out in court to witnesses in the second trial.
- The jury asked several questions during the course of the trial. Early in the second trial, at their request, the jury were given an extract of the indictment, which showed the exact charges to which the Accused had pleaded. They were also instructed that

the Accused had previously been found not guilty of sexual intercourse involving actual penetration of the anus, which is why the indictment now specified only “attempted” sexual intercourse involving penetration of the anus. They next asked for, and received, clarification of which charges in the first trial related to which charges in the second trial. The jury also asked for clarification of evidence given by a police officer, and the answer was given by asking further questions of this witness.

4.8.7 Trial Two - Evidence

In Trial Two the same witnesses were called as in the first trial, although the order of witnesses differed. The substance of their evidence was essentially the same, however, the following excerpt of the evidence given by the forensic biologist is included to show where the emphasis was placed in cross-examination this time:

DEFENCE: ---Now [name of forensic biologist], as I understand you’ve done various courses into the science surrounding DNA, correct? – *Yes, that’s right.*

And as the jury has heard you hold an Honours degree, correct? – *Yes, that’s right.*

And do you keep yourself up to date with the developments in DNA? – *Yes, I do.*

And do you also keep yourself up to date in what it is that DNA can achieve in terms of court cases? – *Yes.*

Would you be kept up to date with the sort of – for example, if DNA has been used in a court case that would be something that you might get to learn about, correct? – *Yes, to a degree. I mean, there’s – DNA is used extensively throughout the world now, so I wouldn’t be privy to all cases, but certainly to new developments.*

Insofar as the development of DNA as a science to assist in court proceedings, you’re aware that the science has moved ahead in leaps and bounds, particularly in the last 5 years? – *Yes, that’s correct.*

That indeed, DNA has been used not only to incriminate people in the involvement of crimes, but you’re aware it’s also been used to clear people, correct? – *Yes, very much.*

And when you say ‘very much’, you’re actually familiar with cases both here in Australia and overseas where DNA evidence has been used to exculpate a person who was either charged, and in some cases, convicted of crimes, correct? – *Yes, that’s correct.*

Indeed, there’s a case that happened in Australia fairly recently that you might have seen featured on ‘Australian Story’. It involved a man who – an Aboriginal man, I think – who was convicted of a rape and the woman said he was the perpetrator, but he didn’t have much recollection about the evening. He was convicted but later

the DNA testing was redone and it showed that the DNA cleared him. He was not the perpetrator. Are you aware of that case? – *I'm not directly aware of that particular case but –*

But you're aware of other examples where something like that has happened ---? – *Yes.*

Well, let us say for example, a person who was charged with rape 10 years ago, and a semen sample is taken and preserved. Okay. If that person – their trial was 10 years ago, for example – the testing that would have been available 10 years ago is not as sophisticated as the testing is now, correct? – *Yes, that's right.*

And there have been cases that you're aware of, old cases, where old DNA samples have been re-investigated, correct? – *Yes, that's right.*

And re-tested, correct? – *Yes, that's right.*

And using new scientific methods in some of those cases it was possible to then exculpate people who had wrongly been convicted of rape? – *Yes, that's right.*

JUDGE: How do you know that? – *There's [sic] various very famous cases, certainly one in Canada where a man was accused of a rape and 10 years later it was actually proved that his semen – it wasn't the man.*

Yes, well how do you learn about this as a scientist though? – *Again, through attending conferences, looking at papers. There's [sic] various forensic journals which –*

So you've got to depend on the results of court cases to come to a scientific conclusion, do you? – *Well, we rely on court cases to assess the evidence.*

DEFENCE: Well, let me move to a different topic. The science, as opposed to the court cases, the *science* has developed to such a level that a person who drops a bead of perspiration, that perspiration can be tested, assuming it is gathered, can be tested? – *Certainly if there were cells present in the perspiration, yes.*

And indeed the sample of what is seen can be so small that it's not even seen under a microscope, correct? – *Yes, that's correct. DNA you couldn't observe under a microscope.*

There are many ways that a person may leave DNA at a crime scene, correct? – *Yes, that's right.*

They may spit when they talk, correct? – *Yes, that's right.*

They may kiss their victim? – *Possible.*

They may hold something and drink from it, correct? – *Yes, that's right.*

They may perspire and leave perspiration? – *Yes, that's possible.*

They may leave trace elements that you have described, correct? – *Yes.*

They may leave other bodily fluids behind, correct? – *Yes, that's right.*

For example, urine? – *Urine is not a substance that we routinely analyse in the present.*

But it is something that is, capable of being analysed, correct? – *It certainly has been analysed in the past, yes.*

JUDGE: What, the DNA contained in the urine? – *Yes, there's DNA which is picked up with the urine as it passes out of the body, basically, from the cells surrounding ---*

I see, DNA is not necessarily a constituent of urine itself? – *No, it wouldn't be a constituent.*

The cross-examination continued briefly beyond this point, but was not relevant to this research.

4.8.8 Trial Two - Deliberations

Late on the afternoon of the tenth day of the trial, the jury retired to consider its verdict. Deliberations were interrupted briefly by the Judge, who redirected the jury on a point raised by the defence.

The jury returned the following morning, and asked for a copy of the transcript relating to the evidence of the Complainant. The Judge declined to give them a copy, but offered to read out the transcript or sections of it. At this point the jury decided to withdraw their request and to carry on with deliberations.

After deliberating almost all day, the jury were recalled and urged by the Judge to reach a decision. The jury asked two questions about particular legal terms and documents.⁶¹¹ The Judge explained the legal terms but declined to give too much direction about the documents, as this sort of evidence had not been adduced during the trial. The jury also asked for two sections of the trial transcript to be read aloud to them, which the Judge then did. The jury again retired.

The jury was recalled at 6 pm, but requested permission to continue deliberating into the night. At 9 pm the jury was again recalled, and the foreman advised the Judge that

⁶¹¹ Specifically, the jury wanted to know what would be found on a “*Domestic Violence Order*” (DVO). A DVO is a Court order that may include conditions to restrain, restrict and prohibit the behaviour of a person in order to prevent further domestic violence.

“there’s a consensus in the jury that we will be unable to reach a unanimous verdict on any of the counts.”

The duration of Trial Two was two weeks.

4.9 RESULTS and DISCUSSION

Sample Size

The first trial was deliberated upon by a full jury – twelve members – and was presided over by a single Judge. The Prosecutor was assisted by an instructing solicitor, and the defence team comprised of a Queens Counsel, a junior barrister and an instructing solicitor.

In the second trial, the jury which deliberated consisted of only eleven members.⁶¹² Again, a single Judge presided, and the prosecution consisted of a senior Prosecutor (a different person to the first trial) and instructing solicitor. The defence team was the same as in the first trial.

Response Rate

The response rate for written surveys completed by jurors in both trials was 100% (n = 12 in trial one and n = 11 in trial two).

The response rate for the telephone surveys completed by jurors in the first trial was 75% (n = 9). The first juror respondent called the day after the trial concluded, and the final juror to respond called two weeks after the trial had concluded.

The response rate for the telephone surveys completed by jurors in the second trial was 91% (n = 10), with the first telephone respondent calling the day after the trial concluded, and the final respondent calling one month after the trial had concluded. One juror (the second juror to call) did not want to answer the survey questions over the telephone and so gave all responses in written form (by email).

⁶¹² *Juries Act 1967 (ACT)* ss 8,11.

Observations About Jury Behaviour During the Trials

Note-taking

- All jurors had access to paper and pencils with which to take notes in court. Most jurors took notes at some stage, with particular attention being paid to the charges, the exact nature of the injuries suffered by the Complainant, and to the various dates relevant to the alleged incidents. This trend continued during the trials, with all jurors appearing to note significant dates as they were mentioned by various witnesses.
- Few jurors appeared to take notes during the DNA profiling evidence, whilst the remainder of the jury watched the forensic expert intently when explanations of DNA profiling evidence were given. As neither jury had a copy of the expert's report, they did not appear to closely follow answers which related directly to the contents of the report – jurors appeared more interested in answers relating to DNA profiling in general. Both the jury and defence counsel appeared openly amazed that DNA could not be seen under an ordinary microscope.
- Most jurors tended to take most notes during evidence given by lay witnesses (that is, witnesses who were not experts such as medical doctors, forensic scientists or police officers). All jurors took notes during the final directions given by the Judge.

Evidence

- Questions asked of witnesses, especially the Complainant and especially during examination-in-chief, seemed very repetitive, time-consuming and slow. The flow of evidence elicited by questions and answers, which are restricted by the rules of evidence, was not smooth and did not allow witnesses to recount their thoughts, frame of mind or intentions – they were led merely through the facts, and not always in a coherent order. This appeared to bore the jury.
- The defence counsel conducted cross-examination in the following manner: Counsel would make a long statement and end with the question "Correct?" Questions were phrased so that the answer was invariably "Yes", however, even if the answer was "No", counsel would appear to pay this absolutely no heed and simply carry on with further questions in the same manner. This strategy created a very strong impression that the witness was agreeing with everything which was put to them. Listeners

- It was not always obvious why particular questions were being asked of particular witnesses, or why additional questions were not asked of some witnesses. Conversely, some witnesses volunteered information about further testing which could have been carried out, but was not conducted.

Voir Dires

- During both trials the jury were sent out many times in order for *voir dire*s to be conducted. In some instances the jury would return from an absence and (due to an objection from the prosecution or defence) be sent out again after only one question had been asked.
- On one occasion during Trial One the Judge did not send the jury out immediately after an objection had been raised, but instead heard the objection and some lively legal argument from both counsel. The jury appeared to be very interested in this discourse, (but it was short-lived, as they were sent out for a *voir dire* only five minutes later).

Analysis of Written and Telephone Survey Responses

In the following results and discussion, questions from the written and telephone surveys have been grouped not necessarily according to the order in which they were asked, but according to the research objectives they address, namely:

1. What expectations did jurors have of the forensic science?
2. How was the forensic science presented and how was that presentation perceived by jurors?
3. How do jurors comprehend, assess and use forensic science to arrive at a verdict?
4. What use did jurors make of aids to understanding the forensic science and what aids could be used to improve this understanding?

For responses from the telephone survey, each juror has been given a number which represents the trial in which they served and the order in which they called back to

answer the questions (for example, T1-JUR 1 was the first juror to answer the telephone survey after Trial One.)

1. WHAT EXPECTATIONS DID JURORS HAVE OF THE FORENSIC SCIENCE?

4.9.1 *The Scientific Evidence – Juror Expectations*

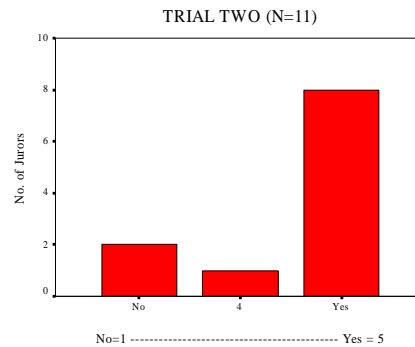
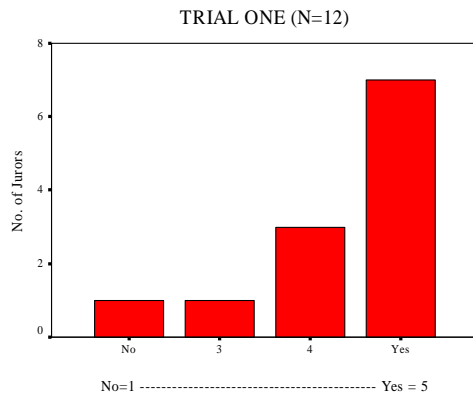
Prior to becoming involved in the trials researched, the people who served on the juries in this case would probably have been exposed to media and entertainment accounts about the power of DNA profiling to identify (and also to exclude) individuals in relation to crime scenes. Indeed, even during the trials researched, the importance of forensic investigation and the ability of “forensics” to satisfy the need for information about a crime was emphasised:

*“Hadr’t you been told, after the very first incident, that the police do very thorough investigations in order to see if they can link any of the evidence to the perpetrator? – Well, I – I knew that – that - I mean if they were going to find anything, they would – it would be done in forensics.”*⁶¹³

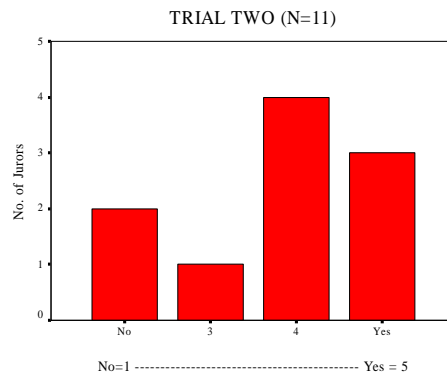
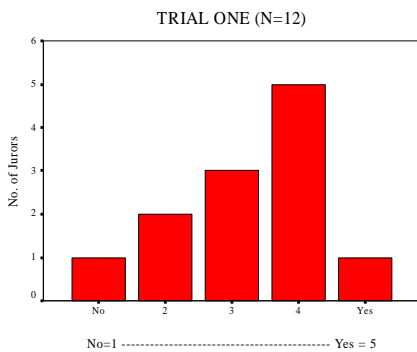
This seemingly innocuous question was put to the Complainant by the Defence lawyer during cross-examination. Aside from the verbal emphasis that was placed on the words “*very thorough investigations*” in the question, what was most revealing was the Complainant’s response: *If they were going to find anything, it would be done in forensics*. This is revealing because it indicates the vitally important role which forensic investigation played in the trials researched. *Even though the forensic investigation had failed to find any of the Accused’s DNA at the alleged crime scene*, the juries nevertheless seemed to fixate on forensic details and what the forensic witnesses “ought” to have been able to explain:

Were the DNA results important to the case? (Written survey)

⁶¹³ Complainant, in response to a question put in cross-examination by the defence lawyer during the Trial One.



Were the DNA results more important than other evidence? (Written survey)



How important was the DNA evidence when it came to deciding on a verdict? Why?
(Telephone survey)

- ☐ Very important
- ☐ Important
- ☐ Neutral
- ☐ Not very important
- ☐ Not important at all

JURORS FROM TRIAL ONE

T1-JUR 1: **Very Important.** For me the DNA evidence was important because everything else was circumstantial; "his word against hers". Only the DNA could give a definite, reliable answer.

In contrast, the DNA evidence was not so important for some other jurors. I estimate that 60% of the jury didn't believe scientific evidence anyway, and tended to rely too heavily on statements (for example from the Complainant).

T1-JUR 2: **Very Important.** DNA evidence was the most important evidence, because in reality only the Complainant and the Accused know what really happened. So the jury needed *hard evidence* from the DNA (although they did not get it) and/or the medical evidence (which they also did not get, because as the Defence lawyer pointed out, the Doctors did not take fingernail scrapings, did not do an anal examination and so on).

T1-JUR 3: **Very Important.** Our jury was restrained by the lack of DNA evidence. They speculated that because the Accused had been a visitor to the Complainant's home in the past, the police may have found the Accused's DNA there and just not worried about it. Or perhaps they had not found any of the Accused's DNA? Since no questions were asked by the Prosecutor or the Defence lawyer to clarify this, we were forced to speculate.

T1-JUR 4: **Not Important at All.** I did not think the DNA was at all conclusive. Since the Accused had helped the Complainant to move into the premises where the attacks occurred, it seemed obvious that the Accused's DNA would be present. However, no evidence was ever mentioned to say that hair/DNA had been found or had not been found. We wanted to know WHY. Since there was effectively no conclusive DNA, I *set the DNA aside completely*. It was not important at all. Other jurors disagreed. In particular, one juror would be satisfied with nothing less than DNA evidence and since there wasn't any, he could only ever acquit (irrespective of any other evidence). That is, the Accused was therefore automatically innocent.

T1-JUR 5: **Very Important** but the fact that there wasn't any, made things difficult. If there had been *any* DNA that the Accused could not reasonably explain, it would have been a "two-minute" decision for me – guilty. The fact that there was no DNA from the Accused (*not a speck*) made it very difficult for me.

T1-JUR 6: **Not Important at All.** I thought it was virtually irrelevant because it did not link the Accused to the crime at all. Not helpful.

T1-JUR 7: **Very Important**, but more DNA evidence was needed. Although the evidence that was raised was very important, I felt strongly that more evidence was needed, because the lack of helpful DNA did tend to raise doubts. I thought there was *so much that DNA could've done for this case*.

A recommendation for the DNA expert: she needed to understand what the case was about. Knowing the power of DNA, and if she felt that more evidence could be gathered, she should

have directed that more evidence be gathered. For example “DNA can tell us XYZ, therefore go and look for extra evidence from ABC et cetera et cetera”. This would have been extremely useful in this case because the lack of DNA evidence made the Prosecutor look unprepared.

T1-JUR 8: **Could have been Very Important.** DNA evidence, even by itself, can determine innocence and guilt and even people who have been in jail for 10 years have been freed on the basis of DNA evidence. But in this particular case the DNA evidence was wanting. DNA was important but it was not covered sufficiently to go beyond reasonable doubt. The DNA evidence just did not go far enough for me.

It was possible that the DNA evidence could have been crucial, but it seems to have been used as just a ‘by product’ of the case. The trial did not seem to take the forensic scientist seriously. She should have been higher up the queue of witnesses. This would have shortened the case by several days, *because once the jury knew what the DNA was (or wasn’t) they knew enough doubt to say “not guilty”.*

T1-JUR 9: **Very Important.** There was no DNA linking the Accused to the crimes and so some jurors would NEVER say guilty. They wanted DNA evidence and just wouldn’t accept anything less (for example other expert evidence like medical reports, or the Complainant’s evidence, or an alibi witness et cetera). Therefore the lack of DNA evidence linking the Accused to the crime made two jurors completely intractable and unwilling to even consider a conviction.

JURORS FROM TRIAL TWO

T2-JUR 1. **[Very Important].** Well it was the key, wasn’t it? It was very important. Without conclusive evidence linking him to the crime scene, or to the alleged crime scene, if you like, in the second instance in particular... I don’t think in the first instance it was that important, because it was not in dispute. The matter of consent was in dispute and that was just a matter of believing one story or the other. In the second case, I think it would be fair to say that it came down to, largely came down to, who you believed, because there was no conclusive evidence.

So you had to rely on one story or another?

Far more than what I would have thought we would have had to, had we had convincing evidence one way or the other. I mean when it came down to – without going into the deliberations in too much detail – if we could have proved categorically that he was there, obviously that would have changed some people’s minds who – there was reasonable doubt because it was never, although, you know they’d gone through opportunity and alibi, or whatever it might have been, a lot of the evidence that was there could be turned, either way, depending on whether you believed her story. If you were inclined to believe her then yes, the

evidence matched up, but if you were inclined not to believe her story then there was a sufficient lack of evidence that there was reasonable doubt.

T2-JUR 2. **Not Important at All.** Inconclusive DNA evidence was of no value in deciding a verdict. All other evidence left us with a choice of whether to believe one party or the other, so all jurors felt very let down by the fact that there were no conclusive DNA results.

T2-JUR 3. **[Important.]** Oh yes. In my view, yes it was. There was a lot of discussion about, 'you know, well, she's a more credible witness, I believe her'. To me, that's one side of it, that's fine, but as the Judge explained to us, you know, there has to be – you have to eliminate reasonable doubt, and I could not do it, because the DNA evidence did not support the prosecution's case. The other thing it also did of course, in my thinking, was to discredit the key witness a bit in that she was trying to come across as a lady who had not had many relationships and was really very prim and proper, and when the DNA evidence came out about the three other semen specimens on the doona, that to me put the nail in the coffin. Well, only because she was trying to come across as very innocent, and being the one – you know, he was just horrible and he did everything with everybody but she was the wonderful one, and that to me really contradicted what she was trying to portray herself as. I would have preferred her to be more honest and say 'yes, I've had other relationships' right from the beginning. But she denied that, at the beginning, so I found that that went against her.

T2-JUR 5. **Very Important,** because it didn't prove to me that the person was guilty, let me put it that way. It didn't prove they were innocent, but it certainly raised major doubts about whether they were there. And that was my job – if I had doubts I was supposed to acquit the person, right. And this is what other people couldn't understand. They wanted people in the jury room to actually explain why he was *not* guilty. And I said "Sorry, no, that's your job". You know – "you've got to prove to me why he is guilty." And they said "Well, that's not fair." And I said "Well, that's the way our legal system works in our country. We're supposed to give him the benefit of the doubt". So that was another bit of a learning curve for a few of them. And even after ten days they hadn't got that, so you know...

T2-JUR 6. **[Very Important.]** In the jury room it was really important, because there was no DNA of him, in the second incident, that's what a lot of people laid their verdict on, yes. Yes, I think it was very important, because there were quite a few people that just based their whole decision on that there was no DNA of his, yes. Probably too important, because it sort of closed people's eyes a bit to other evidence, I think. So they relied really heavily on that. Well, I thought, like you know, a few visual things and just, yes, I thought there were other things that should have been used as well. Well I used other things besides just that, yes.

So because it didn't help you much, you didn't rely on it much?

No, but for others it was sort of pretty well “it”.

T2-JUR 7. **[Very Important.]** It was definitely something that needed to be there...

So would you say ‘very important’ or just—

Yes, yes. What can I say? I don’t think that there was enough. I don’t know. I don’t know.

Was it because it was lacking, and you really wanted it or?

Yes, I think so. It certainly would have opened the case. We would have known one way or the other. Yes, if there was something they found, it would have stuck in my mind, like I sort of just let it go, because I thought “well there wasn’t any”, so I’ve just sort of forgotten about it.

There wasn’t DNA evidence, and that was a problem for you because you really wanted DNA evidence —

Yes, yes, yes.

T2-JUR 8. **[Very Important.]** I think it was very important, but by the same token I was mindful that I think – Can I make a broader comment here? That jurors had sort of ‘heavily loaded’ their expectations about the DNA evidence and – well people were hoping that that would be something quite definitive and that would help cut a swathe through the rest of the evidence. And at the same time I was thinking ‘well, gosh, a whole, a jury verdict shouldn’t rely totally, or, majorly, on DNA evidence alone’. So yes, I think it is sold as such an amazing technology, and you can barely be anywhere without leaving trace DNA, that people had weighted it quite heavily.

T2-JUR 9. **[Neutral.]** It did play a part, but it wasn’t a huge part because it wasn’t conclusive, either way, in my mind, which in itself played a part. You know, it played a part because there wasn’t DNA evidence, which I guess is what I mean, not that it wasn’t that it wasn’t conclusive, but the lack of it was probably played more of a part than the actual DNA evidence, if that makes sense. It was also a factor that they couldn’t totally use it to, as a defence, either. Like they kept using that word, what was it? I can hear what’s-her-name, the defence, when they’re saying “is it *consistent*?” And you can say “yes it’s consistent, but it also means, it doesn’t mean that it happened, that it is that”. Yes, it could be consistent but it doesn’t mean that...so.

T2-JUR 10. **[Very Important.]** Oh yes, that was very important, definitely. There was none. If there – I guess if they had treated it as seriously at the crime as what it was, they would have tried harder to have picked up more DNA. I don’t know how many samples they took. That would be most probably interesting; like ‘how many samples do you take for a breaking-and-entry’, ‘how many samples would you..’. You know, like how important is it, or was it, for the DNA to be properly picked up in the type of place. Like if it was murder, then you’d be looking at quite a few hundred samples. I mean, I don’t know, that’s just in my little mind, so. How serious do you go, you know, there was a lot of evidence, but yet a lot of things just didn’t fall in place –

the suitcase and the shoe and the bat, and the... you know. I don't know how she could have reached around the corner of the, where the bat ended up, in order to, you know, when she was in bed she had it there to protect her, but it wasn't put in a place that I could reach. I mean she said she had the bat there ready to hit anybody if she got attacked. Well, I couldn't reach it where it was found, and that's where she said it was, and I thought, gee whiz, it would be right beside my bed if I was that worried. Yes, there were so many things that just did not, I couldn't definitely give a correct answer to, and people are supposed to be innocent until proven guilty, so.

So in your mind, without the DNA evidence for that second incident, you really just couldn't convict?

No, I couldn't. I mean, sure there were things that lined up, but not many. I mean, like the timing, and maybe the fire – well big deal, with the fire. Yes he had gloves, possibly had gloves, and yes he could've been, but she could have set it up too, so. And there was other men's traces there: It could have been either the other men who'd done it, or she'd had accomplices – I still think she could have set it up, see. To me, it [DNA] was, you know, that was the full outcome. The first part of it – The first part of it, conviction – I mean, we know what happened, but how it happened and whether it was forcible I think possibly that was true, but, so, I would have done one for one and one for the other, I think. You know, guilty for one and I couldn't find guilty for...I actually had my doubts to start with, but then I... The bottom line was, there was no DNA evidence. So I was pretty disappointed in the actual people who collected DNA evidence, the prosecution.

When asked “Were the DNA results important to the case?” the majority of jurors in both trials said that the DNA results were important or very important to the case, even though the results did not identify the Accused as having been at the crime scene. Furthermore, many jurors considered the DNA results to be *more important* than other evidence in the trials, even though the other evidence included an alibi, medical evidence given by two experienced medical doctors and testimony given by police and other witnesses. The critical role which DNA profiling evidence can play in the mind of jurors who are attempting to decide a case and deliver a verdict, was demonstrated by the comment of a juror from the second trial:

“I don't know what case could get through without any DNA evidence at all. We never had DNA in the old days, and I don't really know if I was around then, but we never had it. So how did they actually convict people in those times, without DNA?”

Although there were clearly a number of jurors who did not share this view, the majority of responses to the question “Were the DNA results important to the case?” and “Were the DNA results more important than the other evidence?” suggest that DNA profiling evidence (or the lack of it), still plays a very important role in juror decision-making. Jurors expect to hear DNA profiling evidence and many of them will rely on the results more heavily than they will on any other evidence in the trial.

So if juries enter a trial with unrealistic expectations of forensic biologists and their evidence, can this view be altered by what they hear in court? To some extent, jurors’ expectations of DNA evidence can be tempered by the evidence they actually hear in court. When asked “After hearing the DNA evidence, did you understand what its strengths and weaknesses were”, two thirds of all jurors in the telephone interview (n=12) reported that they did understand, whereas only three jurors said that they did not and two jurors were unsure. Their comments were as follows:

After hearing the DNA evidence, did you understand what its strengths and weaknesses were? (Telephone survey)

JURORS FROM TRIAL ONE

T1-JUR 1: **Unsure.** The expert said mixed DNA samples could be determined but would not give an absolute answer. I would prefer an *absolute* answer. Also, when statistics are given with DNA evidence (for example 1 in 28 billion) it means that the expert is almost 100% sure that it is the same DNA, but there’s still a chance it belongs to someone else.

T1-JUR 2: **No.** This could have been explained by the expert in the same way that the Judge explained things like inferences. This is a hard question to answer (if only because the weaknesses of DNA profiling evidence were not focussed on by either side).

T1-JUR 3: **Yes.** There were some very strong points made about obtaining DNA from blood and semen stains. I thought that the DNA profiling technique was obviously no good for the burnt evidence in the incinerator at the Accused’s home, but even if DNA would have been helpful for this, the jury were never told so.

T1-JUR 4: **Yes.** This was well explained. For instance, DNA on batteries in a vibrator would last longer than DNA left in a hot, wet environment. The expert gave a very good explanation that we all found helpful.

T1-JUR 5: **No**. I needed more explanation about *why* there were no questions asked about the material in the incinerator and *why* no DNA from the Accused was searched for or found at the Complainant's house.

T1-JUR 6: **Unsure**. I wouldn't like to have to write an essay about it, but I think I understood enough about the evidence to know what was going on.

T1-JUR 7: **Yes**. I learnt something more about DNA evidence. The trial added to my general knowledge, although I wouldn't like to have to explain what any strengths and weaknesses were.

T1-JUR 8: No answer.

T1-JUR 9: **Yes**. I am fairly confident of my own understanding about strengths and weaknesses of DNA profiling now.

JURORS FROM TRIAL TWO

T2-JUR 1: **[Yes]**. In terms of what you could do with it, what its capabilities were? Yes, I'd say for the purposes of the case, reasonably well. I was confident. It's one of those things where if someone asked me about it, I'd be pretty vague about it and would not necessarily be able to reproduce a good explanation of it, but at the time, I was satisfied with what had been said, I thought that their explanations were quite clear.

T2-JUR 2: **Yes**, within the confines of this case.

T2-JUR 3: **[Yes]**. Oh definitely. As I said, [the expert] gave an excellent explanation, when talking about how the water breaks it down and it needs the proper surroundings to survive, and just how accurate it is when it is in the appropriate surroundings. To me that made it all crystal clear.

T2-JUR 5: **Yes**. Oh, just in terms of the qualifications about how or what could contaminate it, in terms of heat, age and things like that. I mean I had common sense ideas about it, about how long tissue would last in the open air, and stuff like that, but.

T2-JUR 6: **[Yes]**. Yeah, oh, probably enough. I think probably enough for what a jury would need. I don't think they'd need too scientific. I think that's why they pull people in off the street, rather than have experts in every field on.

T2-JUR 7: **Yes**, yeah.

T2-JUR 8: **[Yes]**. Broadly, I would say. Yes, I would just leave it at that.

T2-JUR 9: **[No]**. Oh, I don't think I could confidently say that. No. I think on one case though, you're not going to fully understand it, especially on this case probably, where it was a bit, sort of, unusual I think.

T2-JUR 10: **[Yes]**. Well, DNA was so small, to pick it up, and in the scheme of things there was a lot that could have been, that you'd have to have examined in order to have picked up DNA, so yes, I can see that in the scheme of things it would be very difficult to pick up DNA, but, you know, things like the bat (and OK, you know, it had blood on it and if that's the case, but, umm)... But then, I mean, how far do you go with testing on those? Do you scrape absolutely everything and everywhere, you know? So it would have been in some ways easy to miss it, I mean, you know, I am saying it one way that I'm disappointed, but in another way it's easy to miss, because DNA is so small. So I can understand it, but then there must be other ways too. There was just no fibres taken, or you know, with the shoes, matching the shoes, you know, to the carpet or... But then each sample is costly I suppose...

Having heard the evidence given by the forensic biologist, most jurors appear to have gained a greater appreciation of the strengths and weaknesses of the technique, even if their confidence in the knowledge was not absolute and they remained disappointed with the lack of DNA evidence in this case. This suggests that forensic witnesses may have some role in combating media and entertainment views of forensic science, and be able to educate jurors about the limitations of their evidence and the limitations of the techniques they used to produce the results. Although jurors may still voice disappointment at what “forensics” did not provide, and may still rely heavily on particular scientific evidence even when it is not particularly helpful, most of them will nevertheless listen to and remember being told about the strengths and weaknesses of that evidence.

4.9.2 Acceptance of the DNA Profiling Evidence by Jurors

Having learnt of the limitations of DNA profiling and results in these trials, the jurors had the choice of either accepting or rejecting the evidence.

Did you accept or reject the DNA evidence; and: (Telephone survey)

If you accepted the DNA evidence, was it because:

- ☐ You understood the science & thought it was right
- ☐ You just believed the science was right
- ☐ You believed the expert was right
- ☐ You thought the expert's qualifications probably meant they were right
- ☐ You were so impressed by the expert's oral evidence that you were sure that their conclusions would be sound
- ☐ Some other reason - >

JURORS FROM TRIAL ONE

T1-JUR 1: **Accepted** DNA evidence. I did not understand the theory behind DNA evidence, but just believed the science was right. I did not think that the expert's qualifications were all that important in deciding whether to accept her evidence, because the most important thing was that she was representing [organisation name] and therefore she was probably trustworthy and her answers would be right.

T1-JUR 2: **Accepted** the DNA evidence because I just believed the science was right and that the witness was qualified and representing the [organisation name].

T1-JUR 3: **Accepted** the DNA evidence. The expert gave a good and useful explanation about how the DNA evidence came about. Her explanation was clear and reasonable and she sounded like she knew what she was talking about, even to the point of correcting the Defence lawyer whenever the Defence lawyer tried to suggest something that wasn't correct.

T1-JUR 4: **Accepted** the DNA evidence. The DNA evidence was acceptable but it just raised more questions.

T1-JUR 5: **Accepted** it, because if this witness was called as an expert then she would know what she was talking about. I believed the expert was right and thought her qualifications probably meant she was right.

T1-JUR 6: **Accepted**. I thought the expert's qualifications meant the evidence was right – if the witness is called as an expert then I accept them as an expert.

T1-JUR 7: **Accepted** the DNA evidence because I understood the science (based on my own general knowledge about the accuracy of DNA and what DNA evidence can provide), and because I believed the expert was right (and her explanations were good). These factors made the DNA evidence completely acceptable.

T1-JUR 8: **Accepted**. *DNA evidence was the only sort of verifiable evidence.* I could not believe the Complainant, the Accused or either lawyer. The DNA evidence was *factual, unbiased and better documented than any other kind of evidence.*

T1-JUR 9: **Accepted**. I thought I understood the science and thought it was right and also just believed the expert was right. I did not think there was any difficulty with the DNA evidence per se.

JURORS FROM TRIAL TWO

T2-JUR 1. **[Accepted]** Yes, I accepted it as being true. It was a combination of factors. Certainly, the expert came across as knowing what she was talking about. I wouldn't say that I accepted her word blindly, but at the same time, I wouldn't be confident to say that I would bring a huge amount of knowledge about DNA and forensics. I suppose it's fair to say that I had nothing – she gave me no reason and I had no personal reason – to reject what she was saying. That's probably the better way to put it.

T2-JUR 2. **Accepted** - I understood the science and thought it was right.

T2-JUR 3. **[Accepted]** Oh definitely accepted it, yes. Certainly because we understood it, and also because the expert seemed to be a credible witness and seemed to be quite believable.

T2-JUR 5. **[Accepted]** I did accept it, but I thought the evidence that was there was unassailable, of course, because I'm not an expert. But there was some evidence that wasn't [presented in court] that could have been collected, and might have shed light either way, as well. But I've told you that earlier, things like giving you examples. You know, I mean I could be wrong of course, but I mean that's how I saw it at the time. I watch enough science shows to know a bit about it, so.

T2-JUR 6. **[Accepted]** I accepted it. I thought the expert was qualified and she was probably correct – I was disappointed with it, because I thought the way my decision went, I wish there was [evidence] *for* [a verdict of guilty]. So I mean I accepted it but I was disappointed with it.

T2-JUR 7. **[Accepted]** Oh, I accepted it, yes. A mixture that her qualifications, and yes. She's a witness, she's on oath, so I accepted her as an expert.

T2-JUR 8. **[Accepted]** I think largely we accepted it, or I accepted it. I thought I understood it and I thought she had some authority to speak on that, and she didn't seem contradict herself or trip up on any technical points, so I guess I trusted the evidence as it was presented, and that's all you have to go on, really. I mean, in an alternative situation, had there been inconsistencies...You know, in another situation I could have responded quite differently.

T2-JUR 9. **[Accepted]** I accepted it. I understood it. It was explained in a way that I could accept and, you know, understand. I guess that's it.

T2-JUR 10. **[Accepted]** Yes, well, there wasn't any evidence, so you sort of had to accept that there wasn't any. So how could you make up something that's not been told to you, you know, that there's evidence. You know, you can't sort of say "Put him in there" without any evidence. I mean we tried to put him in there without any evidence but it just kept falling back on the bottom line that there isn't any. Yes, so I suppose in some ways we discussed DNA in the jury room, but the fact was, it kept coming back that there wasn't anything. So you can't put him in there.

All of the jurors in these trials accepted the DNA profiling evidence, *for what it was worth*. The fact that "there wasn't any [DNA] evidence" linking the Accused to the crime scene, and that the defence had (not surprisingly) accepted the accuracy and reliability of the DNA profiling results, made it reasonable to conclude that jurors would not really have grounds to reject the DNA profiling evidence. Further study of trials where the defence challenges DNA profiling techniques or interpretations of the results would provide an interesting opportunity to see on what bases juries will reject expert evidence.

Nevertheless, the jurors' explanations for *why* they accepted the DNA profiling evidence in this case were revealing. Almost half of the jurors in the telephone interviews accepted the evidence on the basis that the forensic biologist seemed qualified and credible (n=8). Whilst other jurors simply stated that they believed the expert was right and therefore the evidence was acceptable (n=4). Things that contributed to the expert's credibility included:

- Her qualifications,
- The fact that she had taken an oath to tell the truth,

- That she represented a particular government/police laboratory,
- The fact that she was accepted by the court as an “expert”,
- Her “good” explanation of the DNA profiling evidence, and
- Her confidence in “sounding like she knew what she was talking about”.

One juror accepted the DNA evidence because it was the only “factual” evidence.⁶¹⁴ Another juror commented that “It [DNA] was the most accurate evidence.”⁶¹⁵ This view, that scientific evidence is factual, objective, unbiased and better documented than the evidence of lay witnesses, is a reaction to circumstances in which the verdict depended on believing either the word of the Complainant or that of the Accused. This is a distinct advantage held by scientific witnesses, who invariably are able to show that their work has been recorded in official notebooks, supervised within a hierarchical organisational structure (often with quality assurance and external testing), has been based on formal qualifications and training and has not been tainted by personal contact or allegiances with either the Complainant or the Accused.⁶¹⁶ In addition, when scientific experts present their evidence in the manner of the forensic biologist in these trials – by answering both prosecution and defence questions with equal confidence, care, accuracy and courtesy – the evidence is highly acceptable to jurors, even those who profess not to understand the evidence itself (n=3 who “just believed the science was right”).

Other jurors professed a greater understanding of the evidence; they understood the science (n=7). The actual depth and accuracy of the knowledge of those jurors who said that this understanding was based on their general knowledge about the “accuracy of DNA profiling evidence” and “what DNA evidence can provide” could not be directly tested in this survey, because it was important to avoid making jurors feel that they were being examined. It is possible that their knowledge was actually based on the oversimplified and sometimes inaccurate DNA profiling results portrayed in the media,

⁶¹⁴ Comment by a juror in Trial One.

⁶¹⁵ Comment by a juror in Trial Two.

⁶¹⁶ As mentioned elsewhere, it is interesting that jurors in this research did not consider possible bias on the part of this witness on the basis of her employment by a police organisation. In light of the existing literature in legal and forensic circles (for example Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79 at 83), further empirical work in Australia is warranted to ascertain the effect that employment by the police has on the credibility of expert witnesses.

but it is also possible that these jurors felt confident that they understood the results because the scientific evidence was so straightforward in these trials.

4.9.3 Would the Verdict have been Different without the Scientific Evidence?

In these trials, both juries were presented with DNA profiling evidence which generally did not meet all of their expectations, and so many jurors did not or could not rely on the scientific evidence as the basis for their verdict. In ordinary trials, however, where DNA profiling evidence is consistent with guilt of the accused, jurors may rely on it as the basis for their decisions about innocence or guilt. In these circumstances, it is interesting to know just how much the scientific evidence influenced the decision: Would the verdict have been the same, if no scientific evidence had been presented, or would the absence of the scientific evidence make a big difference?

Pretend for a minute that you never heard any DNA evidence in this case. Would your verdict have been the same? Why? (Telephone survey)

If your verdict **would have been the SAME**, is that because:

- ☐ The DNA evidence wasn't very important or other evidence was more Important,
- ☐ The DNA evidence wasn't conclusive,
- ☐ The prosecution or defence showed that the DNA evidence was not important,
- ☐ You didn't understand what the DNA evidence meant, or
- ☐ You think the other jurors understood the DNA evidence and they thought it was wrong.

JURORS FROM TRIAL ONE

T1-JUR 1: **The same** (not guilty) because all of the other evidence was equivocal and not as reliable or trustworthy as DNA evidence. DNA evidence could have been very important in this case, but the Prosecutor and the Defence lawyer just did not ask the right questions of the expert.

T1-JUR 2: **The same** because the DNA evidence just wasn't conclusive, it didn't help.

T1-JUR 3: **The same** (not guilty). The DNA evidence just wasn't conclusive and so it was the lack of DNA evidence that became important. It was this that caused a hung jury. Most jurors thought the Accused was guilty, but the lack of DNA evidence was enough to create a doubt in their mind.

T1-JUR 4: **The same** (guilty). The DNA evidence just was not helpful. In this case if there had been more DNA (for example any DNA linking the Accused to the crime scene) then many more jurors would have convicted. Some jurors thought the Accused had done it, but needed a bit more concrete evidence. Just a bit more evidence would have completely swayed them to a guilty vote.

T1-JUR 5: **[Unsure]**. Too hard to answer. [Note: in other answers this juror did say that if there had been DNA from the Accused found at the crime, and the Accused could not explain it, then it would have been a 'two-minute' decision – guilty.]

T1-JUR 6: **The same**, because the DNA evidence was not pertinent. If there had been DNA linking the Accused to the crime scene, and the Accused could not reasonably explain it, then the case would have been much stronger for the Prosecutor. The DNA in this case was a *tenuous waste of time*.

T1-JUR 8: **The same**. The DNA evidence wasn't conclusive or helpful.

T1-JUR 9: **The same** – guilty. Because the DNA evidence was not conclusive, I relied on other witnesses, photographs, medical evidence et cetera. DNA was important but since it did not link the Accused to the case, it did not really affect my decision. I found all of the other evidence fairly convincing.

JURORS FROM TRIAL TWO

T2-JUR 1. **[The same]**. It would have been the same. In one case it wasn't important, and in the second case it was important, but its absence was certainly a contributing factor to my decision. In the first incident it wasn't an issue for me, and in the second incident, it was important but, I mean there was other evidence as well. I mean it was important, but in this case - The question you are asking is "if there wasn't any given, would it have changed your view?" And I can say "No", because in this case there wasn't any that was conclusive. There wasn't any anyway, if you know what I mean.

There were other things also – I suppose it may have made deliberations harder, because, it's hard to say. If there had been absolutely none offered, it may have made it harder, because it would have made a decision - about, for example, establishing whether or not he was there – that little bit more difficult, because, as it was, there was nothing to suggest it. There had been some evidence given, and there was nothing to suggest that he was. But if there was a complete absence of [evidence] suggesting that he was or he wasn't [present], that may have opened it up a little bit more.

I mean we had some, and it said 'no' or 'inconclusive', so we had to discard it because it was of no use to us, because of course we were working in terms of proving guilty, so we have to put him *there*. Now, if nothing had been presented, that would have perhaps opened up the decision more – I am speculating now – because we wouldn't have been able to say at all whether there was evidence that he was or wasn't there.

T2-JUR 2. **[Unsure]**. The DNA evidence wasn't conclusive. The wording of this question is confusing.

T2-JUR 3. **[The same]**. That really is a hard one. What clinched it for me was that there was no DNA evidence that he had been there. In the absence of DNA evidence I think I would have reached the same verdict, because the chisel never appeared anywhere, and I did not believe that the injuries that she had sustained were gross enough, shall we say. If she had been penetrated with a chisel, whether to the anus or the vagina, I believe the injuries would have been much greater. So that went against her. I mean, I know that the doctor said that it was consistent with a sharp object, but I just don't know. I just don't believe it. I think she would have had more injury in that area, because she was saying it was a repeated penetration in that area, not just one. I could understand it if it was just once, but she was saying it was repeated. And also the fact that she kept saying 'it was his penis, it was his penis' and then she had to be really prodded by the prosecution before she said "oh, and then I sat up and pulled the chisel from between my legs'. It was almost as if – because they sent us out, when she couldn't work out what to say, and then came and got us. And I thought 'what is this, are they coaching her, or what?' So we found that frustrating too, the fact that we kept being sent out, every time there was a point of law...

T2-JUR 5. **[Unsure]**. If I hadn't heard any DNA – It's hard because it was such a crucial part of the evidence for the prosecution, and, as it turned out, for the defence as well – or the lack of. It's hard to say – can I say that?

T2-JUR 6. **[The same]**. No, probably the same, because I think – well, I mean there was a bit...Can I tell you what I think? Well I thought he was guilty, and I think he covered his tracks very well. So I wasn't surprised that there was no DNA, I mean that there was limited, anyhow,

from the trial. I mean because there was none of – there were no carpet fibres or that sort of thing on his shirt...Yes, I thought he'd covered himself well.

So the DNA evidence wasn't helpful.

No, but for the ones that thought he was innocent, it was very helpful.

T2-JUR 7. **[The same]**. It would have been the same; because there wasn't any, I had to disregard all the DNA. Yes.

T2-JUR 10. **[The same]**. Well, without any DNA evidence whatsoever – which is what we had. – *From what I understand you've said if there **had** been DNA evidence for the second incident then you would have tended towards guilty.*

Yes.

Whereas without it, you would just say not guilty, because there's not enough evidence.

Yes.

So in that case you would say your verdict would have been the same?

Yes. I suppose - See, I don't know what case could get through without any DNA evidence at all. We never had DNA in the old days, and I don't really know if I was around then, but we never had it. So how did they actually convict people in those times, without DNA? See, but the Judge would have an idea of that, and if there wasn't things lined up to say 'yes he's guilty' with the bike and stuff, but they only found the bike 2 days after it, so it wasn't, it was really, all circumstantial. But no I don't think I still could have still convicted him and I think she still could have set it up.

If your verdict **would have been DIFFERENT**, is that because:

- ☐ The DNA evidence was very important,
- ☐ The expert witness was very convincing, or
- ☐ You thought the accused was guilty, but the DNA evidence changed your mind.

JURORS FROM TRIAL ONE

T1-JUR 7: **Different**. The process of considering the verdict would have been different, because although the DNA evidence didn't implicate the Accused, it was still very influential on the process of my verdict. Overall, I may have reached the same conclusion, but the process of reaching that verdict would have been different.

JURORS FROM TRIAL TWO

T2-JUR 8. **[Different]**. Well, it may have been different. It's not such a quick thing to come up with a shift like that, but I wouldn't exclude the possibility that it'd be different. It's a question mark about whether the Accused was there or not, and to my mind there was still a question mark about whether he was there or not. But I mean, if you didn't have any evidence about DNA, you'd have even less of a firm view about that, yes.

T2-JUR 9. **[Different]**. It could have been different. I think you can assume a lot of things when there is no DNA evidence that you can't assume when there is DNA evidence. You could say "he could have been in that room", but when there's no DNA evidence it puts doubt into our mind. You know, he could have been, but there's no DNA evidence, so there's a chance he wasn't. Whereas if you didn't have DNA, you could say well 'yeah, he could have been in that room'. Does that make sense?

Well, you wouldn't even think about it, I don't think, like DNA. Well, it's kind of hard. You would because of what you've seen on TV and all that, but if it was never done ever, I don't know, you wouldn't think about it. But as I said, I think you could assume things easier, than you could with DNA evidence given, or tests done.

The DNA profiling evidence presented in these trials appears to have been so far below the expectations of most jurors, that many of them disregarded it to such an extent that it made no difference to their verdict. Without DNA profiling evidence that identified the Accused as having been at the crime scene, jurors fell into the following categories:

- For jurors who believed the Accused was guilty, they accepted that he had so carefully covered his tracks and removed all traces of himself from the scene that no DNA evidence was ever likely to have been found. For these jurors, the lack of DNA evidence was entirely explicable and made no difference to their verdict (guilty).
- For jurors who believed the Accused was not guilty, the lack of DNA evidence linking him to the scene was acceptable and unsurprising. The fact that there was no DNA evidence in a way confirmed that he had not been present for the second incident and did not change their verdict.
- For jurors who thought the Accused was guilty but voted for a verdict of not guilty, the lack of DNA evidence was crucial. Without DNA evidence connecting the

Accused to the crime scene, these jurors could not place the Prosecution's case beyond a reasonable doubt. The lack of crucial identification evidence created enough doubt that even if they thought the Accused had committed the crime, their verdict was nevertheless not guilty.

The trials studied were not ideal for this question, because the question was based on the assumption that the scientific evidence would have identified an accused or at least provided some sort of match suggesting that s/he had been present at the crime scene. Even though the DNA evidence in the trials studied was not typical, however, the question was still asked and the answers provided an interesting insight into how two juries coped with scientific evidence that did not meet their expectations or greatly assist them in coming to an easy verdict.

2. HOW IS SCIENTIFIC EVIDENCE PRESENTED AND HOW IS THAT PRESENTATION PERCEIVED BY JURORS?

4.9.4 *Presentation of the Case*

In ancient Greece, the birthplace of the jury system, each *dikast* (juror) on a *decury* (jury) used a clay ticket, marked with holes, to keep score during the arguments.⁶¹⁷

In these trials, the prosecution's case was based on circumstantial evidence and motive. The prosecution had medical witnesses to give evidence of injuries sustained by the Complainant, but none of the scientific witnesses (a forensic biologist and crime scene examiners) could give *any* physical evidence of the Accused having been at the crime scene for the second incident. The prosecution explained the absence of physical evidence by alleging that the second incident had occurred on a drop-sheet (tarpaulin) which had been deliberately used and later removed by the Accused to hide all traces of his presence.

In response to this, the defence emphasised that despite the marvels of modern forensics, not a single point of physical evidence was found linking the Accused to the

⁶¹⁷ Wolf, R. V. (1998). *The Jury System*. Philadelphia: Chelsea House Publishers at 20.

crime scene; no fingerprints, shoeprints, fibres, hairs, saliva, blood, semen, or any sort of DNA. In fact, the only DNA profiles which were found belonged to the Complainant, some of her other sexual partners and an unknown male.

Thus, whereas physical evidence such as DNA profiling can often strongly bolster the prosecution case and heavily implicate an accused, in this case the lack of DNA from the Accused actually weakened the prosecution case and to some extent strengthened the defence. Importantly, the lack of DNA evidence did not completely exculpate the Accused, and so the trials pressed ahead on the basis of other evidence.

4.9.5 The Adversarial “Question and Answer” Format

Irrespective of the content of the scientific evidence in any case, the material itself is presented in a way that is largely beyond the control of the expert who conducted the examinations, detected the results and determined the conclusions. The evidence is drawn forth by the questions of the prosecution and defence, and occasionally of the Judge. Did the adversarial system in these trials facilitate greater or lesser understanding of the expert evidence by the jurors, and why was this the case?

Do you think the Prosecutor asked enough questions of their expert? Were they the right questions? Why? (Telephone survey)

- ☐ Yes
- ☐ No
- ☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **[No]** The Prosecutor did not work on the DNA evidence at all; the Prosecutor did not ask the expert whether the Accused’s DNA had been found at the Complainant’s house. Perhaps it had been found, perhaps not. This caused immense difficulty for us and caused speculation as to why this question had not been asked. *Half of the jury thought it was because none of the Accused’s DNA had been found, the other half thought it was because it had been found but none of the lawyers bothered (or wanted) to ask the question.*

A more technical point was that although the expert said the DNA found “could not be excluded as belonging to the Complainant and two other men”, she never said that it couldn’t exclude the Accused either. That is, the DNA expert never said “there was nothing on the shoes or clothes of the Accused to link him to the Complainant’s house”. Why was this important aspect never questioned by the Prosecutor or the Defence? There was no evidence that a thorough search was done of the Complainant’s house and therefore the jury was never sure one way or the other, that there was no DNA linking the Accused to the scene of the crime. Neither the Prosecutor nor the Defence asked the right questions.

T1-JUR 2: **No**. The Prosecutor did not ask enough questions. We had significant problems with the burnt remains found in the incinerator at the Accused’s home, because although the remains were photographed, no questions were asked to determine what the remains actually were. This evidence could have substantially strengthened the Prosecutor’s case by verifying the Complainant’s story. For example, if the red tape the Complainant had described in the attack had been linked to the melted red plastic in the incinerator, we would have felt the case was stronger. Similarly, if the rod used in the attack had been linked to the melted metal in the incinerator this would have been a substantial link.

The Prosecutor only asked the witness “Do these *look like* nails?” “Yes”, “Do these *look like* lumps of metal?” “Yes”. *The expert probably could have answered much more useful questions, but these more useful questions were never asked.* So the jury had to rule the incinerator right out and couldn’t be satisfied beyond reasonable doubt – even though the evidence could have been very important.

The Prosecutor should have taken the chance to ask more questions of the forensic work, because ten out of twelve jurors would not believe the Complainant’s story or the Accused’s (too unreliable and not objective or trustworthy) so the jury could not convict.

We found it odd that other evidence was not collected or asked about. For example; fingernail scrapings from the Complainant; soil samples from the Accused’s push bike and the Complainant’s yard; DNA samples from other suspects like the Complainant’s two lovers.

It was basically the Prosecutor’s fault that there was a hung jury, because there was just not enough information for the jury to make a decision beyond reasonable doubt. The Prosecutor should have had more evidence. If it was not his responsibility to gather the evidence, then the police on the case should have given more things to the DNA experts to be tested (for example fingernail scrapings, soil on bike tyres, DNA from other rooms in the house, burnt remains in incinerator et cetera).

T1-JUR 3: **No.** I wanted to know about the absence of DNA (that is, the absence of Accused's DNA at the crime scene and absence of crime scene material on the Accused). Even the DNA evidence that was led was sketchy - it didn't implicate Accused at all. More explanation was also needed about other evidence (for example the incinerator) or perhaps someone could have just told the jury why this evidence was never explored?

T1-JUR 4: **No.** Many jurors commented in the jury room that the Prosecutor did not ask enough questions. I was impressed that the Prosecutor noticed the Defence lawyer was reading selectively from the Complainant's diary and so the Prosecutor read out the entire extracts. However, in general the DNA evidence raised more questions than it answered. For example "Why wasn't DNA found in places where you would expect it to be found?" (because the Accused had helped the Complainant move in and thus you would expect to legitimately find his DNA at her house).

I was also extremely peeved that no evidence was given about the red melted plastic in the Accused's incinerator. There was a lack of emphasis here by the Prosecutor; no useful questions were asked and so no useful evidence was given. No witnesses were ever asked "Is this melted plastic consistent with the red tape allegedly used in the second attack?" and the jury *really* wanted to know.

T1-JUR 5: **No.** I felt "let down" by the forensics in this case, in that there *were no forensics, really*. The witnesses could just not say what was in the incinerator, and the Defence lawyer capitalised on this by zooming through it and putting paid to it. The jury was expecting a lot more from the forensic evidence and eventually felt that they just could not draw any conclusions. So many issues were brought up but then left hanging. This was disconcerting for jurors who felt that, as they themselves were not experts, they were just not able to draw their own conclusions.

For instance, the absence of the Accused's DNA at the Complainant's house. I thought that "surely no-one could not leave ANY DNA". That is, surely the Accused could not have been so careful that he washed off every trace of his DNA from the scene. But this issue was never addressed by the Prosecutor or witnesses.

T1-JUR 6: **Unsure.** Can't remember.

T1-JUR 7: **No.** The Prosecutor needed to prove the accusations and I thought more needed to be done by the Prosecutor. I thought perhaps the Prosecutor couldn't ask more questions because there wasn't enough evidence? More evidence should have been given about fingernail scrapings, more DNA et cetera.

T1-JUR 8: **No.** The Prosecutor didn't seek too much information about the specifics of the case. The defence lawyer asked better questions but my feeling was that both sides were *deliberately withholding information* by NOT asking questions.

T1-JUR 9: **Unsure.** I thought the Prosecutor could have asked more questions. I can't remember the specifics of the examination-in-chief [but later she did say that the Prosecutor "could have pressed harder" and re-examined the witness to extract more information.]

JURORS FROM TRIAL TWO

T2-JUR 1: **[No].** My first reaction would be "no" to both counts. Now, DNA was important but it was of no use in the case because, as you probably gathered, there was no useful evidence gathered, so, the Prosecutor knew, I presume, what evidence was available, and because there wasn't really anything to ask [--] about, she didn't ask the relevant questions. Do you see what I mean? She didn't have a lot to go with. And as you know, the defence simply used any means to cast as much doubt on it.

Looking back on it, there was a question I had, and I'm going back, because obviously we don't have our notes or anything... There was a question I wrote down at the time, and it fitted into the very broad bracket of "I wished they'd asked this question, but obviously they're not going to, so there's nothing we can do about it, because we can't actually ask questions, obviously." So it was more a question from my point that I thought the Prosecutor should have asked. Now I can't honestly remember if it was on the forensic evidence, as in the [DNA expert's], or whether it was the second medical examiner.

There were questions I thought she should have asked, but as the trial progressed, it became obvious that there really wasn't a lot of point asking a lot of these questions because she would have sat there and said "I don't know", "we don't know", "we have no evidence", "no, no". All it would have done was highlighted what they didn't know, and the defence did a fairly good job of that.

T2-JUR 2. **No.** I was left looking for answers on a couple of issues. [The forensic biologist] was allowed to say she was asked to examine a weapon, but neither the prosecution nor the defence asked any questions about it (in our presence).

The crime scene investigator was unable to find one "usable" fingerprint (of even the Complainant) on the scene. He was not asked whether it appeared they had been wiped off, or whether they were just smudged.

T2-JUR 3. **No.** I don't think the Prosecutor asked enough questions, full stop.

Enough questions about anything?

No.

T2-JUR 5. **[No]**. I think no. I think sometimes she didn't ask the right questions, although off the top of my head I cannot think what they were now, because I've been trying to de-brief myself, as much as possible. But I think yes, they really sort of made a bit of a hash of presenting a convincing DNA case. That was one of the problems, that was why we couldn't convict him, basically. A lot of us had major problems with the lack of DNA pinning the person to the scene or proving they were there, or anything, you know.

T2-JUR 6. **No**, I don't think she asked enough. I think the defence lawyer asked more than what the Prosecutor did. And I figured if the Prosecutor had asked more, it would have evened it out a bit more.

T2-JUR 7. **[Yes]**. The DNA...Yeah, I think she asked the right questions. Um, enough questions?

For example, did you want any more information that you thought the Prosecutor should have brought out, or?

No, no. I thought that was fine.

T2-JUR 8. **[Yes]**. This is a bit of a tricky one, because I recognise that there were constraints on what the prosecution could ask, and so to some extent there was a bit of filtering of the evidence according to points of law or other matters. So in some ways – I mean, there are always questions you would prefer that Prosecutors ask, or information that you'd want to ask for yourself, so, to that extent it was a bit frustrating. In terms of the forensic evidence in that case, I can't recall, but it seemed adequate, I think.

T2-JUR 9. **[No]**. When we were talking about the evidence, we felt that certain questions hadn't been asked that we would have liked to have been asked. But we weren't sure if that was because the prosecution didn't ask them or they *weren't allowed* to ask them. Because at times it sort of seemed that they weren't allowed to ask certain things. So it's sort of hard to say. Yes, there were questions I would have liked asked, but we don't know why they weren't asked. Well there were things that we wanted to know, that we didn't.

T2-JUR 10. **Yes**, generally, but there wasn't enough evidence that I could find – you know, they didn't seem to have enough real evidence to convict him, or anything. There was no DNA in the second conviction [incident] at all, especially for the Accused. I mean, how can you, you know, condemn somebody if there's no DNA at all?

So you would say that the Prosecutor asked enough questions, but there still wasn't enough evidence?

Yes, I think so, yes. Not that I can remember fully all the questions, but I think there were other questions we would have liked to have known, but further on in the case the answers came out. You know, we sort of went out into the jury room and sort of thought well what about this and this, and, but further on they told us the answers, so we didn't really have to know at the time.

Clearly the jurors in both trials were extremely dissatisfied with the way in which the evidence, particularly the scientific evidence, was presented in these trials. The questions asked (and not asked) by the prosecution and defence were insufficient to meet the juries' needs and expectations. The primary cause of dissatisfaction was the fact that very little useful evidence was elicited from those whom the jurors saw as key witnesses – the forensic scientists. The overwhelming impression was that firstly, not enough evidence had been collected from the crime scene, and this fact notwithstanding, the evidence that had been collected was not examined properly in court.

The jurors in both trials fixated on the “loose threads”. The tantalising scraps of evidence (such as the melted red plastic in the Accused's outdoor incinerator) which were mentioned to witnesses, even shown in photographs, but never positively identified as items related to the alleged incidents. To the jurors, the evidence seemed only partially explored, and the perception was that if the prosecution had bothered to adduce the evidence in the first place, why were the witnesses never invited to make outright assertions that the items were at least “consistent with” what the Complainant had described of the attack.

It is possible that the prosecution did not pursue these points to their ultimate conclusion because they knew from the forensic reports that the evidence was simply not conclusive. For example, one forensic witness noted that without red tape to use as a control sample, experiments could not be conducted to determine whether the red melted plastic in the incinerator was indeed the same tape that had been used in the second incident. Explanations such as these were not emphasised in court, however, which left both juries dissatisfied and confused as to why certain evidence had been mentioned at all.

In an average trial, the forensic witnesses are called by the Prosecution and the defence attempts to discredit them or downplay the relevance of their results. The trials studied

in this research were unusual because the defence had no need to discredit the forensic work which had been carried out. Rather, it was to their advantage to emphasise the lack of scientific results linking the Accused to the crime scene. Nevertheless, the juries in this research were asked about how the scientific witness (the forensic biologist) handled questions from the defence, in the hope of extracting more information about how scientific experts are perceived to handle questions from the defence.

Do you think the expert handled the defence's cross-examination questions well?

Why? (Telephone survey)

- ☐ Yes
- ☐ No
- ☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **Yes**, but only for the questions she was asked. The witness could not answer questions she was never asked (even when they were questions she *should have* been asked).

T1-JUR 2: **Yes**. The jury came to assume that the Defence lawyer was just deliberately avoiding asking certain questions (for example the identification of things in the incinerator) because the answers would incriminate the Accused.

T1-JUR 3: **Yes**. The expert was very quick to point out any deficiencies in the questions asked by the Defence lawyer.

T1-JUR 4: **Yes**. The expert was impressive in that she did not let the Defence lawyer take any liberties with her – she wouldn't stand for it if the Defence lawyer's questions or statements were incorrect.

T1-JUR 5: **Yes**. I thought so, but a lot depends on the particular questions. I think some jurors were confused about the location and amount of DNA found on the doona, and this may have been a result of how the expert handled the questions.

T1-JUR 6: **Yes**. I can't remember, but I don't have a bad impression, so she must have been OK.

T1-JUR 7: **Yes**. Expert handled cross-examination very well. She was straight to the point with both the Defence lawyer and the Prosecutor.

T1-JUR 8: **Yes**, but the lawyers were deliberately not asking the right questions, in case they received an answer that they didn't want. All of the jury thought this and felt frustrated that *obvious* questions, and questions that would have been very helpful, were not being asked.

T1-JUR 9: **Yes**. I can't remember the details, but overall I had a good impression of the expert and the expert's ability to answer questions.

JURORS FROM TRIAL TWO

T2-JUR 1: **Yes**. I can't remember the specifics of the cross-examination. I think she did, from memory, because I think the forensic and medical witnesses, if I could put it that way, handled the defence better. The defence did a pretty good job trying to attack and undermine the evidence and credibility of all the witnesses, and I think she got - the lead defence counsel - got pretty aggressive with them. But like I said, I can't remember specifically on her case, but I'd say that yes, she handled it pretty competently. She came across as knowing what she talked about.

T2-JUR 2: **Yes**. I found [the forensic biologist's] answers confident, concise, clearly put and impartial.

T2-JUR 3: **Yes**, she handled it very well. Yes, she was definitely not taking any sides, totally neutral and very professional about the whole thing.

T2-JUR 5: **Yes**. She answered everything and it was very easy to understand, and everybody on the jury – even some of my colleagues on the jury – I'm sure could have understood what she was saying. That's all I'm saying, but I think you know what I'm hinting at there.

T2-JUR 6. **[No]**. Well, no, because I think she was held up every time because of the first trial. Because of the first trial, the defence lawyer was stopping all the witnesses, not just the forensic ones, but all the witnesses from elaborating on what they might have wanted to say more. I found that really frustrating. And I think it was all because of the first trial, because she was more asking whether their answers from the first trial were still correct for the second one.

T2-JUR 7. **[Unsure]**. My memory is not too good. I know I just sort of picked out what I needed to remember and that was it.

T2-JUR 8. **Yes** I did. I think she was reasonably comfortable. I mean I thought it is always going to be a nervous situation, but she seemed to have confidence in her knowledge and in her role.

T2-JUR 9. **[Yes]**. I thought they did, because they seemed impartial, they just seemed factual.

T2-JUR 10. **Yes**. It helped us get an idea of exactly what the DNA was, you know, and how to, what – that you only needed such a small amount and how long it lasted and everything before you couldn't use it as evidence – like, it lasted a long time, and they still couldn't get any evidence. And I think at one stage she brought up the fact that in that time, you still haven't been able to obtain that certain bit of evidence. There was something I thought they said they still could have gone back to use, to get, if there was, you know....There was something they said, I can't recall what it was, and they said 'you still haven't gone back to find out what it was'. I can't remember what it was.

The expert was almost universally acclaimed by the jurors for the way in which defence questions were handled. The words used by the jurors to describe the expert convey the utmost professionalism of the witness:

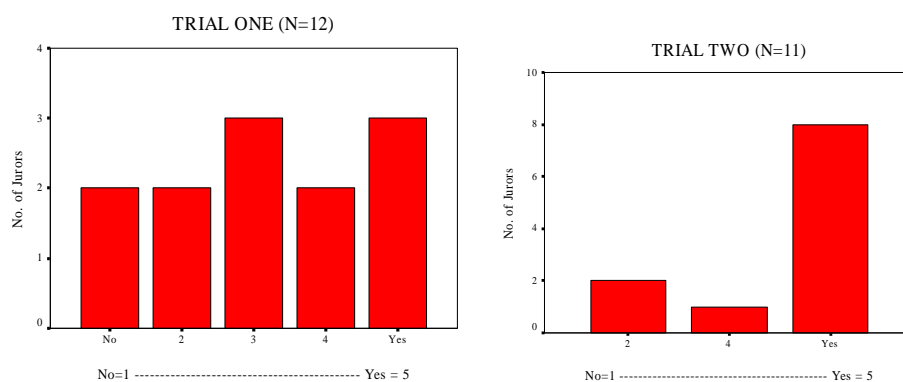
- Impartial, neutral;
- Factual;
- Confident, comfortable;
- Easy to understand, clearly put;
- Concise, straight to the point;
- Competent; and
- Knowledgeable.

This checklist seems an obvious statement of what it takes to be an excellent expert witness and is consistent with research in the literature.⁶¹⁸ However, from observations made by the researcher, not all expert witnesses were able to deliver performances which featured qualities from this list. Some witnesses were antagonistic towards the legal counsel, others were difficult to hear, some appeared to give very qualified and narrow answers, and yet others seemed unfamiliar with their notes or with facts pertinent to their own evidence in the case. Thus, the fact that the jurors themselves identified and recognised the qualities which make an expert witness excellent, adds credit to the common-sense nature of the list.

⁶¹⁸ For example Rosenthal, P. (1983). Nature of Jury Response to the Expert Witness. *Journal of Forensic Sciences*, 28(2), 528 at 529.

The only juror who had a problem with the cross-examination was dissatisfied because the forensic biologist at times appeared to be stifled by the terms of the questions, which did not allow for any elaboration upon the answer. This juror was actually in agreement with several other jurors who noted that both the prosecution and defence questions seemed to avoid getting to the crux of certain matters (namely, positive identification of items from the second incident, including the Accused).

Were the DNA results easy to interpret? (Written survey)



The jury in the first trial seemed to have had great difficulty in coming to terms with the DNA profiling evidence that was presented. Complicated by their own expectations of what DNA profiling evidence *could* provide, these jurors did not find what actually *was* presented, easy to grapple with. Recall that these jurors also engaged in some speculation about nuances of the questions and answers given in relation to the DNA. For instance, the Prosecutor did not specifically ask “Was the Accused’s DNA found at the crime scene?” probably because the answer (“No”) would have just been an unnecessarily detrimental and bald statement of the evidence that had been given by the expert. Some jurors in the first trial, however, appear to have speculated that perhaps the Accused’s DNA *had* been found at the crime scene, but for some (unknown) reason, neither the Prosecution or Defence wanted to reveal this fact.

Similarly, when the Complainant and her previous partners were “not excluded” from having contributed to a certain DNA mixture, some jurors in the first trial extrapolated from that answer. They speculated that perhaps the Accused could not be excluded from the sample either (that is, the Accused could have contributed to a DNA sample found at the crime scene), but because the question was asked in a particular way, the expert had

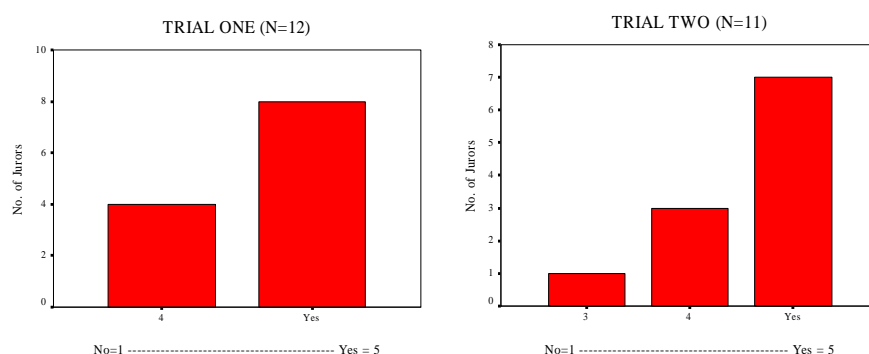
been constrained in her response. This kind of speculation, attempting to read layers of meaning into questions and answers, resulted in a complicated, muddled interpretation of the DNA evidence. The jury in the first trial clearly felt frustrated that certain questions were not asked of particular witnesses, and this caused straightforward DNA profiling evidence to be interpreted and second-guessed in a way which made it very complicated.

In contrast, the jury in the second trial appeared to accept that the DNA profiling evidence did not identify the Accused as having been present at the second incident. Their interpretation of the DNA profiling evidence was correct, although it did leave them disappointed and frustrated.

4.9.6 *The Expert Witness*

The expert's qualifications were examined in a manner typical of Australian courts. That is, the prosecution asked for a recitation of the expert's formal qualifications, experience and work history. In some trials the defence subtly undermines this show by immediately "stipulating" to (that is, accepting) the witness' suitability as an expert, which means that the prosecution then does not usually go through the process of listing the expert's qualifications for the jury. However, in the trials studied, the expert was allowed to give evidence of her fitness to appear as an expert witness, and her qualifications and experience appeared to meet the expectations of almost all jurors (only one juror ranked the expert's qualifications and experience as a "3" on the Likert scale (which equates to a neutral position), whereas all other jurors gave a rank of 4 or above.)

Was the DNA Expert Qualified and Experienced? (Written survey)



These responses indicate that the Bachelor's Degree (with honours), the three years work experience and the other forensic courses which the forensic biologist had taken met with the juries' approval; they considered the witness qualified and experienced enough to give evidence about DNA profiling. When asked in the telephone survey to recall what the expert's qualifications were, the majority of jurors correctly remembered the expert as having a Bachelors degree with Honours (n=14), and only four jurors had no recall as to what the expert's qualifications were. These four jurors were those who participated in the telephone interview several weeks after the trials has concluded, and admitted to suffering memory loss of some details from the case. Although they did not recall the exact qualifications, three of those jurors recalled that the expert had "seemed qualified". Further information was gained from the telephone interviews:

How important were the expert's qualifications when it came to weighing up their evidence? (Telephone survey)

- ☐ Very important
- ☐ Important
- ☐ Neutral
- ☐ Not very important
- ☐ Not important at all

JURORS FROM TRIAL ONE

T1-JUR 1: **Very important.** I think I found qualifications more important than did the other jurors. Although I did not think that the expert's qualifications were all that important, per se, in deciding whether to accept the evidence, because the most important thing was that she was representing the [name of organisation] and therefore she was probably trustworthy and her answers would be right.

T1-JUR 2: **Very important** because the expert is representing scientific / forensic evidence and all of society's perceptions of that.

T1-JUR 3: **Very important.**

T1-JUR 4: **Neutral.** Qualifications just not an issue one way or the other.

T1-JUR 5: **Important.** I did not follow or keep track of which expert had which qualifications. As long as the witness had their job, I thought their evidence would be OK. That is, to be qualified as an expert witness, the expert must be reliable and OK.

T1-JUR 6: **Neutral.** If a person is called up as an expert then this juror says that that is enough; I accept them as an expert and don't see any need to second-guess or question their evidence.

T1-JUR 7: **Very important.** Qualifications do add weight to their evidence, even though I accept that if a person is called as an expert then they are qualified. *I still want to actually hear their qualifications though.*

T1-JUR 8: **Very important.** I considered her to be an expert. I thought she was well qualified and that her evidence was reliable and objective.

T1-JUR 9: **Very important.** The expert was qualified.

JURORS FROM TRIAL TWO

T2-JUR 1: **Important.** Somewhere between "important" and "very important". It's hard to judge the difference between, not being in a position to judge... I didn't know much about what sort of forensic qualifications were available. I'm not sure if you do a science degree, or an applied science degree, et cetera, but it was clear from her qualifications that she had qualifications which I would have considered appropriate, and were not deemed to be in question by the court. Between what she said and what I knew, and I've had a tertiary level education, and what the attitude of the court was, it was fairly clear that she could be considered an expert.

JR2: **Important.**

T2-JUR 3: **[Important]**. They were important, but what impressed me about her was the knowledge that she had, that she gave us about DNA. It was more the explanation, and the knowledge that she had in that respect, rather than her qualifications. I mean, qualifications are one thing, but when you actually prove it with your knowledge, that's quite another. So I found her a very credible witness, in that respect.

T2-JUR 5: **[Neutral]**. Based on what I noticed with everybody, I thought her experience was more important. I mean, I liked her to be qualified, but I thought it was neutral. Because I mean if you've got two years field experience and a PhD, so what? As opposed to someone who's got just a degree and they've got ten years experience.

T2-JUR 6: **[Important]**. Probably just important.

T2-JUR 7: **[Neutral]**. It doesn't really matter, as long as they're a qualified expert of some sort.

T2-JUR 8: **[Important]**. I think they're important because it went to the credibility and because it was such a technical matter, and again the credibility of what she was saying, the authority comes from her qualifications and her position.

T2-JUR 9: **[Neutral]**. I'd say pretty neutral. I don't know what her qualifications mean, basically. I don't know what it entails to get qualifications. They could rattle off a whole list of things and I still probably wouldn't be any wiser.

T2-JUR 10: **[Important]**. Well I think they were important...You've got to have some training in order to perform the DNA testing. You should have some qualifications, so that they know what they're doing. They [the qualifications] sounded good. Well, you know, unless you're in that field you don't really know – I know they were quite qualified from what they – they had a bachelors of something, I don't know – but they sounded okay, and... as long as there is some qualifications I suppose – I wouldn't know what would be the better one or not, so.

These responses indicate the expectations held by jurors about expert witnesses, ranging from a neutral attitude about qualifications (n=5) to those who thought that qualifications were either important (n=7) or very important (n=6) when it came to weighing up the expert's evidence (N=18 for telephone interview). The comments reveal that although jurors expect expert witnesses to have suitable qualifications, because the jurors have little or no experience in forensics they take it on trust that these

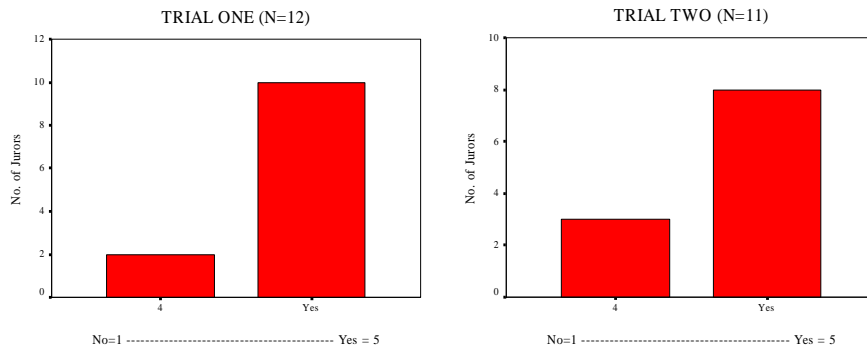
qualifications are appropriate. If there had been opposing experts called by the defence in this case, there may have been more debate about the merit of various qualifications. In these trials however, because there was no dispute as to the fitness of the scientific witness to appear as an expert, both juries appeared to be easily satisfied that the witness was a bona fide expert, having been told that she had graduated from university with an Honours degree in Science. One juror noted that experience may be more important than formal qualifications, but this was not mentioned by any other jurors.

Many jurors noted that because the expert was employed by a particular organisation (a government/police forensics laboratory in this case), and because the court appeared to accept the witness as an expert, then the jurors themselves were satisfied about the expertise (n=7). This raises the possibility that scientific witnesses who are employed by government agencies may automatically derive a positive benefit in terms of acceptance by the jury. Obviously this assumes that the agency itself has a good reputation (as did the organisation in this research). Private or self-employed witnesses may not enjoy such an advantage, although this issue was not explored further in this research.

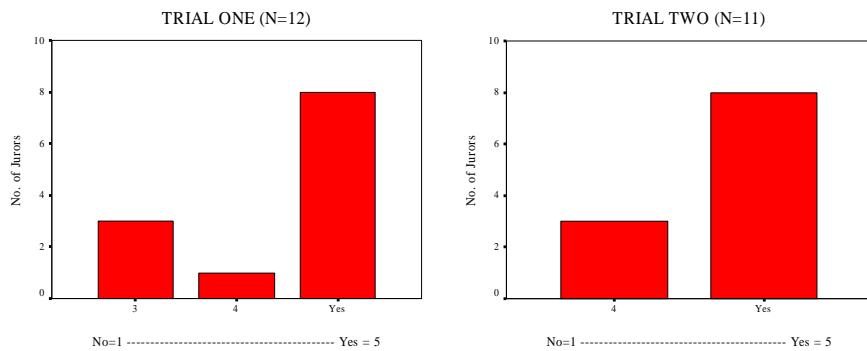
4.9.7 The Expert Witness – Impartiality

The importance of impartial, unbiased expert witnesses in criminal trials cannot be overemphasized, particularly in the many cases in which the defence does not call its own scientific expert witnesses. In the trials researched here, it was observed by the researcher and was noted by both juries, that the forensic biologist, (who had been called to court by the prosecution), behaved impartially in court at all times by responding with equal attention and consideration to questions from the prosecution and defence. The demeanour of the witness was at all times courteous to both the prosecution and the defence and at no time was bias detectable in favour of either side. Obviously, the *appearance* of impartiality is not enough to conclude that the laboratory work and results done before the court appearance were conducted impartially, however, the ability to answer all questions calmly and intelligently undoubtedly gave substantial credibility to the expert's laboratory work and opinions. This was reflected in a correspondingly high rating for trustworthiness.

Was the DNA Expert Impartial (not biased)? (Written survey)



Was the DNA Expert Able to be Trusted? (Written survey)



The expert scored particularly well in terms of impartiality and trustworthiness; in the written survey all jurors gave the expert a rank of 4 or above for a lack of bias (n=23) and almost all jurors ranked the expert as 4 or above for trustworthiness (n=20). The fact that the expert answered the prosecution *and* defence questions with equal care and candour was noted by jurors in both trials. As one juror commented in the written survey:

“[The DNA] witness explained things simply. She demonstrated a clear understanding of relevant issues and the significance of the evidence to both parties. OBJECTIVE.” (Trial Two juror, x1)

None of the respondents commented about the fact that the witness was an employee of a police organisation (although not a uniformed officer) and no aspersions were cast about her credibility as an impartial witness in this respect. This may go some way towards ameliorating the concerns of forensic scientists, (expressed in Chapter Three),

who suspected that witnesses employed by the police may be cast by jurors as biased in favour of the prosecution. Further investigation is warranted about this issue, however, as those concerns might be justifiable where the witness is uniformed and thus more visibly aligned with the police (unlike the witness in this research).

Area of Expertise

A peripheral issue which may have contributed to the trustworthiness of the expert witness was her willingness to admit when matters were moving beyond her area of expertise. Recall the following part of the cross-examination:

[Defence Lawyer:] Now, forensic evidence can consist of many parts. For example, probably one of the oldest is fingerprints. Correct? – *Yes, that would be correct.*

And there's a whole art to interpretation of fingerprints, correct? – *I would say so, yes.*

And I take it that you're aware that fingerprints can last on particular surfaces in fact for many years, correct? – *It's not my area of expertise, but that's my understanding, yes.*

All right. And the thing about fingerprints, I know you say it's not your expertise, but would you dispute that they are individual characteristics pertaining to one individual? – *I wouldn't like to comment on that.*

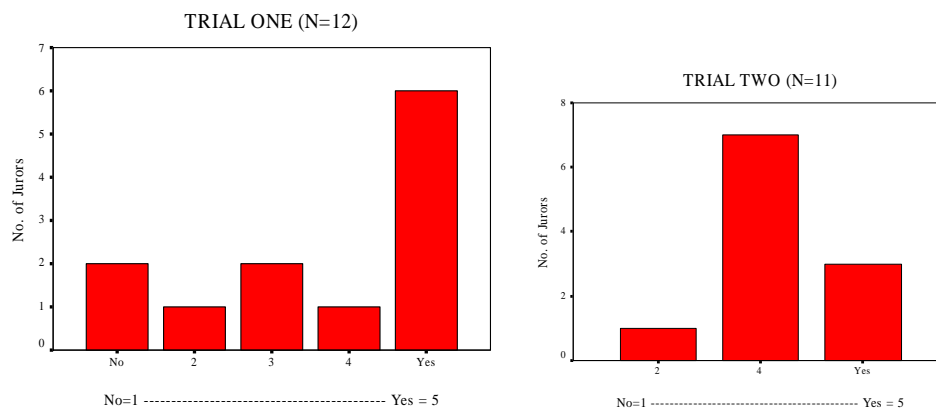
This is an example of an expert witness refusing to be drawn into giving evidence outside their own area of expertise; an extraordinarily important duty of any expert witness. It was not specifically noted by any of the jurors in the trials studied, however, miscarriages of justice have been known to occur when experts move outside their own area of expertise,⁶¹⁹ so even if the jurors were not aware of the significance of the issue, it is worth noting that the expert who gave evidence in these trials was obviously well aware of it.

⁶¹⁹ For example, see Justice Morling, T. (1987). *Royal Commission into the Chamberlain Convictions - Report*. Darwin: Northern Territory Government Printer.

4.9.8 The Expert Witness – Helpfulness

Despite the fact that the DNA profiling evidence in these trials was not particularly illuminating, as it did not identify the Accused as having been at the alleged crime scene, the forensic biologist who presented this evidence was nevertheless required to help the jury understand this fact, and to offer scientific explanations as to why the results were as they were. This resulted in a spread of responses on the Likert scale as to whether the expert was “helpful” to the jury:

Was the DNA Expert Helpful to the Jury? (Written survey)



When the answers about the forensic biologist from the written survey are compared with responses from the telephone survey,⁶²⁰ it is clear that the expert performed her role well. Although two jurors in Trial 1 and one juror in Trial 2 would have preferred more explanation about why certain samples were not collected and tested, the remaining jurors were quick to point out that they ascribed blame for samples not being collected to other workers “further down the line” such as the police and crime scene examiners.

Thus, although the majority of jurors said the expert was helpful (n=19), the spread of answers probably reflects the fact that many jurors blamed crime scene examiners or the police (in general) for not bringing more helpful evidence to court. What had been of

⁶²⁰ Question 23, Telephone survey.

overriding importance to jurors when they were weighing up the DNA evidence included the fact that so little DNA evidence was gathered:

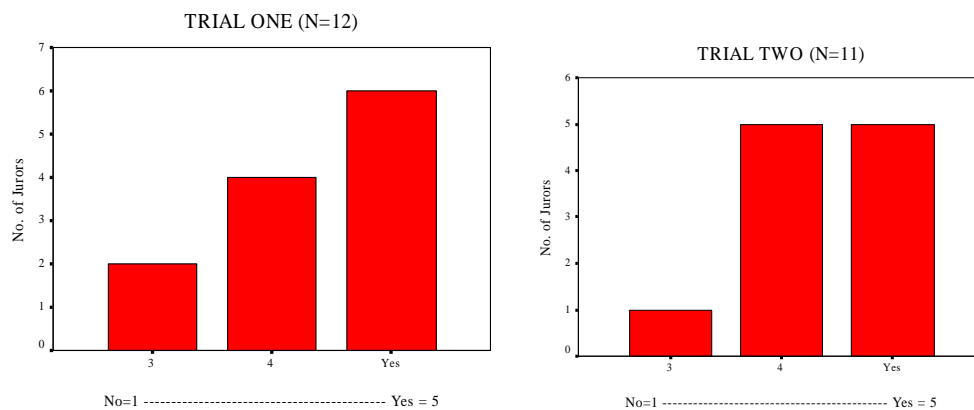
It seemed there were big gaps in DNA evidence. For example, photos of burnt embers of a bin but no explanation as to what those embers were consistent with. (Trial One juror, x1)

[What was important was] that DNA testing was done on all relevant items of evidence. (Trial Two juror, x1)

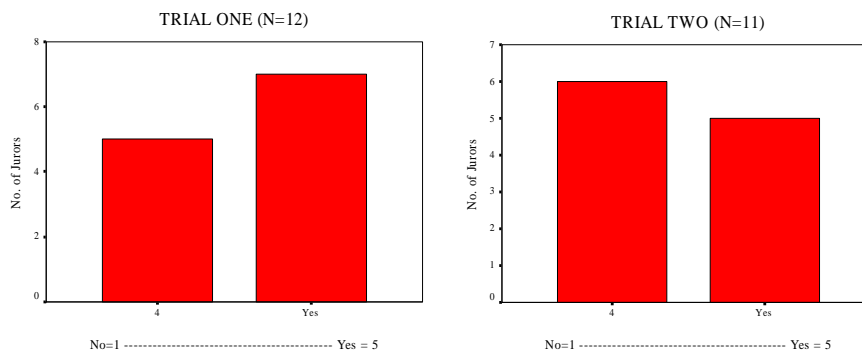
Not much evidence on DNA. Police did not collect enough to help with the case. Some key crime scene evidence not tested. (Trial Two jurors, x2)

4.9.9 The Expert – Communication Skills

Was the DNA Expert a Good Communicator? (Written survey)



Was the DNA Expert Easy to Understand? (Written survey)



In your opinion, could the DNA evidence have been better explained? (Telephone survey)

- ☐ Yes; by whom?
 - ☐ The prosecution
 - ☐ The defence
 - ☐ The Judge
 - ☐ The expert
- ☐ No
- ☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **No.** The explanation given by the expert was good enough for me. However some jurors didn't "get" the DNA evidence and would have benefited by having some knowledge about it prior to coming to court. In my view it would have been impossible to satisfactorily explain DNA evidence to these people during the two weeks of the trial anyway. I really had the feeling that some jurors did not trust the DNA evidence and did not agree with me that it was the only "solid" evidence, and that it should be the only basis for the verdict, particularly for the second incident. Other jurors did not see the DNA as so important and focussed on other evidence.

T1-JUR 2: **No.** The explanation given was enough. Jurors aren't always educated so they can't be bombarded with science. This expert did a good job with her explanation about how DNA degrades and how long it will keep. Jury doesn't want too much information.

T1-JUR 3: **No.** Expert did an excellent job in explaining the DNA evidence.

T1-JUR 4: **No.** Expert did a great job. No-one in the jury had trouble understanding what she had done or said.

T1-JUR 5: **Yes**, by the Prosecutor and by the expert. I felt the expert was constrained by the Prosecutor's questions. Also, even though the expert did explain how DNA profiling works, I would have liked more of that kind of simple explanation when it came to the case-specific answers – even if it meant the expert was repeating herself. Overall, I would have liked more explanation both generally and in a case-specific way.

T1-JUR 6: **No.** *I think everyone would be hard-pressed not to know about DNA evidence these days.* Even if they don't watch Quantum, the advertisements for these shows and the articles in

the paper and on the news should give everyone a general idea about what can be done these days.

T1-JUR 7: **No**. The DNA evidence was explained well enough by the expert (although with more experience giving evidence in jury trials, in future she might be able to expand on her answers a bit).

T1-JUR 8: **No**. The expert's explanation was aimed at the layman's level. She gave a very good summary of the different aspects of DNA evidence and was easy to understand. Her evidence just was not very helpful.

T1-JUR 9: **Yes**, by the prosecution and by the expert. The Prosecutor could have said a lot more and drawn more out of the evidence (for example why was none of the Accused's DNA found at the Complainant's house? The Accused would have been there socially and so one would expect to find some DNA there.) Overall this juror was confident that she understood the DNA evidence that was given, but she thought other jurors might have appreciated a little bit more explanation.

JURORS FROM TRIAL TWO

T2-JUR 1. **[No]**. Well, I'm not entirely sure that I understand what aspect of the question. If you're talking about what DNA is and what they can do with it, et cetera, then I think that was fine. Yes, that was fine. I'd say it probably was, because even when they explained why they hadn't – I mean a good example was the saucepan, the saucepan with the vomit in it. There were people walking around left right and centre. I didn't really have an opinion on why didn't they see it? That was explained that in the case of the vomit for example, (it was of no use, because of bacteria et cetera). So in instances like that I think it was explained sufficiently. I think generally, when it comes down to it, there were more questions as to why certain tests weren't done, or why certain things weren't seized, rather than what actually was done, if that makes sense?

T2-JUR 2. **No**.

T2-JUR 3. **No**, not to my understanding. I think she did an excellent job in that respect. I think the fact that the Judge asked her a few questions helped to clarify a lot of things, but I think both the Prosecution and the Defence were not asking the right questions, but it was suiting their purpose, but I found the whole thing quite frustrating. There were a lot of questions we wanted to ask.

T2-JUR 5. **[Yes]**. Oh, well the Crime Scene Investigator was a bit of a problem for me. He didn't adequately explain why some of the stuff wasn't taken. You know, he seemed to get bogged down in "well, I checked it for prints, but I didn't take it." He didn't adequately explain why vomit could not be tested for DNA. You know I think there was urine too – I'm not sure, I'm just trying to remember – and he said something about, "It could be - what's the word, when something's contaminated"? You know, and I thought, well, wouldn't you take it away first and have it tested? If it turned out contaminated, then too bad, kind of thing. But you don't just make a decision 'oh I'll leave it there because it might be contaminated' or 'my experience tells me it would be'. I just thought – well, we just thought – well, a couple of us, anyway, thought that that was a bit silly, to reject evidence like that.

T2-JUR 6. **No**, I think it was pretty OK.

T2-JUR 7. **No**, I think it was OK.

T2-JUR 8. **[No]**. Well, I was quite happy at the end of that set of evidence being given. Putting aside the issue of what further evidence I might have liked to have heard, no I was, I understood what she was saying.

T2-JUR 9. **[No]**. I remember thinking that it was pretty clear, yes.

T2-JUR 10. **[No]**. Well, from my point of view I could understand it, so that was fine. The Judge did have to interject to find out more, because he did ask some questions, which weren't asked. And that helped I think, even more so. Especially I think the long-term thing, how long it lasted for, and everything. So I think I remember the Judge asking a question about the DNA and that that actually helped us all, and that question wasn't asked by either side. I don't know if you remember that, it was to do with the length of time it would be available.

The forensic biologist was perceived extremely well in both trials for her ability to communicate the DNA profiling evidence clearly and effectively. All jurors found the witness to be a good communicator and easy to understand, and this was consistent with the researcher's observations. The expert witness:

- Spoke slowly and audibly,
- Used very little jargon,
- Made eye contact with the jurors, and

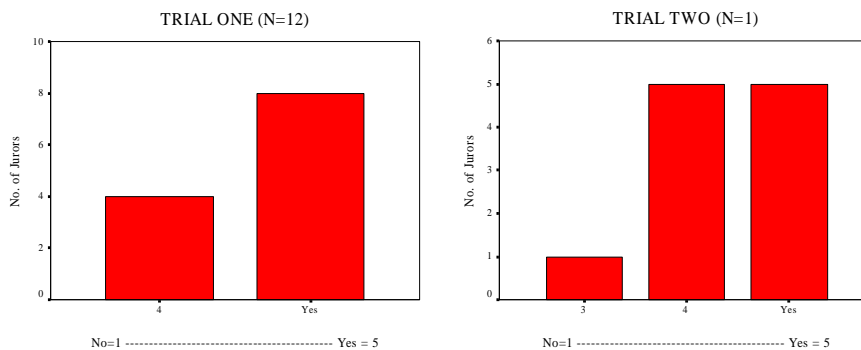
- Appeared to notice and respond to jurors' level of interest and comprehension by giving explanations as appeared necessary, but not labouring the point.

The interaction of the scientific witness with legal counsel and the Judge were also a point of note for some jurors. While some jurors appreciated the questions asked by the Judge (about DNA profiling from ancient remains), other jurors were unimpressed by what they saw as deliberate or incompetent questioning by legal counsel, which did not draw sufficient information from the witness. As has been discussed, both the prosecution and defence would have had solid strategic and case-related reasons for asking the questions they did, and for not asking the questions which the jury might have liked to have had included. Importantly, the jurors in both trials recognised that it was the legal counsel who were directing the evidence and extracting the information: the forensic biologist was merely responding to their cues. In this context, most jurors agreed that the witness gave a simple and comprehensible explanation of her evidence, although a few jurors (n=3) would have liked the expert to elaborate on her answers, if not for their benefit then for the benefit of other jurors.

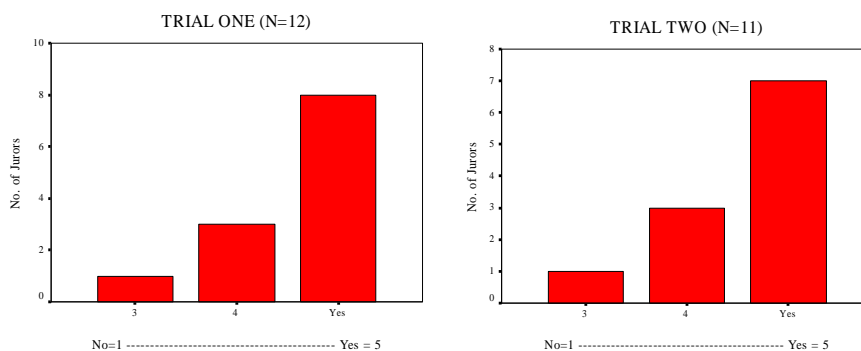
4.9.10 The Expert – Confidence, Appearance and Presentation Devices

From the moment an expert witness enters the courtroom, the eyes of the jurors are trained on them. First impressions are made as the witness makes their way to the witness stand, swears an oath or takes an affirmation, and takes a seat. Thus, even before the evidence commences, impressions are made. In the trials researched, the forensic biologist entered the court and bowed to the Australian coat of arms (on the wall behind the Judge), which showed an important familiarity with court etiquette which was sometimes lacking in other witnesses. The expert was dressed in formal business attire and carried herself confidently. This was reflected in consistently high scores for confidence and appearance, and was confirmed by jurors' comments in the telephone interviews:

Was the DNA Expert Confident? (Written survey)



Was the DNA Expert of Good Appearance? (Written survey)



Do you have any other comments about the expert witnesses in this case (especially the DNA expert): (Telephone survey)

- ☐ Appearance;
- ☐ Demeanour;
- ☐ Ability to answer questions;
- ☐ Use of jargon;
- ☐ Use of presentation devices (photos, overheads et cetera); or
- ☐ Ability to explain their evidence;
- ☐ Et cetera

JURORS FROM TRIAL ONE

T1-JUR 1: The expert was of good appearance. She did not need to use any other presentation devices (even though I would have been interested, it was not necessary). Overall this witness was constrained because forensics needed to do a better job. They ought to have checked all parts of the Complainant's house and collected more evidence. That is, more questions needed to be answered *before* the case came to court.

T1-JUR 2: Excellent appearance and demeanour. Did look very young, but this was not held against her. And she did do a good job. There was no need for any other presentation devices for this evidence.

T1-JUR 3: Very confident and quick to point out to the Defence lawyer when things were not right. Spoke well and was able to give a clear explanation of the DNA evidence. Her presentation was enough; no other presentation devices were needed.

T1-JUR 4: Probably not the DNA expert's fault that more evidence was not gathered. Somebody further down the line (for example at the crime scene) should have done more work, collected more evidence. The DNA expert herself gave great evidence. There was no need for her to use any other presentation devices. All the jurors thought she was fine (even though her evidence didn't end up being very helpful).

T1-JUR 5: Appearance was good and she spoke well. She was clear in answering questions, but could have given more explanation for the lay people. She needed to explain her answers and refer to earlier answers – even at the risk of repeating herself. She also needed to give more information – for example *why* was no DNA from the Accused found at the crime scene? *Why* couldn't anyone identify the red plastic in the incinerator?

T1-JUR 6: I can't remember specifics about appearance et cetera, but any additional presentation devices would have been a complete waste of time because the court is not the place for a professional lecture or presentation.

T1-JUR 7: Overall the expert was very good and very professional. She was to the point. Perhaps she could have explained more about her evidence and expanded on her answers. She might not have been very experienced in giving evidence before a jury. She seemed nervous and although her answers were very professional and to the point, she might be prepared to expand a bit more, when she gets more experience giving evidence.

T1-JUR 8: Expert was very professional in her approach. She was also treated with more respect (by the lawyers) than were other witnesses (for example the police). The lawyers

seemed to respect her qualifications and experience (unlike the police witness, who the Defence lawyer hammered for being too close to the Complainant).

T1-JUR 9: I thought expert witness was OK and did not need to use any other presentation devices.

JURORS FROM TRIAL TWO

T2-JUR 1. No, I thought she was fine. She presented well, she spoke well, she appeared credible. I don't see that aids of any kind would have assisted or would have been appropriate in terms of strengthening what she was saying. Again, that may have been influenced by the fact that there wasn't a lot to say; had she had to argue a point or present more conclusive evidence, that may have been far different, but I thought she was fine.

T2-JUR 2. No.

T2-JUR 3. She appeared extremely professional. I mean just the way she was dressed, and you know, very professional in her approach. She was very calm in her manner. She responded both to the prosecution and the defence in exactly the same manner, very neutral, in that respect. So I found her extremely professional. The evidence was very clear. Heaven only knows we had enough graphic photographs throughout this whole trial. So I really don't think there was anything more she could have done that would have assisted us. You know, she was very clear with her information – she was prepared, she knew what she was talking about, she didn't have to go back to – I mean, she did refer to her notes, I think, from memory – but she was certainly prepared for the questions she was going to be asked and she knew what she was talking about, and that, to me, was a real plus. I mean, compare her with [a police officer] who came in without her notes the first day, and came the second day with her notes that none of us were privy to what was in them. You know, I just found the DNA expert was excellent, as a witness.

T2-JUR 5. No, I thought it was adequate. I don't suppose there's any point in having graphics or anything like that there. No-one questioned her authority, you know, her academic standing, her professional standing, so no, not really.

T2-JUR 6. No, I thought she was really really good. I do think she was probably wanting – and I thought this with the medical experts as well – that they were wanting to say more, but [the defence] was pulling them back all the time, because of the first trial. I found that really frustrating. Because as soon as they sort of tried to elaborate a bit on what they meant, she was going back to 'February the 18th, did you say this, and under oath', and all that stuff. I just felt that they were trying to be a bit more elaborate, but she wasn't allowing that. So whether the

prosecution should have – I don't know – maybe pre-empted what she was going to say, and got them to elaborate when she asked, originally, so yes.

T2-JUR 7. No, I think it was fine, yes. I think it was enough.

T2-JUR 8. I think she was reasonably young, but then again a lot of the witnesses who were called were extremely young. Well I said she was confident and I think she was a reasonably shy character, so if anything there was probably quiet authority there, but if it was anything it was fairly obvious.

For me [presentation devices] weren't necessary – depending on whether it was a much more convoluted question – you know, like we tested these sorts of things and couldn't find any DNA evidence. You know, in this case I thought it was fine.

T2-JUR 9. I can't really remember her appearance. I could understand her alright, I think. She took the time to explain things, without being patronising, like others could be at times. Yes, that's about it. I mean, we had photos of various things, I mean, they were put in by the Prosecutor, not by the actual witness. I don't know if they were necessary on top of those, but I'm not really aware of what else could have been used.

T2-JUR 10. I think a better approach to actually what they're looking at and how they actually go about it and what decides what's going to be picked as DNA evidence might have been a bit more helpful. But no, I can't answer any more than that, no I don't .. She sounded, she seemed OK with the evidence; I could understand what she was saying and I think the questions were OK. But if they, well apart from not having sufficient and not knowing what they were looking at, like originally it would have been good to have taken some DNA off the bat, but then if he'd got gloves on at any rate you wouldn't have picked it up, so that's why they didn't.

So even if they hadn't have got any DNA off it, it would have satisfied you more if they had at least sampled the bat?

Yes, or explained what they were, how they actually went about choosing. Oh I suppose they did say a little bit of what, how they went about choosing their DNA, but [I wasn't] totally satisfied, no.

It is interesting that even though jurors were being asked about the forensic biologist's attire / presentation / communication skills, many jurors could not help but comment on the evidence itself and their disappointment with what forensics had been unable to provide. They had clearly expected more from the crime scene examiners, police, and forensic witnesses than they were given in court. This was not held against the forensic

biologist; jurors repeatedly noted that it was probably the fault of “others further on down the line” that more evidence, and more conclusive evidence, had not been collected. Since the forensic biologist was the witness called to give the DNA profiling evidence, however, the focus on what was not presented tended to shift towards her and some jurors wanted a more detailed explanation about why certain samples were not collected and certain tests were not carried out. This theme of grave disappointment tended to overshadow all other elements of the case, but nevertheless, some useful information about the expert’s presentation was still gained.

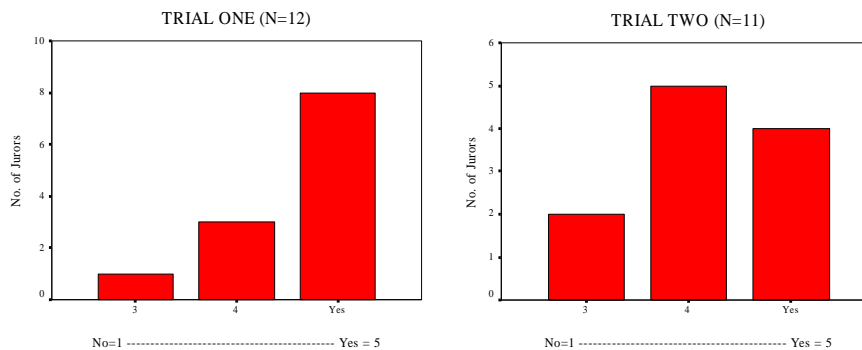
Presentation devices such as overheads, PowerPoint slides and additional photographs were deemed unnecessary for the DNA expert by both juries. Given that the DNA profiling evidence in this case was straightforward, and not contested, this is a reasonable outcome. As noted by some jurors, if the evidence had been more complex, further presentation aids may have been necessary, but they certainly weren’t necessary in this case.

A small number of jurors commented on the age (youth) of the expert witness. As the forensic biologist had completed a Bachelors Degree with Honours, and had had three years work experience since completing her university studies she was younger than all but two of the jurors, so these age-related comments were not unexpected. None of the jurors expressed surprise that the expert was so young, and certainly none of the jurors professed to having expected an older expert, but this can perhaps be implied from their answers. The fact that her age did not influence the high scores jurors awarded the expert for communication skills, helpfulness, trustworthiness and so on, may give hope to expert witnesses of all ages.

4.9.11 The Expert Witness - Notes

The expert carried a folder of documents into court, to which she occasionally referred, without hesitation or confusion. This contrasted with some other witnesses who either did not have any notes, and so had difficulty recalling exact dates, places and conversations, or who had copious notes which they navigated with difficulty when they needed to refresh their memories.

Was the DNA Expert Well Prepared? (Written survey)



T1-JUR 2: (In the context of another question:) The expert carried in a large wad of paperwork but never used any of it... So *why bring it along? Was there evidence in those papers that the Prosecutor forgot to lead, or that the Defence lawyer was trying to hide?*

T1-JUR 8: (In the context of another question:) The DNA expert came into court carrying a big wad of papers, but never seemed to get into them. The right questions just weren't asked. So even though the evidence was totally objective and reliable, I suspect the lawyers just didn't want to go into it, or there just was not anything to go into.

The forensic biologist's efficient use of her notes was reflected in good scores from the jurors for being well-prepared. Nevertheless, while some jurors were impressed with the expert's ability to recall details and rarely look at her notes, other jurors took a slightly more sinister view of the expert's folder of documents. Two jurors wondered why more use wasn't made of the documents, and suggested that they contained things that the prosecution didn't want to lead and things to which the defence didn't want to refer. This puts experts in an interesting position, as no witness wants to attend court without notes which may assist their memory or assist the court. It is not desirable, however, for jurors to draw the kind of inferences about unused notes that were drawn in the trials studied. Given that the jury expressed feelings that information was being withheld from them during *voir dire*,⁶²¹ and particularly by the form of questions and objections

⁶²¹ This feeling of being "kept in the dark" has been documented in other research and is linked with jurors' inability to freely ask questions. Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? *www.criminal-courts-review.org.uk*, 1 at 54.

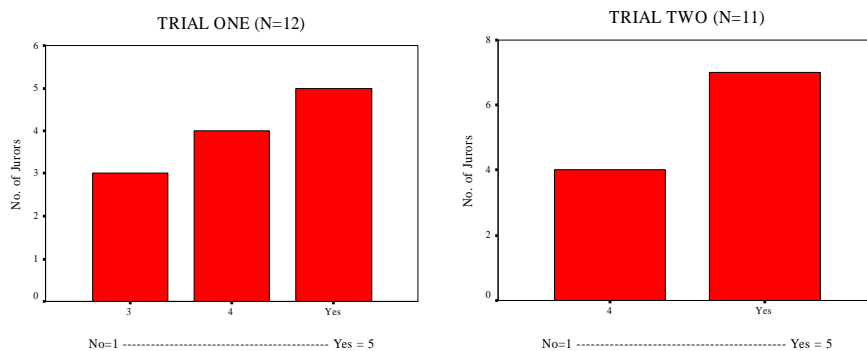
raised by the defence, it is disturbing to contemplate how something as seemingly harmless as a folder full of aide-mémoires can be misinterpreted.

3. WHAT USE DID JURORS MAKE OF AIDS TO UNDERSTANDING OF SCIENTIFIC EVIDENCE, AND WHAT AIDS COULD BE USED TO IMPROVE THIS UNDERSTANDING?

4.9.12 Things to Help Understand the DNA Evidence

Obviously the intention of the legal process is to provide a jury with sufficient evidence to enable them to deliver a fair and reasonable verdict which will duly punish the guilty and release the innocent. In practical terms, this process is not always without difficulty, and the sources of information for jurors – the lawyers, judge, witnesses, experts, and other jurors – may not seem sufficient for the task.

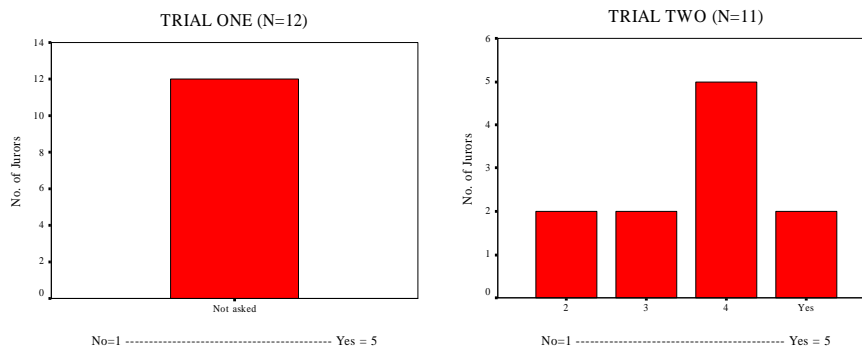
How much did these things help you understand the DNA evidence – The Expert's Explanation? (Written survey)



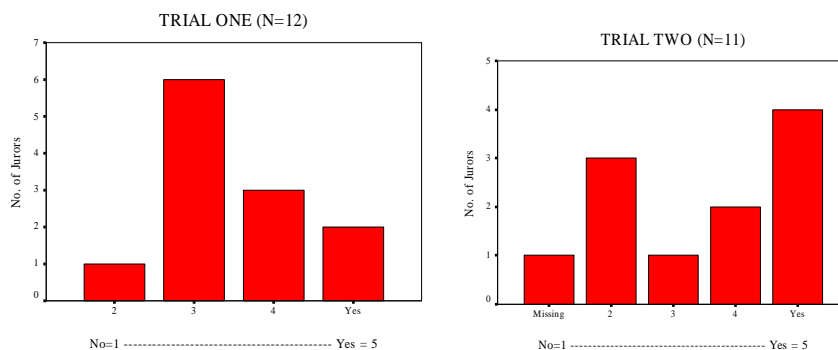
The forensic biologist who provided the jury with the sole source of evidence about DNA profiling appears to have accomplished the task admirably. The jurors in Trial Two were all assisted or greatly assisted in their understanding of the DNA evidence, because of the expert's explanation. Three quarters of the jurors in Trial One also found the explanation to be valuable in assisting their understanding. All reactions to the expert's explanation were either neutral or positive, in both trials studied.

In contrast, the explanations offered by the Prosecution and Defence counsel, and by the Judge, were not as universally helpful. Although their explanations were still helpful for many jurors, a mixed reaction was evident:

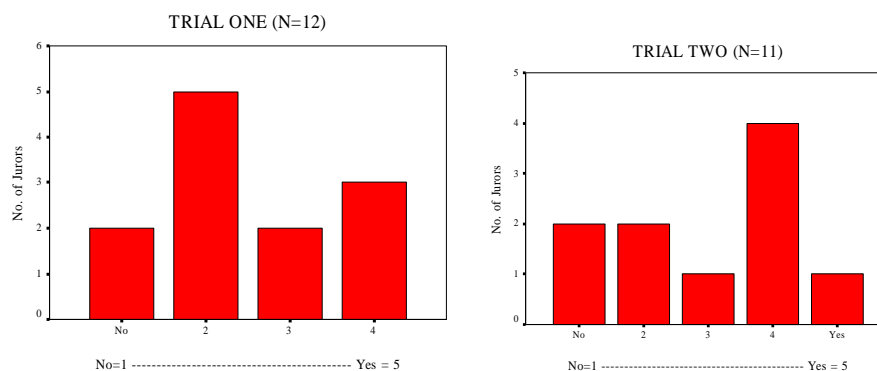
***How much did these things help you understand the DNA evidence –
The Prosecutor’s Explanation? (Written survey)***



***How much did these things help you understand the DNA evidence –
The Defence Lawyer’s Explanation? (Written survey)***



***How much did these things help you understand the DNA evidence –
The Judge’s summing up? (Written survey)***



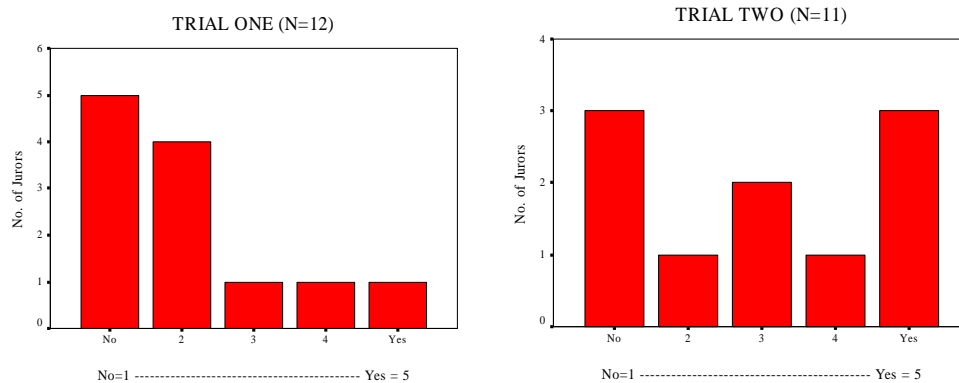
The Judge's summing up in Trial One was not found by most jurors in Trial One to be helpful in terms of understanding the DNA evidence. This is perhaps because the Judge simply read out extracts from the trial transcript, repeated the expert's definition and explanation of DNA profiling, and did not offer any reinterpretation of the scientific evidence, nor did he give any clues as to his own thoughts about the veracity, significance or effect of the DNA profiling evidence. For these reasons, it is not surprising that jurors did not rely heavily on the summing up when trying to understand and assess the DNA profiling evidence.

Jurors in Trial Two found the Judge's summing up to be of slightly more assistance in their understanding of the DNA profiling evidence, but the difference was not enormous. Similarly to the summing up in the first trial, the Judge recounted the evidence, and aside from not indicating any personal view, this Judge also reminded the jury that even if they thought they had detected his personal views, they were not to accord them any weight, but instead should rely only on the evidence.

Overall, juror reliance on the explanation offered by the expert witness is a reassuring find, because the expert witness was the only person in the courtroom with a thorough training in biology (and specifically DNA profiling) and who had conducted the testing and derived the results. It would be worrisome if jurors had to rely too heavily on explanations by other parties (for example, the legal counsel) for assistance in understanding scientific evidence; at the least this would be an indicator of poor performance by the expert witness.

Jurors are naturally also exposed to the assistance (or otherwise) of their fellow jurors. The collective wisdom of the jury room may have an important impact on how well jurors understand scientific evidence, so jurors were asked to rate the assistance they felt they were given by their peers.

***How much did these things help you understand the DNA evidence –
Other jurors? (Written survey)***



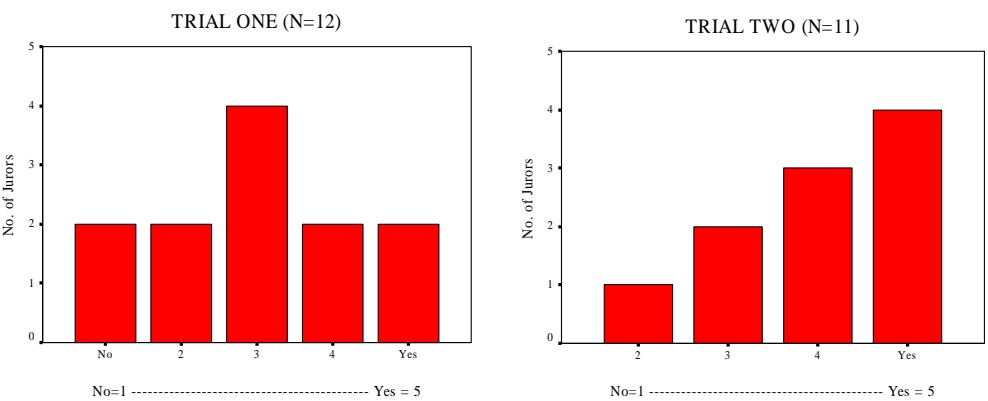
In Trial One, the results indicate that most of the jury did not benefit from the help of other jurors when it came to understanding the DNA evidence (n=10). This may reflect the strong opinions held by many jurors in Trial One about the capabilities and attitudes of their fellows. Recall that some jurors in Trial One were reluctant to trust the notes of other jurors, some jurors were strongly concerned about pro-prosecution and pro-defence bias, and other jurors in this trial felt strongly self-sufficient when it came to understanding the scientific evidence and forming their own views.

In Trial Two, jurors were evenly split with four of them finding other jurors helpful and four of them finding other jurors explanations unhelpful when it came to understanding the DNA profiling evidence. Three jurors were neutral on this subject, but the nature of the split reinforces what was revealed in earlier responses. Although some jurors in Trial Two found jury room discussion about the DNA profiling evidence to be helpful, others did not participate in any such discussion, or did not think that the discussion added anything to their own understanding. Of the latter jurors, many thought that the discussion was ill-informed, speculative, biased or inaccurate, and this explains why they did not find other jurors explanations of the DNA evidence to be helpful to their own understanding.

This is reinforced by the following responses, which indicate whether the jurors were assisted by their own knowledge, when it came to understanding the scientific evidence. Jurors in Trial Two seemed more self-reliant, with more than half of them reporting that their own prior knowledge assisted their understanding (n=7). In contrast, the Trial One

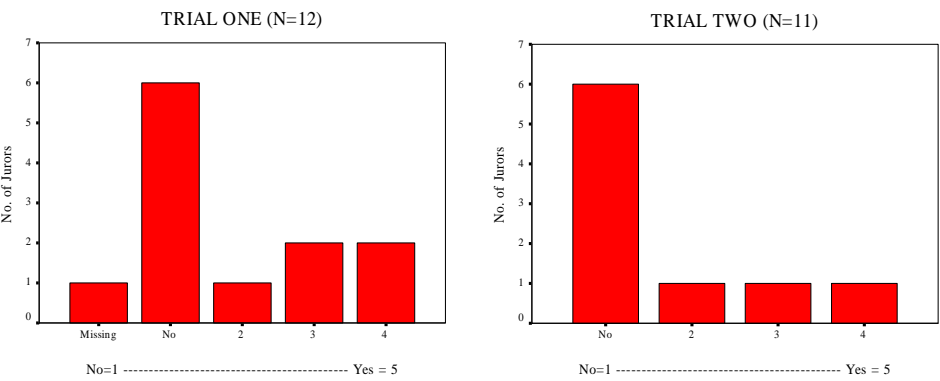
jury seemed to rely more on external sources, with only one third of them finding their own knowledge to be of assistance or great assistance in understanding the DNA profiling evidence (n=4).

How much did these things help you understand the DNA evidence - Your own knowledge? (Written survey)



Jurors in both trials were cautioned not to talk to family, friends or others about the case they were hearing, and in fact to limit all discussion about the case to the jury room, when all jurors were present. This request appears largely to have been heeded:

How much did these things help you understand the DNA evidence - Family or friends? (Written survey)



Few jurors from the trial researched indicated that they had had outside help in comprehending the DNA evidence. This may be because not only were the jurors given sufficient assistance by the forensic biologist and warned against seeking outside help

by the Judges, but the nature of the expert evidence is complex – few family members or friends may be likely to have in depth knowledge about the science anyway.

This is confirmed by more detailed questioning which was carried out in the telephone interviews:

What helped you deal with the scientific evidence & the case in general, by the end of the trial? (Telephone survey)

- ☐ The expert's explanations
- ☐ Your own knowledge
- ☐ Barrister's questions
- ☐ Judge's questions
- ☐ Prosecutor's closing address
- ☐ Defence's closing address
- ☐ Judge's summing up
- ☐ Other jurors
- ☐ Family members or friends

JURORS FROM TRIAL ONE

T1-JUR 1: **Expert's explanations.** I did not rely at all on my own knowledge or the Judge or barristers. I.e. thought the Prosecutor's closing address made it look like he didn't have much of a case; that is, just not enough evidence at all. I had expected the Accused to take the stand and was disappointed when this did not occur because it did not force the Accused to deny the allegations under oath. The Judge's summing up was a concerted effort to be fair to both sides, but I did take the warning that because there wasn't any fixed evidence the jury must be careful and not think that the issues were cut and dried. The Judge said "circumstantial evidence" at least three times – I attached some weight to this, to the extent that the Judge was warning the jury to be careful using the evidence.

T1-JUR 2: **Own feelings.** My general feeling is that DNA evidence can be relied upon because it is objective and is expert evidence. That is, society thinks it is credible. I did not rely on the expert's explanations or the Judge's questions.

T1-JUR 3: **Own knowledge & Judge's summing up.** I relied on my own knowledge, as I had been a juror in a brief assault trial the week before, and so knew about the elements of assault. I

also relied on the Judge's summing up, because the Judge gave a detailed explanation of the elements of each charge (even charges which looked simple had to be gone into in detail, because of the various elements).

T1-JUR 4: **Own knowledge & expert's explanations**, which were very commonsense and easy to understand, and my own knowledge about DNA (I am the mother of identical twins). I did not rely on other jurors at all.

T1-JUR 5: **Defence & other jurors**. I wanted to rely on the expert's explanations but didn't know enough to know what the evidence meant. I *needed more than just photographs* (that is, of the incinerator, bedroom, et cetera), *I needed explanations*. I relied somewhat on the Judge and the Defence lawyer when they emphasised "beyond reasonable doubt" and because the Defence lawyer was so forceful. I did rely on other jurors to some extent, because talk did occur between them.

T1-JUR 6: **General knowledge** and background in science to understand the DNA evidence.

T1-JUR 7: **Own knowledge & expert's explanations** were very helpful. This was the most influential thing that helped me deal with the evidence. Also, my own knowledge about what DNA could provide. No weight was put on the words of the barristers and Judge, because their role was just to extract information – I put more weight on the expert herself.

T1-JUR 8: **Expert's explanations & Defence Counsel's questions**. Even though the Defence lawyer's questions were leading, they did help to extract the information. Between the Defence lawyer and the expert, the jury gained an understanding of how far the DNA evidence did or didn't go.

T1-JUR 9: **The expert's explanations**. I had no background knowledge about DNA. I had heard of DNA, but thanks to the expert now have a better understanding and knowledge of how long it can last, what conditions it needs et cetera.

JURORS FROM TRIAL TWO

T2-JUR 1. **[Expert's explanation.]** The most important, without a doubt, was the experts – you had to rely on them. We have our own conceptions of what these things are, and what they mean, but they're not always reliable. I mean, my own, or when other jurors have put forward their views, you think 'that's feasible', but we don't know for sure whether what we know is true. A little bit of knowledge is dangerous. I suppose in terms of the whole scientific evidence thing, there were two aspects to it that would influence you in making a decision. Now I suppose,

technically, only one should, but both do. And that is, the first one is the hard facts – he was there, he wasn't there; the bruises, you know, the wound was there, it wasn't there. Then you get into the second part, which certainly influences your thinking, even if you are determined not to allow yourself to be swayed by what legal arguments are put forward, I think, I believe there is an influence. And that ranges from wounds being "consistent" or "inconsistent" with things, you know, if it's put that way. And also the legal cases that are built on evidence, I think, I suppose, what the Judge was talking about inference – when inferences are drawn from – and that's either by the counsels or by the jurors themselves in their minds. So there's two parts. For example, in this case, specifically, there were wounds there, or there were injuries there, I should say, on [the Complainant] in both instances. Now, you went straight from the fact they were there, to an inference. And the inference determined whether you thought that they were consistent, which meant they could equally be inconsistent ...I'd put 'consistent' as opposed to 'caused by' –It's not a definite. But that's moves into the second part, which is inference, and I think That is, even within the juror's own mind, that is something that is influenced by legal argument and legal questioning of experts – medical and scientific experts. So there's two parts to that. Does that make sense?

T2-JUR 2. The expert's explanations, barrister's questions, and Judge's summing up. The experts' explanations I accepted as fact, which was like a lifeboat in a rough sea of lies. The barristers' questions were helpful regarding the scientific evidence, but in the circumstances of this case, the motives and claims of the barristers themselves became suspect. Even so, most helpful was the Prosecutor's frank admission in her summing up that her case rested entirely on the credibility of the Complainant. [The Judge's] clear interpretations of questions of law were also very helpful. Least helpful was the questionable efficiency of the evidence gatherers at the crime scene. Numerous items that should have been seized for examination or investigation were not. And no fingernail scrapings were taken from the Complainant.

T2-JUR 3. [Expert's explanation]. Oh definitely the expert's explanation. I didn't have a lot of DNA - I know it's unique and everybody has their own DNA et cetera, but she did explain on how accurate it is and how it has to be acquired under certain conditions, et cetera. So it left no doubt in my mind that what she did provide was very accurate information.

So it was her explanation, more so than the Judge or the lawyers that –

Oh absolutely, yes. Definitely. They weren't very helpful at all. Oh, the Judge was good. I must admit, I was very impressed with the Judge.

T2-JUR 5. [Judge and Defence Counsel]. The least helpful was the other jurors, because some of them probably have an IQ of about 80, I suppose, I don't know. And they just didn't want to take any of that into account, they just decided the person was guilty because he had boots on – that sort of mentality – or because he had a glass eye, or things like that, or they didn't like the way he spoke about his wife in the interview. [It was] three or four [jurors]. They

really made it up, they didn't really care about the lack of DNA evidence, you know. They just took one look at the person and they know they're guilty, you know. That was what they were going to stick to. I mean, they didn't say that in so many words, but it was obvious.

I suppose it was, in retrospect, the summing up and also the opening address, and the summing up of the defence, and also the summing up of the Judge.

But not the Prosecutor's questions?

Not really, no. Well, in a way, in a backhanded fashion, because it was what she didn't explain and what she didn't do, it made her – she had questions, and then of course, the charge; the defence confirmed those [sic], when they had their turn to speak.

T2-JUR 6. **[Expert's explanation & Counsel's questions]**. Well, probably for me it was just the forensic evidence. Yes, the expert, but probably in the questioning of the defence and prosecution. You know, probably that whole, her being on the stand and the questions being asked, both ways, yes.

T2-JUR 7. **[General knowledge]**. I think my previous knowledge, and just what she said went with what I already knew, so.

Do you have a background in science, or..

No, no, it's just you know, just knew it – but I suppose she did tell me a lot, because I didn't really know some of what she said, so yeah, that was helpful as well.

T2-JUR 8. **[Expert's explanation]**. Probably, I guess being able to understand it and the evidence, I mean, the way she described it in layman's terms, and the questions she was asked, either by the barrister or the Judge or whatever else. But bearing in mind that I knew there were limitations there – there were lots of questions still hanging in the air – but you can only sort of discuss or analyse or make judgements on what you're given in the trial. So I'm not saying it was satisfying at all, it was just that I understood the dynamics that were there.

T2-JUR 9. **[Expert's explanation, other jurors, general knowledge]**. Umm, probably the expert, and just the other jurors and my own understanding going in as well. Oh probably just the general knowledge, you know and things you read about and see, which I'm sure you shouldn't believe all of anyway, but.

T2-JUR 10. **[Expert's explanations & Judge]**. A combination....Well, it was interesting hearing the expert talking, and I think that was important. The Judge also helped with asking questions that weren't really asked, but I suppose yes, it was just a combination of everything, it wasn't one thing or the other. I don't know, I guess I understood a certain amount of it, but then, yes, no it was a combination.

Once again, the expert witness was the most helpful source when jurors were attempting to understand the scientific evidence and fit it into the context of the case (n=11). This was followed by reliance on the jurors' own general knowledge and confidence in DNA profiling as a technique (n=6), which raises the issues already mentioned about whether the general public has an accurate understanding of forensic science, based on the limited and distorted information presented in entertainment and the media. Only one juror reported a background in science, which may better have equipped them for understanding the expert evidence in this case.

Marginally more helpful than either of the Judges (n=4) or the prosecution (n=2), was the Defence Counsel (n=5) when it came to helping jurors understand the meaning and significance of the DNA profiling evidence. Jurors attributed this reliance on the defence to the fact that Defence Counsel presented the case extremely forcefully, and even if they didn't fully understand the science, they could always hark back to "reasonable doubt", which was also mentioned by the Judge.

Very few jurors relied on other jurors for help in understanding the scientific evidence (n=2). This confirms earlier comments which suggest that some jurors did not trust the ability of their fellow jurors to take accurate notes, maintain an objective view, or to comprehend complex issues.

4.9.12 Court Processes – Questions and the Trial Transcript

As the opportunity of both juries to ask questions was relatively constrained (especially compared with the ability of the Judges and lawyers to ask questions), it is likely that the situation was "less than conducive to facilitating jurors' comprehension of complex matters."⁶²²

In both trials, it was only during the summing up of the Judge (after all of the evidence had been given) that the jurors were informed that they were permitted to ask questions. In both trials, the juries went on to ask questions during deliberations. When this

⁶²² Thomson, D. M. (1994). Towards a More Effective Judicial System: Matching Requirements of the System to the Capacities of the Users. In L. McConkey & H. Wilton & A. Bernier & A. Bennett (Eds.), *Australian Psychology: selected applications and initiatives* (pp. 1). Melbourne: Australian Psychological Society at 8.

happened, the questions were read out by the Judges to the court (when the juries were absent), the questions were discussed by Counsel for both parties and submissions were made to the Judge as to how the questions ought to be answered. Ultimately, the questions were answered by the Judge reading out sections of the trial transcript to the jury. Some jurors took notes, although most did not. At no time were jurors given access to the trial transcript.

Were there any times when you (or the jury as a whole) would have liked to ask questions about the scientific evidence? What kind of questions? At what point in the trial would you have liked to ask these questions? (Telephone survey)

☐ Yes

☐ No

JURORS FROM TRIAL ONE

T1-JUR 1: **Yes.** During deliberations the jury did ask for a written copy of the charges, because they did not trust the veracity of their notes. The Judge refused to give them a copy but said he would read them out. Having the transcript read out was not a satisfactory answer as *it did not overcome the problem with accurate note-taking, was time consuming and tedious*. Therefore, when the jury wanted to ask about the DNA evidence, they did not do so because (a) they didn't think the Judge would help (by giving them the transcript) and (b) the questions they wanted answered had never been asked, and so would not have been on the transcript anyway. This was very frustrating and the jury were unhappy with their lack of access to (what they perceived to be) important information; the transcript and additional questions.

Examples of additional questions that the jury wanted to ask; what was in the incinerator at the Accused's house? Forensics photographed the contents and the jury were given photographs. However, when the Prosecutor was leading the evidence his questions just asked the witness to identify the items generally – for example “does that look like melted pieces of metal?” “Yes”. “Can you see a melted red mass in the top corner?” “Yes” et cetera et cetera. The Prosecutor needed to ask the witness more useful questions like “is that melted red mass consistent with the red tape allegedly used in the second attack?”; “are those metal items consistent with the collar and cuff device allegedly used in the second attack?” The Prosecutor just did not seem to draw anything from this potentially useful evidence. Without these questions, the Prosecutor's case seemed very weak and the incinerator evidence was useless to the jury. It made the

Prosecutor's case seem very poorly prepared by the forensics team. Some jurors tried to draw evidence from the incinerator, but this was abandoned, especially when the Defence lawyer pointed out that there really was no "evidence".

T1-JUR 2: **Yes.** Many jurors wanted to ask additional questions as the evidence was being presented. For example, when shown the photos of the contents of the incinerator, and after hearing the examination-in-chief, many jurors wanted to ask "What are the materials in the bin?" They did not ask these questions because they did not think they were allowed to do so. It was only after the Judge summed up that the jury thought they could ask questions, and even then they thought their questions must be restricted to what was in the transcript.

The jury thought a lot about the pillows placed under the Complainant. There were many questions that seemed obvious but the DNA expert was never asked to say anything about it. Jury wanted her to say "the pillows were examined and no DNA was found" or "the bike was examined and the soil did not match the soil at the Complainant's house" et cetera et cetera.

T1-JUR 3: **Yes.** Right from the very beginning, when the Complainant gave evidence as the first witness. The jury had questions that were in addition to those asked by the lawyers, but the jury *knew that they were restricted to asking only about questions that would be in the transcript*. I also thought that the jury was not allowed to ask questions during the trial. Even when the Judge summed up and said that questions could be asked, and that the transcript would be read out to them, the jury as a whole had the impression that their additional questions (no matter how important they were, or how crucial to the verdict) could not be asked.

T1-JUR 4: **Yes.** The jury wanted to get hold of transcript to clear up misunderstandings – some jurors heard things completely the opposite of what other jurors heard and so everyone wanted to re-examine the exact wording used. The jury did ask for transcript during deliberations and guard said that it could be read out to them by the Judge. The jury thought this was totally impractical. It was never going to be an issue of the jury re-hashing the whole trial by reading the transcripts. There were only certain sections of evidence that they wanted to go over again.

As well as not getting the transcript, the jury thought that they were not allowed to ask questions that hadn't been addressed in the transcript. For example, why was the Accused's boarder already moving out before the Complainant came over to evict her? I was especially upset about the lack of questions on this 'eviction scene' and thought that the Prosecutor could have done a much more thorough job in asking the boarder and re-examining her to clarify the issue.

T1-JUR 5: **Yes.** We wanted to ask about incinerator, doona et cetera, but did not think they were allowed to ask during trial. Then, during deliberation, when the jury thought they could ask

questions, they thought they could only ask questions about things that would be already in the transcript.

T1-JUR 6: **Yes.** Absolutely. At times the jury had more than 10 questions they would've liked to ask. In fact, apart from asking more questions of the existing witnesses, the jury would have liked to call in extra witnesses. This was so all during the trial, and in deliberations. During deliberations the jury did ask the Judge about the legal definition of one of the charges. The jury did not bother to ask the Judge for a reading of the transcript at any point (even though they knew they were allowed to) because: (A) Many jurors had taken notes, and by going through all of these notes it was possible to determine which ones were fairly accurate. Therefore these notes were accepted as enough to go on with. (B) Jury did not think it was worth it (that is, having everyone called back into court). This didn't mean the jury was taking their duty lightly, just that they thought they had enough information in the reliable notes, to use for deliberations.

T1-JUR 7: **Yes.** Many times throughout the trial, but especially during the *voir dieres*, the jury would have liked to ask many questions about the evidence (including the DNA). For example: did the Accused have bruises from being hit by the Complainant with a hockey stick? It seemed an obvious thing to look for, given the Complainant's version of events, but no-one ever did. The questions they wanted to ask were in addition to those that had been asked in the transcript. They also wanted to go over questions and answers that were in the transcript. That is, some things needed to be clarified and some things were just never asked. These extra questions (outside the scope of the transcript) were vital in the hung jury result. The jury just did not feel that it had enough information to work with.

We thought about asking questions but thought we were not allowed to. Did get message from the Judge that questions could be put in written form, but this was towards the end of the trial. During the evidence itself, jurors felt like putting up their hand and asking questions of the witness themselves (but they knew this was not allowed).

The jury thought the police investigation was very poor. So many aspects of what could have been useful evidence were left unexplored, and the gaps seemed exceedingly obvious to the jury.

T1-JUR 8: **Yes.** All through the trial, I was *a/ways* wanting to put my hand up – where is the bike? Where are the tools, plastic sheet et cetera? The jury was given photographs, but these never went to the meat of the argument. So many questions stopped before any sensible point was reached. The case finished too suddenly, with too many loose threads. The jury expected and wanted more information.

T1-JUR 9: **Yes.** Some jurors wanted to ask questions while the evidence was being given, but all assumed that they were expected to sit quietly. Some wanted transcripts during deliberations and all jurors assumed that they could only ask questions which could be found in the transcript. During deliberations the Judge was asked about elements of the charges and about the alibi witness. *It never occurred to me that the jury could ask a witness to come back and give extra evidence.*

JURORS FROM TRIAL TWO

T2-JUR 1. **Yes.** Yes. I did have questions. I'm just trying to remember. There were... Oh, I had one specific question for the medical, that I would have asked if I was in the prosecution. Well, that depends on what the answer would have been, but I think it related to bruises – I really can't remember. I'm just trying to jog my memory. There had been the evidence-in-chief, then during the cross-examination the defence counsel tried to basically undermine the strength of the evidence in support of the case, as you'd expect they would, and there was a question, or two questions, I thought the prosecution could have usefully asked. And I can't for the life of me remember what they are. But there were questions, and I can speak for the other jurors in as much as I know that there were at least, I think, two or three other people, at one stage or another, asked me if we could ask questions, and I had to say "no", because we don't.

I remember what the question was. The questions was DNA evidence – because the defence counsel said, basically made the point, that if you'd been in a room, you know, you're going to leave DNA behind. It just takes a drop of sweat, a hair off your head, you know, something off your finger, and the question I would have asked as the prosecution is – two questions – and the first question is "how hard is it (or easy, whichever way you want to put it) would it be to go into a room when someone has been in there and not collect DNA evidence that they'd been there, as in "yes, it can be as simple as a drop of sweat or a hair", but because it can be so small, how easy is it to miss it. I mean, how are you going to find that drop of sweat?" So I mean, I would have asked "OK, just because it's very easy to find, it can also be incredibly hard to find, because..."

The second question I would have asked is "How easy is it to disguise your presence, in terms of making DNA available?" I mean, what sort of reasonable precautions could you take, to limit what you're going to leave behind, and clean up after it? I mean we had the drop sheet, et cetera, that were there, but I would have asked that question, because I think in both instances it would have helped the prosecution, because they would have said "I could come to this room when ten people have been in here, and *not* found anything." Just because they didn't do what I needed them to do. And the other thing is, I would think that reasonable precautions could be

taken, fairly easily, which would cut down the chances of you leaving behind DNA traces, substantially.

It was in deliberations as well. The DVO⁶²³ question – do you want me to tell you what that was in relation to? What happened was, we were watching the taped interview of the Accused and there was a section in there - you could probably find it in the transcript – but towards the end, he stops completely what he is saying, changes tack and says something like, to the effect that “I know, [the Complainant] would’ve told you that I locked the screen door” or the “back door”, or something to that effect and he looked, when he said that, he looked at a piece of paper on the table in front of him, which we assumed, through watching the tape, was the DVO. Now, it struck us as the sort of evidence – the sort of comment – that he only would have made if he had access either to her statement or to – basically would have known what she’d said or what the allegation was. Because he changed tack. So we were trying to work out how he knew it, so that’s why I asked what was on the DVO, because we were looking at the level of detail that might have been on that piece of paper if it outlined the allegation. Whether it just said, you know, “sexual intercourse without consent”, or whether it said “He came in, locked the door...” Details. So that’s what I was looking for and that’s why, when the defence moved onto a side issue with the DVO I said “No, that’s not important”, because we just wanted to know what you would see on a DVO, because we assumed that’s what he had in front of him.

...It wasn’t super-crucial and our judgement didn’t hang on it, but it was just something – I mean, I think when we were watching the tape, three or four people, including myself jumped at that and said ‘hang on, hang on, hang on, where’s he got that from?’. It’s sort of like – the example I gave other people – and it’s an exaggeration for the sake of analogy but, it’s the sort of thing where, say, I was the Accused and I’d said that I didn’t even like the pink dress, and they’d said “but we never said anything about a pink dress”. Do you know what I mean, like, why would he have made that comment there, without knowing that that was something that was going to be addressed –

We checked out, for example, the [witness name] side issue to see whether he [the Accused] could have heard from [the witness]. But it became clear there that the conversations he’d had with them had been pretty short and sweet and they certainly wouldn’t have given him any detail to that level. So that’s why that comment.

That was a question we wanted, that we were asking in deliberations, and there would have been a few questions that would have been asked throughout the course of the trial, I think it would be fair to say...If we could have. I don’t think that’s going to change and I don’t think it can change because...I’m no legal expert, don’t have legal qualifications or anything, but I put in my comments on a sheet on things that could be improved. I think there are elements of the

⁶²³ Domestic Violence Order (see *n611* above).

whole jury selection process – it could be improved, but I have no suggestions, and I haven't heard any reasonable suggestions, or... for how it could be improved.

T2-JUR 2. **No.**

T2-JUR 3. **[Yes].** Oh, yes, absolutely. We found whole sections of questioning quite irrelevant, and there were obvious questions that they could have asked, that they didn't. That really related mostly to the rest of the trial though – with the scientific evidence, as I said, a very good explanation was given, on the evidence that they had to go on.

T2-JUR 5. **[Yes].** Well, I don't know about the DNA evidence, but just the evidence in general. You know, there were a couple of times when I wanted to ask something, so yes. There was a few things – like the amount of blood at the scene, was it consistent with the injuries that she was supposed to have sustained? It seemed like too little blood to me, not that anybody was interested in hearing what I had to say about that. But when someone's injured with that sort of implement, like that, well the ground sheet wouldn't explain that. I just thought there should be blood everywhere, you know. And it was the same thing with the alcohol. They finally got to that at the end of the summing up, I think. The forensic expert also hit on it finally, to some extent, but my first reaction, when I heard it was a two litre bottle and you were forced to drink three quarters of it – you wouldn't just be unconscious, you'd be dead, or at least comatose. And if you weren't in hospital within a very short space of time, having your stomach pumped, you'd be dead. I mean it's almost like pure alcohol, vodka. So that kind of insulted my intelligence, you know. So I just thought – and to have a reading of 0.9 only three hours after, or whatever it was – three or four hours – I just thought 'no, that's not possible'. I mean I don't know a lot about it, but I wanted an expert to tell me that, and there was no-one doing it. So I wanted to ask that question too: Would you expect to get a blood alcohol reading like that, in that space of time, or would you expect it to be a lot higher?

And of course we're not allowed to ask questions. You know, we were only allowed to ask questions about what someone said, aren't we, and things like that? Maybe we were wrong, but I got that impression, like I couldn't just ask a question that hadn't been asked, I could ask about evidence that had been given. So I suppose when I think about it, maybe we could have. I'm not so sure now, but I think they should be. Absolutely. I think we need to have it cleared up straight away, before you move on.

But there were so many other things: Like the keys lying in the garden, for one, like the phone card – did they take that away, did they test it for fingerprints? No, they didn't. So I don't know why they were showing us the photo, because they didn't test it for anything. It was quite strange. The hockey stick didn't get taken at any stage, even the saucepan that he was supposed to have brought along, and bashed her in the head with, that wasn't tested – he

tested it for prints, he said, and left it there, but they didn't test it for [the Accused's] DNA. So that, you know – they didn't test it for her DNA from her head, to match her head wound, and they didn't take it – the hockey stick wasn't tested for any of his DNA, so. You know, there were two opportunities lost, two or three there.

T2-JUR 6. **Yes**, but I think what our decision was, when we were in the jury room, was that we could only take what was given to us. We couldn't ask extra – because we had tried that and we weren't given it. We could only sort of use what we were given.

[We wanted to ask questions] all the way through. There was quite a few. Probably not about the DNA, but more about the first trial, and different things like that. Yes, probably not the DNA, but lots about the first trial – whys and why nots and all that sort of thing.

Well we went in after, I think, the first day and asked something about the first trial, and all we were told was 'yes it had gone to trial before', and....Nothing else. It got very frustrating.

T2-JUR 7. **[Yes]**. Of course. All the way through we would have liked to ask questions. Why it was only certain things that they tested for DNA. Could there have been more things they could have tested?

T2-JUR 8. **[Yes]**. God yes. I think the questions – not so much about the scientific evidence but what the evidence presented meant. The questions were more about, well, why didn't the police do X, or why didn't somebody else, or why didn't some other party do something. Or what was the reason for? Yes, just sort of pointers when you were trying to synthesise the whole lot of it, we had questions about other aspects.

Things came up regularly because of the amount of information, the dates, the facts, all the way through. Again, what was that fact, what was that piece of evidence, what was the date? And sort of the more you were informed the more you sort of cross-checked back again.

Would it have helped you to have had the transcript with you for questions like that?

Yes, well you would have heard when we asked that several times. It was just to check points of fact, I mean, it wasn't that we wanted to mull through the whole thing through again, it was just as a reference to factual parts of the evidence. Because again, like any group of people they will all hear things and interpret things differently, so we wanted to sort of diffuse that whole part of the conversation going around and around about what might have been the actual facts, and just refer to it, and then you could just move on. So that was rather frustrating, to think that it was quite unusual to have that requested. We tried to get it a couple of times.

T2-JUR 9. **Yes.** I just remember being in there and saying “well, we can’t go in there and ask that, because the prosecution or the defence never asked it, so we’re trying to ask our own questions.” Because you can only call on what evidence has already been given. But I don’t remember what it was about, sorry.

It was during [the trial], and also when they’d finished asking questions; not at the end of the trial, but at the end of a witness. You’d sort of wish they’d asked something. Or even when they were on a line, you know, going along a line, you’d sort of wish they’d ask, to clear up in your own mind something. And at the end, as well, when you’re going through the evidence.

T2-JUR 10. **[Yes].** Well yes, because we would have liked to have known why so much wasn’t taken, and why they didn’t do the shoes and why they didn’t – and we appreciated that the Judge helped us with how long the DNA lasted for – you know, why wasn’t it done, more samples? Well we did find out about what was in the saucepan and that – they didn’t take that because it was no point – so we did understand that in the end, but I mean we had a lot of questions that we had thought of during it, but by the end of it we had a lot of the answers, you see. So our earlier questions for the DNA and the questioning were answered further on in the track, and I guess we understood that you know, you can only understand the thing when it is completed.

Several themes consistently emerge from these responses, both in the first trial and the second. Firstly, the convoluted way in which questions were asked and answered resulted in the juries asking fewer questions. Not only were the jurors unhappy with the answers read out from the transcript, but a major source of difficulty was the notion that they could ask questions *only* about things which had been directly addressed in court. This is a misguided notion, because whilst the Judge was unlikely to entertain questions that were not relevant to the case, if a witness needed to be recalled so that additional questions could be asked, then this may have been done. However, the juries’ initial misunderstanding about the potential scope of what they could ask, limited what they did in fact ask. Not only did this cause widespread frustration, but it became a source of speculation for some jurors, who wondered why particular witnesses had not been asked particular questions by either of the legal teams. This kind of speculation extended to why the DNA expert was not asked about finding additional sources of DNA at the crime scene, and whether in fact the DNA expert had actually excluded the Accused as a contributor to the DNA at the crime scene or whether clever wording had just made this seem to be so. The experiences of the jurors in these trials are not dissimilar to reports of other cases in Australian jurisdictions, where

“[C]itizens may look for facts and explanations which the prosecution is reluctant or unable to present, accuseds prefer not to disclose, or judges cannot admit into evidence”.

In terms of access to the trial transcript, some jurors reported that unfettered access to relevant parts of the transcript would have assisted them in determining things that were unclear or in dispute from their own notes. Neither jury were permitted to see the transcript, although both Judges read out excerpts from the transcript in response to specific questions from the juries. Clearly this was a time-consuming and ultimately dissatisfying experience for the jurors, who were disinclined to ask further questions (knowing that the answer would be a recitation of the transcript).

Particularly in Trial One, some jurors did not understand that they could ask questions at any time during the trial. Although in practice this habit may be discouraged (not least because constant interruptions by jurors with questions would severely disrupt proceedings), it is not a rule of the court that questions from the jury must be restricted to deliberations. This was not a major concern however, as some jurors noted that their questions were often answered in the course of later proceedings, so that they need not have asked them at the time they occurred anyway. This phenomenon has been reported in the literature and indicates that although jurors may have what they believe to be compelling questions in the course of the trial, there is some merit in suggesting that juries are not invited or encouraged to ask questions until the trial has concluded and deliberations have commenced.⁶²⁴ The advantage of this may be negated however, if the questions are not answered within the trial and witnesses need to be recalled at a later date, and authors in the cited research concluded that

“The need to leave some juror questions unanswered [because they are inadmissible or because they will be answered in the natural course of the trial] offers no justification for missing the opportunity to assist jurors on reaching well-grounded decisions.”⁶²⁵

In the context of these trials, neither jury had compelling questions about the content of the DNA profiling evidence that was presented in court. Given that the scientific

⁶²⁴ Diamond, S. S., Rose, M. R., & Murphy, B. (2004). Jurors' Unanswered Questions. *Court Review*, 41(Spring), 20 at 26.

⁶²⁵ Ibid. at 29.

evidence was straightforward, and involved no statistics or area of dispute, this is unsurprising. However, a major issue that both juries had with the DNA profiling evidence was to do with evidence that had *not* been collected, samples that had not been *tested* or *detected*, and the significance of these omissions. These were questions which could have been answered by the forensic biologist or crime scene examiners, but because they were not asked during the examination-in-chief or cross-examination, the juries were left to either speculate about the possible answers or simply lament that they did not know them.

4.9.13 Other Resources

Would it have helped you to have had science textbooks or other resources like that in the jury room? (What else?) (Telephone survey)

- ☐ Yes
- ☐ No
- ☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **Maybe.** Additional resources might help explain, but the material must be relevant. Perhaps the expert could bring it? In this particular case it would not have helped the jury to have a copy of the DNA report, because it did not seem to have relevant answers in it anyway.. Before the case gets to court the lawyers should get together and sort out what evidence they have, rather than leaving so much of the work to the jury.

T1-JUR 2: **No.** Even having access to the transcript was not necessary. All of the evidence was pretty straightforward. I took notes at first and then gave up. I just listened and only took notes about certain details. For instance, I noted that the Complainant burst into tears every time the Defence lawyer pointed out that her story was wrong and stopped crying when the Defence lawyer pointed out this fact. I also took notes about the size of the bruises on the Complainant, because although it seemed like there were many bruises, and the photos made them seem very big, some of them were only very small (1 cm x 1 cm). Notes like this were useful in deliberations when the jury were discussing the use of force against the Complainant.

T1-JUR 3: **No.** this would be overloading the jury. They relied on notes, the Prosecutor and the Defence lawyer and even other jurors to fill in gaps in their knowledge of the evidence.

T1-JUR 4: **Unsure**. The transcript could have helped to sort out the jurors who had misheard evidence and yet insisted that they were right. Any other resources would have to be very case specific otherwise they would not be necessary or useful. Might need to ask jury as they go along, to see what they need.

T1-JUR 5: **No**, but could have done with more explanation from expert. I also wanted more pronounced and definite answers. I wanted a definite and precise summary of the evidence; I needed to be walked through it, but never was.

T1-JUR 6: **No**. Between the 12 of them, the jury had enough notes. It might have helped to have a copy of the transcript, as it would have been much quicker than going through 12 sets of notes, and more accurate too. Didn't need textbooks et cetera because did not need to know how DNA profiles were done, to rely on the results. This would just overload some jurors and waste time. Besides, if the court is calling "experts" then it is almost demeaning to force them to over-simplify their work for lay audiences.

T1-JUR 7: **No**, this would have been overloading the jury. Much better to have clear, simple explanations by the witnesses, especially about what DNA could prove and could be used for.

T1-JUR 8: **No**. This would have been too much information and also a distraction. Jury needs to just concentrate on the elements of the charges and the evidence itself.

T1-JUR 9: **Yes**. For example it would have been helpful to have resources about how the alcohol level in a person changes over time. It would have helped to have something in writing when the jury was discussing the Complainant's blood alcohol reading (from the vodka). Jurors were drawing on their own knowledge about how alcohol levels subside over time, because no witness was asked to address this point.

JURORS FROM TRIAL TWO

T2-JUR 1. **Possibly**. I can't say that's a strong possibility. It would depend to what level you go to. We did have questions of a more technical nature. One example would be that DVO; we just wanted to know not necessarily what was on that DVO, but what sort of information you get on a DVO. So that's one example where – there were a couple of times we wished we could have possibly – not so much on scientific evidence, I don't think – but possibly on legal matters. I mean, on legal matters you basically ask the Judge, because he's there as a resource to use, which is what we did when we wanted to double-check on consent and recklessness, or being reckless as to consent. I'd say it's possible that. The problem there is that I personally think that

if people knew they had access to all sorts of stuff, it could become unnecessarily bogged down. People may become more focussed on detail or aspects of the case which, while interesting, don't directly bear on the decision – what we're there to do. So I think it'd be useful in some instances, but I think you'd have to determine – I don't know that you could determine it case by case – but I wouldn't think it would be necessary to have it open on all cases and have everyone sort of told, you know "anything you want in terms of information, just ask, and we'll chase it down for you", but if it was a case where there was a lot of scientific evidence, with a lot of technical terms that were sort of beyond the legal framework...See, the jurors don't have a recourse, as far as I understand, to ask questions of a technical nature once the – or even before – but certainly once the experts have been dismissed. So if you had a follow-up question, even fairly simple in nature, then that may offer some recourse through which they could be satisfied.

But, to a certain extent it comes down to – as I understand it, the role of the jury is to make a decision as best they can, based on what they're given, and that's through the court process, obviously. And our case was a very good example of that. We couldn't reach a decision because we didn't get enough. I'm not saying that if we'd had access to resources outside then that would have helped in that case, but...and that's not our fault. I mean, people find it frustrating, but you sort of have to say 'look, they're the ones who are putting it to us, we just have to work with what we're given.' Because, I did it myself. We all sat there and at one stage I said 'gee, wouldn't it be good if we had this' or 'wouldn't it be good if they'd asked that', or 'wouldn't it be good if someone could've answered that'.

Was that frequent?

Relatively frequent, yes. Particularly on the DNA side of things...If more had been done at the crime scene, if different tests had been done. I mean, you would know, having sat in there, that there were a number of tests that they said "We could have done this but we didn't". There were a number of times where people said, for example, 'the hockey stick – why wasn't it seized?' Mainly because I think – I don't know if that's a fair comment – they were looking for anything and everything that could link, or clear.

T2-JUR 2. **Unsure.**

T2-JUR 3. **No**, not in this particular case, because we could clarify any questions we were unclear about, or any information. But what I found frustrating is, that we could only clarify on evidence that had been given in the trial. Whereas we wanted other thing clarified. And when we asked the question about what information is on a Domestic Violence Order, there was a real reason for that, and that was because we were watching the interview of the Accused again in the jury room, and there was a moment there where he said "And she said that I locked the door behind me." And then he had a piece of paper that he was shuffling through, in the video,

which appeared to be the Domestic Violence Order – Because he wouldn't have had access to her statement - I mean, that would have clarified a lot of things for us. If it wasn't on the Domestic Violence Order, then he couldn't possibly have been telling the truth, because he wouldn't have known that she would have said that – and you know, and she said “and I locked the door behind me”. But unfortunately there wasn't any light shed on that one, because we didn't get an answer at all. And that certainly would have assisted us. So there were things like that that we found very frustrating, because that would have assisted us greatly in making a decision about the first charge. And if we would have found him guilty on the first charge, then there would have been not as much doubt about the second and third. So it was extremely frustrating, and I don't think anyone realised what a stumbling block it was – We kept asking the question, and defence kept going on about different aspects of Domestic Violence Orders – I don't know what she even got that inference from, but, yes.

T2-JUR 5. **No**, no, no. I don't know what sort of use we could have made of them, really.

T2-JUR 6. **No** I don't think so in this case. It was pretty obvious what was there and what wasn't there. It was more the fact that there wasn't any of his DNA there.

T2-JUR 7. **No**, not with the DNA, I don't think so. It would have just been another thing you would have had to have a look at, and read.

T2-JUR 8. **[No]**. Because I thought I understood things, not for me at that time. I would prefer the job to have been done about the explanation in the actual courtroom, than have to rely on us to have to be sort of quasi-researchers when we were deliberating – I just don't think that's appropriate. But if you were left with a question, there is still a capacity to ask that through the foreman I think.

T2-JUR 9. **No**, I don't think so. Not me personally – it might have other people.

T2-JUR 10. **No**, not really, because there was no time really even with deliberations, such as they were, because there wasn't much time for that in lots of ways, because by the time we were excused to deliberate it was afternoon on the Monday, so we finished after 5, and then it was the next day and we had the one day and although it sounds like a long day but it's not when you start at 10 and you have to listen between each other. So no, I don't think the books would have made any difference. If we had found out the system of what they actually do though, when they collect the DNA – what do they, how do they actually work out what's important and not – that would have been interesting, that would have been more interesting. Like you know, what is their process of working out what's important and what's not. Although we did hear a bit about that, I must admit, with not –

It is clear from these responses that neither jury wanted additional resources such as textbooks in the jury room. Rather, they needed more information from the proceedings, including additional questions to be asked of the expert witnesses. In cases where the scientific evidence is more complex or is in dispute, it is possible that additional materials such as diagrams, charts or summaries of scientific methods or results may be useful, however that was not the case in either of the trials studied here.

4.9.14 Citing Other References

In academic pursuits, and in science in particular, peer review and mastery of the existing literature is an integral part of proving the veracity of new results and adding to the common knowledge within the field.⁶²⁶ In order to be published in reputable journals, scientific methods are peer-reviewed and thus tested for veracity, relevance and significance.

In legal trials where scientific evidence is disputed, important expert witnesses may present a barrage of literature to support their view, but in ordinary proceedings, many expert witnesses are able to present their opinions without direct reference to the literature.⁶²⁷ Whether this enables them to present results which are not necessarily upheld in their field is a question for further research, but in the context of the trials studied, jurors were asked whether they thought experts should have to refer to the work of others, in order to lend credence and weight to their own opinions. The aim was to see whether jurors recognised the value of peer-review and general acceptance, or whether they were prepared to accept the word of the expert who was actually giving the evidence.

Do you think experts who testify in court should have to quote other studies, statistics or scientific evidence, to back up their opinion? (Telephone survey)

☐ Yes

☐ No

⁶²⁶ Justice Goldring, J. (2000). DNA Evidence - The Way Forward? *Judicial Officers' Bulletin*, 12(7), 49 at 16.

⁶²⁷ See Ibid. at 17 for a discussion as to whether this breaches the rule against hearsay evidence.

□Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **Unsure.**

T1-JUR 2: **No.** Not important at all.

T1-JUR 3: **Yes.** It is important for experts to have research to back up their own opinions in court. They should also have to explain any deficiencies in their own evidence, compared with the literature. That is, should have to refer to (external) standards in the literature.

T1-JUR 4: **Yes.** I remember that the medical witness had referred to research literature about the age of bruises and thought it was very interesting and believable.

T1-JUR 5: **No.** No opinion. Experts who have the job of giving evidence in court and doing the tests must be OK. If they want to back up their opinion with other people's work then That is, OK, but it is not necessary. I would not have known if the expert was quoting someone else's work or not. Just not able to say whether this happened

T1-JUR 6: **Yes.** Naturally you would be hard-pressed to always call experts who had done their own research in any particular area. Therefore, of course they will have to call on other research. The use of references in science is crucial (I have my own experience of recently having to write a scientific thesis and properly reference it).

T1-JUR 7: **No.** There is no need for experts to refer specifically to other research and literature. They could just give their own opinion, because they are qualified and experienced enough to be called to court as an expert, so that is enough.

T1-JUR 8: **No.** This would be too much information for the jury. The expert is not trying to prove a scientific point, so there is no need for them to go into that kind of scientific detail.

T1-JUR 9: **Yes.** This would give them a stronger argument and make them more believable. I remember the medical witnesses referred to 'the literature' and 'other research'.

JURORS FROM TRIAL TWO

T2-JUR 1. **[No].** It didn't worry me. I don't think it should be necessary but...It's one of these things where, I think if you were expecting it, then you might wonder about the evidence they were giving. But I think if they hadn't, and you'd accepted them as an expert, then it wouldn't be

a problem. But if, for example, you had some knowledge of it, of the area, or even if you expected them to draw on other evidence – like other people had written papers et cetera – then – I don't think it was all that relevant, all that discussion, but that was beside the point - I could go either way. In short, it didn't make much difference to me. I think it could be used effectively to strengthen, because you have, essentially, someone who is considered an expert, saying 'yes, there is other evidence as well, not just my opinion', so it doesn't hurt, but I don't think it's necessary.

T2-JUR 2. **Yes**, where such information is likely to assist the jury by reducing the possible margin of error.

T2-JUR 3. **[No]**. Well, I don't think so. It is obviously a necessity to make them appear more credible witnesses, and I think that that was the case in this case – when the Judge said 'well, where have you heard this, or which' – so he was trying to clarify in his own mind whether she knew what she was talking about or not. I was prepared to take her at her word, because she obviously does this all the time, and she's got the qualifications – which, as I said, I don't think are as important as the knowledge – but, as far as I was concerned, she was a very credible witness. She had the qualifications, she obviously had the knowledge, and where she picked up the information I – and usually these sorts of people – it's like doctors, they read a lot of manuals, they attend a lot of seminars, and whilst they may not get a certificate for every seminar they attend, that's how knowledge is acquired.

T2-JUR 5. **[No]**. Not really. We've got to take that as a given. Otherwise we'd be there until dooms day, you know what I mean? And the prosecution would start to trot out their stuff and quote, and it'd be like exchanging papers in a journal, you know? You'd have this journal war of papers. And of course they'd be able to bring their 25 papers each, or studies that prove the opposite. I'm like "So what?" I mean I just rely on the fact that the person's a practising forensic expert and they know more about it than I do. There's also the fact, you know, that they've carried out the tests in the correct scientific manner, and, you know, reached proper conclusions from their analysis.

So you'd accept that they were an expert?

Absolutely.

T2-JUR 6. **No**, I wouldn't help me. I don't think so, it doesn't – not from my point of view, no.

T2-JUR 7. **No**, not really, no.

T2-JUR 8. **[Unsure]**. Well, it's legal opinions by experts. Quote studies – well, I mean they're just sort of comments about sort of trends in the discipline and I just sort of took them as that. You know, I didn't sort of dwell on it too much. Yes, because in academic papers there's always

a contrary view. I can't remember specifics. She did talk about papers and studies, and more, as I recall, more about the trends, or she talked about a particular country. Developments versus – I mean, because, you know, sort of saying, some sort of particular hotshot scientist or sort of ah, molecular biologist wouldn't mean much to us anyway. So I mean, it's not about, necessarily, individuals.

T2-JUR 9. **[Unsure]**. I'm not sure about that. I remember the defence pushing her to say that DNA has cleared people rather than convicted people. I don't remember her quoting anything else. I think I remember her quoting something when the defence pushed her, that's the only time I remember.

T2-JUR 10. **[Yes]**. An example would help, I suppose. Some sort of example, but I think they did some of that. I, you know, when they explained what it was all about. But then I think the Judge asked some questions too...Yes, mummies, how long do they last; forever? That's why when they said they could go back to – Oh, I don't know, that was 12 months down the track, so I don't know.

Many jurors in both trials recognised the value of having experts refer to other studies or views in their scientific field (n=8), not only because it may bolster their own arguments or force them to explain any discrepancies, but because all experts rely on the work of others within their field to develop the discipline.

However, a number of jurors were not interested in material that would merely support the expert's testimony or overwhelm the jury with excess information, because these jurors believed the experts had been accepted by the court and therefore their own opinions were sufficient (n=9). Although this view is pragmatic, because it recognises that jurors do not have the time, facilities or expertise to expertly judge whether a scientific witness is an authority or a charlatan, is it nevertheless disturbing, because it reveals the depth of trust that some jurors feel they must place in "experts". Given that the court is not a scientific forum in which scientific points can or should be debated, instead these jurors must rely on the examination and cross-examination skills of lawyers to deliver sound scientific evidence and expose poor substitutes.

4. HOW DO JURORS COMPREHEND, ASSESS AND USE SCIENTIFIC EVIDENCE TO ARRIVE AT A VERDICT?

4.9.15 Understanding the DNA Profiling Evidence

Before jurors can assess the value and significance of DNA profiling evidence, they must first comprehend it. Jurors in this research were asked whether or not they understood the DNA profiling evidence. It is possible that some may have professed to have understood it when actually they did not, however, this question allowed jurors who did not understand the evidence to address the issue directly and those who did understand could be double-checked by their responses to this and other questions.

Did you understand the explanation about DNA evidence, given by the expert?

(Telephone survey)

☐ Yes; when?

- ☐ The Prosecutor / defence gave their opening argument
- ☐ The prosecution expert
 - Gave evidence-in-chief
 - Was cross-examined
 - Was re-examined
- ☐ The Prosecutor / defence gave their closing arguments
- ☐ The Judge summed up
- ☐ In the deliberation room

☐ No

☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **Yes**, when the expert gave their evidence. I remember the Prosecutor asked questions like “What is DNA?” and these were satisfactorily answered. I remember feeling like I had understood (that is, never felt confused by the expert’s explanations). *I was waiting anxiously for the DNA evidence because all of the other evidence seemed equivocal.*

T1-JUR 2: **Yes**, when the expert gave her evidence in chief. Her explanation was good – not too technical or complicated, it was sufficient. It was about day four, or some way down the track.

Not until there had been a few witnesses and then the doctors giving medical evidence. *I expected to hear DNA evidence right after seeing pictures of the crime.* DNA seemed the obvious thing to do next, but it was not done this way, and that was a surprise.

T1-JUR 3: **Yes**, when the expert gave her evidence in chief. The effect of the DNA evidence fell into place then.

T1-JUR 4: **Yes**, when the expert gave her evidence. The evidence was easy to understand, even though it wasn't really helpful. Did not think DNA was that important in this case anyway.

T1-JUR 5: **Yes**, but it was very difficult to take all the information in. I am only a lay person, with no expertise. I found it hard to take it all in and figure out what the answers *meant*. I did not understand until after the DNA expert was questioned by the defence lawyer. I found the evidence about the two unidentified males very confusing and wanted the DNA evidence to be better explained, more clear cut and more definitive (especially because it seemed to clear the Accused). After hearing the DNA evidence, one juror (who *really* relied on the DNA) said "right, it's all over now. The DNA lets the Accused off the hook, so that's "not guilty"".

T1-JUR 6: **Yes**, when the expert gave her evidence in chief. Her explanation about what DNA is, how it is collected et cetera was pretty unnecessary. Jury should just accept the expert's word for it and take their results. Any explanation of theory behind it is almost a waste of everyone's time. I have a background in biology and honours in environmental science, so I was knowledgeable about science in general. Also helped to have jury room discussion about the DNA evidence, in the deliberations room during deliberations.

T1-JUR 7: **Yes**, when the expert gave her evidence. I have general knowledge about DNA and therefore understood the evidence at the time it was given.

T1-JUR 8: **Yes**, when the expert gave her evidence in chief. I have no background in science (I trained in law and economics and am familiar with courts). Since DNA is very prominent in the media (almost part of the English lexicon), I was aware of it, and especially of the usefulness of DNA evidence. My impression of DNA profiling was that it could be so conclusive and useful; just not in this case. Right from the beginning I knew what the DNA evidence was and was surprised and impressed that it was being called at all (since it did not implicate the Accused).

T1-JUR 9: **Yes**, when the expert gave her evidence in chief. The evidence was easy enough to understand. The expert was pretty clear and understandable.

JURORS FROM TRIAL TWO

T2-JUR 1: **Yes.** That one's tricky but it was certainly clear that by the time we got around to the experts giving their evidence. It came up clearly there. Whether or not there was an inkling to that fact in the opening statements – because I can't recall if the defence said, for example, that there was no forensic evidence directly linking him to the [*crime scene*] – I can't remember if they said that, but I suspect they probably did.

T2-JUR 2. **Yes.** When the Prosecutor then the defence gave their opening arguments. It was obvious the Prosecution had no scientific proof of culpability. It claimed none. The Defence claimed there was no incriminating DNA evidence. My heart was sinking already. Surely they can't just say believe him or believe her? My hopes of some snippet of scientific brilliance that would assist us to reach a verdict died steadily with each prosecution expert's frustrated results. First, no fingerprints. Then no incriminating DNA. No conclusive results from forensic tests of incriminated articles. Suddenly, there was to be no defence case put forth, and with the prosecution/defence summings up came the final realisation that we weren't going to get any forensic help. Here we were, being told by the prosecution that the forensic evidence "takes us neither here nor there", and we would have to believe the Complainant's story. And the defence counsel, gloating in the largely obvious. They were indeed giving us no option but to believe him or her, using only their claims and what each told of relevant circumstances.

T2-JUR 3. **Yes.** I think possibly, the way I looked at it is, it was just – the DNA evidence was just another point in his favour, because it didn't say that he was actually there. And they couldn't prove it. There was a lot of unasked questions and a lot of grey matter in this whole trial, I felt. And it really was very difficult for us to make a decision because of that. And I found that I was relying on the DNA to give me a lead. I mean, obviously if they had found his DNA there, on *anything*, it really would have strengthened the case of the prosecution. The fact that there was *no* DNA found – and, in fact, I don't know whether it's because they didn't test the right areas or not, (I felt that the bit about the hockey stick and not actually testing that was just amazing) – that helped me in drawing the conclusion that there was reasonable doubt.

T2-JUR 5. **Yes.** It was when the prosecution asked her to clarify, asked her a number of propositions about proving stuff. But it was also actually a combination of three, now that I think about it – because then the defence sort of said "Is it true that there have been rather big developments?" and "Is it true that DNA has actually been used to prove that people actually didn't commit an offence, and righted injustices where people have been in prison for a year?" And the Judge sort of took issue with it – I don't know why he was taking issue with it – he got himself into a bit of a muddle there and sort of got the wrong end of the stick in many ways. Because then he said she was sort of saying "Now you keep up with what the latest sort of developments are with global journals.." remember that? He reckoned that that was irrelevant. I couldn't quite work out what he was on about there, but I thought he was barking up the wrong tree, really. I think he misunderstood what they were saying. You know, he was more interested

in how they did it in the pyramids and all that, and everybody sort of looked around and went 'my god, what was that?' Anyway, I thought some of the stuff he then asked her about qualifications and DNA and what it does and can and can't do, and that. But the combination of all three of them sort of made it abundantly clear what DNA can and can't do, well, from her point of view.

When was it that you understood that that's what the DNA evidence was about – was it right at the beginning in the opening arguments- ?

Oh yes. That they were trying to prove that he, that they couldn't link him to it, yes. And their argument was that because there was a ground sheet, well we don't have to provide any evidence. The logic taken to the extreme, was that because there was a ground sheet, that's why there's no DNA – and because he had gloves and all this other kind of stuff, there was no DNA. But we don't have to prove that, because he had this ground sheet. So of course that was a problem – it puts the onus back on him, it's almost like he's got to prove he wasn't there.

You know, it wasn't just the DNA. It was the same sort of weird thing with the black bike – no-one explained how the police knew about this black bike, and they searched for it after the second time. You know, after he was in custody, they searched his house and everything. And that same policeman that found the razor the second time, also was the same policeman [name] that rang up and said to the boarder 'you didn't happen to see a black bike out the back, did you?', and she goes out there and what does she find? A black bike leaning up against the fence. And then she also happens to go into the shed and look for cans of paint, and find them. Now, if it hadn't been there the first time when they searched, when he was in custody, who put it there the next day? It wasn't [the Accused], was it. See, this was what – some people didn't seem to get this, this information. And how did the prosecution know there was a black bike, and the police? They never explained that at any stage, because no-one saw this person come, either way, on the black bike. So how does it – you know what I mean? It's really like it appeared out of nowhere. You know, it's kind of bizarre, but anyway...You know, the funny thing was, the defence made nothing of that. I just couldn't work that out. They did that here and there, but there were times when they should've had a really big opening, and did nothing.

T2-JUR 6. **Yes** I thought that was pretty good, and I'm certainly not that knowledgeable in that way, so. Probably both when the Prosecutor was asking her few questions, and the defence, and then the Judge sort of asked a few things too. The defence lawyer sort of more or less pointed it out, because I think the forensic person was saying that nothing was found, but that *meant* nothing – but I think the defence lawyer was really focussing on that there was nothing found on him. Yes, [my understanding was] not at the beginning, we sort of didn't know anything about that.

No, so it became clear in the cross-examination?

Yes, when she was – when the forensic lady was on the witness box, yes.

T2-JUR 7. **Yes.** Well I don't really remember it in the opening, I don't really remember it in the opening address, but I suppose it was when she was speaking, when she came up, they called her, yes. I think from when she started speaking about it, in the first bit, and what I knew previously, you know, what you hear.

Like general knowledge?

Yes, yes.

T2-JUR 8. **[Yes].** There was a clue about that in the introductions, when the prosecution and defence were giving their introductory comments, so I had a bit of a clue that this was going to be problematic. Yes, so by the time she came to give evidence, it wasn't a surprise to me. Yes I did [understand the DNA evidence] because there was some time taken to explain it in lay persons terms, what the more difficult concepts were. And where that didn't happen, sometimes the [Judge] asked a question or asked her to explain something, I think. But, he mightn't have done that – he did that throughout the trial, so I can't remember a particular specific instance where he sought clarification from her. He could have, but I just can't remember. Or the Prosecutor might have asked her for some explanation about what that means, or what X means, or what's involved in such a step, or that sort of thing.

T2-JUR 9. **Yes,** I think I did. When I heard the evidence. I mean, they alluded to it in the opening argument, but it wasn't clear that that what's the DNA person was going to say. Probably both when the Prosecutor and the defence were asking questions. At the very start they said there was no DNA evidence, so it wasn't as if they said the DNA evidence would show he wasn't there, so, yeah.

So it really became clear when she actually gave her evidence?

Yes.

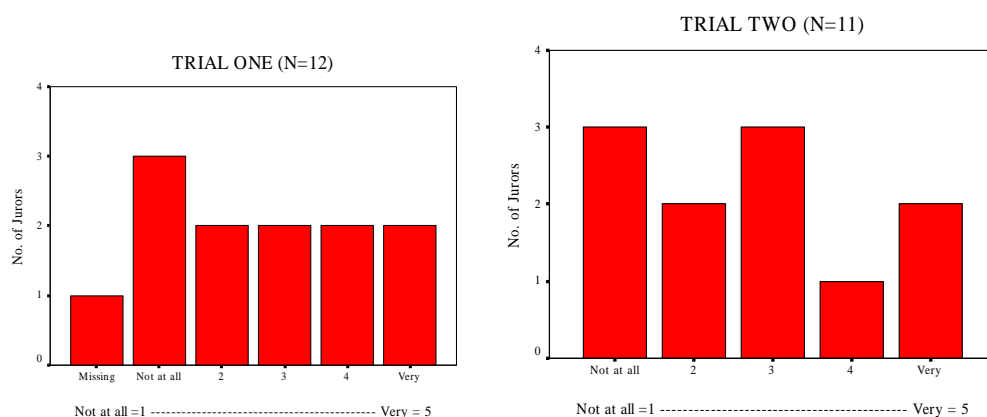
T2-JUR 10. **Yes,** I did. I understood it at the time. I could understand it, I suppose, being in the medical side, I can understand different things. No that was OK. Well once they started talking about DNA I understood what they were looking for - at the beginning, yes. I was just disappointed that they didn't – well, not disappointed, because that's not...but just surprised that there was absolutely **nothing** that was picked up. In the break and entry, the second incident, not **one** fibre, not one anything. Almost there was no case, to me, because I mean, how could you convict somebody who, there was no, just no evidence he was there. There was just no case, to me. I mean the first part of it [the first incident], yes he was there, but you know, it was really hard to – you know, you could see that it lined up, certain things in the case lined up, but unless there was some bit of evidence that he was there, you know, you can't convict. It's incredible what a difference it made to the outcome.

All of the jurors in both trials professed to understand the DNA profiling evidence at least by the time the expert witness was cross-examined. Those with some prior knowledge – either from their occupation (including a registered nurse) or from general knowledge – seemed to comprehend the import of the evidence more quickly, compared with other jurors who had some idea that the DNA evidence might not live up to all expectations, but did not realise the significance of it until the expert was examined and cross-examined. This suggests that comprehension across a jury is gradual, and it cannot be assumed that because certain important points are mentioned in the opening addresses, they will be immediately recognised, understood or remembered by the jury.

4.9.16 DNA Evidence in Context

Expert evidence is never presented in isolation and jurors are not automatons who are impervious to other influences. The combination of a jurors' own background and the circumstances in which expert evidence is presented may have a significant impact on how scientific evidence is comprehended, assessed and used.

What was important to you when you weighed up the DNA evidence - Feelings about the accused and the crime? (Written survey)

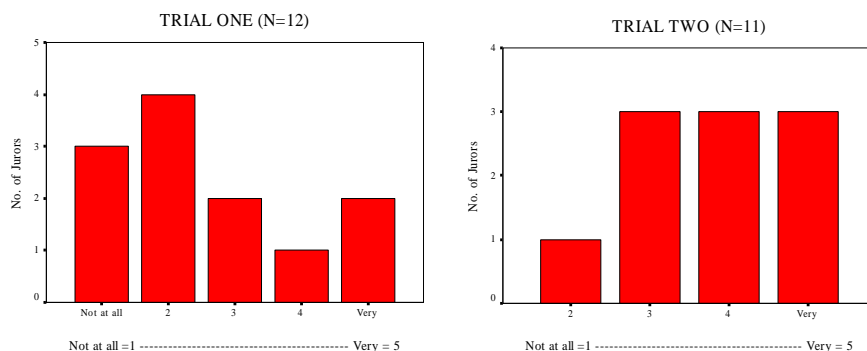


The crimes alleged to have been committed in these trials were brutal acts of physical violence, and in the second incident, the alleged violence was particularly prolonged, premeditated and unpalatable. The Accused in both trials sat through the proceedings with very little visible reaction to the evidence or witnesses, although occasionally he would shake his head or frown in disagreement at a witness' statement. In both trials,

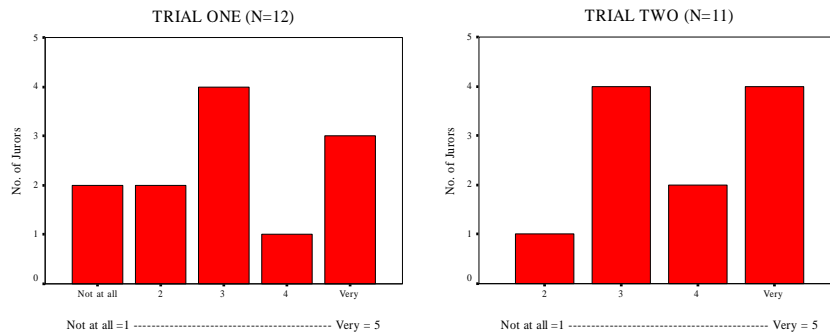
the juries contained a mix of feelings about the importance of the Accused and the crime in relation to the DNA evidence. Only approximately a quarter of each jury (n=4 and n=3) felt strongly or very strongly about the Accused and the crime when they were considering the DNA evidence. This may correspond with what other jurors had reported about certain members of the juries who held very strong opinions about the guilt of the Accused, which translated into the view that the lack of DNA profiling evidence was not particularly important.

In Trial One, the Judge reminded the jury that they were to base their decision on all of the *evidence*, but that of course they were products of their own personal experience and that would naturally inform their decisions too. So although juries are cautioned not to let their own views and experiences cloud an *objective and reasonable* assessment of the evidence, some jurors were nevertheless prepared to admit that their feeling about the Accused and the nature of the crime were strong or very strong, even just in the context of other evidence. It is also worth noting that the Judge in Trial One reminded the jury that their verdicts would in no way relate to the Complainant. That is, her rights or ability to claim compensation or proceed in any way in relation to the alleged crimes would not be affected by the outcome of the trial. Since this research did not ask whether or not the jurors' feelings about the Complainant affected their judgement of the scientific evidence, it is difficult to determine what effect this may have had.

What was important to you when you weighed up the DNA evidence - How the Prosecutor explained the expert's evidence? (Written survey)

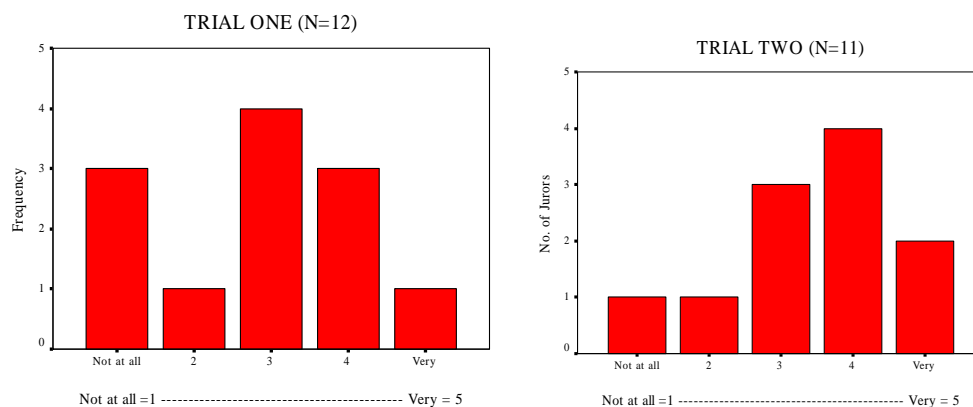


What was important to you when you weighed up the DNA evidence - How the defence explained the expert's evidence? (Written survey)

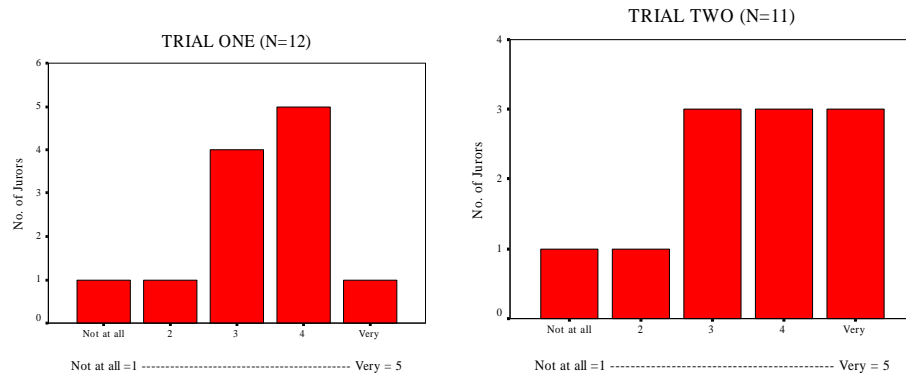


Results from both trials suggest that neither jury found any one view – from the prosecution or the defence – particularly important when it came to assessing the DNA profiling evidence. The jurors in Trial One appeared to place slightly more importance on the explanation given by the defence, although the trend is more qualitative than quantitative, and this probably corresponds with their dissatisfaction at the way the prosecution handled the witnesses and drew significant and useful information from the evidence. The jurors in Trial Two appeared to be slightly more committed to the explanations given by the prosecution, but compared with the jurors in Trial One, they also placed more importance on the explanations given by the defence. That is, they were not so persuaded by either side that either explanation of the DNA evidence was more convincing or important than the other. When other influences were suggested, the results were also mixed:

What was important to you when you weighed up the DNA evidence - Your impressions of how the Judge felt about the expert? (Written survey)

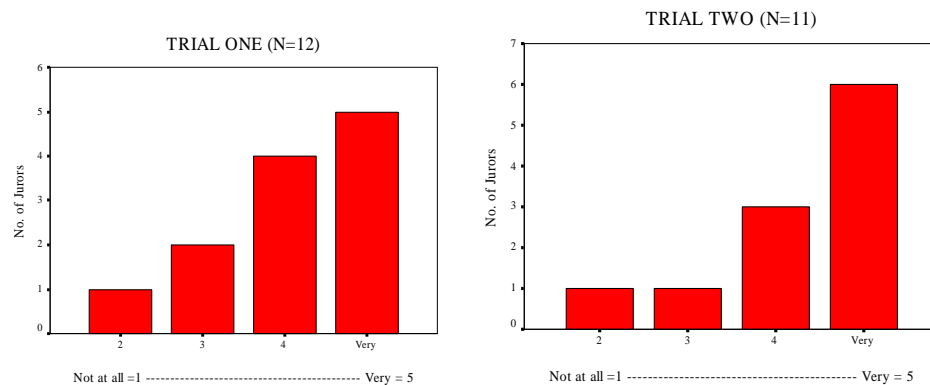


What was important to you when you weighed up the DNA evidence - What the Judge said about the expert's evidence? (Written survey)



Some jurors in both trials were strongly or very strongly influenced by the behaviour of the Judge, when it came to weighing up the DNA evidence. Particularly in Trial Two, what the Judge said and even what the jury perceived the Judge to *feel* about the DNA evidence, had a strong or very strong influence on how the jurors weighed up the evidence (n=6). In Trial One, the jurors who were influenced by the Judge seemed more influenced by what was said, rather than what the Judge might have felt (n=6 compared with n=4). This would seem to be a more reasonable way to react to any guidance from the bench, because a jury is not necessarily able to interpret correctly or accurately how a judge feels about any particular witness or piece of evidence. Overall, however, these results suggest that juries are susceptible to non-verbal indications from the bench about how scientific evidence should be assessed; not only are a judge's words important, but for some jurors even what the judge appears to *feel* about the expert and/or the evidence may play a role in deciding how those jurors weigh up and assess that evidence.

What was important to you when you weighed up the DNA evidence - How the scientific expert explained the evidence? (Written survey)



In contrast, the scientific expert's explanation of the DNA profiling evidence was decisively influential when both juries were weighing up the evidence. Approximately three quarters of each jury (n=9, n=9) were strongly or very strongly influenced by the explanation given by the forensic biologist. This is a positive result for expert witnesses who might otherwise fear that their evidence is sometimes accidentally or deliberately reinterpreted by the prosecution or defence, in ways which might not be accurate. The juries in both of the trials studied here appeared to be heavily influenced by the expert witness, when it came to weighing up the expert evidence.

4.9.17 Juror Confidence

Given the range of influences on each juror, their different capabilities, and the pressure under which they must comprehend, assess and use expert evidence, it is possible that their evaluation of the scientific evidence may be less than ideal. Nevertheless, jurors are called to hear the evidence and use it to make decisions which will have a significant impact on the lives of others.

How confident are you about your evaluation of the DNA evidence? (Telephone survey)

- ☐ Very confident
- ☐ Confident
- ☐ Neutral

- ☐ Not very confident
- ☐ Not confident at all

JURORS FROM TRIAL ONE

T1-JUR 1: **Confident**, but again the lawyers did not ask the right questions of the expert. Therefore it was difficult for me to use or evaluate the DNA evidence.

T1-JUR 2: **Confident** – not much to go on.

T1-JUR 3: **Confident**.

T1-JUR 4: **Very confident**. Some other jurors had used the phrase “black and white” to describe me, but I was confident and even though the case kept me up at night I am sure about all of my opinions.

T1-JUR 5: **Neutral**. I did not know if I was qualified – as a lay person I could not say how good I am at evaluating complex evidence and so I have no opinion for this question.

T1-JUR 6: **Confident**. General knowledge and scientific background (mostly common knowledge) contributed to this. I know there is a lot more theory behind DNA (and I don't understand or know it), but I knew enough to deal with the DNA in this case.

T1-JUR 7: **Confident**. Combination of general knowledge and the adequate explanation of the DNA evidence and what it could provide (by the DNA expert).

T1-JUR 8: **Very confident**. The DNA evidence was accepted by a court of law, so I thought “who am I to second-guess it?” The witness was qualified and experienced enough to be called as an “expert” therefore I took her word for it.

T1-JUR 9: **Confident**. I don't think of myself as a very confident person and would hesitate to put “very confident” as my response.

JURORS FROM TRIAL TWO

T2-JUR 1. **[Confident]**. I mean when I say I ‘discarded’ [the DNA evidence], I mean putting it aside in terms of its usefulness in terms of reaching a guilty verdict. It couldn't form a building

block supporting a guilty verdict, because it simply wasn't conclusive. I mean I approached the whole 'guilty / not guilty' thing as: If it's a 'possible' then it's also a 'not possible', because possible itself is not a given. It's not a certainty. And I know there's a reasonable doubt and a shadow of a doubt – we had discussions about this in the jury room, about where different people had, where they sat. For one person it might be reasonable, for another person it might be beyond reasonable. So that's subjective in a lot of cases to a certain extent, I think, but I mean I just looked at it and thought, it's not conclusive in proving it, therefore I can't use it to base a guilty verdict on, and I even steered away from using that evidence which was in itself inconclusive, from drawing inferences which may have led me – do you now what I mean? I didn't discard it straight away – I didn't say "OK, that doesn't prove anything, so let's move on."

T2-JUR 2. **Very confident.**

T2-JUR 3. **[Very confident].** Oh, very confident, yes.

T2-JUR 5. **Very confident.**

T2-JUR 6. **[Confident].** I mean I accepted it that it was right, so I'd have to be confident with it that way, but it's yes – um, yes, no, I'd have to say confident that it was right, but I was just disappointed with it.

T2-JUR 7. **[Confident].** What do you mean? The DNA evidence that we were told about? Yes, I am, yes.

T2-JUR 8. **[Confident].** Evaluation of the DNA evidence? It was hard because we had such totally opposite presentation of the facts there. And this was meant to assist us in interpreting it and I guess there was a view – Did it assist or not? A lot of people would say, well...Oh, just to conflict with the other bits of evidence. So it just added to the frustration, I think. But it was a useful piece of evidence, even if it was meant to throw doubt or not throw doubt. I mean, the actual finding, of no DNA from the Accused, you had to weigh that up against the other matters. So I don't know if I answered your question there, but – My evaluation. Well I guess because I trusted the evidence presented, and I was mindful of some of the constraints of what was tested and what wasn't tested, that sort of thing, I guess I sort of took the factual basis with me and used that. Yes, I'll say confident, because on the things that were tested – but I was mindful of the things that weren't tested, you know.

T2-JUR 9. **[Confident].** Oh, oh. Um, pretty confident.

T2-JUR 10. **[Confident].** Confident in my evaluation? Well, I have to believe what I am told, but if they had have picked up some DNA that would have been really – even if it was the smallest

amount – it would have swayed me totally. Yes, so I reckon, yes it was very important, but I mean I can't, you can't change your mind or what you've gone through because you've got nothing, no evidence to change it to.

In these trials, jurors were overwhelmingly confident or very confident about their understanding of the DNA profiling evidence. Given that the evidence was presented without using the statistics which often accompany DNA profiling, and that it was not challenged by the defence or by an opposing expert witness, the juries' confidence in their understanding is not surprising. The reasons why *they* felt confident about their assessment of the DNA evidence, however, are revealing. Confidence was based on:

- Personal confidence in all opinions, even to the extent of being heavily biased (n=1);
- General scientific knowledge (n=2);
- The accepted expertise of the scientific expert witness. This confirms the literature which suggests expert witnesses are automatically afforded a degree of kudos merely by the fact that the court has accepted them as an expert (n=1);
- A good explanation of the evidence by the forensic biologist (n=1);
- Not much DNA profiling evidence was presented; few samples were tested, and non-conclusive results were found (n=6).

4.9.18 *Deliberations*

The dénouement to a jury trial occurs only after the group of twelve (or eleven, as it was in the second trial) have sat together, discussed, debated and decided upon a verdict. In Australia, the jury does not decide upon a sentence, if they find the accused guilty. This is done by the judge at a later stage. The process of deciding upon the guilt or innocence of the accused, based upon all of the evidence and coloured by the addresses of legal counsel and the directions of the Judge is, however, a daunting task. In this process, expert evidence is weighed by lay people who may have last studied science in high school, or who may have higher degrees in a scientific field. What is common to all jurors, is the need to consider their own views *and* the views of their fellow jurors: All jurors have one, equal vote, irrespective of their education, bias, previous experiences or personal convictions.

Did the jury room discussion help you to understand and make decisions about the scientific (especially DNA) evidence? (Telephone survey)

☐ Yes

☐ No

☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **No.** No attempt was made to clarify what the DNA evidence meant.

T1-JUR 2: **No.** Another juror was *fixated on the DNA evidence* and made everyone frustrated because he kept saying “I just want the DNA” and the DNA never came.

T1-JUR 3: **Yes.** Joint discussion did help to clear up misunderstandings and doubts. Some people had very poor recollections about what had happened, even to the point of being incorrect. Also some jurors had difficulty understanding the scientific evidence, or didn't seem to want to understand – they were immature. It took some argument to try to get the points across.

T1-JUR 4: **No.** I disregarded the DNA evidence because it was not helpful. I thought the small bit of DNA evidence about the Complainant's lover [name] was just a red herring by the Defence lawyer and disregarded it also. Other jurors thought it was more important.

T1-JUR 5: **Yes,** especially about the incinerator and the DNA on the doona. There was lots of discussion to clarify different views. Some degree of consensus was reached because one juror had very good notes; these helped others to agree.

T1-JUR 6: **No.** I had enough general knowledge and background in science to understand the DNA evidence.

T1-JUR 7: **Yes.** It was in the context of jury room discussion that common understanding about what the DNA was, was reached. This discussion was fairly helpful to the jury as a whole.

T1-JUR 8: **Yes.** DNA was discussed and the discussion was helpful (even though the jury had no chance of changing the minds of the two jurors who said “guilty and that's it”).

T1-JUR 9: **Yes.** Discussion did help. It was just a general sort of discussion about DNA evidence.

JURORS FROM TRIAL TWO

T2-JUR 1. **[No]**. In this case, on the medical evidence, 'probably' – because there was certainly wide ranging discussion of that evidence and I think I'd have to say that there was at least an influence on what I was thinking, because you're listening to other people views of what they mean, and whether they think the injuries are important or not important and consistent or inconsistent or whatever. On the DNA evidence specifically, I'd say 'probably not' because it was very clear once we got in, that they didn't have anything to give us, and we didn't have to take that any further. It was like 'we don't have anything there' so let's move on. On scientific evidence more broadly, like forensic evidence from the incinerator et cetera, again I'd say it was – the jury discussion didn't influence me much, me personally. There were a couple of theories put forward from that which were conjecture and they weren't convincing, they weren't convincing. The evidence was that there was nothing there that was of any potential use in terms of evidence.

T2-JUR 2. **No**.

T2-JUR 3. **[No]**. I think we were all pretty clear on the DNA evidence. As I said, the DNA evidence was very good for what it was.

T2-JUR 5. **No**. At one stage – I shouldn't have said it, actually – but at one stage when we were getting quite late in the piece before we told them we weren't going to reach a decision, I actually sort of said "Look, I'm sorry, but all these police, all these forensic experts, a QC and assisting counsel and a Prosecutor and a [Judge], they've all spent the last ten days explaining to us all this evidence and everything else – What makes you think you're going to convince me on a whiteboard?" You know? Well that's how I saw it but I probably shouldn't have ventilated it, but I was getting pretty frustrated with it, you know.

T2-JUR 6. **Yes**, probably. I mean not that we had any experts. But I think we just tossed it around a little bit in there, yes, and things that we hadn't thought of, maybe someone else had thought of.

So there was discussion about the DNA evidence?

Oh definitely, yes.

T2-JUR 7. **[No]**. Well that was a bit hard because there wasn't any. Well, there wasn't any that I wanted to know, I mean I would have liked there to have been some [DNA]. Obviously we were looking at it to try and see if he was there, and when there was no evidence from the DNA that he was there, then it really wasn't talked about, only to the degree that there was none.

OK, so there was not much to discuss on it?

No, no that's right.

T2-JUR 8. **No**, I think that that is, a danger. I mean, trying to sort of interpret it yourself. You're better off asking a question. We were quite prepared to use our foreman to do that. And where people were inclined to do that, I think, one or a number of us were able to make that point.

T2-JUR 9. **[Yes]**. A little bit, yeah. It was probably just placing it all together. You know, you hear all the evidence separately, and you're sort of putting it all together with the DNA evidence and that, I guess. I mean I can't remember specifically.

T2-JUR 10. **No**. Between cases we weren't allowed to talk much at all, were we? ... But as far as the evidence was concerned, there wasn't much time in between to talk about things.

Did jurors try to explain the scientific evidence to other jurors? How/why/what?
(Telephone survey)

☐ Yes

☐ No

☐ Unsure

JURORS FROM TRIAL ONE

T1-JUR 1: **No**. Nobody trusted anyone else. Even where five jurors had notes about particular evidence, just one or two words difference would create difficulties. Personally, I thought that note-taking was somewhat unreliable because the note-taker was making up their mind as the case went along, and their notes reflected this. The notes were written from the perspective of "guilty" or "not-guilty". For this reason I think the jury should be given the transcript of the day, at the end of each day. This would have clarified and verified what actually went on, and allowed more informed and efficient discussion.

T1-JUR 2: **No**.

T1-JUR 3: **Yes**. As described above, there were some discussions about what the evidence was and what it meant. Some people didn't seem to want to understand.

T1-JUR 4: **Yes**. One juror thought the medical evidence had been that bruises turn yellow *before* 18-24 hours, so the other jurors had to correct him.

T1-JUR 5: **Yes**, using the notes of one juror which were viewed to be reliable, explanations about the location and amount of DNA were given to other jurors.

T1-JUR 6: **Yes.** Both the medical and DNA evidence was explained. Some jurors clearly did not understand it, so other jurors tried to explain. It was *like watching the blind leading the blind*.

T1-JUR 7: **No**, not that I recall. There may have been side discussions between other jurors, but no “explanations” occurred in my presence.

T1-JUR 8: **Yes.** Talking about trace DNA and how not even trace DNA was found on the Accused’s clothing. The explainer was trying to convince “recalcitrant” jurors that they ought not ignore the evidence. This failed – they ignored it and insisted on guilty.

T1-JUR 9: **Yes.** It was just a general discussion though, it was not as though anyone took anyone else aside and lectured to them.

JURORS FROM TRIAL TWO

T2-JUR 1. **[Yes].** They certainly argued whether or not injuries were consistent or whether they believed that they were – I mean, we got into a discussion a couple of times, but at least once, a fairly lengthy discussion. No-one denied that the injuries were there, particularly in the second case, but we got into a lengthy discussion as to what could have caused - and a lot of that came out of both the medical evidence and the cross-examination. I mean, an interesting thing, if you want to look at the dynamics – well, I think it is an interesting example of the dynamics between an expert, the legal counsel and the jurors, one example I can remember is when they were discussing injuries to [the Complainant] – and whether it could have been – the defence in the cross-examination was hunting down a concession that they could have been caused by a vibrator, and she really pushed it. And I know, in my case, it was something for me, but it was certainly expressed by another juror – that they thought that the evidence, when the medical examiner/expert said that ‘yes, it was *possible* that the injuries were caused by the vibrator’, that concession was made under extreme pressure and, I mean ‘duress’ is the wrong word, but she was extremely, extremely reluctant to go down that path. It was obvious that despite the fact that she made the concession in court, that she did not believe that that was the case.

So even though it was on the transcript, you knew, when you heard it, that it was forced?

Yes, that’s what I mean. I can say that, that at least one other juror stated that explicitly in discussions.

T2-JUR 2. **Unsure.** There was much discussion about the scientific evidence, but I cannot recall explanations being necessary.

T2-JUR 3. **[Yes].** Oh yes, we were all pretty clear on it by the end of it.

T2-JUR 5. **Yes.** Just things like the bruises, and injuries, and things like that. But a lot of the time they got confused – they were confusing the charges – things like that, you know. So they were talking about injuries, and sort of convicting someone of actually having done something, when we were talking about attempting to do something. And just things in general, like the anal penetration and all that, well, you know, for the second one it was actually sort of attempted, right – that third charge? And they got bogged down in all that sort of stuff and I said “Well, but we’re not even talking about that – not even being asked to make a judgement about that.” You know, things like that, and things like rape on the third one, which again, we weren’t sort of asked to consider.

T2-JUR 6. **[No].** Oh, I can’t sort of – No, yeah I don’t think so. There wasn’t really anyone there that sort of thought they were sort of an expert, or... Yes, no I don’t think so.

T2-JUR 7. **No,** I don’t think that was – no.

T2-JUR 8. **[Yes].** They tried to, well, they were relaying their understanding of what they heard, yes. It was sort of like clarifications. No, when they were discussing that, it was trace DNA versus DNA itself, and there were clarifications, of you know, in the case of semen stains on the doona – was that all from the same person, or three different people? There were points like that, and people heard that evidence differently. So it was trying to get a view of what were the actual facts that were presented.

T2-JUR 9. **[Yes].** I don’t think they tried to explain it in a scientific manner, but they cleared up sequence-of-events sort of...I’m just thinking about the thing like um, the two different DNA on the batteries. I guess that wasn’t explained, but discussed, and argued. Just things like that. But I don’t think we sat down and scientifically sort of said “well, I know DNA doesn’t stay on there for X amount”, and that sort of thing, I guess.

T2-JUR 10. **No,** they didn’t. [In the context of another question, this juror also remarked:] A juror came in, went home and worked on it and stewed on it and when he came back and had it all typed up and everything. But you know that’s his job to do that – that’s his previous job, and that made it really extremely hard on the jurors. Well I suppose it shouldn’t, because we heard the same evidence, it’s just he was very sure that he was guilty, from the beginning, and with or without DNA evidence, it didn’t worry him, so. So he wasn’t a good juror in lots of ways, but then he was very thorough in lots of other ways.

Tell me more about these notes that were typed up at home.

I’m not really supposed to tell you too much – I wasn’t supposed to know. (But we all knew)...Well he’s not supposed to do that, I don’t think.

Was he keeping them to himself, or?

No, of course he wasn't, but that we weren't supposed to let anybody know that that's what he was doing...Or so we thought, anyway. He would sift through them again, and everything. I guess he had it all worked out.

Jurors in both trials were almost evenly split as to whether jury room discussion helped them to understand and make decisions about the DNA profiling evidence, or even whether jurors had tried to assist other jurors in understanding the evidence.

For those jurors who thought that jury room discussion did **not** help their understanding of the scientific evidence, the main reasons were:

- There was not much to discuss as the DNA profiling evidence did not identify the Accused. This is to be expected in trials where the scientific evidence is merely another thread in a bundle of evidence, rather than being a shining beacon which identifies the guilty party. These jurors did not waste time discussing evidence which, to their mind, was much less helpful than it could have been.
- One juror felt self-sufficient; he did not need help understanding the DNA evidence (n=1). Although this juror apparently had a background in science, or at least a general knowledge about DNA profiling, it seems that he was not willing to share this knowledge with other jurors to aid their understanding. This might be a good thing, as his own knowledge may have been inaccurate, incomplete or out-of-date and caused other jurors to wrongly speculate about the evidence based on a second-hand source of wisdom. It also coincides with judicial warnings that the jury must consider only *the evidence they have heard in court* and not make decisions based on outside material.
- One juror did not “trust” the scientific evidence and thought it had been used by the Defence to cast aspersions on the Complainant (n=1). In the context of other responses, this juror was extremely strongly in favour of a Guilty verdict and would not be persuaded on any point outside this view by other jurors. Thus it is not surprising that this juror did not engage in jury discussion which helped her to better understand the DNA profiling evidence, nor did she find explanations from other jurors to be helpful.

- The thought that discussion of scientific evidence was dangerous, as it might be heavily influenced by personal bias, and, if the jury had questions then rightfully they should ask the court for clarification (n=2). These jurors recognised the danger in speculation about evidence, especially in cases where lay people were assessing technical evidence. On a more pragmatic note, one juror noted that even where notes were referred to, in an attempt to define the “correct” version of the evidence, often the notes themselves had been written from a biased perspective and did not reflect an objective view of the evidence anyway, which caused more disagreement and speculation. Juror willingness to use the foreman to ask questions of the court, if more information is needed to comprehend the evidence, is a laudable way to deal with scientific evidence (even if it was not necessary in this case), and avoids what one juror recalled as “like watching the blind leading the blind”.

Jurors who reported that there *had* been discussion and intra-jury explanations about the DNA profiling evidence which had aided their own understanding noted the following:

- Discussion revealed that some jurors had incomplete or inaccurate recall of the DNA profiling evidence (and other expert evidence), which was rectified by the use of other jurors notes. This highlights the importance of note-taking during court sessions, and the fact that some jurors were more adept scribes than others.
- The notes were consulted to clarify the evidence and (according to some jurors, n=2) help reach a consensus amongst the jury, but even discussion and notes could not combat the perceived bias of certain jurors. Interestingly, these jurors confirmed this, saying that jury room discussion had not helped them understand the DNA evidence (n=2).
- Some jurors appeared to not want to understand the DNA profiling evidence, despite the attempts of other jurors to explain it to them (n=1).

Thus it seems that jury room discussion may assist juror understanding of scientific evidence, but its use is limited if jurors are biased against the evidence, have not taken reliable notes, are wary of speculating, or consider themselves so knowledgeable that further discussion is unnecessary.

4.9.19 Making Decisions and Taking Risks

The assessment of expert evidence, and ultimately deciding on a verdict, involves a calculated risk. Jurors must decide whether the scientific evidence they heard was based on reliable methods, whether the tests were conducted accurately and appropriately, whether the results were justifiable and verifiable, and if the impact of the scientific evidence on their overall decision is reasonable. Although they may have expected the scientific evidence, particularly DNA profiling evidence, to have given a 100% result (that is, an unqualified “match” with the Accused), this expectation may not have been met. The verdict is therefore a calculated risk based on the evidence and on the other sources of influence which have been discussed.

Juries can never be 100% certain about their decisions. Now that you have been on a jury, what kind of risk do you think other jurors are prepared to take, about making a wrong conviction? 1 wrong case in..... (Telephone survey)

JURORS FROM TRIAL ONE

T1-JUR 1: Could not put a figure on it. However; one juror will always side with the woman, one juror will always side with the police (because they would say the police would not bother to proceed if they thought the person was innocent). I felt that two jurors had commenced the trial with a strong presumption of guilt and just would not budge, irrespective of any evidence that came up.

The juror who would always side with the woman stated right at the beginning of deliberations that *the only thing that would change her mind was if “the Complainant came in here (the jury room) and admitted she was lying”*.

The ten other jurors would try to do the right thing (that is, base their decision on the evidence).

Even two or three jurors can convince the whole group. For example, on the first count the jury was originally 8:4 (Not Guilty), but after a day’s worth of discussion based entirely on speculation rather than evidence the vote went the exact opposite way (8:4 Guilty). I think over time the group could have convinced the remaining four to change their view to guilty, as the speculation increased and the evidence/speculation divide became muddled. The final votes were indicative of the hung jury and the shifting views over time: charge 1 first incident (7:5 Not

Guilty); charge two second incident (9:3 Not Guilty); and charge three aggravated burglary (10:2 Not Guilty).

I think the process of deliberation ought to be abolished because jurors actively convince others. Jurors should hear the evidence, then be given transcripts and asked to scrutinise them individually and nominate an individual verdict. This way each juror could take as much or as little time as they liked, to look over the evidence (and not have to rely on notes, speculation or recollection) and their verdict would truly be their own.

T1-JUR 2: Ten jurors were not prepared to take any risk (by convicting) even though they believed the Complainant's story. Two jurors had a black and white attitude that the Accused was guilty. I don't think another jury would have reached a decision either, because of the lack of information.

T1-JUR 3: 100.

T1-JUR 4: Other jurors want 1000% certainty of guilt before they will convict. Even 0.1% doubt is enough for them to acquit. Some jurors are more flexible than others though. The range would go from 1 wrong conviction in 100, to those jurors who would accept nothing less than DNA evidence or a photo of the Accused caught in the act, before they would convict (so 1 wrong conviction in 1 million).

T1-JUR 5: Couldn't put a number on it, but some jurors really wanted a quick decision.

T1-JUR 6: Depends entirely on the individual. I have worked with a total of 17 other jurors over 2 cases, and think some jurors just absolutely did not want to get it wrong (either by convicting or acquitting incorrectly). Whereas other jurors were happy enough to say "guilty, now let's get out of here and don't worry any more about it".

T1-JUR 7: 1 wrong case in 10 or 20, or in other words a risk of 5% of cases being wrong convictions. I did not feel that there was a strong aversion to risk, in this jury. Some jurors quickly dismissed the doubts of other jurors, suggesting that they were prepared to take a higher risk of a wrong conviction.

T1-JUR 8: Because it was such a long case, jurors had lost interest. One juror kept noting that he had not taken a holiday from work in four years. He was very proud of this, he kept emphasising how much he wanted to get back to work and kept asking "when are we going to finish?" He hassled the other jurors all through the trial and so I think he would be prepared to take quite a high risk of a wrong conviction. The juror who wanted to leave was a nuisance and when the case looked like being a hung jury, that juror immediately said "well, if they are never

going to change their minds [about the Accused being guilty] then why are we all still sitting here twiddling our thumbs? Let's go, I want to go back to work".

In contrast, I am a contract worker and was actually losing money to fulfil jury duty. Yet I think jury duty is a priority and meant taking a responsible attitude irrespective of the time it took.

T1-JUR 9: Can't put a number on it. Obviously each case is going to involve some uncertainty. In this case almost every juror said guilty for the first charge, but for the second charge there were so many elements that doubts could be raised about almost every element. Some jurors changed their mind as the case progressed.

Some jurors just would not believe the Complainant and other did not want to take any risks (about convicting) at all. It seemed very hard for the Prosecutor to prove all the elements. Even days more of deliberation would not have helped. Most jurors said guilty on the first charge, but there was much more division on the second charge. Two jurors in particular said "Not Guilty" and would not budge (one of these jurors said he would *never* convict without DNA evidence).

JURORS FROM TRIAL TWO

T2-JUR 1. I think you would find, if you had twelve, easily you'd find more – I would say more than not – would be really wary of putting someone away. I'm just trying to think, without nominating them, who was there. I can think of two or three people – not including myself because I haven't really thought about where I stand in this – and to a certain extent it was different (I won't say harder) being the foreman, because to a certain extent you're overseeing other people's views. So I found I sort of tended to distance myself a little bit further from what I was thinking, and involve myself more in what the other people in the group were thinking.

I'd say at least two or three were really concerned about the weight of the decision, in that they had to choose whether to put someone away, and I think they were definitely – they were concerned both ways though. You know, it was one of those things were 'Well, what happens – we're going to put this guy away for five years, ten years, whatever it may have been, can we do that?' But at the same time, they were like 'But can we put him back on the street, if he's guilty?'. But they were also people that weren't sitting in any particular camp. They were the middle ground people.

You had people that sat – I would put them more in the rationalising group, if I can put it that way. And I'm not saying that the others were irrational, I'm talking about people who sat there and said "You cannot prove to me beyond a reasonable doubt, therefore he has to be [Not] Guilty", and they were very calm and analytical about it, and there was no real emotion there. It

was just “look, this is a decision we have to make. I can’t go beyond a reasonable doubt, therefore he’s Not Guilty.” No big deal, that’s the way the system works. They weren’t casual about it, but they were fairly clinical about it.

Then you have the people who sat on either end of the spectrum, and they were the ones with the strongest convictions, and they were being driven by their convictions. Now, their convictions were, I think, in most if not all cases, driven by a combination of evidence and personal experience. As in what they believed the person – they were the sort of people who said “OK, he’s guilty”, or “he’s not guilty”, and they did so very strongly. And all the supporting evidence they saw, because they accepted either story. And they accepted either story because they believed the witness or the Accused or the plaintiff was credible, and they based their summation of whether or not they were credible on their own personal experience.

So that gave them very strong convictions?

Yes, it did. The two strongest views were held by the two oldest people. That I would attribute, in part, to greater experience, and longer experience, and more ingrained views. I mean, you can’t put that all down to age, there is personality that comes into that a lot. But that came out really strongly. Really strongly. And if I can go further, to say it wasn’t what I necessarily would have expected – in that the strongest proponent of the guilty verdict was a man. And the strongest proponent against – and I mean *avid* – was a woman. I just thought that was interesting. And like I said, there was the age point in there, and they definitely were drawing on, or just seemed to be drawing on, experience. I mean, that’s what life experience is all about, but very strongly drawing on that, and that made up a big component of what they believed.

T2-JUR 2. Some jurors are prepared to buckle under pressure from fellow jurors, changing their verdicts merely to try to achieve consensus, or because they don’t have the skills to defend their views. Some are fence-sitters, who will wait to see which way the majority vote, and go that way. Some are prepared to bargain, agreeing to a “Guilty” on one charge in order to gain a “Not Guilty” on another. Some are unable to commit to making a decision. Some do not have the courage of their convictions.

T2-JUR 3. Well, I think they’re prepared to take a risk. And I was prepared to be convinced that perhaps I was wrong, as were a lot of the other jurors. And a couple of them even said “Look, well alright, if you so strongly believe that possibly he’s guilty on charge one, we’ll change our verdicts to Guilty, but you’ve got to change your verdicts to Not Guilty for charges two and three.” So there was a bit of plea bargaining in the jury room. So I think that’s the way it is.

T2-JUR 5. Well some – high risks. Yes.

T2-JUR 6. Yes, well with us it was more – it was the opposite. It was more the case that – they would prefer to have a guilty man innocent, well, free, than an innocent man go to jail. They were very conservative, and, I mean, not conservative – that's terrible – but they were pretty public-servant-ish. And I just thought they weren't open to too much change. They'd sort of – I'm only talking probably two or three people, but they certainly wouldn't have – I think that's why we didn't get a verdict, because no-one was prepared to maybe be talked into one thing or another.

T2-JUR 7. I think a lot of it goes on gut instincts as well, and how they perceive the witnesses, like as in the woman, in this case, what she said. Whether or not – I mean that's what it came down to – whether or not you believed her. Everything that we heard, that's what it basically came back to, so I think it's a lot of a personal 'feeling'.

Well I think they thought it was the right thing, a risk. I don't know if they'd see it as a risk, though, because they actually believed it. Yes, I don't think anyone is prepared to take a 'risk', no.

T2-JUR 8. Well, it's really for that set of people that are wrestling with the reasonable doubt question. Because where you feel quite confident either way, that's obviously not an issue. So I think – well most people – and I think the [Judge] said this in the courtroom at one point – that there was a bit of a view that it's better to let a guilty man go free than to, you know, put an innocent person away. And to some extent everybody should have their own view about that. I think that people accepted that there would be a risk. You know, to generalise, they wanted it to be more of a reduced risk than what was perceived to be there.

T2-JUR 9. Oh, I don't know. I mean we didn't come to a verdict, and I think that demonstrates....I don't know, I don't really know. I think the hard thing, well from my experience, the hard thing is getting the unanimous, and the lack of DNA evidence is probably what determined that, on the second two charges.

So it was the DNA evidence that was crucial?

Well, I think it was in some peoples minds. I think if you could have said he was there, other people wouldn't have had the big doubts.

That shows to some extent that people won't take a big risk – and correct me if I'm wrong – a big risk if the DNA evidence doesn't tell them, whereas if the DNA evidence is there, then they're prepared to convict?

Yes, I think that's pretty accurate.

T2-JUR 10. That's their choice and I mean, I don't put them down at all for that. If they want to – if they felt strongly enough – which they did, that he was guilty or not guilty. I mean said "look,

there's was just not enough evidence. There's no way. He's innocent until we prove him guilty, and we can't prove him guilty. So that's it for all convictions", sort of thing. That was one, and the other one sort of made up his mind from the very beginning that he was guilty, and it didn't matter what we did or said, he just wouldn't change, so he was. But that particular person had been involved with court cases before on a professional level. And that made it very difficult. And he took notes the whole time and he also went home and worked on it. That put him on a higher level, in lots of ways, because we only came and went, and we left it all back there and we didn't...

The responses to this question show that jurors were highly conscious of the risk-taking behaviour of other jurors, be it very conservative behaviour or not. A variety of reasons were suggested as to why other jurors would risk a Guilty or Not Guilty verdict:

- Personal reactions to the Complainant, Accused or witnesses. This was termed “gut instinct” by the jurors, and could equally apply to their evaluation of expert witnesses. Where the evidence given is not strong or persuasive, some jurors appear to rely on their feelings about the people involved in the case.
- An innate sense that “it is better to let a guilty man go free than to put an innocent person away”. When scientific evidence is equivocal, as it was in this case, jurors are not given the “shining light” which tells them what the verdict should be. Having to rely on what they perceive to be as “lesser” evidence means that it is safer to deliver a verdict of not guilty, or to have a hung jury, than it is to convict the accused. This is not to say that juries could never convict in cases where the scientific evidence was not clear cut, because the other evidence may be persuasive enough, however, in trials such as those studied, it is clear that scientific evidence of a low impact, combined with circumstantial evidence, is insufficient to create a unanimous verdict of guilty.
- Extremely high expectations of scientific evidence. The jurors who expected to hear scientific evidence that clearly identified or exculpated the Accused were disappointed. Without it, they insisted on a verdict of not guilty, irrespective of any other evidence. Although this may have been the “correct” outcome (based on all of the evidence) it is nevertheless a flawed approach to assessing evidence. No one type of evidence ought to be so crucial to the jury’s decision that without it the verdict must be not guilty, nor should one type of evidence be so influential that it causes a verdict of Guilty that is otherwise unjustified. Indeed, legal history is littered with

examples of juries having placed too much emphasis on scientific evidence, to the detriment of justice.⁶²⁸ Although these cases may not be many in the context of the total number of cases heard, the principle remains important. The impact of scientific evidence, such as DNA profiling, must not be so overwhelming as to make the rest of the evidence virtually obsolete.⁶²⁹

- Bias either towards innocence or guilt, irrespective of the evidence. This sort of attitude, whether it was based on personal beliefs or professional experience (as in the case of the juror who had worked as a court-side journalist) would probably also affect the way in which a juror would respond to any expert evidence. In the trials researched it was not such an issue, because for those biased jurors who believed the Accused was guilty, the lack of scientific evidence was explainable and for those who believed he was innocent, the lack of scientific evidence was also entirely to be expected.⁶³⁰ In cases where expert evidence is crucial, however, the strongly biased juror might nevertheless choose to ignore the evidence, or strongly assert its importance, depending on the nature of their bias. Such jurors run a high risk of choosing an unjust verdict, although if their reaction to scientific evidence is unreasonable, the remainder of the jury may disregard their views and the jury result overall would be hung.⁶³¹

⁶²⁸ Cases where poor scientific evidence contributed to faulty verdicts are the best known: Justice Morling, T. (1987). *Royal Commission into the Chamberlain Convictions - Report*. Darwin: Northern Territory Government Printer; Shannon, C. (1984). *Royal Commission Concerning the Conviction of Edward Charles Splatt - Report*. Adelaide: South Australian Government Printer; Kaufman, F. (1998). *The Commission on Proceedings Involving Guy Paul Morin - Executive Summary & Recommendations*. Ontario: Ministry of the Attorney-General at 8; Tipple, S. (1986). Forensic Science: The New Trial By Ordeal? *NSW Law Society Journal*(August), 44; Walker, T. (1985). Consider Your Verdict: New Evidence from the Chamberlain Committee. *Law Institute Journal*, 6, 650.

⁶²⁹ Koehler, J., Chia, A., & Lindsey, J. (1995). The Random Match Probability in DNA Evidence: Irrelevant and Prejudicial? *Jurimetrics*, 35, 201.

⁶³⁰ These results confirm earlier jury research which indicates that personal bias has a greater impact in trials where evidence is ambiguous, as jurors are “liberated” from having to weigh up the evidence in a disciplined and reasonable way: Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1 at 10.

⁶³¹ It is noted that Australian research shows that it is uncommon for hung juries to be the result of such “rogue” jurors; more commonly hung juries are caused by equivocal evidence and interpersonal dynamics and the split of jurors is more commonly 7:6 or 8:4 than 11:2 or 10:2. NSW Law Reform Commission. (2005). *Majority Verdicts* (111). Sydney: NSW Law Reform Commission at 55.

4.9.20 Jury Duty as an Experience

*“...Like holding a kitten underwater until it drowned”.*⁶³²

Citizens are exposed to court-room scenes via the media and as entertainment, however, having to attend a two-week long trial and then deliver a unanimous verdict, casts a different light on the criminal justice process. What became apparent in the two trials studied, was that the personalities of individual jurors cast an enormous influence over the way they assessed and used the evidence, including the scientific evidence, and the way in which the deliberations and verdicts developed.

How would you describe your general experiences as a juror? Pleasant? Unpleasant?
(Telephone survey)

JURORS FROM TRIAL ONE

T1-JUR 1: It was frustrating because of lack of evidence, especially reliable evidence like DNA. Some jurors started with the presumption of guilt, and kept it up, even though the Judge constantly and deliberately mentioned that there was a presumption of innocence and that the jury must be sure beyond reasonable doubt.

T1-JUR 2: This trial was a complete waste of time and the jury knew it right from the beginning. It was obvious that two jurors were so biased that no evidence (except the Complainant coming into the jury room and admitting that she was lying) would change their minds. I did consider alerting the Judge to the problems with these two jurors and their attitude, but did not do so.

T1-JUR 3: It was a positive experience and was enjoyable; an open and fair trial. Being a juror meant I didn't get a one-eyed view of the case, as I would have if I had just read about it in the newspaper.

T1-JUR 4: Different jurors would read different things into the evidence. For example, in the medical forms, the doctors used the term “hold”. Some jurors interpreted this as just one person “holding” another. I interpreted it as a strong grip – “like holding a kitten underwater until it drowned”. This made deliberations difficult because some jurors would also hear the complete opposite of what the rest of the jury heard. Trying to rely on notes was unsuccessful because they were unreliable and every version was different.

⁶³² The way one juror interpreted the “hold”, as it referred to how the Accused allegedly held the Complainant during the second incident.

T1-JUR 5: Although I had been a juror on a previous case (assault case the week before, with four other jurors from the current case), I still wanted something “easy” like a lie detector test to help the jury judge the witnesses and their truth. Although lie detector tests may not be reliable they are probably more reliable than a jury just speculating about the witnesses and evidence.

I felt bad about a hung jury but thought perhaps it would give the Prosecutor the chance to get it right next time. As it was, I was amazed that the trial had commenced with five charges and two were thrown out whilst a third charge was changed. A second trial might give the Prosecutor the chance to gather more evidence and organise the charges better.

Right from the start of the trial, two jurors had very set views about their verdict; one guilty, one not guilty. This is what held the verdict up at the end – the jury knew that they would never get agreement from either of these jurors, even if they kept deliberating for days.

Some verdicts did change over the course of the trial. For example, I thought the Accused was guilty but I still had an element of reasonable doubt. After another juror went through the doubt (with the rest of the jury), I changed my mind and thought the Accused was guilty. I was comfortable with “guilty” at this stage. [Later answers suggest she ultimately changed her mind again].

Knowing that the Accused had been in remand for about a year had no role in deliberations, even though the jury were aware of it and were conscious that a hung jury would result in more time and a new trial. That is, the jury was aware that a hung verdict meant that lives were going to be seriously affected by their indecision.

T1-JUR 6: I had been in a three-day assault case, the week before the current case, with 4 other jurors from the current case. Seeing this earlier case helped me to know what to expect; to know what to take down in notes; to know what questions the jury would be asked to consider. In the first case it was really difficult to know what was important and what wasn't. Some jurors in the current case said (given the above) that maybe courts should use professional jurors (I'm not exactly sure what they meant by that, but did think that maybe jurors should be allowed to watch a case before they're called for actual jury duty, so that they know what to expect and how things work and what notes to take, et cetera).

T1-JUR 7: Experience as a juror was frustrating, both time-wise and because the jury did not come to a decision.

T1-JUR 8: Two jurors took the word of the Complainant and *that was it*. They would not even consider any other evidence (police reports, medical reports, DNA evidence, alibi witness.) They

took this stance right from the beginning of deliberations and stated “this case is black and white. Nothing will change my mind”.

The majority of jurors thought the case had not been proven beyond reasonable doubt, because there was no direct linkage to the Accused and even more loose threads, left hanging by a lack of questions. But the two jurors (above) were resolute, intractable and inflexible. Their empathy with the Complainant was total and nothing would change their mind. In fact they stated this and didn't ever move from this position.

As a juror in an assault case the week earlier, I thought this case had too many loose threads. It was hard to be certain about anything and hard to quantify doubts. In contrast, the assault case had been easy – tick off the elements and know that the answer was OK (or at least be pretty certain).

As jury duty doesn't come with a manual (which probably wouldn't help anyway; just have to try things and see how they go), it was hard to know how to proceed. [As the foreman] I offered to let deliberations go on, but other jurors said no.

When I read in the newspaper that the Judge had refused bail for the Accused two days after the trial, I was immediately concerned – what did the Judge know about the Accused that the jury had never been told? Did he know something about the case that the jury didn't? He must have, and the lawyers must have too. This confirmed that we [the jury] had been kept in the dark about potentially important things; things that had influenced the Judge's decision not to grant bail. This raised doubt about whether the jurors voting for not guilty were right or not, but ultimately I was glad that the jury had not given in to the demands of the two biased jurors.

Overall I was very disappointed and upset, for days after the trial. I was sad about the Prosecutor's attitude and thought that the case itself seemed to make a mountain out of a molehill: if the Complainant or Accused had just apologised to one another the case would never have come to court.

Also, days of careful summing up by the Judge and the Defence lawyer just went right over the heads of the biased jurors. They were completely inflexible and refused to brook any argument. One of them was overbearing, talkative, troublesome and had her own agenda right from the start.

T1-JUR 9: I was dreading jury duty; not looking forward to it at all; *apprehensive*. I had never done jury duty before and did not want to go. Even so, I found it to be an interesting experience and an 'eye-opener'.

JURORS FROM TRIAL TWO

T2-JUR 1. It just occurred to me, having talked to you, that you may be interested for your own knowledge, or to tell jurors in the future, that having talked to you and talked through things, and having been given the opportunity just to talk about the case, et cetera, I found it quite useful. I just got off the phone and thought "That was good". It was a useful process for me, because it's something which to a large extent you can't talk to anyone about it – either (A) because you're not allowed to talk to people or (B) even when you do have someone available to sort of talk to confidentially, they don't understand the process. They haven't been at the case, they don't understand what you're talking about. And I can honestly say – that's why I rang you back – because I got off the phone and walked away from the phone and suddenly thought, I actually thought "I feel better". Not that I felt bad about it, but there probably was a certain hang-up from this case, because it was to a certain extent unresolved because we couldn't reach a verdict. There was certainly a sense of anti-climax about it – and I certainly couldn't speak for everyone, but I know a number of people in the jury also at least felt that it was an anti-climax – We accepted the fact that we couldn't reach a verdict, but I just thought that for your own knowledge you might be interested in that comment – And also that it would be useful, possibly, to pass on to people in the future, if they're thinking about it. I mean, it's not a therapy session, but like I said, I noticeably feel better about the whole thing.

T2-JUR 2. The experience had pleasant and unpleasant aspects. It was good to be part of the team, helping one another, as we gathered the evidence. It was not pleasant to see the frustrations of disagreement and uncertainty during deliberation. It was pleasant to find that once it was all over, we were all still friends. It was not pleasant losing two weeks of your life over such an issue. It was unsatisfying that we were unable to reach unanimous decisions, yet satisfying to have done your duty to the best of your ability.

T2-JUR 3. I did enjoy the whole process. You know, the other jurors, we all got on extremely well. It was certainly an eye-opener, to see how the whole court system works, and a disappointment at the same time – in the sense that it was very much a playing on legal terms and legal issues, rather than getting to the nitty-gritty part of things. You know, saying 'right, this is what he is Accused of having done, this is **all** the evidence we have, make a decision'. I found that part extremely frustrating. I was **extremely** disappointed that we didn't reach a verdict, as were a couple of other members of the jury, in the sense that we felt we had invested so much time in this situation, to not reach a verdict. But it came to the point when we realised that there were a couple of members of the jury that – especially one – that wasn't going to change their mind, no matter what. And I just felt that the reasons that were given for that were not strong enough for me to change my view, whilst respecting their view. And once it started getting to the point where people were being nasty with each other, it was time to call it quits. So would I do it

again? Yes I would, oh yes. I feel 'though that as a whole, the court system – the legal system – has a lot to answer for and could do a lot more with its time than it is doing at present. And I just think that all of these little bits and pieces of legal argument, and how evidence is suppressed, is unfair to everybody concerned, and a waste of the courts time. I think if you've charged somebody, if you've got the evidence, present it, and that's it. It seems to be more of a bit of game about who knows the legal issues better than the other one, and how well they can argue, and how far you can wear the Judge down, rather than what's right and what's wrong.

T2-JUR 5. Can I say mixed? Yes, during the evidence and all that it was quite pleasant, at times it was even funny, when they cracked a joke for attention, you know, but obviously when they're talking about sexual matters on and on in great detail, well that can get a bit sort of trying sometimes. But no, I think it was very interesting and I was glad to do it. You know, I wanted to do it and always wanted to know what it would be like to be a juror, so.

T2-JUR 6. If I look back it wasn't a terrible experience. It wasn't a pleasant experience – the evidence, some of the photographic evidence was not the nicest thing to look at. And I'm fairly open minded, but I was shocked with the, his video evidence and so that wasn't pleasant. And like coming home – I've got three kids – and coming home to (one works and two are at school) and coming home after listening and looking at that all day, and just walking into the house and changing your whole like from that to "What's for tea", wasn't nice. It was like walking in and out of a time warp – when you went back into court the next day you were back in the time warp. It took me probably until that Saturday to come down, after our decision, you know, like we made our decision on the Tuesday night – well I was a bit zombie-fied for three days.

I think that's a bit tough. Well probably a lot of trials don't need it [de-briefing], but I think ours did because... Also because we couldn't come to a decision – it would have been nice to have some ultimate end to it. And even now, you know, it's something that's at the back of your mind all the time. It's a funny sort of a thing. I think probably they could have something where maybe when you've all finished maybe, they could have someone there to debrief you and tell you 'these are the signs if...' – I mean probably females and some males wouldn't bounce back from some of the things we heard or saw. And you can't really discuss it with anyone either, you know. It's just that once you get back to work and back to your home stuff and all that, you're just so far behind. And I mean you still can't really discuss it with anyone. Like a few people asked 'oh well did you read it in the paper?'. Well that's enough. All that in the paper was enough.

It got to about 9 o'clock or whatever time, and we'd gone around in circles for two days, and someone just made the sensible decision; well if we come back tomorrow, is this going to change? And we were just starting to get a bit narky with each other, too. And it wouldn't have changed the next day, because we had, you know, we had people who were prepared to you

know, play one decision off the other, sort of thing. Just to get like one or another result, but you know, no-one was even doing that, so. Twenty four hours would have made no difference at all.

T2-JUR 7. I'd say pleasant, yes.

T2-JUR 8. I think I had the full range of emotions there. There were humorous points and really difficult and disturbing parts and quite just interesting... I mean, I found it a very useful and interesting experience to go through. A little unsatisfying at the end, because, I mean you'd like to think that everybody's time was useful and you know, I guess I just have the perception of a hung jury as not being useful, but you know, maybe it's the system working, anyway.

T2-JUR 9. Well it wasn't pleasant...I think the whole case was pretty unpleasant, but I don't think it was unpleasant – it was just an experience I think.

T2-JUR 10. I would not have not been there for it, despite the fact that I was very tired afterwards because I had to do shift work. Because I had to work – I did 12 days work in that fortnight. Because I had to, you see I work shift work, so I work weekends and evenings, and because it was a Monday to Friday, I have Monday, Tuesday as my days off, so I got paid, well they paid me a minimum of \$70 on those days, and then I... See the first day we were called, which was a Wednesday I was there in the morning and we were called, and said not till Thursday. Well I had to work till 11 o'clock that night – 2:30 to 11 – and then I had that weekend off, and then my days off were Monday Tuesday and I went to court. And then I had to work the following weekend at work, so I was extremely tired, yes. Because when I finished, we finished on the Tuesday night, late, I had to work Wednesday, Thursday, Friday that week. But I wouldn't have not done it. I mean for the experience.

It does cost you to come. Because when you're on shift work you rely on the extra money, and you have to do weekend work, and that pays. So you do lose if you don't do that weekend work that you normally have. And I don't know how to get out of that part of it; it's alright for Monday to Friday people, but for shift workers there is quite a difference in pay that you drop, because you have to do the shift work, and they don't pay you shift allowance, the hospital won't.

It's quite stimulating. I think I only slightly dozed once in the court. No, I wouldn't do that because it's somebody's life and, no, no, no, I kept on. And I wrote notes and things to keep my mind active.

What evolved from the responses to this question was a deep concern that the attitudes of individual jurors were extremely influential on the outcomes of these trials. Jurors in

the first trial were particularly strongly concerned about the perceived bias of certain jury members and noted that this bias caused two irreconcilable behaviours:

- A strong push for a verdict of not guilty, because for one juror the forensic scientists had not delivered “the only reliable / objective / factual evidence” (that is, DNA profiling evidence which identified the Accused); and
- A strong push for a verdict of guilty, because of the juror’s personal convictions, assisted by the fact that the forensic science could not exclude the possibility that the Accused had committed the crimes.

This was a great source of frustration for the other jurors, particularly since it resulted in a hung jury in both instances. As has been noted previously, research in Australian and elsewhere indicates that the incidence of “rogue jurors” (who persist in disregarding evidence or arguments, in favour of pursuing their own biased views) is not particularly common as the cause of hung juries.⁶³³ It is more common for hung juries to arrive at that position because of weak, equivocal evidence, poor presentation of evidence by the prosecution, strong arguments from the defence, or difficult interpersonal interactions between jurors during deliberations.⁶³⁴ In the context of the results in this chapter, it is important to recall that all of these additional factors played a role in the trial outcomes, in addition to the apparent bias of several jurors. Importantly, in respect to the issue of scientific evidence and how it could best be presented to juries, it is noted that for those jurors who were waiting for decisive scientific evidence which would clearly indicate the “correct” verdict, the trials were particularly disappointing.

Of those jurors who found the experience pleasant, or at least partially pleasant, the main reason was the fulfilment of their civic duty to the best of their ability.

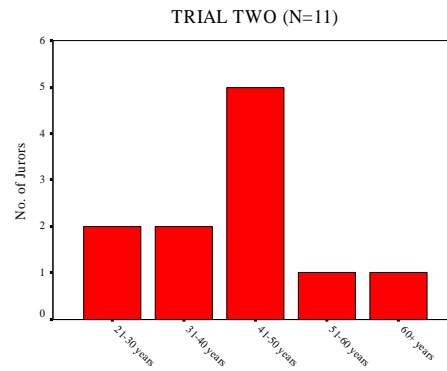
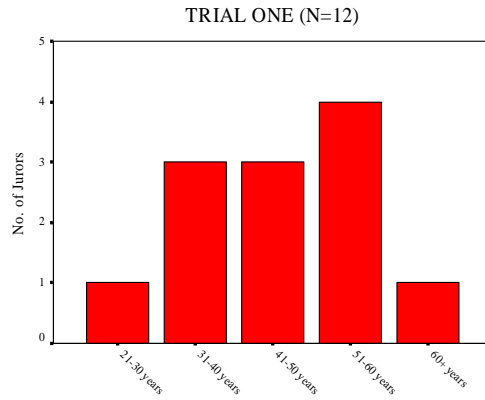
4.9.21 Juror Demographics

Qualitative data should not be drawn from the results of this research, as the sample size is too small. Some demographical information is provided however, to supply background information which adds context to the jurors’ responses.

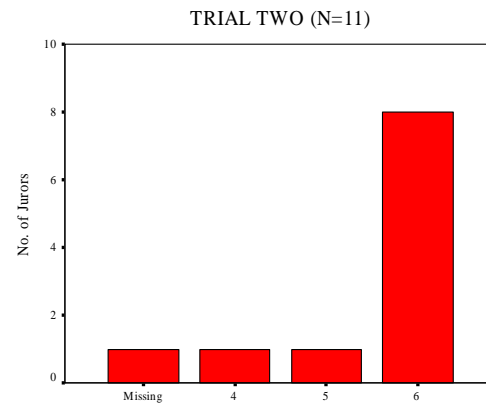
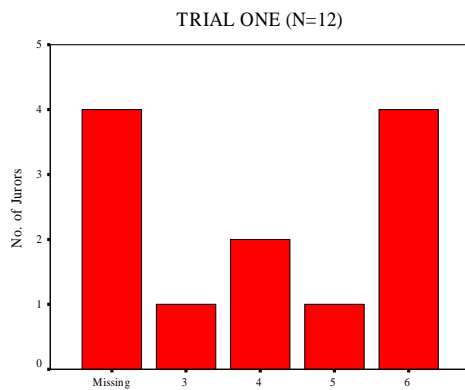
⁶³³ NSW Law Reform Commission. (2005). *Majority Verdicts* (111). Sydney: NSW Law Reform Commission at 55.

⁶³⁴ Hannaford-Agor, P., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are Hung Juries a Problem?* Williamsburg, VA: National Center for State Courts, National Institute of Justice, at 84.

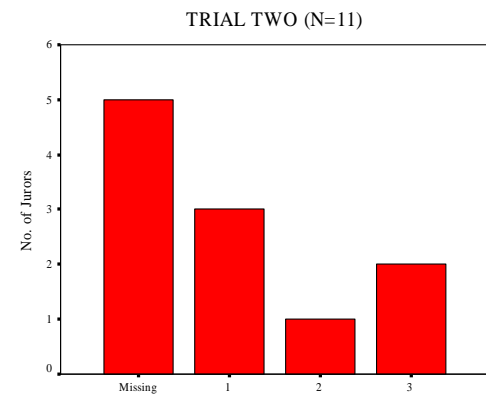
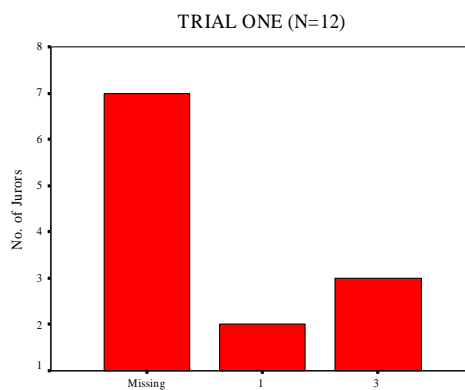
Age Distribution of Jurors?



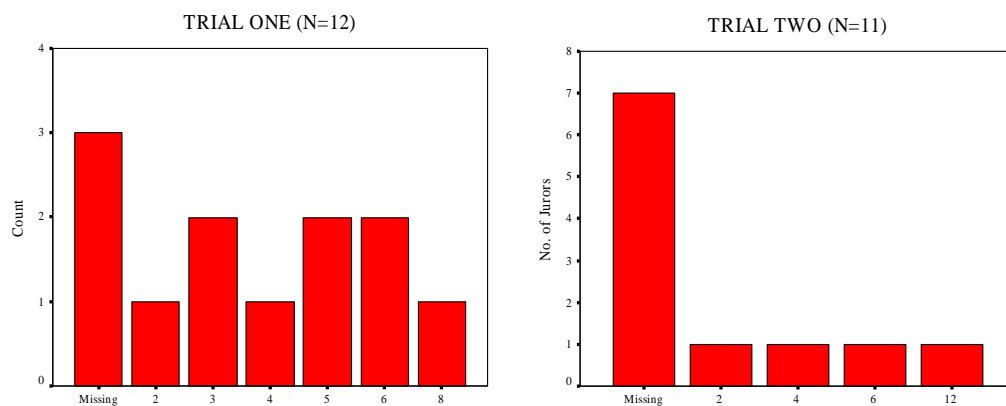
Years of high school?



Years of TAFE?



Years of university?



Main occupation?

TRIAL ONE (N=12)

- Computer programmer, IT contractor, Computer expert. (x3)
- Economist. (x1)
- Human resources manager. (x1)
- Laboratory manager. (x1)
- Public servant. (x2)
- Retired. (x1)
- Question not answered. (x3)

TRIAL TWO (N=11)

- Journalist. (x1)
- Office Manager. (x1)
- Public Servant. (x5)
- Registered Nurse. (x1)
- Retired school teacher, School assistant. (x2)
- Service Technician. (x1)

The jury selected in Trial One was made up equally of men and women, whereas the jury in Trial Two comprised of four men and eight women (the cohort of men was further reduced in this trial when one juror was excused due to illness). The group of jurors in Trial One was slightly older than the group in Trial Two, however both groups displayed the range of ages consistent with juries in other Australian jurisdictions.⁶³⁵

In terms of education, the jurors in Trial One reported a higher level of attendance at university, although many jurors in both trials had attended tertiary studies at TAFE

⁶³⁵ Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration at 60.

(n=11), and in Trial Two the majority of jurors had completed the higher years of secondary education (years eleven and twelve) (n=8).

The range of occupations reported by the jurors reflects the distribution of educational backgrounds, and the ubiquitous tag “public servant” reflects the predominant occupation of many within the ACT (without providing any information as to what the work involves).

It is difficult from the small sample size to detect any trends within each jury which can be directly attributed to the age, gender or education of the jurors. Neither jury were able to reach a unanimous verdict, yet all jurors in both trials appeared to understand the scientific evidence and the case in general (even if their ultimate response to the evidence was biased rather than objective). It has been remarked upon in previous studies that age, gender and education are not satisfactory predictors of how Australian juries will respond to evidence or make decisions, and this view has not been confirmed or denied by the current research.⁶³⁶

4.9.22 Reflections of Survey Methodology

Attendance at court for the entirety of both trials studied was extremely time consuming, and may not be practical in the larger study contemplated from this research, however for this initial work it provided two significant advantages:

- The jurors were aware of the presence of the researcher each day in court, and this familiarity and a degree of camaraderie may have contributed to their willingness to participate in the research at the end of the trial; and
- The answers given by jurors, particularly in the telephone survey where the answers were often broad-ranging and detailed, could be put into context, because the researcher had seen all of the trial and not just the scientific witnesses.

The administration of the written survey at the end of the trials was a straightforward and effective method of obtaining a high response rate. Once again it necessitated the

⁶³⁶ Ibid. at 108.

presence of the researcher, however, the alternative would mean relying on busy court staff to administer and explain the survey, which is a significant ask at the end of any busy trial.

The administration of the telephone survey was also completed satisfactorily. When the initial response rates were not as high as expected, reminder notices were sent to jurors (through the court registry, so that jurors anonymity was maintained) and the final response rates were most satisfactory. This method of completing lengthy survey questions by allowing jurors to call at a time which was convenient for them, proved to be successful although in a large-scale study it would be necessary to limit the calls to business hours, or use more than one interviewer to conduct the surveys.

4.10 CONCLUSIONS

The research detailed in this chapter was a preliminary endeavour to determine how scientific evidence might better be presented, comprehended, assessed and used in criminal trials in Australia. Within the limits of the trials which were available for study, some important insights were gained into how juries cope with expert evidence; in these cases, DNA profiling evidence delivered by a forensic biologist.

Qualitative conclusions can be drawn within the framework of the following objectives:

4.10.1 What expectations do jurors have of forensic science and scientific expert witnesses?

The jurors in the trials studied were aware of DNA profiling evidence and had high expectations about the content and importance of the DNA profiling evidence they expected to hear. These expectations were not met, because crime scene examiners and the forensic biologist could not determine whether or not there was DNA from the Accused at the alleged crime scene. This failure to meet expectations resulted in severe frustration for all jurors, even those who had not expected DNA profiling to be the paramount evidence in the case. For those jurors who had expected to rely heavily or solely on DNA profiling to guide their assessment of guilt or innocence, the failure of

the experts to deliver the expected DNA evidence resulted in the inability of these jurors to even contemplate delivering a verdict of guilty.

Expert witnesses were able to educate jurors to some extent, to ameliorate jurors' unrealistic expectations about DNA profiling evidence. Jurors in the trials studied were able to appreciate the strengths and weaknesses of DNA profiling concepts and methods. Most jurors were not satisfied, however, with the minimal information given about why certain samples were not tested and why no evidence of the Accused's presence was detected at the crime scene.

The frustration of the jurors was exacerbated by the anonymous nature of the investigative and trial process; jurors were unsure as to who was responsible for evidence not having been collected and tested and were unable to direct their frustration at the lack of evidence at anyone in particular. Although the expert witness in these cases was exonerated by the juries (who concluded that someone else was probably responsible for making certain decisions about what evidence was collected and tested), the anonymity and unclear role division of the criminal justice process was a notable and significant source of frustration.

4.10.2 How is scientific evidence presented and how is that presentation perceived by jurors?

The jurors in these trials were extremely dissatisfied with the scientific evidence adduced in the adversarial format of the court. Questions asked by both the prosecution and defence were judged by the jurors to be unhelpful, ineffective and inadequate because:

- They did not address the central issues of why certain samples had not been tested for DNA and why certain items were not conclusively identified;
- The scientific witnesses were, by the nature of the questions asked by the lawyers, restricted in their responses and prevented from giving comprehensive answers;
- Issues which had become apparent in examination-in-chief and cross-examination were not followed up in re-examination or in questions put to other witnesses.

Overall, the juries studied in this research believed that critical scientific evidence had been denied them, because of the filtering effect of the method of questioning used by the prosecution and defence.

Where questions were asked in such a way that only limited answers by the forensic expert are allowed, some jurors speculated as to the meaning and significance of those answers. Jurors also speculated about the content of the scientific expert's notes. These were not available for the jury to scrutinize, and given the strong feelings of all jurors that information was being withheld from them, the expert's notes were the cause of some speculation.

The presentation skills of the scientific expert in this research were exemplary. Although the content of the biological evidence was limited, there were several important characteristics by which the expert was judged by the jury to be competent, knowledgeable and impartial. This was based on the scientific evidence being delivered:

- Factually,
- Confidently and audibly,
- Clearly and concisely,
- Without jargon,
- Without reacting differently to either the prosecution or defence,
- With efficient reference to notes, and
- With reference to communication cues from the jury.

The scientific evidence in these trials was delivered entirely orally and jurors reported no need for further media such as diagrams, posters or animation. Given that the expert evidence in these cases was relatively simple, however, this area still remains open for further research.

All expert witnesses in the trials studied were called by the prosecution and were unopposed by the defence. The qualifications of the forensic biologist were accepted by all jurors, not only on the basis that the expert had tertiary qualifications that appeared to be of a high standard, but, importantly, because the court had accepted the witness as an "expert". Many jurors also relied on the fact that the witness was representing a

particular organisation (and one which is actually part of the police force in the Australian Capital Territory). The association with the police did not appear to negatively impact on jurors' perceptions of the witness, and may in fact have enhanced them. It cannot be concluded from this easy acceptance of the witness' suitability, however, that all juries would be so accepting. If the expert was opposed by witnesses called by the defence, or if the expert had formal training but little experience, or if the witness' employer was a police-based organisation in another jurisdiction, it is possible that the jury would be more rigorous in their assessment of the expert's qualifications and credibility. This is an avenue for further research.

Jurors were able to recognise when expert evidence was presented impartially. This observation was premised for some jurors on the underlying expectation that scientific evidence, particularly DNA profiling, was inherently objective and impartial, whereas other jurors noted the markedly impartial behaviour of the expert witness in responding with equal candour and courtesy to the questions of the prosecution and defence.

4.10.3 What use do jurors make of aids to their understanding of scientific evidence, and what aids could be used to improve this understanding?

Jurors in the trials studied were frustrated by their inability to access the information they believed they needed in order to deliver a verdict. The manner in which the juries were allowed to ask questions, (through written submissions made to the Judge during the deliberations) was acceptable to both juries, and both juries did ask questions at the end of the trial. If jurors had known that they could ask questions earlier, this opportunity may have been taken, however the jurors themselves noted that questions which arose during the trial were often answered as the trial went on.

More significant a problem was the belief by jurors that they could not ask questions that had not already been put to witnesses during the trial. The possibility that witnesses might be recalled, or that the jury might ask a question at the end of a witness' evidence were not entertained by either jury, although they had not been told otherwise at any point during their service. This misapprehension about asking additional questions resulted in frustrated, under-informed, speculative groups of jurors who did not have enough evidence on which to base a verdict.

Particularly with respect to the expert evidence, the juries in this research had many more questions than those which were actually put to the scientific experts by the prosecution and defence. The adversarial nature of the court – that is, the control of the evidence by the prosecution and defence – rendered access to the trial transcript a null point in these circumstances, because the juries recognised that the answers they wanted were not contained in the record of what had been asked and answered in court. Nevertheless, access to the trial transcript to clarify details about scientific evidence, is an issue which might bear investigation in further research.

The jurors in this research were divided as to the merits of scientific witnesses citing external references for their own evidence, such as relevant journal articles or standard practices in their field. Because the scientific evidence in these trials was not contested by the defence or subject to arguments from opposing experts, the question of whether jurors value external referencing was not conclusively answered in this research.

4.10.4 How do jurors assess, comprehend and use scientific evidence to arrive at a verdict?

In the trials studied, the words of the Judge and, for some jurors, even the apparent feelings of the Judge, were important when assessing the DNA profiling evidence, and some jurors were influenced by the explanations offered by either the prosecution or defence. Notably, the directions offered by the Judges at the end of the trials did not greatly assist the juries in their use of the DNA profiling evidence, as neither Judge gave an indication as to their own view of the expert evidence, and indeed merely repeated what the expert had said. By far the greatest influence on how the jury assessed the DNA profiling evidence was the forensic scientist.

Jury room discussion of the scientific evidence was not universally helpful for all jurors. The potential for mid-trial discussions and final deliberations to assist jurors in comprehending and assessing the DNA evidence was limited where jurors were biased against the evidence, had not taken reliable notes, were wary of speculating about technical issues, or considered themselves so knowledgeable that further discussion was unnecessary. Nevertheless, jury discussion was valuable for some jurors by way of

clarifying the expert testimony and also correcting misunderstandings about the DNA profiling evidence.

Assessment and use of the scientific evidence was influenced by several factors which were beyond the control of the expert witness. Juror bias existed at both extremes: some jurors were not prepared to acknowledge any significance for the total lack of physical evidence linking the Accused to the crime scene. Such jurors placed complete faith in the testimony of the Complainant and would not countenance any view to the contrary. To these minds, evidence of the absence of the Accused's DNA at the crime scene held no probative value whatsoever. Other jurors placed critical importance on DNA profiling evidence, to the exclusion of all other evidence. These jurors were prepared to ignore all elements of the circumstantial (non-scientific) evidence and acquit the Accused on the sole basis that there was no DNA profiling evidence which positively identified the Accused at the crime scene.

Overall

The overall objective of the larger research project is to make forensic science easier for Australian jurors to understand, and, at the same time, to make the court process more receptive to complex evidence. Ultimately this should help the legal system make better use of the increasingly complex and specialised expertise now available, not only when jurors are asked to determine its strength but also when they judge the quality of the science that was used to obtain it. This research indicated that jurors who are biased, either towards the prosecution or defence, or towards or against particular types of evidence, may disrupt jury function and not comprehend, assess or use forensic science in a reasonable manner. By far the larger problem for the juries in this research, however, was the communication of matters of court process and evidential substance to the juries. Inadequate communication of evidence, including the full range of scientific evidence, and a failure to adequately explain why things were done as they were, were significant contributors to the hung juries in this research. Furthermore, the poor overall communication with the jury on matters of both procedure and substance exacerbated intense juror dissatisfaction with the process and the outcome of the trials.

The results gained from this preliminary study indicate that the methodology of using a written survey followed by a juror-initiated telephone survey will yield valuable

information not only about what jurors expect from scientific experts, but how those expectations are met through an adversarial system in which jurors are largely expected to be impassive observers of the trial and objective assessors of the facts. The preliminary results indicate that juror expectations may be a significant factor in trial outcomes and that the adversarial system as played out in front of juries does not necessarily avail them of sufficient information, or opportunities to gain the necessary information, when trying to comprehend assess and use expert evidence to come to a reasoned verdict. Nevertheless, the performance of the scientific expert as an unbiased, qualified and able communicator is vital in ensuring that juries comprehend what they are given and feel confident in their assessment of scientific evidence on their way to delivering a reasoned and reasonable verdict.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Complex expert evidence is an element of modern trials that warrants close investigation. This thesis has examined some of the issues surrounding complex scientific evidence - such as juror expectations; juror capabilities; the way the evidence is used by advocates; the way the evidence is presented by witnesses; and the impact that all of these factors have on the comprehension and use of scientific evidence by the jury. The results do not suggest that any of the factors which contribute to a successful legal system (judges, advocates, witnesses, scientific evidence, juries) ought to be drastically changed. Rather, the results suggest that simple things need to be considered and small changes might be made to improve the way in which scientific evidence is presented and therefore the way in which juries are able to comprehend and use that evidence. All of the conclusions indicate that further research is warranted to examine each of the issues in more detail.

As an illustration of complex scientific evidence, DNA profiling presents a challenge to the criminal justice system. The mock jury research in this thesis suggests that members of the general public are capable of comprehending DNA profiling evidence to the extent that many recognise that DNA *alone* does not completely prove that a suspect is guilty. Nevertheless, those respondents who did not speak English as their primary language, those who had fewer years of high school education, and those who had not attended university had far greater difficulty in comprehending the statistical aspects of DNA profiling evidence and coming to a reasonable and rational verdict. Overall, the entire sample of respondents demonstrated an inability to consistently answer mathematical questions about DNA profiling evidence correctly. If mathematical (statistical) concepts and calculations continue to be relied upon in the use of DNA profiling evidence in court, care needs to be taken to ensure that the evidence is presented in the simplest language possible. Research to determine how this could be achieved (including the use of explanations, analogies and visual aids) is warranted. Further investigation is also warranted to determine the exact impact that language proficiency has on juror competence, and, further to this, whether vetting of the jury

pool to more carefully determine language competence, is necessary for the satisfactory assessment of complex evidence by the jury.

This research also investigated Bayes' Theorem in the context of DNA profiling evidence. Although the formal theorem has been rebuffed by the courts, the majority of mock jurors in this study were able to intuitively combine evidence and update the probability of a person's innocence or guilt, consistent with a Bayesian framework (of prior odds combined with new evidence to create the posterior odds). Although language again proved to be a significant barrier for some respondents, the theorem may provide an alternative way for advocates to conceptualise their case theory. Considering the evidence as a series of components which can be consciously combined to determine the verdict, may better enable advocates to present the evidence in a logical and orderly way which assists jurors in their task. Advocates consciously assessing the value of DNA profiling evidence and presenting it with this assessment in mind, may also ameliorate the tendency of some jurors to over-emphasise the importance of DNA profiling evidence in a case. This tendency was demonstrated by a cohort of mock jurors in this research who were prepared to find an accused guilty on the basis of DNA profiling evidence which was relatively weak, especially compared with the strength of DNA profiling evidence now commonly used in Australian trials. Although the impact of DNA profiling evidence has long been suspected, further investigation is warranted to determine what impact this tendency has in real criminal trials.

Within the limits of the trials which were available for study in this research, some tentative conclusions can also be drawn about real jurors and scientific evidence. The research indicates that juries have little knowledge of forensic practises (such as the demarcation between forensic disciplines), and forensic principles (such as why certain evidence had not been collected or analysed, or why certain evidence had yielded no results). Being largely unfamiliar with forensic and legal practises, jurors would also like more information about the content of expert witnesses' notes and files referred to in court. Failure to provide juries with this type of information appeared to create speculation, dissatisfaction and ultimately contributed to the juries' inability to deliver a verdict. Further investigation is justified to determine how much of this type of information juries can practically be provided with. Given the media coverage of "forensics" to which many jurors had been exposed, research which weighs such dis-

information against the rules of evidence, time limitations and trial strategies which impact real criminal trials in Australia, is clearly warranted.

A further important contributor to jury frustration and dissatisfaction in the trials studied for this research was the effect of the adversarial nature of the trial process. Advocates need to be aware that where expert witnesses are forced to be very limited in their responses, particularly in cross-examination, jurors are cognisant of the fact and may accord the responses (and implications) less weight. A failure by advocates to anticipate jury questions and a resultant failure to address the issues in examination-in-chief, cross-examination and re-examination, were also viewed as a conspiracy consistent with overly “filtering” the information provided to the jury. It can be concluded that where juries feel that important information is being deliberately withheld from them, it may result in speculation, frustration and juries conducting their own research outside the confines of the trial. Further investigation is warranted to determine whether juries need more information as to how and when they may ask questions, and whether those questions are confined to the contents of the trial transcript or may include asking for extra evidence from witnesses.

The presentation of complex scientific evidence in criminal trials was also examined from the perspective of expert witnesses. One overriding theme emerged: Advocates are not utilising the expertise of their witnesses by engaging in pre-trial consultations.

Pre-trial consultations which ensure that experts and advocates are fully versed on the content, meaning and presentation of the scientific evidence would overcome many of the problems encountered by expert witnesses, including having their evidence led poorly or incorrectly in examination-in-chief; a failure by advocates to understand the demarcations within forensic disciplines; experts being denied the opportunity to adequately defend their results, conclusions or opinions in cross-examination or not having their evidence clarified during re-examination; experts failing to present their evidence to the satisfaction of the judge; a lack of opportunities to prepare and use visual aids to enhance comprehension of the evidence; and failure by advocates to ensure that the credentials, conclusions and opinions of opposing experts are legitimately tested.

In this context, forensic scientists reported the need for ongoing and improved dialogue between the legal profession and forensic scientific community to ensure that both parties are aware of the lacunae that exists in the knowledge of each about the other. This would facilitate more effective communication of scientific evidence to the fact-finder in a criminal trial, be they a judge or jury. Exactly how pre-trial consultations could be arranged and would work in practise, merits further investigation.

Some forensic experts also called for further research into the benefits of the provision of forensic science by non-police organisations. Particular concerns related to attacks by the defence on expert witnesses who are employed by police-based organisations, and the effect that their source of employment may have on jury perceptions about their credibility and impartiality. These concerns were not prevalent in effect in the research conducted on real jurors, however, more research in other jurisdictions would be required in order to make further conclusions on this point.

The overall objectives of the research initiated in this thesis were to investigate how forensic science is presented, used and comprehended by juries in the Australian criminal justice system. Although there is scope for further investigation, the results clearly indicate that small changes such as improving pre-trial consultation between expert witnesses and advocates; clarifying and improving the ability of juries to ask questions; more carefully considering giving juries extra information about forensic practises and procedures; actively countering jury expectations about what DNA profiling evidence means and can provide in a criminal trial; improving the use of visual and other aids for presenting complex evidence; and considering the impact of juror language proficiency when presenting complex evidence, will improve the comprehension and use of forensic science in Australian criminal trials.

REFERENCE LIST

- AAP. (17 October 2005). Falconio Murder Trial Told of DNA Match, *Sydney Morning Herald*. Sydney
- AAP. (2006, June 14). Fresh Clues in Pensioner Death. *News.com.au*
- ABA Section of Litigation. (1989). *Jury Comprehension in Complex Cases: Report of the Special Committee of the ABA Section of Litigation*. Chicago: American Bar Association
- ABC Radio National. (2005). *The Science Show - The Truth About CSI* (9 April). ABC Radio National 9 April [2005, 19 May]
- Abraham, W. (2006). Difficulties in Using Expert Evidence - *R v Karger* - A Case Study, *10th Annual Conference of the International Association of Prosecutors*. Paris
- Aitken, C. G., & Taroni, F. (2005). *Statistics and the Evaluation of Evidence for Forensic Scientists* (2nd ed.). Chichester: John Wiley and Sons
- Aitken, C. G. G. (2003). Evaluation of Evidence. *Australian Journal of Forensic Sciences*, 35(1), 105
- Amar, A. R. (1995). Reinventing Juries: Ten Suggested Reforms. *University of California Davis Law Review*, 28, 1169
- Amar, A. R., & Amar, V. D. (1996). Unlocking the Jury Box. *Policy Review*, 77(May-June), 1
- Anderson, C. A., & Bushman, C. J. (1997). External Validity of "Trivial" Experiments: The case of laboratory aggression. *Review of General Psychology*, 1, 19
- Asche, A. (2002). The Expert Witness, *The Psychologists of the Northern Territory* (pp. 5). Darwin
- Atchison, B. (2003). DNA Statistics may be Misleading. *Law Society Journal*, February, 68
- Australian Bureau of Statistics. (2005). *Criminal Courts, Australia*: Australian Bureau of Statistics
- Ayres, K. L., Chaseling, J., & Balding, D. J. (2002). Implications for DNA Identification Arising from an Analysis of Australian Forensic Databases. *Forensic Science International*, 129, 90
- Balding, D. J. (1999). When Can a DNA Profile be Regarded as Unique? *Science and Justice*, 39(4), 257
- Balding, D. J. (2000). Interpreting DNA Evidence: Can Probability Theory Help? In J. L. Gastwirth (Ed.), *Statistical Science in the Courtroom* (1 ed., Vol. 1, pp. 443). New York: Springer-Verlag
- Balding, D. J., & Donnelly, P. (1994). The Prosecutor's Fallacy and DNA Evidence. *Criminal Law Review*, 1994, 711
- Baldwin, J., & McConville, M. (1979). *The Jury*. Oxford: Oxford University Press
- Banks, A., & Pitsis, S. (2004, 27 July). Black DNA no Proof of Rape, Says Lawyer. *The Australian (news.com.au)*
- Barrett, D. (1991). Scientific Evidence in an Adversarial System with a Lay Audience: A Problem for Justice? *Journal of the Forensic Science Society*, 31(2), 271
- Bell, A. (1997). Twelve Men and True! Bah Humbug. *New Law Journal*, December 19, 1857
- Biedermann, A., & Taroni, F. (2006). Bayesian Networks and Probabilistic Reasoning About Scientific Evidence When There is a Lack of Data. *Forensic Science International*, 157(2), 163
- Bird, S. J. (2001). Scientific Certainty: Research versus Forensic Perspectives. *Journal of Forensic Sciences*, 46(4), 978

- Bourke, J. (1993). Misapplied Science: Unreliability in Scientific Test Evidence. *Australian Bar Review*, 10, 123
- Bourke, J. (1993). Misapplied Science: Unreliability in Scientific test Evidence PART 2. *Australian Bar Review*, 10(3), 183
- Branson, L. (1999, December 18). DNA Tests Catch the Prosecutors. *Canberra Times*, p. 5
- Brekke, N., & Borgida, E. (1988). Expert Psychological Testimony in Rape Trials: A Social-Cognitive Analysis. *Journal of Personality and Social Psychology*, 55, 372
- Broeders, A. (2006). Of Earprints, Fingerprints, Scent Dogs, Cot Deaths and Cognitive Contamination - A Brief Look at the State of Play in the Forensic Arena. *Forensic Science International*, 159, 148
- Brown, D., & Neal, D. (1988). Show Trials: The Media and the Gang of Twelve. In M. Findlay & P. Duff (Eds.), *The Jury Under Attack* (pp. 243). Sydney: Butterworths
- Buckelton, J., & Triggs, C. M. (2005). Relatedness and DNA: Are We Taking it Seriously Enough? *Forensic Science International*, 152, 115
- Buckleton, J., Evett, I. W., Curran, J., Champod, C., & Foreman, L. (2002, 28 January). *Source Attribution - Reply to Mary Raidy* (email), [email to forens@statgen.ncsu.edu]. forens@statgen.ncsu.edu [2002, 18 Feb]
- Budowle, B., Chakraborty, R., Carmody, G., & Monson, K. L. (2000). Source Attribution of a Forensic DNA Profile. *Forensic Science Communications*, 2(3), 1
- Bush, J. (1987). The Stethoscope & the Scales of Justice - Partners or Adversaries? *The Police Surgeon*, 31, 56
- Callen, C. (1991). Cognitive Science, Bayesian Norms & Rules of Evidence. *Journal of the Royal Statistical Society: Series A*, 154(1), 129
- Carmody, G. (1999, May 3-7). *Statistics*. Paper presented at the International Symposium on Setting Quality Standards, San Antonio Texas
- Cecil, J., Hans, V., & Wiggins, E. (1991). Citizen Comprehension of Difficult Issues: Lessons from Civil Jury Trials. *American University Law Review*, 40, 727
- Champagne, A., Shuman, D., & Whitaker, E. (1991). An Empirical Examination of the Use of Expert Witnesses in American Courts. *Jurimetrics*, 31, 375
- Chesterman, M. (2001). *Managing Prejudicial Publicity*. Sydney: Law and Justice Foundation of New South Wales
- Chief Minister's Department. (2003). *A Social and Demographic Profile of Multicultural Canberra*. Australian Capital Territory: Department of the Chief Minister of the Australian Capital Territory
- Connors, E., Lundregan, T., Miller, N., & McEwen, T. (1996). *Convicted by Juries Exonerated by Science: Case Studies in the use of DNA Evidence to Establish Innocence After Trial*. Virginia: US Department of Justice Office of Justice Programs and National Institute of Justice
- Cooper, C. P., & Roter, D. L. (2001). Recruitment of Research Participants from US Jury Pools. *Psychological Reports*, 88(3), 981
- Cooper, J., Bennett, E., & Sukel, H. (1996). Complex Scientific Testimony: How Do Jurors Make Decisions? *Law and Human Behavior*, 20, 379
- Cooper, J., & Neuhaus, I. M. (2000). The "Hired Gun" Effect: Assessing the Effect of Pay, Frequency of Testing, and Credentials on the Perception of Expert Testimony. *Law and Human Behaviour*, 24(2), 149

- Cowdery, N. (2001, June). Getting Justice Wrong. *The Forensic Bulletin*, June, 6
- Cowdery, N. (2003, 11 June). *The Future Legal Environment: Some Thoughts*. Paper presented at the Australian Academy of Forensic Science ACT Chapter, Canberra
- Croucher, J. S. (2003). Assessing the Statistical Reliability of Witness Evidence. *Australian Bar Review*, 23, 1
- Darbyshire, P., Maughan, A., & Stewart, A. (2001). What can the English Legal System Learn from Jury Research Published up to 2001? www.criminal-courts-review.org.uk, 1
- Devine, D. J., Clayton, L. D., Dunford, B. B., Seying, R., & Pryce, J. (2000). Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups. *Psychology, Public Policy, and Law*, 7(3), 622
- Devlin, P. (1981). *The Judge*. Oxford: Oxford University Press
- Diamond, S. S., Rose, M. R., & Murphy, B. (2004). Jurors' Unanswered Questions. *Court Review*, 41(Spring), 20
- Diamond, S. S., & Vidmar, N. (2002). *Juror Discussions During Civil Trials: A Study of Arizona's Rule 39(f) Innovation*. Arizona: The Arizona Superior Court in Pima County and The Supreme Court of Arizona and The State Justice Institute
- Diamond, S. S., Vidmar, N., Rose, M. R., Ellis, L., & Murphy, B. (2003). Inside the Jury Room: Evaluating Jury Discussions During Trial. *Judicature*, 87(2), 54
- Divne, A.-M., & Allen, M. (2005). A DNA Microarray System for Forensic SNP Analysis. *Forensic Science International*, 154, 111
- DNA Advisory Board. (2000). Statistical and Population Genetics Issues Affecting the Evaluation of the Frequency of Occurrence of DNA Profiles Calculated from Pertinent Database(s). *Forensic Science Communications*, 2(3), 1
- Duff, P., & Findlay, M. (1997). Jury Reform: of Myths & Moral Panics. *International Journal of the Sociology of Law*, 25, 363
- Duff, P., Findlay, M., Howarth, C., & Tsang-fai, C. (1992). *Juries: A Hong Kong Perspective*. Hong Kong: Department of Law City Polytechnic of Hong Kong
- Dutton, G. (1998, December 1998). The Importance of Being Impartial. *Police Association of Tasmania, Association News*, 2, 5
- Dutton, G. (1998). The Importance of Being Impartial. *Association of Firearm and Toolmark Examiners Journal*, 30(3), 523
- Edmond, G. (1998). Azaria's Accessories: The Social (Legal-Scientific) Construction of the Chamberlains' *Guilt and Innocence*. *Melbourne University Law Review*, 22, 396
- Edmond, G. (2003). After Objectivity: Expert Evidence and Procedural Reform. *Sydney Law Review*, 25(2), 131
- Edmond, G., & Mercer, D. (1997). Scientific Literacy & the Jury: Reconsidering Jury "Competence". *Public Understanding of Science*, 6, 329
- Evetts, I. (1983). What is the Probability That This Blood Came From That Person: A Meaningful Question? *Journal of the Forensic Science Society*, 23, 35
- Evetts, I. W., Foreman, L. A., Jackson, G., & Lambert, J. A. (2000). DNA Profiling: A discussion of issues relating to the reporting of very small match probabilities. *Criminal Law Review*, [2000], 341
- Evetts, I. W., & Weir, B. S. (1998). *Interpreting DNA Evidence*. Sunderland Massachusetts: Sinaue
- Faigman, D., & Baglioni, A. (1988). Bayes' Theorem in the Trial Process: Instructing Jurors on the Value of Statistical Evidence. *Law and Human Behavior*, 12, 1

- Farrant, D. (2000, March 3). Calls for Reforms to Stop Jury Bullying. *Melbourne Age*, p. 3
- Federal Court of Australia Practice Direction: Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia, (1998, 2004).
- Field, H., & Powell, P. (2001). Public Understanding of Science Versus public Understanding of Research. *Public Understanding of Science*, 10, 421
- Findlay, M. (1994). *Jury Management in NSW*. Victoria: Australian Institute of Judicial Administration
- Findlay, M., & Grix, J. (2003). Challenging Forensic Evidence? Observations on the Use of DNA in Certain Criminal Trials. *Current Issues in Criminal Justice*, 14(3), 269
- Freckelton, I. (1994). Expert Evidence & the Role of the Jury. *Australian Bar Review*, 12, 73
- Freckelton, I. (1997, 1997). *Wizards in the Crucible: Making the Boffins Accountable*. Paper presented at the 1st World Conference on New Trends in Criminal Investigation & Evidence, Netherlands
- Freckelton, I., Reddy, P., & Selby, H. (1999). *Australian Judicial Perspectives on Expert Evidence: An Empirical Study*. Melbourne: Australian Institute of Judicial Administration
- Freckelton, I., Reddy, P., & Selby, H. (2001). *Australian Magistrates' Perspectives on Expert Evidence: A Comparative Study*. Melbourne: Australian Institute of Judicial Administration
- Freckelton, I., Reddy, P., & Selby, H. (2001). *Australian Magistrates' Perspectives on Expert Evidence: A Comparative Study - Summary of Key Findings and Outcomes*. Melbourne: Australian Institute of Judicial Administration
- Freckelton, I., & Selby, H. (1993-). Expert Evidence. Sydney: Law Book Company
- Freidman, J. (1977). The Scientist As Expert Witness: Why Lawyers & Scientists Can't Talk to Each Other. *Jurimetrics*, 18, 99
- Gatowski, S. I., Dobbin, S. A., Richardson, J. T., Ginsburg, G. P., Merlino, M. L., & Dahir, V. (2001). Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World. *Law and Human Behaviour*, 25(5), 433
- Gill, P., Jeffreys, A., & Werrett, D. (1985). Forensic Application of DNA "Fingerprints". *Nature*, 318, 577
- Gutheil, T. G. (2000). The Presentation of Forensic Psychiatric Evidence in Court. *Israel Journal of Psychiatry Related Sciences*, 37(2), 137
- Gutowski, S. J. DNA Typing in Criminal Investigations. In I. R. Freckelton & H. Selby (Eds.), *Expert Evidence* (Update 13 ed., Vol. 3, pp. 8). Sydney: Law Book Company Limited
- Haesler, A. (2005). *DNA for Defence Lawyers*. Lawlink. Available: http://www.lawlink.nsw.gov.au/lawlink/pdo/ll_pdo.nsf/vwPrint1/PDO_dnaforlawyers [2005, 12 January]
- Hannaford-Agor, P., Hans, V. P., Mott, N. L., & Munsterman, G. T. (2002). *Are Hung Juries a Problem?* Williamsburg, VA: National Center for State Courts, National Institute of Justice,
- Hastie, R. (Ed.). (1993). *Inside the Juror: The Psychology of Juror Decision Making*. New York: Cambridge University Press
- Havard, J. (1991). Historical & Comparative Review of the Reception of Forensic Medical & Scientific Evidence under Different Systems of Law. *Forensic Science Reviews*, 3(1), 29

- Henderson, J. (2002). The Use of DNA Statistics in Criminal Trials. *Forensic Science International*, 128, 183
- Heuer, L., & Penrod, S. (1994). Juror Notetaking and Question Asking During Trials. *Law and Human Behavior*, 12(3), 121
- Heuer, L., & Penrod, S. (1994). Trial Complexity: A Field Investigation of its Meanings and its Effects. *Law and Human Behaviour*, 18(1), 29
- Heuer, L., & Penrod, S. (1996). Increasing Juror Participation in Trials Through Note Taking and Question Asking. *Judicature*, 79, 256
- Heyes, R. (2001). Expert Evidence: DNA Profiling. *The Forensic Bulletin*, November 2001, 12
- Holmgren, J. (2005). DNA Evidence and Jury Comprehension. *Canadian Society of Forensic Sciences Journal*, 38(3), 123
- Horowitz, I. A., Willging, T. E., & Bordens, K. S. (1997). *The Psychology of Law* (2 ed.). New York: Addison Wesley Longman
- Horowitz, M. I. (1999). The National Jury Trials - Innovations. *Federal Lawyer*, 46(1), 30
- Hutchinson, C., Newbold, J., Potter, S., & Edgell, M. (1974). Maternal Inheritance of Mammalian Mitochondrial DNA. *Nature*, 251, 536
- Isenberg, A. R., & Moore, J. M. (1999). Mitochondrial DNA Analysis at the FBI Laboratory. *Forensic Science Communications*, 1(2), 1
- Jackson, J. (1991). Towards a Dialectic Theory of Proof for Legal Procedure. *Journal of the Royal Statistical Society: Series A*, 154(1), 107
- Jackson, J. (1998). Trying Criminal Cases Without Juries. *Medicine, Science and the Law*, 38(2), 112
- Janovsky, T. J. (2003). Forensic Science - Society is Depending (Dependent?) On Us. *Australian Journal of Forensic Sciences*, 35(1), 161
- Jasanoff, S. (2005). Law's Knowledge: Science for Justice in Legal Settings. *American Journal of Public Health*, 95, S49
- Jeffreys, A. J., Brookfield, J., & Semeonoff, R. (1986). DNA Fingerprint Analysis in Immigration Test Cases. *Nature*, 322, 290
- Johnson, P. (2004). The Sally Clark Case: Another Collision Between Science and the Criminal Law. *Australian Journal of Forensic Sciences*, 36, 11
- Judicial Council of California. (2002). *A Guide to California Jury Service*. Judicial Council of California. Available: <http://www.courtinfo.ca.gov/jury/index.htm> [2002, June 20]
- Justice Crispin, K. (1992). Coping with Complexity. *Australian Journal of Forensic Sciences*, 24(3), 74
- Justice Crispin, K. (1992). Coping with Complexity. *Criminology Australia*, 4(2), 11
- Justice Eames, G. (2003, 22 January). *Towards Better Direction - Better Communication with Jurors*. Paper presented at the Supreme and Federal Court Judges Conference, Adelaide
- Justice Goldring, J. (2000). DNA Evidence - The Way Forward? *Judicial Officers' Bulletin*, 12(7), 49
- Justice Goldring, J. (2003). An Introduction to Statistical 'Evidence'. *Australian Bar Review*, 23, 1
- Justice Kirby, M. (2000). DNA Evidence: Proceed With Care. *Australian Journal of Forensic Sciences*, 33, 9
- Justice Kirby, M. (2002, 3 July). *Expert Evidence: Causation, Proof and Presentation*. Paper presented at the Inaugural Conference of the International Institute of Forensic Studies, Prato, Italy

- Justice Morling, T. (1987). *Royal Commission into the Chamberlain Convictions - Report*. Darwin: Northern Territory Government Printer
- Justice Sperling, H. (2000). Expert Evidence: The Problem of Bias and Other Things. *The Judicial Review*, 4, 429
- Justice Wood, J. (2003). Forensic Sciences From the Judicial Perspective. *Australian Bar Review*, 23, 1
- Kalven, H., & Zeisel, H. (1966). *The American Jury*. Chicago: Chicago University Press
- Kaufman, F. (1998). *The Commission on Proceedings Involving Guy Paul Morin - Executive Summary & Recommendations*. Ontario: Ministry of the Attorney-General
- Kaye, D., & Koehler, J. (1991). Can Jurors Understand Probabilistic Evidence? *Journal of the Royal Statistical Society: Series A*, 154(1), 75
- Kenefick, K. (2000, August). The Wisconsin Innocence Project. *Profiles in DNA*, 12
- Kessler, J. (1983). The Expert Witness & the Use of Videotape Recordings. *Journal of Forensic Sciences*, 28(2), 518
- Knox, M. (2002, Friday 1 January). Trial and Error. *Sydney Morning Herald*, p. 15
- Koehler, J., Chia, A., & Lindsey, J. (1995). The Random Match Probability in DNA Evidence: Irrelevant and Prejudicial? *Jurimetrics*, 35, 201
- Kogan, J. (1978). On Being a Good Expert Witness in a Criminal Case. *Journal of Forensic Sciences*, 23(1), 190
- Kovera, M. B., McAuliff, B. D., & Hebert, K. S. (1999). Reasoning About Scientific Evidence: Effects of Juror Gender and Evidence Quality on Juror Decisions in a Hostile Work Environment Case. *Journal of Applied Psychology*, 84(3), 362
- Lagan, B., & Kennedy, L. (2000, April 22). Test Case. *Sydney Morning Herald*, p. 32
- Landsman, S. (1993). The History & Objectives of the Civil Jury System. In R. Litan (Ed.), *Verdict: Assessing the Civil Jury System* (Vol. 1, pp. 22). Washington: The Brookings Institution
- Landy, D., & Sigall, H. (1974). Beauty is Talent: Task evaluation as a function of the performer's physical attractiveness. *Journal of Personality and Social Psychology*, 29, 299
- Lawrence, C. (2002). *Differences Between Adversarial and Inquisitorial Legal Systems*. Unpublished manuscript, Hobart.
- Levine, J. (1996). The Case Study as a Jury Research Methodology. *Journal of Criminal Justice*, 24(4), 351
- Likert, R. (1932). *A Technique for Measurement of Attitudes*. New York: Archives of Psychology
- Litigation Lawyers Section. (1997). Expert Evidence - Proposal in the Federal Court. *Litigation Lawyer*, 31(April/May), 21
- Liverani, M. R. (1997). Expert Witnesses Tell Lawyers: Manage Us Better. *Law Society Journal*, August 1997, 50
- Lord Woolf. (1996). *Access to Justice - Final Report*. London: HMSO
- Lucas, D. (1989). The Ethical Responsibilities of the Forensic Scientist: Exploring the Limits. *Journal of Forensic Sciences*, 34, 719
- Madden, B. (2000). Changes to the Role of Expert Witnesses. *Law Society Journal*, June 2000, 50
- Magnusson, E. A. (1994). Reasonable Doubt, Legal Doubt & Scientific Doubt. *The Australian Journal of Forensic Sciences*, 26(8-14), 8
- May, R. (1998). Jury Selection in the Unites States: Are There Lessons to be Learned? *Criminal Law Review*, April 1998, 270

- Miller, J. D. (1998). The Measurement of Civic Scientific Literacy. *Public Understanding of Science*, 7, 203
- Miskin, C. (1995). Watch His Honour's Light Pen. *New Law Journal*, May 1998, 648
- Neufeld, P. J. (2005). The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. *American Journal of Public Health*, 95, S107
- Neufer, N. L. (2002). Complex Evidence and Communication: The Good, the Bad and the Ugly. *The Practical Litigator*, 13(5), 45
- New South Wales Law Reform Commission. (2005). *Report 111 Majority Verdicts*. Sydney: New South Wales Law Reform Commission
- New York Times. (2000, February 27 2000). DNA Stretches Limit of Rape Laws. *Sydney Morning Herald*, p. www
- news.com.au. (2002). *DNA tests snare 100 prisoners*, [www]. news.com.au. Available: <http://www.news.com.au/common/printpage/0,6093,3640147,00.html> [2002, 23 January]
- NSW Law Reform Commission. (2005). *Majority Verdicts* (111). Sydney: NSW Law Reform Commission
- O'Muirheartaigh, C., Krosnick, J. A., & Helic, A. (2000). *Middle Alternatives, Acquiescence, and the Quality of Questionnaire Data*. Chicago: University of Chicago
- Oggloff, J., Clough, J., Goodman-Delahunty, J., & Young, W. (2005). *The Jury Project: A Survey of Australian and New Zealand Judges*. Melbourne: Australian Institute of Judicial Administration
- Parsons, R., & Lakhkar, B. (2002, 1 February). *Source Attribution - reply to Mary Raidy* (email), [email to forens@statgen.ncsu.edu]. forens@statgen.ncsu.edu [2002, 18 February]
- Pelly, M. (2004, 22 July 2004). Please Excuse me from Jury Duty, the Voices tell me my Budgie will be Sick. *Sydney Morning Herald*, p. 22 July 2004 www
- Pennington, N., & Hastie, R. (1991). A Cognitive Theory of Juror Decision Making: The Story Model. *Cardozo Law Review*, 13, 519
- Perez-Pena, R. (2000, May 10, 2000). Jurors May Not Use Professional Expertise to Sway Others, Court Says. *The New York Times*, p. 1
- Petters, C., & Royds, D. (1999). "Independent" Forensic Practitioners - Fact of Fiction? *Australian Journal of Forensic Sciences*, 31, 45
- Poole, D. (1994). The Expert and the Advocate. *Forensic Science International*, 68, 75
- Ragg, M. (1995, June 13 1995). Proof Positive of Negative? *The Bulletin*, p. 14
- Raymond, T. (1989, 30-31 October). *DNA Profiling: the Transition from Watching Brief to the Courts - A Victorian Perspective*. Paper presented at the DNA and Criminal Justice, Canberra
- Rendle, D. F. (2005). Advances in Chemistry Applied to Forensic Science. *Chemical Society Reviews*, 34, 1021
- Richter, R. (2005). Twelve Reasons to Cheer. *Sydney Morning Herald*, p. 26
- Robertshaw, P. (1998). Method and Ethics in Advancing Jury Research. *Medicine, Science and the Law*, 38(4), 328
- Rosenthal, P. (1983). Nature of Jury Response to the Expert Witness. *Journal of Forensic Sciences*, 28(2), 528
- Ross, A. (1998). Controversy Corner - The Quest for Truth. *Australian Journal of Forensic Sciences*, 30, 41
- Saks, M., & Koehler, J. (1991). What DNA Fingerprinting Can Teach the Law about the Rest of Forensic Science. *Cardozo Law Review*, 13, 361

- Saks, M. J. (1990). Expert Witnesses, Non-Expert Witnesses & Non-Witness Experts. *Law and Human Behavior*, 14(4), 291
- Saks, M. J. (1997). What do Jury Experiments Tell us About How Juries (Should) Make Decisions? *Southern California Interdisciplinary Law Journal*, 6, 1
- Saks, M. J., & Kidd, R. (1981). Human Information Processing and Adjudication: Trial by Heuristics. *Law and Society Review*, 15, 123
- Selinger, B. (1986). Expert Evidence & the Ultimate Question. *Criminal Law Journal*, 10, 246
- Selvanathan, A., Selvanathan, S., Keller, G., Warrack, B., & Bartel, H. (1994). *Australian Business Statistics* (Vol. 1). Melbourne: Thomas Nelson Australia
- Shannon, C. (1984). *Royal Commission Concerning the Conviction of Edward Charles Splatt - Report*. Adelaide: South Australian Government Printer
- Shuman, D., Champagne, A., & Whitaker, E. (1994). An Empirical Examination of the Use of Expert Witnesses in the Courts - Part II: A Three City Study. *Jurimetrics*, 34, 193
- Shuman, D., Champagne, A., & Whitaker, E. (1996). Assessing the Believability of Expert Witnesses: Science in the Jury Box. *Jurimetrics*, 37, 23
- Shuman, D., Champagne, A., & Whitaker, E. (1996). Juror Assessments of the Believability of Expert Witnesses: A Literature Review. *Jurimetrics*, 36, 371
- Sigall, H., & Ostrove, N. (1975). Beautiful but Dangerous: Effects of Offender Attractiveness and Nature of the Crime on Juridic Judgements". *Journal of Personality and Social Psychology*, 31, 410
- Southard, G. (1991). Communication in the Courtroom - Clarification or Crucifixion? *Journal of the Forensic Science Society*, 31(2), 275
- Starrs, J. (1991). The Forensic Scientist & the Open Mind. *Journal of Forensic Sciences*, 31(2), 111
- Starrs, J. (2004). The CSI Effect. *Scientific Sleuthing Review*, 28(3), 1
- Steventon, B. (1993). *Royal Commission on Criminal Justice: Ability to Challenge DNA Evidence (Research Study No 9)* (Research Study No 9). London: HMSO
- Stoney, D. (1991). What Made us Think we Could Individualize Using Statistics? *Journal of the Forensic Science Society*, 31, 197
- Strawn, D. U., & Munsterman, G. T. (1982). Helping Juries Handle Complex Cases. *Judicature*, 65, 444
- Tanton, R. (1979). Jury Preconceptions & Their Effect on Expert Scientific Testimony. *Journal of Forensic Sciences*, 24, 681
- Taroni, F., & Aitken, C. G. (2000). DNA Evidence, Probabilistic Evaluation and Collaborative Tests. *Forensic Science International*, 108, 121
- The Right Honourable Lord Justice Auld. (2001). *Review of the Criminal Courts of England and Wales*
- Thompson, & Schumann. (1987). Interpretation of Statistical Evidence in Criminal trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy. *Law and Human Behaviour*, 11, 167
- Thompson, W. C. (1996). DNA Evidence in the OJ Simpson Trial. *University of Colorado Law Review*, 67(Fall), 827
- Thomson, D. M. (1984). Towards a More Efficient Judicial System - Observations of an Experimental Psychologist. In M. C. Nixon (Ed.), *Issues in Psychological Practice* (Vol. 1, pp. 107). Melbourne: Longmans Cheshire
- Thomson, D. M. (1985). The Reliability and Contamination of Evidence. In S. Tilmouth & N. Pengelley (Eds.), *Criminal Law Advocacy : papers delivered at the second*

- and third annual conferences of the Legal Services Commission of South Australia, Tanunda 1984 (pp. 56). McLaren Vale: Wakefield Press
- Thomson, D. M. (1987). *Beyond Reasonable Requirements: the jury and its task*. Paper presented at the Criminal Justice Forum, Melbourne
- Thomson, D. M. (1994). Towards a More Effective Judicial System: Matching Requirements of the System to the Capacities of the Users. In L. McConkey & H. Wilton & A. Bernier & A. Bennett (Eds.), *Australian Psychology: selected applications and initiatives* (pp. 1). Melbourne: Australian Psychological Society
- Tipple, S. (1986). Forensic Science: The New Trial By Ordeal? *NSW Law Society Journal*(August), 44
- Victorian Department of Justice. (1998). *Report - Survey of Victorian Jurors*. Victoria: Victorian Department of Justice - Criminal Justice Statistics & Research Unit
- Victorian Law Reform Committee. (1996). *Jury Service in Victoria*. Melbourne: Victorian Law Reform Committee
- Viscount Runciman. (1993). *Royal Commission on Criminal Justice Final Report* (Royal Commission). London: HMSO
- von Wurmb-Schwark, N., Malyusz, V., Fremdt, H., Koch, C., Simeoni, E., & Schwark, T. (2006). Fast and Simple DNA Extraction from Saliva and Sperm Cells Obtained from the Skin or Isolated from Swabs. *Legal Medicine*, 8(3), 177
- Walker, T. (1985). Consider Your Verdict: New Evidence from the Chamberlain Committee. *Law Institute Journal*, 6, 650
- Walsh, S. J. (2005). Legal Perceptions of Forensic DNA Profiling Part I: A Review of the Legal Literature. *Forensic Science International*, 155, 51
- Walsh, S. J., Ribaux, O., Buckleton, J. S., Ross, A., & Roux, C. (2004). DNA Profiling and Criminal Justice: A Contribution to a Changing Debate. *Australian Journal of Forensic Sciences*, 36, 34
- Whitaker, J., Cotton, E., & Gill, P. (2001). A Comparison of the Characteristics of Profiles Produced with the AMPFISTER SGM Plus Multiplex System for Both Standard and LCN STR DNA Analysis. *Forensic Science International*, 123, 215
- Wilson, M., DiZinno, J., Polanskey, D., Replogle, J., & Budowle, B. (1995). Validation of Mitochondrial DNA Sequencing for Forensic Casework Analysis. *International Journal of Legal Medicine*, 108, 68
- Wilson, P. (1994). Lessons from the Antipodes: Successes and Failures of Forensic Science. *Forensic Science International*, 67, 79
- Wolf, R. V. (1998). *The Jury System*. Philadelphia: Chelsea House Publishers
- Yarnell, M. A. H. (2005, November 7, 2005). *The Arizona Jury Past, Present and Future Reform*. Paper presented at the University of Canberra School of Law Annual Jury Conference, Sydney
- Young, W. (1999). *Juries in Criminal Trials*. Wellington: New Zealand Law Commission
- Zander, M. (1998). The Case for Jury Research. *Medicine, Science and the Law*, 38(2), 106
- Zander, M., & Henderson, P. (1993). *Royal Commission on Criminal Justice: Crown Court Study (Research Study No 19)* (Royal Commission Research Study No. 19). London: HMSO

ANNEX A - SURVEY FORM FOR MOCK JURORS (Chapter 2)

Associate Professor Eric Magnusson,
Doctoral Fellow Rhonda Wheate &
the CSIRO Student Research Scheme
invite you to help us determine

how juries respond to DNA evidence

.....

DNA evidence is being used in trials all over Australia, yet scientists and lawyers do not know how the Australian public feels about the risk that innocent people could be found guilty. By answering the short questionnaire which follows part of a criminal “trial” presented on cassette tape*, you can provide this essential information.

Here’s what to do:

1. Listen to the first part of the evidence. Stop the tape. Talk over the evidence together & discuss whether or not the accused person is guilty “beyond reasonable doubt”.
2. Everybody fill in Page 1, **giving your own opinions - even if you're not sure that you're right**
3. Listen to the second part of the evidence. Discuss it.
4. Everybody fill in Page 2, again giving your own opinions.
5. Fill in page 3
6. Please return the answers and the cassette to the teacher.

If you have any queries, you are welcome to phone Rhonda Wheate on 6268 8087.

Thank you again for your time and participation.

For Eric Magnusson and Rhonda Wheate

Chemistry Department, University College

Australian Defence Force Academy.

***Approx 6 min. duration**

SUMMARY OF SCIENTIFIC EVIDENCE

* 7 DNA tests. 1 in 4 000 chance of match from person chosen at random

<p>a. Do the blood tests COMPLETELY PROVE John guilty?</p> <p>b. What about the other suspect? What do the tests prove about him?</p> <p>c. Assume that without the DNA evidence, there's a "fifty-fifty" chance (1:1) that John is guilty. If a juror decides that this is enough to declare that John is guilty, in what percentage of cases does this mean that an innocent person is convicted? Is this acceptable to you?</p> <p>d. Assume the odds are 1:1. Do the odds get bigger or smaller when the DNA evidence is considered? ("Bigger odds" means a bigger chance that John is guilty. Eg 50:1)</p> <p>e. When the DNA evidence is taken into account, the odds that John is guilty rise from 1:1 to about 4,000:1. Does this calculation seem about right to you?</p> <p>f. If juries always say "guilty" with odds like these, then in one case out of 4000, they would be declaring an innocent person guilty. Is this acceptable to you?</p> <p>g. What odds would be acceptable to you?</p>	<p>h.</p>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">YES</td> <td style="width: 50%;">NO</td> </tr> <tr> <td colspan="2">Tests prove blood isn't his OR Tests prove nothing</td> </tr> <tr> <td colspan="2">_____ %</td> </tr> <tr> <td>YES</td> <td>NO</td> </tr> <tr> <td colspan="2">Get bigger OR Stay the same OR Get smaller</td> </tr> <tr> <td>YES</td> <td>NO</td> </tr> <tr> <td>YES</td> <td>NO</td> </tr> <tr> <td colspan="2">1 case in _____</td> </tr> </table>	YES	NO	Tests prove blood isn't his OR Tests prove nothing		_____ %		YES	NO	Get bigger OR Stay the same OR Get smaller		YES	NO	YES	NO	1 case in _____	
YES	NO																	
Tests prove blood isn't his OR Tests prove nothing																		
_____ %																		
YES	NO																	
Get bigger OR Stay the same OR Get smaller																		
YES	NO																	
YES	NO																	
1 case in _____																		

SUMMARY OF THE NEW EVIDENCE:

* 10 DNA tests. 1 in 4 million chance of match from person chosen at random.

i. If you were a one-person jury, would you declare John guilty now?

j. Originally the odds were 1:1. With the new DNA evidence the odds become about 4 million : 1 that John is guilty.

Does this calculation seem about right to you?

k. If juries always say "Guilty" when the odds are like these, then in one case out of 4 million, they would be declaring an innocent person guilty.

Is this acceptable to you?

l. The risk of declaring an innocent person guilty can never be completely removed. In your opinion, what is the biggest risk a jury should take in reaching a verdict about a serious crime?

YES

NO

YES

NO

YES

NO

1 case in _____

**THANKYOU FOR YOUR
PARTICIPATION**

Answers here would be much appreciated. No names are necessary.

1. Your age group?

Under 12 12-14 15-18 19-24 25-44 45 +

2. What language do you mostly speak? _____

3. How many years of high school? _____

4. Where did you finish your formal education?

School Trade course or TAFE University
Apprenticeship College

5. Do you remember studying probability or statistics at any time? _____

6. Are you familiar with betting language? (For example, 50:1 odds)

Not very familiar A bit familiar Very familiar

7. Were the questions clear? _____

8. Imagine you had to serve on a jury in a criminal trial. If the evidence was given in words like those on the tape, would you be able to understand well enough to make a good decision? _____

9. Think of cases that depend a lot on forensic science evidence. What do you think is the percentage of the time that juries convict the wrong person?

1% or less 1-5% 5-10% 10-20% More than 20%

10. Have you ever served on a jury? _____

11. Any comments? _____

ANNEX B - SURVEY FORM FOR FORENSIC SCIENTISTS (Chapter 3)
--

(Note: The format of the following survey has been abbreviated (answer boxes removed) for the purposes of this thesis.)

RESPONDENT'S DETAILS (OPTIONAL)
--

- 1. Name:** _____
- 2. Telephone:** () _____
- 3. Email:** _____
- 4. State or Territory:** ACT / NSW / NT / QLD / SA / TAS / VIC / WA
- 5. Employer:** _____
- 6. Job title:** _____
- 7. Gender:** Male / Female
- 8. Are you available/willing to answer further questions?** Yes / No
- 9. Please list your areas of expertise and relevant dates:**
(Eg "Ballistics (1979-2001)")
- 10. How many times in court do you appear per year?**
(Use an average from the past five years)
- 11. How many reports or statements do you prepare for court per year?**
(Use an average from the past five years)
- 12. What percentage of your work is for**
- (a) the prosecution?** _____ %
- (b) the defence?** _____ %

PRE-TRIAL PROCEDURES

13. What is the most common question that instructing solicitors or barristers should ask you, but don't, BEFORE you go to court?

14. What is the most common question that barristers should ask you, but don't, IN COURT?

15. What kinds of things do instructing solicitors or barristers commonly misunderstand or misinterpret about your discipline?

16. Do these misunderstandings of your discipline come out in court (either directly or indirectly)?

PRESENTING EVIDENCE IN COURT

17. Please describe your best experience as an expert in court.

What made it so good? Does this happen often? Was it due to a particular prosecutor, defence lawyer, judge or case?

18. Please describe your worst experience as an expert in court?

Has anything been done to rectify any problems? How do you think other parties reacted? Did you share this experience with colleagues/supervisor?

19. Do you think the scientific/technical merits of your work are adequately discussed in court?

If yes, do you have any comments? If no, does this bother you?

20. There are two aspects to expert evidence:

(A) How it supports the prosecution or defence case; and

(B) How good it really is (in terms of technique, strength, appropriateness et cetera).

In your opinion, which part(s) usually come out in court?

Do you think both parts (A) and (B) should come out in court?

Please rate examination-in-chief for the following qualities:

(On the scale, 1 means *strongly disagree* and 5 means *strongly agree*.)

21a. Examination-in-chief is well-structured and logical.

21b. Examination-in-chief questions show barristers understand the evidence.

21c. Jurors appear to be able to follow the examination-in-chief.

21d. Examination-in-chief questions are relevant and sensible.

21e. Examination-in-chief questions appear to help jurors.

21f. Examination-in-chief questions appear to confuse jurors.

22. Do you have any further comments about examination-in-chief in general?

Please rate cross-examination for the following qualities:

(On the scale, 1 means *strongly disagree* and 5 means *strongly agree*.)

23a. Cross-examination is well-structured and logical.

23b. Cross-examination questions show barristers understand the evidence.

23c. Jurors appear to be able to follow the cross-examination.

23d. Cross-examination questions are relevant and sensible.

23e. Cross-examination questions appear to help jurors.

23f. Cross-examination questions appear to confuse jurors.

24. Do you have any further comments about cross-examination in general?

THE JUDGE

25. From your position in the witness box, do you think the judge usually understands the evidence you give?

26. Do you think judges could do more to aid the presentation of your evidence? *If yes, what could they do?*

THE JURY

27. In your opinion, is it necessary for jurors to have a scientific/technical/medical background to fully appreciate the evidence you give in court?

28. In general, in your discipline, what would you prefer the jury to be told? Why?

(A) Background information concerning the techniques/methods used; or

(B) Just enough to understand the results?

29. Where do you think the potential for error by juries lies?

OTHER EXPERTS

30. Is there a question that lawyers should ask opposing forensic witnesses in your discipline, but don't?

EXPERT EVIDENCE IN GENERAL

31. How do you perceive your own ability to effectively communicate your work to a lay audience (that is, a judge or jury)?

If you are confident, why? If you are not confident, why not?

32. Do you use visual aids to present your evidence? Why or why not?

If yes, what type(s) of visual aids do you use?

33. Do you have any further comments about this research or expert evidence in general?

ANNEX D - INTRODUCTION TO SURVEY OF REAL JURORS (Chapter 4)

Good afternoon ladies and gentlemen,

My name is Rhonda Wheate. I am a researcher at the University of New South Wales at ADFA. The Australian Institute of Judicial Administration and the National Institute of Forensic Science have asked us to study how well scientific evidence is being presented in court. The questions I am going to ask you today, are mainly about the --- expert M(s)(r) ---. Remember her/him? (S)he gave evidence last [day] about the [DNA on the batteries and on the doona et cetera].

I know it has been a very long trial; I've sat through the whole thing with you so that I know what is going on and what you have had to put up with. So all I am going to ask you to do this afternoon is take a quick look at this questionnaire. It should take about 15 minutes for you to answer.

The Judge, the Attorney-General and all of the lawyers in this case have given me permission to ask you these questions. I will never know your names and not even the name of this case will be used. All of the results will just be put together with the results from the other cases we've done.

I should add that your participation in this is voluntary and you can withdraw at any time. But, the forensic science community would really like to know what you think about how they do in court. The Judicial Institute also wants to know whether forensic evidence is useful, whether lawyers explain it properly and what juries think of it. So your perspective as jurors is unique – it's my job to help you explain to lawyers and scientists what needs to be done better or what is being done well and so on.

I'm also going to give you a 1800 number you can call later on. This number goes directly to my phone. It's important that over the next week or so, you give me a ring when you have a spare moment, so that we can talk about other things to do with the --- evidence that I don't want to ask you this afternoon. As I said, it's a 1800 number so it won't cost you anything to call.

So that's it. There's a brief questionnaire this afternoon and please give me a ring on the 1800 number later on in the week, or next week, or even tonight if you're really keen.

Are there any questions?

ANNEX E – WRITTEN SURVEY FOR REAL JURORS (Chapter 4)

*(Note: This survey was given to each juror on a piece of double-sided A3 paper.
The A4 version shown here has been produced for this thesis only.)*

Expert Evidence in the Criminal Justice System
How effectively is forensic science being used in Australian courts?

This research was commissioned jointly by the **Australian Institute of Judicial Administration (AIJA)** and the **National Institute of Forensic Science (NIFS)** assisted by Professor Ian Freckelton and conducted by Associate Professor Eric Magnusson and Mrs Rhonda Wheate of UNSW University College (ADFA).

The Attorney-General has granted permission
for you to answer these questions.

The Director of Public Prosecutions and the Judge presiding in
this trial also gave their consent.

These questions take about 15 minutes

**Participation is voluntary.
You may withdraw at any time.**

No individual juror and no trial will be identified
but your answers will help judges, lawyers and forensic
scientists to improve their performance.

SURVEY ID NUMBER

**The questions here are mainly about
[DNA expert's name], the DNA expert**

Was the DNA expert...

	No >>> Yes
Persuasive?	1 2 3 4 5
A good communicator?	1 2 3 4 5
Of good appearance?	1 2 3 4 5
Qualified & experienced?	1 2 3 4 5
Impartial (not biased)?	1 2 3 4 5
Easy to understand?	1 2 3 4 5
Confident?	1 2 3 4 5
Well prepared?	1 2 3 4 5
Helpful to the jury?	1 2 3 4 5

**How much did these things help
you understand the DNA
evidence?**

	No >>> Yes
The expert's explanation?	1 2 3 4 5
The prosecutor's explanation?	1 2 3 4 5
The defence's explanation?	1 2 3 4 5
Other jurors?	1 2 3 4 5
Your own knowledge?	1 2 3 4 5
Family or friends?	1 2 3 4 5
The judge's summing up?	1 2 3 4 5
Nothing helped me!	<input type="checkbox"/>

**What was important to you when you
weighed up the DNA evidence?**

	Not at all >>> Very
Your feelings about the defendant & the crime?	1 2 3 4 5
How the prosecutor explained the expert's evidence?	1 2 3 4 5
How the defence explained the expert's evidence?	1 2 3 4 5
How the expert explained their evidence?	1 2 3 4 5
Your impressions of how the judge felt about the expert?	1 2 3 4 5
What the judge said about the expert's evidence?	1 2 3 4 5
Other scientific evidence?	1 2 3 4 5
Anything else?	

Were the DNA results...

No >>> Yes

Easy to interpret? 1 2 3 4 5

Important to the case? 1 2 3 4 5

Clearly connected to the charges?
1 2 3 4 5

More important than other evidence?
1 2 3 4 5

Other things:

No >>> Yes

Was the prosecution case clear?
1 2 3 4 5

Was the defence case clear? 1 2 3 4 5

The order in which the witnesses came on. Was it OK? 1 2 3 4 5

At the end, could you remember everything necessary? 1 2 3 4 5

Were you ever seriously confused?
1 2 3 4 5

The DNA evidence overall...

How much of it did you understand?

None > > > All
1 2 3 4 5

How ready were you to decide?

After the judge's summing up, how ready were you to make decisions about the evidence?

Not at all >>> Fully
1 2 3 4 5

How ready were you later, after discussing it with other jurors in the jury room?

Not at all >>> Fully
1 2 3 4 5

Why?

Your educational background:

Years of high school?

Years of TAFE?

Years of university?

Age?

Main occupation:

Was the trial a negative or a positive experience for you? Why?

What part of the trial could be improved?

What part of the whole trial system could be improved?

What was the biggest problem for you?

Any other comments?

**ANNEX F – FLYER ABOUT TELEPHONE SURVEY OF REAL JURORS
(Chapter 4)**



Australian Institute of Judicial Administration

UNSW University College

Expert Evidence in the Criminal Justice System

The **Australian Institute of Judicial Administration** and the
National Institute of Forensic Science have asked us to conduct a survey
about juries and scientific evidence

The Attorney-General, the Director of Public Prosecutions,
the Judge & the lawyers in this trial
have given us permission to ask you these questions.

- *All the information you provide will remain strictly confidential.*
- *No juror, jury or trial will ever be identifiable from this work.*
- *If there are any questions you do not wish to answer, you are under no obligation to do so.*
- *Your participation is voluntary and you may withdraw at any time.*

If you have any comments or suggestions, please do not hesitate to contact:

Eric Magnusson

School of Chemistry, University College UNSW

Australian Defence Force Academy

Northcott Drive Canberra ACT 2600

Ph: (02) 6268 8298

Fax: (02) 6268 8017

Email: eam@adfa.edu.au

If you have any complaints about the conduct of this research, please contact:

Ethics Secretariat

University of NSW

NSW 2052

Ph: (02) 9385 4234

Fax: (02) 9385 6648

Email: ethics.sec@unsw.edu.au

FREECALL 1800 --- ---

**There are a few additional questions
we wish to ask you when you have time.**

Please call the number above.

It's free and your responses to these questions are
VERY IMPORTANT.

All calls will be kept **STRICTLY CONFIDENTIAL**
& you may answer all questions **ANONYMOUSLY**

Call at any time.

All calls are free
(except from mobile phones)
from anywhere in Australia.

ANNEX G – TELEPHONE SURVEY OF REAL JURORS (Chapter 4)
--

Permission to record interview? X:

Your age? X:

Your occupation? X:

1. How important were the expert's qualifications when it came to weighing up their evidence?

- ☐ Very important
- ☐ Important
- ☐ Neutral
- ☐ Not very important
- ☐ Not important at all

Comments? X:

2. Do you remember what the expert's qualifications were?

Comments? X:

3. Do you think the Prosecutor asked enough questions of their expert? Were they the right questions? Why?

Comments? X:

4. Do you think the expert handled the defence's cross-examination questions well? Why?

- ☐ Yes
- ☐ No
- ☐ Unsure/Can't remember

Comments? X:

5. Did you understand the explanation about DNA evidence, given by the expert?

- ☐ Yes; when?
 - When the Prosecutor / defence gave their opening argument
 - When the prosecution expert
 - Gave evidence-in-chief
 - Was cross-examined
 - Was re-examined
 - When the Prosecutor / defence gave their closing arguments
 - When the judge summed up
 - In the deliberation room

- ☐ No, I *never* understood how the scientific evidence fitted into the case
- ☐ Unsure

Comments? X:

6. In your opinion, could the DNA evidence have been better explained?

- ☐ Yes; by whom?
 - ☐ The prosecution
 - ☐ The defence
 - ☐ The judge
 - ☐ The expert
- ☐ No
- ☐ Unsure

Comments? X:

8. After hearing the DNA evidence, did you understand what its strengths and weaknesses were?

- ☐ Yes
- ☐ No
- ☐ Unsure

Comments? X:

9. What helped you deal with the scientific evidence & the case in general, by the end of the trial? What helped you the most? What was the least helpful?

- ☐ The expert's explanations
- ☐ Your own knowledge
- ☐ Barrister's questions
- ☐ Judge's questions
- ☐ Prosecutor's closing address
- ☐ Defence's closing address
- ☐ Judge's summing up
- ☐ Other jurors
- ☐ Family members or friends

Comments? X:

10. Did the jury room discussion help you to understand and make decisions about the scientific (especially DNA) evidence?

- ☐ Yes
- ☐ No
- ☐ Unsure

Comments? X:

11. Did jurors try to explain the scientific evidence to other jurors? How/why/what?

- ☐ Yes
- ☐ No
- ☐ Unsure

Comments? X:

12. If you accepted the DNA evidence, was it because:

- ☐ You understood the science & thought it was right
- ☐ You just believed the science was right
- ☐ You believed the expert was right
- ☐ You thought the expert's qualifications probably meant they were right
- ☐ You were so impressed by the expert's oral evidence that you were sure that their conclusions would be sound
- ☐ Some other reason - >

Comments? X:

13. If you did not accept the scientific evidence, was it because:

- ☐ You didn't believe the expert
- ☐ You didn't understand the expert
- ☐ You didn't believe the science
- ☐ You didn't understand the science
- ☐ You didn't think the expert was qualified enough to give that evidence
- ☐ You weren't impressed by the expert's oral evidence
- ☐ Some other reason ->

Comments? X:

14. How confident are you about your evaluation of the DNA evidence?

- ☐ Very confident
- ☐ Confident
- ☐ Neutral
- ☐ Not very confident
- ☐ Not confident at all

Comments? X:

15. How important was the DNA evidence to you, when it came to deciding on a verdict?

Why?

- ☐ Very important

- ☐ Important
- ☐ Neutral
- ☐ Not very important
- ☐ Not important at all

Comments? X:

16. Do you think experts who testify in court should have to quote other studies, statistics or scientific evidence, to back up their opinion?

- ☐ Yes
- ☐ No
- ☐ Unsure

Comments? X:

17. Did the DNA expert quote other studies or scientific literature?

- ☐ Yes
- ☐ No
- ☐ Unsure

Comments? X:

18. Were there any times when you (or the jury as a whole) would have liked to ask questions about the scientific evidence?

- ☐ Yes – see below
- ☐ No

If yes, then what kind of questions?

Comments? X:

At what point in the trial would you have liked to ask these questions?

Comments? X:

19. Would it have helped you to have had science textbooks or other resources like that in the jury room? (What else?)

- ☐ Yes
- ☐ No
- ☐ Unsure

Comments? X:

20. Pretend for a minute that you *never heard any DNA evidence* in this case.

Would your verdict have been the same? Why? (See options below)

If your verdict **would have been the SAME**, is that because:

- ☐ The DNA evidence wasn't very important or other evidence was more important
- ☐ The DNA evidence wasn't conclusive
- ☐ The prosecution showed that the DNA evidence was not important
- ☐ You didn't understand what the DNA evidence meant
- ☐ You think the other jurors understood the DNA evidence & they thought it was wrong

If your verdict **would have been DIFFERENT**, is that because:

- ☐ The DNA evidence was very important
- ☐ The expert witness was very convincing
- ☐ You thought the accused was guilty, but the DNA evidence changed your mind

Comments? X:

23. Do you have any other comments about the expert witnesses in this case (especially the DNA expert):

- ☐ Appearance
- ☐ Demeanour
- ☐ Ability to answer questions
- ☐ Use of jargon
- ☐ Use of presentation devices (photos, overheads etc)
- ☐ Ability to explain their evidence
- ☐ etc

Comments? X:

24. Any additional matters?

Comments? X:

Thank you for your answers. Your responses are important because they will help make a difference for juries of the future.