Doing without thinking? Processes of decision-making in period instrument performance

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Doing without thinking?

Processes of decision-making in period instrument performance

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The performance of a musical work involves making many decisions about the notated score. This study explores the nature and role of intuitive and deliberate processes of musical decision-making in period instrument performance of solo Baroque string music. This research uses dual process theories of cognition as a conceptual framework to examine issues of Baroque performance practice and interpretation.

A threefold approach to data collection was employed. In the first study, semi-structured interviews were conducted with leading Baroque violinists and cellists, focusing on the solo works of J.S. Bach. A high proportion of deliberate decision-making was found (60% overall) although this varied considerably between individuals. Performers described their interpretation of these pieces as being influenced by various factors and provided insights into how elements of the interpretative process such as intuition are experienced and defined.

The participants in the second study were Baroque violinists of varying levels of expertise who were asked to sight-read, practise and perform a short piece of unfamiliar solo Baroque violin music. Retrospective verbal reports were collected after both the sight-read and performance and participants were asked to 'think-aloud' during the practice period. A small proportion of deliberate decision-making was found (18% overall) and experienced performers were found to use deliberate processes to a greater extent than less experienced performers.

The third study traced the preparation process involved in recording the Suites for Solo Cello by J.S. Bach through a longitudinal case study of Baroque cellist Daniel Yeadon. This study demonstrates how an interpretation develops over time and found a large proportion of deliberate decision-making (65% overall).

The results largely confirm the characteristics of intuitive and deliberate decision-making as described in recent psychological literature, such as the importance of pattern recognition in intuitive processes. The relatively low proportion of deliberate decision-making in the second study can be explained by the use of a sight-reading task and a more implicit measure of decision-making. Based on data from the three studies, a spiral model is proposed to account for changes in the contribution of intuitive and deliberate decision-making over time, including the process by which intuition becomes 'informed.'

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Chapter One

Introduction

1. Aims

The performance of a notated musical score involves a complex and often rapid process of decision-making. These decisions, made consciously or otherwise, result in the individual differences, stylistic traits, and expressive power of a musical performance. This thesis investigates how musical decisions are made, questioning whether they are the result of intuitive or deliberate processes. While performers often refer to the operation of intuitive processes, these experiences are not well defined or understood. The complexities of musical decision-making are brought into focus by considering historically informed performance, in which performers must reconcile extensive historical and contemporary writings on performance practice with their personal judgment. In summary, the main research question addressed in this thesis is the following: what is the nature and role of intuitive and deliberate decision-making as experienced by period instrument performers?

2. Rationale

> 'Intuition,' 'magic,' and 'alchemy' are suspect in musicological discourse: they are too subjective, too elusive… However, these are terms frequently used by performers to refer to and articulate real experiences and we cannot simply dismiss them if we want to understand how performers work (Dogantan-Dack, 2007, p. 9).

The impetus for this research was writings by performers that refer to the influence of musical intuition on their artistic processes. References to intuition occur in the literature by performers with relative frequency, but they present a wide range of ideas on how intuition works and are usually vague on detail. Having said this, there are a number of core issues that can be briefly explored through a sample of this literature. Writings by performers will be discussed in greater depth in Chapter 2.

Firstly, the juxtaposition of intuition with intellect, rationality or analysis is common to many descriptions of intuition. For example, the cellist Pablo Casals (1970) claimed:

> Of course technique and intelligence have vital functions – one must master the technique of an instrument in order to exact its full potentialities and one must apply one's intelligence in exploring every facet of the music – but, ultimately, the paramount role is that of intuition (p. 96).

Secondly, performers suggest that intuitive processes are based on the accumulated experience of the individual. Pianist Charles Rosen (2002) has stated that "it is not the dogmatic application of knowledge or of rules of style that deepens an interpretation but the years of experience that transmit themselves unconsciously to performance" (p. 98), while Yehudi Menuhin (1972) defined intuition as "the condensation of all experience" (p. 112).

A third issue is the trustworthiness of intuitive processes, which arises through a musician's use of phrases such as "informed intuition" as the basis for decision-making. Rink (2002, p. 36) has used this phrase to recognise "the importance of intuition in the interpretative process but also that considerable knowledge and experience generally lie behind it" (also see Rink, 1990). Although Rink acknowledges that there is considerable substance behind intuitions, "informed intuition" implies that intuition can be uninformed to some extent and needs to be developed before becoming a reliable source for judgment and decision-making. The perceived need to train one's intuition could be a way for expert musicians to distinguish their intuitions from those of a novice.

An appeal to informed intuition might also be a convenient turn of phrase that enables performers to defend themselves against characterisations of intuitions as habitual reflexes, such as the following by Taruskin (1995):

> Our intuitions are not the fine, free, feral things we may think they are. They are thoroughly domesticated beasts, trained to run along narrow paths by long years of unconscious conditioning, endowed with vast reserves of cliché, naïve posture, and nonsense. If you are a trained musician, what you will find if you scratch your intuition will be the unexamined mainstream, your most ingrained responses, treacherously masquerading as imagination (p. 78).

This brief overview of core issues raised by performers and scholars in relation to intuition demonstrates the need for detailed, empirical research to develop a greater understanding of the nature and role of intuitive and deliberate decision-making. By examining these questions within historically informed performance (HIP), the thesis focuses the topic on a subset of musical performers who share general aims and have a background in deliberate historical research. These performers balance historical knowledge with personal judgment, making their interplay between deliberate and intuitive processes of particular interest. The methodology and structure of the thesis will be outlined at the end of this chapter, but firstly, a conceptual framework for the thesis will be presented by reviewing the psychological literature on intuitive and deliberate decision-making.

3. Conceptual framework

Within the dichotomy of intuitive and deliberate processes, intuitive processing is more problematic to define and will therefore be the main focus of this section. The conceptual framework is based on the psychological literature that delineates and discusses intuition within theories of reasoning and cognition. Further psychological research will be discussed in Chapters 4 and 6.

<u>Delineating intuition</u>

In 1964 Westcott remarked, "a look at the psychological literature indicates that it is unusual for anyone to be studying intuition" (p. 47). A few years later he stated, "empirical studies within the framework of general psychology which consider 'intuition' – either as a problem or as a solution – are clearly few and far between" (Westcott, 1968, p. 73). While intuition may have been historically consigned to the fringes of psychology, there is now a growing body of research on the subject, particularly in the fields of cognitive and social psychology.

Recent research on intuition has also stoked the public imagination, largely due to the publication of Gladwell's *Blink* (2005), which drew on the work of scholars such as Damasio, Gigerenzer, and Klein. While avoiding the term intuition, Gladwell

highlighted the use of rapid cognition in various situations including appraising art, fire fighting and speed dating. In particular, he focused on the concept of thin-slicing; "the ability of our unconscious to find patterns in situations and behaviour based on very narrow slices of experience" (Gladwell, 2005, p. 23). Some have criticised Gladwell for his selection of anecdotes used to stress the power of snap judgments without clearly distinguishing between situations when rapid cognition is and is not effective (Hogarth & Schoemaker, 2005; LeGault, 2006), and the effectiveness of intuitive decision-making continues to be debated within academia (e.g., Dijksterhuis, 2004; Dijksterhuis & van Olden, 2006; Newell, Wong, Cheung, & Rakow, 2009). Other publications that have brought the subject of intuition to a general audience include popular books by Gigerenzer (2007), Klein (2003), Lehrer (2009), Myers (2002, 2007), and Sadler-Smith (2008, 2009).

The amount of popular and scholarly literature related to the study of intuition can make defining the term a complex task (see Bastick, 2003; Shirley & Langan-Fox, 1996; Sinclair, 2011). For example, based on an analysis of forty-four separate definitions of intuition from six theoretical schools of psychology, Sprenkle (2005) identified a lack of continuity in intuition research with a diversity of meanings, none of which was dominant. She concluded that similarities and differences in definition were due to three factors: orientation, zeitgeist, and emphasis of work (Sprenkle, 2005, p. 51).

Within the psychological literature, intuition has been conceptualised as a cognitive ability (Sternberg, 1997), an enduring cognitive style or trait (Allinson & Hayes, 1996), and as a cognitive strategy (Hogarth, 2001; Klein, 2003; see Hodgkinson, Langan-Fox, & Sadler-Smith, 2008, pp. 4-8). Intuition can also be connected to theories that do not address intuition specifically, but describe properties that are generally considered to be defining qualities of intuitive processes. For example, Hodgkinson et al. (2008, p. 6) link intuition to Sternberg's (2003) triarchic theory of intelligence as an element of practical intelligence (the others being creative intelligence and analytical intelligence). Practical intelligence (PI) is theorised to lie beyond conscious awareness, is difficult to articulate, and comprises knowledge that is acquired experientially and stored tacitly (Hodgkinson et al., 2008, p. 6).

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The range and volume of literature on intuition means that it is necessary to delineate the term from studies of concepts that are closely related but have important differences. Such concepts will not be addressed in detail in this thesis and include creative cognition (Finke, Ward, & Smith, 1992) and creativity (Sternberg & Lubart, 1996), tacit knowledge (Polanyi, 1964), implicit learning and implicit memory (Reber, 1989, 1993; Roediger, 1990; Seger, 1994), and insight (Bowden, 1997; Bowden, Jung-Beeman, Fleck, & Kounios, 2005).

Dual process theories

Psychological studies that discuss intuition often do so within a dual process theory. These theories argue that any given task may be processed using two distinct mechanisms that employ different procedures and may result in different outcomes. These theories come in various forms, but typically distinguish between one process that is "fast, effortless, automatic, nonconscious, inflexible, heavily contextualised and undemanding of working memory," and another process that is "slow, effortful, controlled, conscious, flexible, decontextualised, and demanding of working memory" (Frankish & Evans, 2009, p. 1).

While the idea of a divided mind and dual processes can be traced to Plato, Freud, and the work of some Gestalt psychologists, contemporary dual process theories were largely developed in the wake of the cognitive revolution in psychology during the 1960s and 70s (Frankish & Evans, 2009). Modern dual process theories developed from research within various fields of psychology including learning, reasoning, social cognition, and decision-making. Influential studies include Reber's work on implicit and explicit learning beginning in the 1960s (Reber, 1989, 1993), accounts of deductive reasoning by Wason and Evans (1975), Schneider and Shiffrin's distinction between controlled and automatic information processing (1977; Shiffrin & Schneider, 1977), the Elaboration Likelihood Model (ELM) developed by Petty and Cacioppo (1986), and Chaiken's Heuristic-Systematic Model (HSM) (Chaiken, 1980, 1987; also see Chaiken & Trope, 1999; Smith & DeCoster, 2009). In 1999, Stanovich coined the terms System 1 and System 2 as generic labels for the growing number of closely related dual process theories (e.g., Epstein, 1994; Evans, 1984, 1989; Evans & Over, 1996; Sloman, 1996). Stanovich (1999, p. 126) listed the properties of System 1 as

associative, holistic, automatic, relatively undemanding of cognitive capacity, relatively fast, and acquired by biology, exposure and personal experience, and System 2 as rule-based, analytic, controlled, demanding of cognitive capacity, relatively slow, and acquired by cultural and formal tuition (also see Stanovich & West, 2000, p. 659). Since then, the terms dual system theory or two-systems framework have been widely adopted.

Dual process theories are also implied in Kahneman and Tversky's research into judgment and decision-making known as the heuristics and biases approach (Kahneman & Tversky, 1973, 1979, 1982, 1984; Tversky & Kahneman, 1973, 1974, 1981). In fact Kahneman (2000) has stated, "Tversky and I always thought of the heuristics and biases approach as a two-process theory" (p. 682). In his later work Kahneman has used dual system terminology, for example in his Nobel lecture on intuitive judgment and choice, in which intuition or System 1 was described as fast, parallel, automatic, effortless, associative, slow-learning, and emotional, in contrast to reasoning or System 2, described as slow, serial, controlled, effortful, rule-governed, flexible, and neutral (Kahneman, 2002; also see Kahneman & Frederick, 2002; Myers, 2010, p. 372). In recent years, books for the general reader by Evans (2010b) and Kahneman (2011) have brought greater public attention to dual process theories of reasoning.

An overview of dual process theories from the 1970s until the present is provided in Table 1.3.1. This table is an amalgamation of reviews by Evans (2008) and Stanovich (2011) who have both presented tables aligning the terminology used by various theorists.

Table 1.3.1: Labels attached to dual processes in the literature (adapted from Evans, 2008, p. 257; Stanovich, 2011, p. 18)

Theorist	System 1	System 2
Bargh & Chartrand (1999)	Automatic processing	Conscious processing
Bazerman, Tenbrunsel, & Wade-Benzoni (1998)	Want self	Should self
Bickerton (1995)	Online thinking	Offline thinking
Brainerd & Reyna (2001)	Gist processing	Analytic processing
Chaiken et al. (1989)	Heuristic processing	Systematic processing

Theorist (cont.)	System 1	System 2
Epstein (1994), Epstein & Pacini (1999)	Experiential system	Rational system
Evans (1984, 1989, 2006)	Heuristic processing	Analytic processing
Evans & Over (1996)	Tacit thought processes	Explicit thought processes
Evans & Wason (1976; Wason & Evans, 1975)	Type 1 processes	Type 2 processes
Fodor (1983, 2001)	Modular processes	Central processes
Gawronski & Bodenhausen (2006)	Associative processes	Propositional processes
Haidt (2001)	Intuitive system	Reasoning system
Hammond (1996)	Intuitive cognition	Analytical cognition
Johnson-Laird (1983)	Implicit inferences	Explicit inferences
Kahneman & Frederick (2002, 2005)	Intuition	Reasoning
Lieberman (2003)	Reflexive system	Reflective system
Loewenstein (1996)	Visceral factors	Tastes
Metcalfe & Mischel (1999)	Hot system	Cool system
Nisbett et al. (2001)	Holistic thought	Analytic thought
Norman & Shallice (1986)	Contention system	Supervisory attentional system
Pollock (1991)	Quick & inflexible modules	Intellection
Posner & Synder (1975)	Automatic activation	Conscious processing
Reber (1993)	Implicit cognition	Explicit learning
Shiffrin & Schneider (1977)	Automatic processing	Controlled processing
Sloman (1996)	Associative system	Rule-based system
Smith & DeCoster (2000)	Associative processing	Rule-based processing
Strack & Deutsch (2004)	Impulsive system	Reflective system
Thaler & Shefrin (1981)	Doer	Planner
Toates (2006)	Stimulus-bound	Higher order
Wilson (2002)	Adaptive unconscious	Conscious

Several authors of dual process theories refer to the concept of intuition directly, but not necessarily as an overall label as in the case of Kahneman and Frederick (2002). For example, within Sloman's two systems of reasoning that contrasts associative and rule-based systems (Sloman, 1996, 2002), intuition is considered to be one of several illustrative cognitive functions of the associative system (the others being fantasy, creativity, imagination, visual recognition, and associative memory). For Sloman (2002, p. 383), the two systems work interactively by lending their different resources to the task at hand.

Besides Sloman, how intuition fits within individual dual process theories is usually not made clear by authors, although it is widely assumed that System 1 processes link closely to the workings of intuition. For example, Hodgkinson et al. (2008) take the

notion of "experiential" in Epstein's cognitive-experiential self-theory (CEST) to be "broadly equivalent to 'intuitive'" (p. 9). Epstein himself confirms this by considering intuition a subset of the experiential system with identical operating rules and attributes (Epstein, 2011, p. 37; also see Epstein, 2010, pp. 298-300). According to Epstein (2000), the two systems of CEST usually engage in "a harmonious, seamless manner" but sometimes produce "what are commonly identified as conflicts between the heart and the head" (p. 671). Distinguishing properties of the experiential/intuitive and rational/analytic systems can be seen in Table 1.3.2:

Table 1.3.2: Comparison of the experiential/intuitive and rational/analytic systems (Epstein, 2011, p. 39)

Experiential/intuitive system	Rational/analytic system
1. Pleasure-pain operated (what feels good)	1. Reality oriented (what is accurate and logical)
2. Implicit beliefs encoded in cognitive-affective networks	2. Conscious beliefs encoded in affect-free cognitive networks
3. Holistic	3. Analytic
4. Associative relations	4. Cause-and-effect relations
5. More outcome oriented	5. More process oriented
6. Behaviour mediated by feelings from past experience	6. Behaviour mediated by conscious appraisal of events
7. Encodes reality in concrete images, metaphors, and narratives	7. Encodes reality in abstract symbols, words, and numbers
8. More rapid processing: oriented toward immediate action	8. Slower processing: oriented also toward delayed action
9. Resistant to change: changes with repetitive or intense experience	9. Changes more readily: changes with speed of thought
10. More crudely differentiated: broad generalisation gradient, categorical thinking	10. More highly differentiated: thinking is more nuanced, qualified, and dimensional
11. More crudely integrated: organised by context-specific representations	11. More highly integrated: organised by context-general principles
12. Experienced passively and preconsciously: people feel seized by their emotions	12. Experience actively and consciously: people feel in control of their conscious thoughts
13. Self-evidently valid: 'experiencing is believing'	13. Requires justification by logic or evidence

Similar two-system frameworks have emerged from the field of social cognitive neuroscience, notably Lieberman's reflexive X-system and reflective C-system, based on functional magnetic resonance imaging (fMRI) studies (Lieberman, 2003, 2007;

Lieberman, Jarcho, & Satpute, 2004; also see Lieberman, 2000). Table 1.3.3 outlines the features associated with each system.

Table 1.3.3: Features associated with X- and C-systems posited to support reflexive (analogous to automatic) and reflective (analogous to controlled) processes (Lieberman, 2007, p. 261)

X-system	C-system
Parallel processing	Serial processing
Fast operating	Slow operating
Slow learning	Fast learning
Nonreflective consciousness	Reflective consciousness
Sensitive to subliminal presentation	Insensitive to subliminal presentations
Spontaneous processes	Intentional processes
Prepotent responses	Regulation of prepotent responses
Typically sensory	Typically linguistic
Outputs experienced as reality	Outputs experienced as self-generated
Relation to behaviour unaffected by cognitive load	Relation to behaviour altered by cognitive load
Facilitated by high arousal	Impaired by high arousal
Phylogenetically older	Phylogenetically newer
Representation of symmetric relations	Representation of asymmetric relations
Representation of common cases	Representation of special cases
	Representation of abstract concepts

Lieberman (2007) explains the X- and C-systems as associated with particular regions in the brain (also see Satpute & Lieberman, 2006). The X-system is associated with the amygdala, basal ganglia, ventromedial prefrontal cortex (VMPFC), lateral temporal cortex (LTC), and dorsal anterior cingulate cortex (dACC) while the C-system is associated with the lateral prefrontal cortex (LPFC), medial prefrontal cortex (MPFC), lateral parietal cortex (LPAC), medial parietal cortex (MPAC), medial temporal lobe (MTL), and rostral anterior cingulate cortex (rACC). Although Satpute and Lieberman (2006) draw on a range of studies to support these associations, they acknowledge that the "kind of evidence that is required to make definitive claims about the automatic or controlled nature of a neural region is largely unavailable" (p. 94).

As well as the distinction between automatic and controlled, the emerging neuroscientific evidence of multiple systems in decision-making can also be modelled using the dichotomies of emotional and cognitive or episodic and associative (Frank,

Cohen, & Sanfey, 2009). For example, an fMRI study involving choices between smaller/earlier and larger/later money amounts distinguished between an affective, automatic beta system (β) and a deliberate, cognitive delta system (δ) (McClure, Laibson, Loewenstein, & Cohen, 2004; Sanfey, Loewenstein, McClure, & Cohen, 2006). When choices involved an opportunity for near-term reward there was greater activity in the β areas (limbic and paralimbic cortical structures), which is associated with the midbrain dopamine system and relatively automatic reward processing. Selection of later, larger rewards resulted in activity mainly in the δ system, comprising of brain areas associated with cognition (lateral prefrontal and parietal areas). The authors suggest that the "degree of engagement of the δ areas predicts deferral of gratification, consistent with a key role in future planning" (McClure et al., 2004, p. 506). While such studies assist in generating novel hypotheses, researchers have warned against oversimplifying the case for two separable systems, stressed the interdependence of neural regions, and called for more empirical data to further refine or constrain existing models (Frank, Cohen, & Sanfey, 2009; also see Goel, 2005; Vartanian & Mandel, 2011).

<u>Questioning dual process theories</u>

While dual process theories seem to be the dominant way of thinking about intuition, there are several unresolved issues that need to be considered. These include the relative importance of each system across diverse settings and tasks, and the related question of how precisely the two systems might interact (Hodgkinson et al., 2008, p. 12). Perhaps most importantly, the implication that theories or system properties can be aligned coherently into two categories has been the focus of much criticism (e.g., Keren & Schul, 2009; Kruglanski & Gigerenzer, 2011; Osman, 2004). As Evans notes, while it is tempting to group theories and attributes into two generic systems, this can lead to a view of cognitive processing that is "oversimplified and misleading" (Evans, 2008, p. 270).

Reflecting on his formulation of the System 1 and System 2 distinction, Stanovich (2011) notes that these terms can lead to the mistaken assumption that the two processes in dual process theories "map explicitly to two distinct brain systems" (p.

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18). While Kahneman (2011, pp. 28-30) considers two-systems terminology a "useful fiction," most theorists have begun to move away from these terms to clarify the point that there are not two distinct, singular and well-defined systems in operation, rather a set of systems that share various attributes. For example, instead of System 1, Stanovich (2004) has suggested using the acronym TASS (The Autonomous Set of Systems) to describe a heterogeneous set.

In recent years, leading researchers in the field have adopted the terms Type 1 and Type 2 processing to stress that a dual process theory is not necessarily a two-system theory (e.g., Evans, 2008, 2009, 2010a, 2010b, 2011, 2012c; Stanovich, 2011, 2012; Stanovich & Toplak, 2012; also see Manktelow, 2012, pp. 148-152). Further, Evans (2012a) has critiqued the "received view" of dual process theories that emerged around 2000, by outlining the following five fallacies:

1. All dual process theories are essentially the same:

    According to Evans, dual process theories include dual mode theories that propose two different modes of processing, dual type theories that concern different types of cognitive processes, and dual system theories that make specific proposals about underlying cognitive mechanisms (Evans, 2010b, pp. 215-216; Evans, 2012a, pp. 124-125). Evans (2008) has also attempted to address the question of how the two processes in dual process theories relate by distinguishing between parallel-competitive forms of dual process theory and default-interventionist forms:

    > Parallel-competitive forms of dual process theory seem to be rooted in the idea of two forms of learning, leading to two forms of knowledge (implicit and explicit) that can then lead to competing attempts to control behaviour… However, the category of theories that I call "default-interventionist" assume, in contrast, that rapid preconscious processes supply content for conscious processing, cueing default behaviours that the analytic reasoning may approve or intervene upon with more effortful reasoning (p. 271).

2. There are just two systems underlying Type 1 and 2 processing:

    Evans argues that there are actually several kinds of processes that meet the Type 1 criteria: "associative processes involved in learning and retrieval of implicit

knowledge; processes attributed to cognitive modules such as the language acquisition device; preconscious and pragmatic processes that retrieve explicit knowledge for processing through working memory; procedural processes that were once explicitly rehearsed and have become automatic through practice" (Evans, 2012a, p. 126).

From the four kinds of Type 1 processes listed by Evans, those most commonly referred to by other authors are "associative" and "procedural" processes. For example, the lack of conscious access to intuitive processes is explained by Weber and Lindemann (2008), as either because "previously conscious, analytic processes have become automated to a point in which conscious attention is no longer necessary or as the result of cumulative, associative learning that has never been conscious" (p. 191). Similarly, Pretz (2011, p. 17) has differentiated between judgments based on analytical processes that have become automatic through practice (termed inferential intuition) and holistic judgments that integrate complex information (termed classic or holistic intuition) (also see Hill, 1987-1988; Pretz & Totz, 2007). Finally, Stanovich and Toplak (2012) have described Type 1 processing as "a grab-bag – encompassing *both* innately specified processing modules/procedures and experiential associations that have been learned to automaticity" (p. 8).

"Inferential" or "procedural" Type 1 processes in which behaviour is made automatic through practice are likely to be a significant part of expert intuitions and are the focus of some definitions of intuition, for example as "analyses frozen into habit" (Simon, 1987, p. 63). Procedural processes were also discussed by pioneering music psychologist Carl Seashore in 1919:

> One must have been intensely conscious of technique, must have known laws, must have isolated element after element for intensive study, all severely intellectual, cold, and quite free from the artistic impulse, before control of these can become so automatic as to drop into the background of consciousness (p. 259).

A further decomposition of the intuitive system has been proposed by Glöckner and Witteman (2010a) who describe four partially complementary types of processes: associative intuition based on simple learning and retrieval, matching

intuition relying on complex prototype and exemplar storage and retrieval, accumulative intuition based on automatic linear integration of information from memory and currently perceived information, and constructive intuition based on the construction of consistent mental representations (p. 18). While there is more literature exploring the systems involved in Type 1 than Type 2 processing, Evans (2009, 2012a) points out that Type 2 processes should also be defined in terms of multiple systems rather than a singular system.

3. Type 1 processes are responsible for cognitive biases; Type 2 processes for normatively correct responding:

Historically, reasoning researchers have presented abstract problems to participants for which they did not have relevant experience. Type 2 processes were usually required to reach a correct solution, while cues would prompt Type 1 processes to compete or conflict with correct answers (Evans, 2012a, p. 127). It does not follow however that either process always produces a wrong or right solution, and there is much evidence showing the importance of intuitive thinking in expert decision-making (e.g., Gigerenzer, 2007; Klein, 1998).

4. Type 1 processing is contextualised, whereas Type 2 processing is abstract:

This fallacy has arisen for similar historical reasons to the previous point. A novel task generally requires attention to logical structure and de-contextualisation, favouring Type 2 processing. Therefore, Evans (2012a) proposes that it is better to claim that "there are ways in which prior experience can cue intuitions and behaviour by associative and procedural learning that bypass working memory (Type 1), which are separate from the retrieval and manipulation of explicit memories and beliefs through working memory (Type 2)" (p. 128).

5. Fast processing indicates the use of a Type 1 rather than Type 2 process:

While it is generally the case that Type 2 processing is slow and Type 1 judgments are quick, there are also fast Type 2 judgments made on the basis of simple rules and heuristics (Evans, 2012a, p. 128; Betsch, 2008). This raises a problem for

research design and analysis, as it would be difficult to ascertain if a fast, unexplained judgment is actually the result of simple rules that could be applied explicitly, rather than being a truly intuitive judgment based on feelings.

A definition of Type 1 and Type 2 processes that avoids the fallacies outlined above has been proposed by Evans (2012a) using the terms intuition and reflection, providing clear distinctions on which to base an analysis of decision-making:

> Intuition (Type 1) is fast and automatic, giving rise to feelings of confidence in answers or decisions but with no conscious knowledge of the basis of these feelings. Reflective processing (Type 2) is slower, involving manipulation of representations through working memory, at least part of which appears to be consciously accessible. However, reflective processing does not necessarily override or correct intuitions: it often confabulates justifications for them (p. 18).

The issue of Type 2 processes confabulating justifications for intuitions presents another issue for research design and analysis, since a justification or explanation may obscure the workings of Type 1 processes. As Evans (2010b) notes, "there are no experts in *self*-knowledge" and "while people do not know the causes of their behaviour, they *think* they do" (p. 126). In the definition above Evans also deals with the much-debated issue of consciousness, which he has explained as occurring in two forms: phenomenal consciousness of sensations and feelings, and reflective consciousness that requires language and meta-representation (Evans, 2010b, p. 181).

Price and Norman (2008) resolve the issue of consciousness in a different way. They suggest that instead of relying on dual process theories, all that is needed are the ideas that decision-making and judgment "are a mishmash of more conscious and more non-conscious processes, and that our minds are full of so-called fringe conscious signals which help to direct the onward flow of cognition" (Price & Norman, 2008, p. 37). Based on Mangan's revival of the concept of fringe consciousness (Mangan, 1993, 2003), they propose categorising mental phenomena in a multidimensional space where three of the principle axes are: 1) the distinction between automatic and controlled processing styles, 2) the distinction between non-conscious and conscious processing, and 3) relative cognitive versus emotional context (Price & Norman, 2008, p. 38).

Another approach to the issue of consciousness is the Cognitive Continuum Theory (CCT) or spectrum of cognition proposed by Hammond and his colleagues (Hammond, Hamm, Grassia, & Pearson, 1987). According to this model, tasks are processed along a continuum ranging from intuition to analysis, with intuitive processing defined as low cognitive control, rapid data processing, and low conscious awareness, and analytical processing comprising high cognitive control, slow data processing, and high conscious awareness (see Table 1.3.4).

Table 1.3.4: Properties of intuition and analysis (Hammond et al., 1987, p. 755)

	Intuition	Analysis
Cognitive control	Low	High
Rate of data processing	Rapid	Slow
Conscious awareness	Low	High
Organising principle	Weighted average	Task specific
Errors	Normally distributed	Few, but large
Confidence	High confidence in answer; Low confidence in method	Low confidence in answer; High confidence in method

Hammond (2007) has urged psychologists to move beyond the tradition of a dichotomous relationship between intuition and analysis, while acknowledging that the concept of a cognitive continuum is an abstraction; "no one has ever seen such a continuum and, of course, no one ever will" (pp. 125-126). Hammond further explains the dynamic nature of the continuum by describing how cognitive activity can oscillate between intuition and analysis:

> Oscillation on the continuum can be observed as a person tries to "make up his or her mind." It often follows this path: intuition seems unsatisfactory because it cannot defend its conclusions, so one turns to analysis, which then seems unsatisfactory because there isn't time to consider all features of the task and because one doesn't quite know how the information should be organised, and therefore one returns to an intuitive attempt. Or the person making the judgment may work out a fairly satisfactory analytical judgment and then seek to bolster it by an appeal to his or her intuition (does it feel like the right answer?) or vice versa. That is, one does not oscillate forever but stops somewhere on the continuum. The result is a quasi-rational judgment; that is, one that is almost but not quite a rational judgment, a compromise between intuition and analysis… In short, the tactics most of us use most of the time are neither fully intuitive nor fully analytical: they are a compromise that contains some of each; how much of each depends on the nature of task and on the knowledge the person making the judgment brings to the task. And over time, the person will move his or her cognitive activity across the cognitive continuum (p. 237).

As well as the notion of a cognitive continuum, Hammond has outlined a task continuum and a surface-depth continuum that help to contextualise and explain decision-making processes (see Figure 1.3.1).

Figure 1.3.1: Hammond's continua (based on Hammond, 2007, pp. 123-129)

a) The task continuum

$\longleftrightarrow$

Intuition-inducing   Analysis-inducing

b) The cognitive continuum

$\longleftrightarrow$

Intuition   Analysis
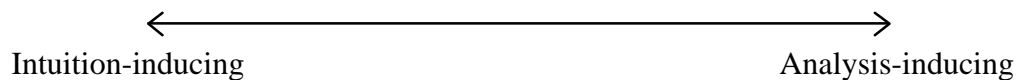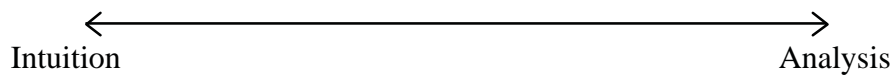
c) The surface-depth continuum

$\longleftrightarrow$
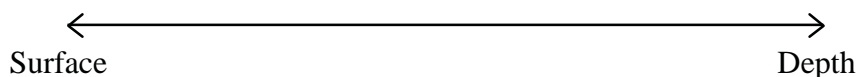
Surface   Depth

The surface-depth continuum refers to data that are close to the person making the judgments (surface) and data about objects and events that are remote in time or place from that person (depth) (Hammond, 2007, p. 127). The task continuum differentiates judgment tasks according to whether they are intuition-inducing or analysis-inducing, with common sense-inducing falling between the two poles. Hammond (2007, p. 125) suggests researchers list properties of a task, locate it on the task continuum, and predict the nature of the judgment that the task induces. This procedure was followed in a study of highway engineers in which judgments and tasks were assessed using a Cognitive Continuum Index (CCI) and Task Continuum Index (TCI) respectively (Hammond, Hamm, Grassia, & Pearson, 1997). The study required judgments of highway aesthetics (intuition-inducing), safety (quasi-rationality-inducing) and capacity (analysis-inducing), and found better performance when the mode of cognition used (CCI) corresponded to the task properties (TCI).

An earlier study of highway engineers by Hamm (1988) also required judgments of highway aesthetics, safety, and capacity, but demonstrated the dynamic nature of the cognitive continuum by mapping analytic and intuitive cognitive activity over time. Hamm (1988) suggested five possible ways in which cognitive activity may change

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during the experiment (see Figure 1.3.2). The study found no evidence for linear trends, but there was evidence of alternation between intuition (I) and analysis (A) in both an I-A-I and A-I-A pattern (curves 4 and 5 of Figure 1.3.2).

Figure 1.3.2: Possible patterns of change in Moment by Moment Cognitive Continuum Index (MBMCCI) over time (Hamm, 1988, p. 766)[1]
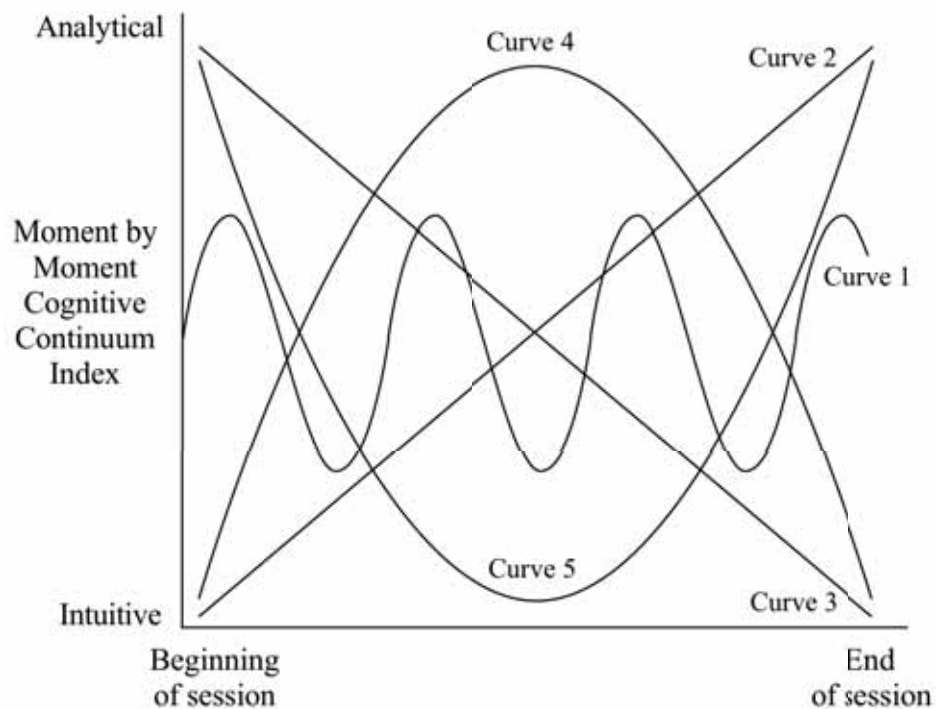
Besides engineering, researchers in fields such as nursing (Cader, Campbell, & Watson, 2005) and agriculture (McCown, 2012) have also drawn on the Cognitive Continuum Theory (CCT) to conceptualise and differentiate between the many processes that lead to a decision. The CCT captures the basic distinctions described by dual process theories while acknowledging their interdependence through Hammond's adoption of Brunswik's (1952) term quasi-rationality to explain the greater part of cognitive activity. Hammond (2010) defines quasi-rationality as resembling rationality "in its intent to be an adaptive, thus defensible (and positive) form of cognition" (p. 330). He goes on to explain that the process fails to achieve logical perfection due to one more of the following: a) an absence of current knowledge, b) an absence of skill

in organising the knowledge it is based on, c) the person is simply forced to rely on unreliable, partially valid information (cues etc.), as is normally the case, or d) the person refuses to make the effort required for analytical cognition (pp. 330-331).

<u>The intuitive experience</u>

Petitmengin-Peugot (1999) identifies a lack of studies that write about the intuitive experience itself as opposed to research attempting to define the concept of intuition. She argues that descriptions of the intuitive experience are possible to obtain by focusing on the preparation that encourages the surging forth of an intuition. Therefore, her study used an "explicitation session" to bring the subject to the point of reliving the intuitive experience, helping them to operate a "think-through" of their experience, and enabling them to put this represented experience into words (p. 46). From these descriptions, detailed models were constructed to illustrate phases of the experience.

Like Petitmengin-Peugot's research, much of the limited literature exploring experiences of intuition has been phenomenological in nature, including studies of intuition as experienced by educators (Windom, 2007), novice nurses (Ruth-Sahd & Tisdell, 2007), and music therapists (Brescia, 2004). In an interpretative phenomenological study of the use of intuition in homeopathic clinical decision-making (Brien, Dibb, & Burch, 2011), the authors discussed four main themes in the data: 1) how homeopaths recognise and describe intuition, 2) beliefs about the origins of intuition, 3) types of intuition, and 4) the selective use of intuition. Intuition often manifested itself as a feeling, such as "an inkling," "a gut-feeling," "a sense," or "a picture" (Brien et al., 2011, p. 3) and many other qualitative studies have found the same terminology being used to describe intuition. For example, a study of 50 people who perceived themselves to be highly intuitive found that 62% of participants explained intuition as a gut feeling or instinct (Rogers & Wiseman, 2005-2006, p. 165).

Another group of studies that relate to the experience of intuitive processes comes from the literature on creativity; studies which often elicit descriptions of intuition from participants. For example, in a study of eleven artists from a range of disciplines,

Nelson and Rawlings (2007, p. 239; also see Nelson, 2005) found that a central part of the artistic creative process is a movement toward intuitive mental processes. The authors proposed that intuitive processes group together with other factors to constitute an aspect of the experience frequently referred to as "the zone" or "flow." They also observed movement between intuition and more critical, analytical mental processes that "may occur frequently in the course of the overall process or only several times" (p. 239). The nature of this movement is dependent on "the nature of the artistic medium, the general approach of the artist, and the stage of the artwork" (Nelson & Rawlings, 2007, p. 235). Nelson and Rawlings (2007) explain the movement between modes through a number of possible scenarios:

> The artist may be prompted to become more analytical in his approach when he senses that the artwork in not 'flowing' as easily and therefore loses confidence in his approach to the work; when there is a sense of elements of the artwork not 'fitting together' as well as they were earlier in the process; when he encounters a technical challenge, making him contemplate how he will technically be able to convey certain ideas; or when the focus of attention moves from the artwork to another mental object… The demands of the process of completing the artwork will itself prompt the artist to become more analytical in her approach at various points in the process. For example, as part of the drafting process, the writer may work through the initial body of text with a critical analytical approach; musicians working in a studio may start analysing the interplay of musical elements and consider whether original ideas for the piece have been successfully conveyed. The process of engaging with the artwork in this way will often prompt the artist to become deeply absorbed in the work again, leading to another period dominated by intuitive mental processes (pp. 235-236).

Studies of the intuitive experience show how researchers can obtain data with a high level of descriptive detail and ecological validity. Phenomenological data on how intuition is experienced in various settings can make important contributions to the modelling of cognitive processes and the definition of intuitive and deliberate decision-making.

4. Definitions

<u>Intuition</u>

Based on the research reviewed in the previous section, it is clear that intuition has been the subject of much theoretical speculation, both in popular and scholarly literature from diverse disciplinary viewpoints. Therefore, it is important to delineate intuition from related concepts such as insight and to avoid any element of mystery in its definition. This has been done through an examination of the varied and growing psychological literature on the topic, a body of research that Betsch (2008) has broadly separated into three schools of thought:

> Some scholars focus on intuition as a *source* of knowledge. Accordingly, intuition is what we know without knowing how we learned it. Others suggest a *process* view by equating intuition with automatic or implicit processes of thinking. Finally, one spots proponents of a *system* view claiming that intuition is a distinct faculty of the human mind (p. 4).

While acknowledging that intuition is a term loaded with diverse and sometimes contradictory ideas, this study will seek clarity on the topic through a conceptual framework built around the psychological literature suggesting a *process* view of intuition. In line with dual process theories of reasoning, intuition will be equated with Type 1 processing, which is "fast and automatic, giving rise to feelings of confidence in answers or decisions but with no conscious knowledge of the basis of these feelings" (Evans, 2012a, p. 18). The working definition of intuition for this study was chosen for its description of Type 1 properties and focus on decision-making:

> *Intuition is a process of thinking. The input to this process is mostly provided by knowledge stored in long-term memory that has been primarily acquired via associative learning. This input is processed automatically and without conscious awareness. The output of the process is a feeling that can serve as a basis for judgments and decisions* (Betsch, 2008, p. 3; also cited in Glöckner & Witteman, 2010b, p. 2).

Although intuition has been studied and defined in other disciplines such as philosophy, this study is limited to a discussion of intuition within the psychological framework outlined in this chapter.

Deliberation

In contrast to intuitive processing, deliberation or deliberative (Betsch, 2008, p. 8) will be used to reflect *the operation of Type 2 processes, which are "slower, involving manipulation of representations through working memory, at least part of which appears to be consciously accessible"* (Evans, 2012a, p. 18). The terms deliberation or deliberate processing were chosen as they are commonly used in binary opposition to intuitive (Dijkstra, Van der Pligt, & Van Kleef, 2012; Kruglanski & Gigerenzer, 2011; Raab & Johnson, 2008) and appear within definitions of intuition to clarify what intuitive processes do not involve (Hogarth, 2001, p. 14; Sadler-Smith, 2008, p. 31).

These definitions of intuition and deliberation acknowledge that there may be multiple systems underlying Type 1 and Type 2 processes and part of the aim of this study will be to elicit detailed descriptions of how specific musical decisions might reflect different underlying cognitive systems. In an attempt to model musical decision-making at the micro and macro levels, the default-interventionist form of dual process theories (Evans, 2008) and the Cognitive Continuum Theory proposed by Hammond (2007) will form starting points in investigating how intuitive and deliberate processes of decision-making may interact over periods of time.

Musical decision-making

Musical decision-making in performance (as opposed to composition) refers to *"the decision-making process implicit in the interpretative act"* (Rink, 2004, p. 49). This affects what could be termed performance features; elements of a scored composition that the performer manipulates in performance (articulation, phrasing, tempo, dynamics etc.). As well as the context of performance, the thesis explores musical decision-making in other situations such as reading a score at sight and private practice.

Historically informed performance

Historically informed performance (HIP) is *a highly developed approach to performance that aims to recapture stylistic characteristics of performance*

conventions from the period in which the work was composed and typically includes the use of period instruments.

Historically informed performance grew from the so-called early music movement of the second half of the twentieth century which was founded on the assumption that the performance practices of earlier centuries could be accurately reconstructed through the application of information gathered from primary sources from the era (see Haskell, 1988). It soon became evident that although the movement alluded to the past, very little historical performance could claim to be historically authentic. The literature on authenticity and HIP is extensive, but a few brief points are worth noting here. According to Taruskin (1995, p. 166), the importance of the early music movement is not in its attempt to be the voice of history, but in its role as the true voice of now, a reflection of late twentieth century taste. While an important criticism, Taruskin's claim related to a phase or brand of HIP labelled 'straight' or "strait" (Haynes, 2007, p. 61), a style which does not account for performers who perform according to the expressive "rhetorical" style based on Classical oration (see Fabian, 2001, 2003; Haynes, 2007). The theory of HIP will be discussed further in Chapter 2. By focusing on elite period instrument performers, the thesis provides some insight into the attitudes and priorities of current practitioners of HIP.

5. Thesis overview

As stated at the beginning of this chapter, this thesis explores the following main research question: what is the nature and role of intuitive and deliberate decision-making as experienced by period instrument performers? This question is addressed in the thesis through three studies, resulting in a mixed method, tripartite structure.

<u>Methodology</u>

The methodology employed is a mixed method approach, defined as research that "combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration"

(Johnson, Onwuegbuzie, & Turner, 2007, p. 123; also see Johnson & Onwuegbuzie, 2004; Leech & Onwuegbuzie, 2009). The mixed method approach is designed to provide data source, method, and analysis triangulation, whereby a complex picture of the phenomenon being studied can be developed (Liamputtong & Ezzy, 2005, pp. 40-41). Triangulation should not be considered a tool of validation, but a strategy that adds "rigor, breadth, complexity, richness, and depth to any inquiry" (Denzin & Lincoln, 2005, p. 5; also see Flick, 2002, 2007; Flick, Garms-Homolová, Herrmann, Kuck, & Röhnsch, 2012).

Within this approach, the qualitative elements are based on phenomenology, in accordance with the emphasis on the experience of the performer in the research question. A phenomenological approach aims to study situations from the viewpoint or "life-world" of the individual experiencing them (Liamputtong & Ezzy, 2005, pp. 18-19). Rooted in early twentieth-century continental philosophy, phenomenology is concerned with the lived experience and involves the in-depth exploration, description and communication of the rich detail of people's experiences (Grbich, 2007, p. 84). Forinash (1995) uses the example of studying intuition to describe the priorities and benefits of a phenomenological approach:

> The phenomenologist's stance is that experience need not be categorised as either true or false, valid or invalid. Experiences simply exist and therefore are worthy of investigation. If people experience intuition, then the research can study what they experience… Providing a description of the lived experience of intuition will allow the participants who experience intuition to understand their own experience as well as to compare it to the intuition experiences of others, thus adding to their understanding of the aspects of the experience that are shared and those that are also unique (p. 368).

The specific phenomenological method used is Interpretative Phenomenological Analysis (IPA), a method initially developed by Smith (1996) in the field of health psychology. It is concerned with "the detailed examination of personal lived experience, the meaning of experience to participants and how participants make sense of that experience" (Smith, 2011, p. 9; also see Landridge, 2007; Smith, Flowers, & Larkin, 2009; Smith, Jarman, & Osborn, 1999; Smith & Osborn, 2003;). IPA produces detailed data specific to a targeted group or individual and "facilitates an intimacy with the data in a way that formally structured quantitative analyses do not"

(Davidson, 2004, p. 65). This method acknowledges that the phenomenological analysis produced by the researcher is always an interpretation of the participant's experience (Willig, 2008). As Smith and Osborn (2008) note, IPA involves a two-stage interpretation process, or double hermeneutic: "the participants are trying to make sense of their world; the researcher is trying to make sense of the participants trying to make sense of their world" (p. 53). Therefore, "the researcher's sense-making is second-order; he/she only has access to the participant's experience through the participant's own account of it" (Smith, Flowers, & Larkin, 2009, p. 3). IPA differs from Grounded Theory in its focus on the "micro analysis of individual experience," emphasising "convergence and divergence between participants" instead of seeking a conceptual explanation usually based on a larger sample (Smith et al., 2009, p. 202).

IPA was chosen for this research due to its acknowledgement of the subjectivity of participants' accounts and the role of the researcher as the instrument of research. The focus on lived experience and detailed analysis of a small sample size was considered suitable for analysing self-report data describing the experience of musical decision-making from a relatively small number of participants. IPA was chosen over Grounded Theory due to its concern with producing a nuanced interpretation of individual cases. Although a model is proposed towards the end of the thesis that draws on individual accounts to support more general theoretical claims, this is considered complementary to the micro level claims discussed within the three separate studies that comprise the thesis.

As with the studies of the intuitive experience reviewed earlier in this chapter, the first and third parts of the thesis primarily discuss phenomenological data gathered through various self-report methods. To decrease reliance on self-reported data, the second part of the thesis introduces an experimental method to determine decision-making processes through more implicit means. As intuitive processes are not fully accessible to consciousness, intuitive and deliberate processes are distinguished by comparing 'think-aloud' data, score markings and analysis of performances. Think-aloud protocols are a method of verbal reporting developed by Ericsson and Simon (1993; also see De Graaff & Schubert, 2007; Ericsson, 2006; Van Someren, Barnard, & Sandberg, 1994) and will be discussed in greater detail in the method section of Chapter 5.

Each of the three parts of the thesis begins with an introductory chapter covering the relevant literature and theoretical framework for the study. This is followed by a chapter that outlines the aims and method, discusses the results of the study, and concludes with a brief overview, summary of results, limitations, and implications. The three parts of the thesis are summarised below:

1. Musicians' voices (Chapters 2 and 3)

   The first study involved semi-structured interviews with eighteen leading Baroque violinists and cellists with a focus on what musical decisions a performer makes and the process of reaching these decisions. The interviews focused on the interpretation of the solo string works of J.S. Bach.

2. Observing the process (Chapters 4 and 5)

   The second study was an experimental study, conducted to capture the musical decision-making process within a laboratory setting. Seven Baroque violinists of varying levels of expertise were asked to sight-read, practise, and then perform a short, unfamiliar piece of solo Baroque violin music.

3. A case study (Chapters 6 and 7)

   To understand more deeply the experiences, perceptions, and priorities of an individual period instrument musician, a third study was conducted with Baroque cellist Daniel Yeadon. This two-year long case study traced Yeadon's processes of decision-making while he prepared to record the Suites for Solo Cello by J.S. Bach.

The final chapter of the thesis (Chapter 8) considers the implications of all three studies and presents suggestions for future research in this area.

Part 1:

Musicians' voices

Chapter Two

Introduction

1. Musical performance

> The fundamental nature and meaning of music lie not in objects, not in musical works at all, but in action, in what people do (Small, 1998, p. 8).

It is generally understood that musicians in the Western classical tradition translate notated symbols into an aural product. Less obviously, these musicians are engaged in complex, inner processes of interpretation, which result in the perceived and real communicative effects of a musical performance. Small describes the ritual of musical performance in *Musicking* (1998), the title being a verb (*to music*) that encompasses all musical activity (see also the term *musicing* as discussed by Elliott, 1995). The following passage illustrates Small's claim that musical performance is a social ritual that reflects and shapes relationships:

> Members of a certain social group at a particular point in its history are using sounds that have been brought into certain kinds of relationships with one another as the focus for a ceremony in which the values – which is to say, the concepts of what constitute right relationships – of that group are explored, affirmed, and celebrated (p. 183).

While this study will focus on the perspectives of the performer, it acknowledges the wider context of *musicking* in which the activities of a performer take place. Therefore, a Western classical musical performance could be thought of as a ritualistic, temporary experience that is shaped by and critiqued in relation to an infinitely varied spectrum of musical activity. Highly trained musicians prepare and present their interpretations of a musical score in a manner that is constantly influenced by changing conceptions of tradition, authenticity, and context (Schippers, 2006).

The term interpretation has been the subject of much debate, particularly within philosophical discussions of musical performance (e.g., Benson, 2003; Davies, 2001;

Kramer, 2011; Levinson, 1993; Thom, 2007). This study uses the term to refer to the complex process of decision-making whereby a performer presents their particular conception of a musical score to a public audience. Chaffin, Lemieux, and Chen (2006, p. 202) have suggested that the decisions reached during this process can be categorised into three levels of performance cues that a musician attends to during performance:

1. *Basic* performance cues include critical fingerings, technical difficulties, and patterns of notes to watch out for.
2. *Interpretative* performance cues include critical phrasings, dynamic emphases, and changes in dynamic level and tempo.
3. *Expressive* performance cues represent the musical feelings that the performer wants to convey to the audience.

While such categorisation has led to some modelling of the artistic process, answers to how and why these decisions are made remain elusive. For instance, Walls (2003, pp. 26-27) suggests that a theoretical "flow-chart" for performing in a historically informed manner might begin with decisions regarding basic issues of equipment, then progress to technical concerns and decisions about specific musical features of the piece being prepared. Such a model however, could not account for the whole process and would become too complicated "where the mostly unconscious, intangible aspects of musicality… take over" (Walls, 2003, p. 27). It is at this stage that performers often invoke the workings of musical intuition.

2. The intuitive performer

The influence of intuition on musical interpretation has been advocated by many well-known musicians of the twentieth century. These performers include cellists Pablo Casals (1970) and Janos Starker (Geeting, 2008), and violinists Fritz Kreisler (Martens, 1919), Leopold Auer (1921), and Yehudi Menuhin (1972). For example, Casals often spoke of intuition being decisive in his approach to the performance of music:

> When all is said it is instinct which not only creates but directs the performance… although intelligence is a powerful auxiliary, intuition remains

the deciding factor. All I do is based on intuition… Intelligence helps the
process of development and the progressive integration of perceived forms, but
it must be nourished and directed by intuition (Corredor, 1956, pp. 122-123;
also see Casals quotation in Chapter 1, Section 2).

Similar to the relationship between intuition and intelligence expressed by Casals, the
conductor Leonard Bernstein valued the guidance of instinct above knowledge:

That's my heritage from Koussevitzky: the spontaneity of musical instinct, and
that you have to trust it. Of course, you have to have knowledge, you have to
have taste, you have to have background, you should know languages, you
should know the literature of the various periods in which the music that we
play came forth; but above all that, the main thing that counts is the natural
instinct that comes from the spirit (Bernstein, 1982, p. 313).

Connection to and trust in musical instinct or intuition can be seen as a way of
achieving a more spontaneous, individual conception of a musical work. By following
one's intuition, one's inner, personal convictions are considered a source of authority.
For cellist Janos Starker "instead of authenticity, *authority* is supreme – authority that
comes from intuition, endless experimentation, and conviction" (Geeting, 2008, p. 20).
The influential violinist and pedagogue Leopold Auer (1921) expressed this sentiment
in relation to "older" music, in which considerations of historical style should not
restrict the artistic freedom associated with musical instinct:

How is a violinist to conceive the meaning of an older work which he may be
studying if his own musical instinct, his freedom of conception, are obfuscated
by the dictum: "This must be played in such and such a manner, because so
and so played it in that way two hundred years ago"? (pp. 176-77).

Similarly, for cellist Bernard Greenhouse, "The only thing that truly excites me is a
personal input into the manuscript by the performer: Bach played by Casals, Bach
played by Enescu" (Owen, 2001, p. 185). Implicit in such statements is the connection
between intuition and creativity, often made explicit by composers (see Harvey, 1999)
and other artistic practitioners (Bannerman, 2006; Nelson, 2005; Nelson & Rawlings,
2007; Policastro, 1995; Raidl & Lubart, 2000-2001).

These quotations demonstrate that performers generally contrast intuition with
concepts such as intelligence, knowledge, deliberation, analysis, or rationality.
Although musicians often use intuition and instinct interchangeably, the term intuition

more accurately reflects the role of deep knowledge structures and prior learning in the process that most musicians seem to be describing (Carlson, 2004). As was discussed in Chapter 1, intuitive decisions are based on knowledge stored in long-term memory and are experienced as subjective feeling rather than a thought that can be fully articulated (Betsch, 2008; Glöckner & Witteman, 2010a; Hodginkson et al., 2008; Hogarth, 2001). Epstein (1995) suggests that these feelings take the form of an emotion-based sense of rightness: "Lying behind all judgments which pertain to performance, to the shaping of artistic concepts, are criteria of 'rightness' whose roots are intuitive, essentially affective – seemingly, though not definitively, beyond the grasp of discourse and reason" (p. 127).

The following statements describe the highly subjective, feeling-based experience of musical intuition, including the feeling of rightness that accompanies intuitive processes:

> Tradition in interpretation does not mean a cut-and-dried set of rules handed down; it is, or should be, a matter of individual sentiment, of inner conviction. What makes one man an artist and keeps another an amateur is a God-given instinct for the artistically and musically right. It is not a thing to be explained, but to be felt (violinist Fritz Kreisler in Martens, 1919, p. 109).

> Sometimes a performer's intuitive feeling for the music is so "right" that there is no need for any research. But musicians blessed with such extraordinary insight are rare, and their intuition usually works better for certain styles than for others (pianist Boris Berman, 2000, p. 142).

The possibility that intuitive processes are preferred by elite musicians has been the subject of several studies. Using the Myers-Briggs Type Indicator (MBTI), Kemp (1996, p. 62) found that 60% of student performers and 71% of professional musicians perceived and interpreted information using an intuitive approach. Similarly, Wubbenhorst (1994) found that 66% of student performers were intuitive. Kemp (1996) describes a proclivity towards "feelingfulness" and openness to intuition amongst musicians and refers to these traits within Cattell's concept of "pathemia" (pp. 68-84). Tendencies toward an intuitive cognitive style using the MBTI have also been found in highly creative architects, mathematicians, research scientists and writers (Hall & MacKinnon, 1969; Woolhouse, 1996; Woolhouse & Bayne, 2000; also see Bastick, 2003, pp. 314-321).

A related finding comes from a study by Hallam (1995a, 1995b), who interviewed twenty-two musicians about their practice habits and found differences between musicians who were "intuitive/serialists" versus "analytic/holists." Seven musicians preferred the intuitive approach, allowing their interpretation to evolve unconsciously and avoiding deliberate analysis and planning. Two musicians were classed as analytic and relied on deliberate, conscious analysis of the piece. Ten musicians used a mixed, "versatile" strategy, adopting the two approaches interchangeably and three musicians remained unclassified. Overall, the study found that professional musicians "have a tendency to prefer versatile or intuitive/serialist styles of learning" (Hallam, 1995a, p. 121).

3. The historically informed performer

In contrast to the views of Starker and Auer quoted in the previous section, historically informed performers make musical decisions based on a theory of performance that aims to recapture stylistic characteristics of performances from the period in question and typically includes the use of period instruments (Haskell, 1988; Lawson, 2003; Lawson & Stowell, 1999). Since historically informed performers study the stylistic conventions of the period as described in historical treatises, these performers could be considered to employ a more deliberate process of musical decision-making:

> I think when we talk about HIP, what we are really talking about are performing styles that no longer exist naturally, but must be deliberately and consciously revived (Haynes, 2010, 15:46-15:57).

> The intuitive method of performance becomes problematic as soon as the first murmurings of the historical performance movement are heard. For 'Early Music' has always been happier on the *terra firma* of rationalism (Dreyfus, 2007, p. 269).

Historically informed performance may involve a large component of planned decision-making based on historical study, but it can also be argued that intuitive decisions are necessary due to gaps in historical knowledge and the incomplete nature of Baroque scores. On the whole, research into the theory and practice of HIP demonstrates that there is always a complex relationship between deliberate decisions based on research and the need for a performer's personal, essentially intuitive

judgments (Butt, 2002; Fabian, 2001, 2003; Haynes, 2007; Kenyon, 1988; Kivy, 1995; Leech-Wilkinson, 1984; Leppard, 1988, Taruskin, 1982, 1984, 1988, 1995; Walls, 2003). For example, Richard Taruskin (1995, p. 101) quotes American harpsichordist Kenneth Cooper to demonstrate this:

> It should be remembered about history…that what we know about history was only a small part of what was done, so that when we represent what we know about it, we are distorting it; and therefore to try and fill in a little of the creative energy – even if it's not exactly the same creative energy (because we'll never know what that is) – [helps us in] getting closer to a fuller picture.

Taruskin surmises that, "For Cooper, then, to realise Bach's intentions one needs not only knowledge but a vital impetus born of intuition to fill the gaps between the facts. This alone can convert knowledge into action" (p. 101). This statement can be compared with Baylor's claim that in psychology, intuition is the moment of transition from knowledge (I know what I am looking for) to action (I know what to do) (Baylor, 2001, p. 238).

A significant number of historically informed performers have talked about intuition in their artistic practice including conductors John Eliot Gardiner (Sherman, 1997), Roger Norrington (Sherman, 1997), Nikolaus Harnoncourt (1982/1988; Clark, 2000; as cited in Holloway, 1996), Paul McCreesh (2001), Masaaki Suzuki (Clark, 2007), and Trevor Pinnock (Anderson, 2007), as well as violinists Elizabeth Wallfisch (2005), Sigiswald Kuijken (Swanston, 1997), and Andrew Manze (2002; Ford, 2002). From a survey of their statements, three important aspects of intuition emerge that can be summarised as follows:

Firstly, intuitive processes facilitate practical expediency. In the moment of performance, performers must commit to a musical decision and often do so intuitively:

> Masaaski Suzuki (Clark, 2007, p. 17):
> On all questions, I prefer to follow my musical instinct and see how it works in practice. I'm not a theologian or musical theorist. I'm a practical musician.

> Paul McCreesh (2001, p. 25):
> I have an incredibly strong physical response to music, so the only time I get frustrated is when I can't find a solution to a problem. Usually I have strong

confidence in musical instincts – because that's the only way I can work. For me the tension is between the intellectual analysis and the intuitive musical analysis, which is in some ways a very creative thing.

Trevor Pinnock (Baumgartner, 2002, p. 13):
I know that on the concert platform, in the moment of performance, one must be inside the music, and so one cannot be thinking whether the performance practice is right or wrong; whatever one is doing must have conviction, and it would be better to do the wrong thing with conviction than to do the so-called right thing and not understand it. As a performer, when one learns something new – for example, about ornamentation or historical style – one must assimilate it, because in performance it must be innate and emerge in the moment.

Secondly, intuition can be the deciding factor in making musical choices. Both Pinnock (Baumgartner, 2002, p. 13) and Harnoncourt (Clark, 2000, p. 6) have raised the issue of choosing between 'wrong' and 'right.' In conversation with Bernard Sherman (1997, p. 357), conductor Roger Norrington speaks of choosing the intuitively 'right' over the historically 'right':

Sherman: The extreme case, though, might be whether you would flat-out contradict the historical evidence, if it didn't feel as artistically right to you as doing something anachronistic?
Norrington: I guess the right answer is "Yes." I have to believe in what I'm doing, and believe it at an instinctive level. But as I said before, I try to train the instincts so that they will create gestures entirely in keeping with the mode of a particular epoch, while keeping an eye out for the unique and the extraordinary in a particular piece.

A third issue is the idea that intuition can be informed. In the statement above, Norrington suggests that intuition changes over time and can become informed, which is a theme common to several performers. For example, in conversation with Andrew Ford (2002), violinist and conductor Andrew Manze refers to intuition in relation to good taste:

Ford: How do you know what is in good taste?
Manze: Ah. I don't. I have to guess. I mean there are books you can read but they never tell you really what you want to know. The best way would be to meet the composer and ask them or hear a recording of Vivaldi or someone. So actually what I try to do is to educate my instincts by reading these things and playing the music a lot and then just follow my instinct in concert, just to see where it leads me really.

In addition, violinist Elizabeth Wallfisch (2005, p. 29) has discussed the importance of trusting one's instincts, "even more so when they become informed" and John Eliot Gardiner (Sherman, 1997, p. 374) has similarly described a balanced approach in which "the whole challenge consists in precisely this: finding the perfect meeting-point of heart and mind, instinct and knowledge. But we should beware of instinct as a bottleable commodity. It changes with habit, usage, and redefinition of stylistic parameters."

A more comprehensive snapshot of recent attitudes was captured in a survey study of 227 professional early music performers (Ornoy, 2008). This study found that only a minority of performers (18.9%) supported the "positivistic" viewpoint that considers performers to be of secondary importance to the composer. On the other hand 42.3% of performers supported the subjective and individual transmission of personal messages, while taking into consideration the composers' intended, original messages, a view which "reflects a wide spectrum of attitudes legitimising performers' individual intuition, taste or aesthetic style" (Ornoy, 2008, pp. 14-15).

The study described in the next chapter aims to provide additional insights into performers' attitudes, but also attempts to collect data describing how these attitudes influence specific musical decisions. The writings reviewed in this chapter hint at the role of various concepts and processes, but only do so loosely and without detailed examples. To understand which areas of a historically informed performance are left to intuitive or deliberate processes, it is necessary to collect in-depth empirical data explaining how various decisions are made. For example, in Berkowitz's (2010, p. 85) study of cognition and creativity in musical improvisation, renowned period keyboard player Malcolm Bilson outlined a "conscious and explicit formulation" of the design of a Mozart cadenza, but invoked intuitive processes in describing what he plays in the cadenza:

> Bilson: I don't know, I just sat down and started playing and said, "I like this, I don't like that…"
> Berkowitz: …so for you it wasn't so much an active process of studying and saying, "Okay, now nine out of ten times…"
> Bilson: Absolutely not. Absolutely not.
> Berkowitz: …you just lived with the music long enough that when you started doing it…

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Bilson: It's intuitive, period. That is to say I've never thought it through.

In this example, the structural components of a passage were formulated deliberately with intuitive experimentation ("I like this, I don't like that") guiding the actual musical content. The study described in the next chapter will discuss similar examples to clarify the role of intuitive and deliberate processes in period instrument performance of Baroque music.

Chapter Three

Performers' perspectives on musical decision-making

1. Aims

In 1988, Nicholas Kenyon ended his introduction to the influential volume *Authenticity and Early Music* by quoting Philip Brett and suggesting a milestone through which to measure the progress of the historical performance movement: "When a strong intuitive feeling for the music can again be reflected 'without self-consciousness, then the early music movement will have achieved maturity, and authenticity will no longer be an issue'" (Kenyon, 1988, p. 18). Over twenty years after this statement, to what extent do current historically informed performers acknowledge the role of intuitive decision-making?

This chapter expands on existing writings by performers to explore in more detail how period instrument musicians explain their processes of musical decision-making. A series of semi-structured interviews was conducted with leading period instrument string players, focusing on the musical decision-making processes involved in preparing and performing solo works by J.S. Bach. The interviews explored the key musical decisions these performers had made about a piece, the influences on their interpretation, and how their musical decisions were reached. This chapter aims to discover the extent to which performers claim to make intuitive or deliberate decisions when interpreting this music.

Hypotheses

Based on the literature outlined in the previous chapter, the assumption of the study was that performers in general favour intuitive processes, but historically informed performers may claim to construct their interpretations in a more deliberate manner. On the other hand, in light of the changes within HIP over the course of the twentieth century and the range of possible approaches to the performance of the solo works of

J.S. Bach, considerable variation was anticipated between the musical decision-making processes described by participants in the study.

2. Method

Participants

The eighteen participants listed in Table 3.2.1 were selected on the basis of their experience in period instrument string playing. Criterion sampling was used to target expert musicians specialising in historically informed performance. Each performer interviewed has over ten years of study and performance experience and makes a living principally from performing. A variety of nationalities and ages were involved in the study and where possible, an emphasis was placed on selecting performers who had recorded the solo string works of J.S. Bach or had taught extensively. Performers with experience in recording or teaching these pieces would presumably have quite clear ideas about interpretation. A focus on violinists and cellists provided common ground between this study and data collected in the studies discussed in Parts 2 and 3 of the thesis.

The first two performers in Table 3.2.1 took part in pilot interviews, but will be discussed as part of the data set as no significant changes were made to the interview procedure following the pilots. It should be noted that McDonald chose to discuss a solo work by Bach while Evans discussed a soprano aria with a prominent violin line: *Ich bin vergnügt in meinem Leiden* from Cantata BWV58. Following these pilot interviews, participants were asked to choose solo works as they were deemed the simplest to talk about. As Goodman (2002) has discussed, the musical and social skills involved in ensemble performance such as anticipation and reaction, can make the processes of musical decision-making more complicated in comparison to solo performance.

Table 3.2.1: Interviewees

Born	Interviewee	Instrument	Piece	Interview date
1967	Anna McDonald	Violin	BWV1004 Allemande	9 Dec 2008
1968	Alice Evans	Violin	BWV58	16 Jan 2009

Born	Interviewee (cont.)	Instrument	Piece	Interview date
1949	Susie Napper	Cello	BWV1011 Prelude	15 Apr 2009
1960	Pavlo Beznosiuk*	Violin	BWV1005 Fugue	8 Aug 2009
1948	Susan Sheppard*	Cello	BWV1009 Prelude	11 Aug 2009
1972	Alison McGillivray	Cello	BWV1009 Allemande	13 Aug 2009
1946	Lucy van Dael*	Violin	BWV1001 Adagio	17 Aug 2009
1964	Job ter Haar	Cello	BWV1008 Prelude	26 Aug 2009
1974	Lidewij van der Voort	Violin	BWV1004 Chaconne	26 Aug 2009
1960	Margaret Faultless	Violin	BWV1001 Adagio	9 Sept 2009
1968	Jennifer Morsches	Cello	BWV1010 Prelude	9 Sept 2009
1955	Sebastian Comberti	Cello	BWV1008 Prelude	10 Sept 2009
1958	Christophe Coin	Cello	BWV1009	12 Sept 2009
-	Hélène Schmitt*	Violin	Various	13 Sept 2009
1955	Enrico Gatti	Violin	BWV1001 Adagio	19 Sept 2009
1948	John Holloway*	Violin	BWV1006 Loure	26 Sept 2009
1957	Hidemi Suzuki*	Cello	Various	4 Nov 2009
1966	Ingrid Matthews*	Violin	BWV1004 Allemande	25 Aug 2010

* Has released a recording of the complete solo works by J.S. Bach for their instrument (prior to 2012)

Participants were recruited by email and told that they were participating in a study about the interpretation of the solo string works by J.S. Bach. All participants were given informed consent forms to sign and agreed to use of quotations with the author identified in text. All participants viewed a draft of the study and were offered the opportunity to verify, edit, or expand the quotations used. This resulted in minor editing to a small number of quotations for reasons of clarity or fluency.

Materials

Prior to the interview, violinists were asked to choose a movement from the Sonatas and Partitas for Solo Violin BWV1001-1006, while cellists were asked to choose a movement from the Suites for Solo Cello BWV1007-1012. Written in the early 1720s, these technically challenging sets of pieces by J.S. Bach "demonstrate Bach's command of performing techniques but also his ability to bring into play, without even an accompanying bass part, dense counterpoint and refined harmony with distinctive and well-articulated rhythmic designs" (Wolff, 2001, p. 232). A movement from these pieces was used as the subject of the interview because musicians often have "strong feelings" about the interpretation of Bach's music (Kerman, 1985, p. 203) and a given movement provided focus for a discussion of musical decision-making. In addition,

the absence of text or overt meaning in the music invites a multitude of possibilities for interpreting the score.

The interviews were recorded with a Canon XHA1 High Definition video camera, RODE Stereo VideoMic, and a Zoom H4 digital recorder for audio backup.

<u>Procedure</u>

Using a semi-structured approach, the interview questions were designed to elicit reflection on the interpretative choices involved in performing the piece (see Kvale, 2007; Kvale & Brinkmann, 2009). Direct questions about intuitive or deliberate processes of decision-making were not included in order to avoid creating a demand characteristic, defined by Orne (1962) as "the totality of cues which convey an experiment hypothesis to the subject" (p. 779). These cues can influence the participant's perception of what is expected of them and may affect their behaviour within that setting. Therefore any direct questions about intuitive or deliberate processes were only asked if the participant raised the subject first. Furthermore, these questions were open-ended and designed to clarify or encourage further explanation rather than being directive.

Each interview began with a hypothetical masterclass scenario and included a variety of follow-up "why" questions and prompts. The masterclass scenario was designed to gather responses regarding the main priorities and challenges involved in the interpretation of the interviewee's chosen movement. The interview guide is reproduced below, consisting of an opening question and prompts followed by a series of more general questions:

- Imagine that you are giving a masterclass and this piece has just been played by an advanced student. How would you teach the interpretation of this piece? What are the priorities/challenges, key moments/decisions in the piece?
  Follow-up questions, for example: What tells you it is important? How do you know? Why do you have that sense? Why do you think so? What makes you think so? How do you decide? Could this be interpreted any other way? How did you form these options? Why do you prefer this way? What would make you decide

either way? Why/how did you decide to approach Bach like this? Can you think of any examples? What makes you like an interpretation? Why would that be?

- How do you make musical decisions when preparing a Baroque piece for performance?
- What do you do to develop your musical interpretation?
- What influences your musical decisions when preparing and performing Baroque repertoire?
- Are there any particular experiences that have influenced your conception of this music? Are there specific moments from the past that you would consider to be turning points in your relationship with Bach's music?
- What are the challenges of interpreting and performing Bach, and how are these challenges similar or different to other music of the same period?
- Broadly speaking, when performing Baroque repertoire, what are the principal goals that you aim to achieve?
- Are there any other points or issues you would like to raise?

Data analysis procedure

The interviews were transcribed in full and then analysed following the principles of Interpretative Phenomenological Analysis (IPA), conducted within the qualitative data analysis software program Atlas.ti (Version 6). The initial reading and re-reading of the full transcripts within Atlas.ti involved the underlining of significant words or phrases using the text editor tool and notes were made about portions of the text using the memo function. Emerging themes were then identified and labelled using the open coding function. This was done in two steps:

1. Coding of specific musical decisions by a) performance features (articulation, bowing etc.) and b) category of musical decision-making. The category of musical decision-making assigned to the decision was based on the language used within the quotation. This approach resulted in three categories of musical decision-making:
    i. Intuitive: Decisions that were based on a feeling, sense, or preference and were not explained further.

      ii.   Deliberate: Decisions that were explained by a reason. For example, "I look for," "I'm aware of," "I notice," "it should be," "I read," or "he/she said."

      iii.   Deliberate HIP: Deliberate decisions that were explained with reference to specific knowledge of historical performance practices. For example, "according to (treatise author)" or "in my experience of HIP…"

2. Coding of more general discussion resulted in a list of themes. The themes were anything that was not an actual musical decision and were generally more conceptual in nature. The themes related to two areas:

      i.   Influences on musical decision-making

      ii.   Processes of musical decision-making

The list of themes regarding influences and processes was then analysed to create super-ordinate themes (higher level codes). This was done through a process of abstraction that involved identifying patterns between themes and developing names for each cluster (Smith et al., 2009, p. 96).

As an example of this procedure, Figure 3.2.1 shows how a quotation by McDonald was coded as an intuitive musical decision regarding the musical character of the Allemande from Partita No. 2. The performance feature and category have been coded as 'Character I' (I for intuitive) and the importance of reacting to the harmony has been coded as a theme (influence on musical decision-making). Later in the quotation, discussion of the Baroque bow and instrument has also been coded as a theme.

Figure 3.2.1: Atlas.ti screenshot of McDonald interview
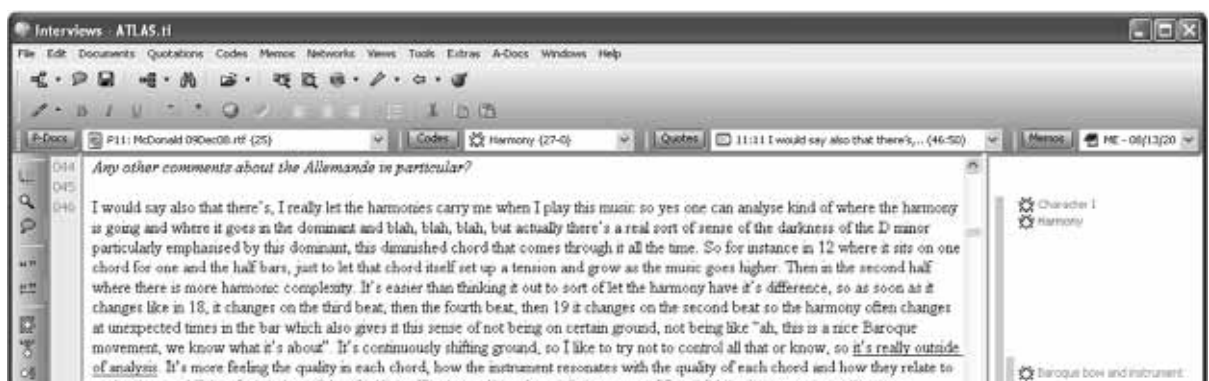
If a single quotation contained more than one decision (e.g., discussed changes to several performance features) it was coded multiple times. Therefore, the total number of musical decisions includes decisions that relate to the same passage of music (see quotations discussed under decision-making categories in Section 3 for examples).

The clustering of musical decisions and themes was achieved using the code manager and families functions in Atlas.ti. While the procedure described above seems quite systematic, these categories emerged during the analysis process and were not predetermined. The final codes were discussed and confirmed in consultation with the supervisory team to ensure that the quotations were accurately coded. The members of the supervisory team brought both musicological and psychological perspectives to this task.

The results are discussed in two parts: Section 3 focuses on the data coded as specific musical decisions, whereas Section 4 deals with the data coded by themes related to decision-making. These sections employ a mixed method approach to analyse the results, using both quantitative and qualitative techniques.

3. Results and discussion A: Musical decisions

This section will discuss specific musical decisions raised by the interviewees that relate to their interpretation of the solo string works of J.S. Bach. In total, 166 musical decisions were identified and categorised as intuitive, deliberate, or deliberate HIP. Overall results will be reported first in this section, followed by examples from each category of decision-making discussed in relation to the specific musical context.

Overall results

Categories

The study found a large proportion of deliberate decision-making overall, with 66 decisions classed as intuitive, 81 as deliberate, and 19 as deliberate HIP. Therefore, 40% ($N = 66$) of musical decisions raised in the interviews were made intuitively, with

the remaining 60% ($N = 100$) representing a more deliberate, reflective process of decision-making (deliberate and deliberate HIP combined).

Performance features

Table 3.3.1 shows the number of musical decisions according to performance features such as articulation and bowing, and further categorised as examples of intuitive, deliberate, or deliberate HIP decision-making.

Table 3.3.1: Musical decisions categorised by performance feature

Performance features	Intuitive	Deliberate	Deliberate HIP	Total
Articulation	7	13	2	22
Bowing	8	12	4	24
Character	14	9	1	24
Chord playing	4	6	5	15
Dynamics	5	6	0	11
Fingering	4	3	0	7
Notes	0	3	0	3
Ornamentation	2	1	0	3
Phrasing	5	9	0	14
Rhythm	5	8	3	16
Tempo	5	8	2	15
Tone colour	7	3	2	12
Total	66	81	19	

The performance features listed above incorporate the major elements of musical interpretation that were raised in the interviews. These ranged from technical matters such as fingering to more abstract concepts of character and tone colour. The category of chord playing covers decisions regarding how double, triple, or quadruple stops were played. This was usually a decision about which notes to emphasise within an arpeggiated chord. The category of rhythm reflects timing decisions that would be heard as rhythmic alterations from the score while tempo relates to decisions about overall tempo within a piece. The category of notes refers to decisions about the actual pitch to be played. For example, both Van Dael and Faultless commented on the apparent oversight of a missing E flat in the autograph score of the Adagio of Sonata No. 1. The note is found in the bottom voice of a three-note chord (see Figure 3.3.1, beat 3). As Neumann (1994) has noted, "the written E should almost certainly be an E

flat and is normally so interpreted" (p. 20). While that may be the case, several prominent Baroque violinists such as John Holloway, Pavlo Beznosiuk and Monica Huggett have recorded the work with the E as written (see Discography).

Figure 3.3.1: Adagio from Sonata No. 1 in G minor, bar 3, beats 2-4

The highest number of musical decisions related to articulation, bowing, and character. Articulation referred to discussions of which notes should be stressed, how to shape notes through the use of bow speed and weight, and descriptions of how notes should begin, develop, and end. Quotations categorised as bowing were those that made reference to notes or groups of notes being on a down or up-bow. Therefore, decisions about slurs were categorised as bowing decisions rather than articulation. While a slur may carry information about how to articulate or phrase notes depending on the musical context, the principal meaning of a slur in string music is "to show that all the notes comprehended within it must be drawn with one bow" (Prelleur, 1731, p. 7). The category of character covered decisions about the musical character of a piece. This was usually communicated through a descriptive term like "painful" or "serious" to explain the overall character of a movement or changes of character or mood within pieces.

In Figure 3.3.2, the twelve performance features have been graphed to highlight the differences between the number of decisions in each category.

Figure 3.3.2: Musical decisions categorised by performance feature
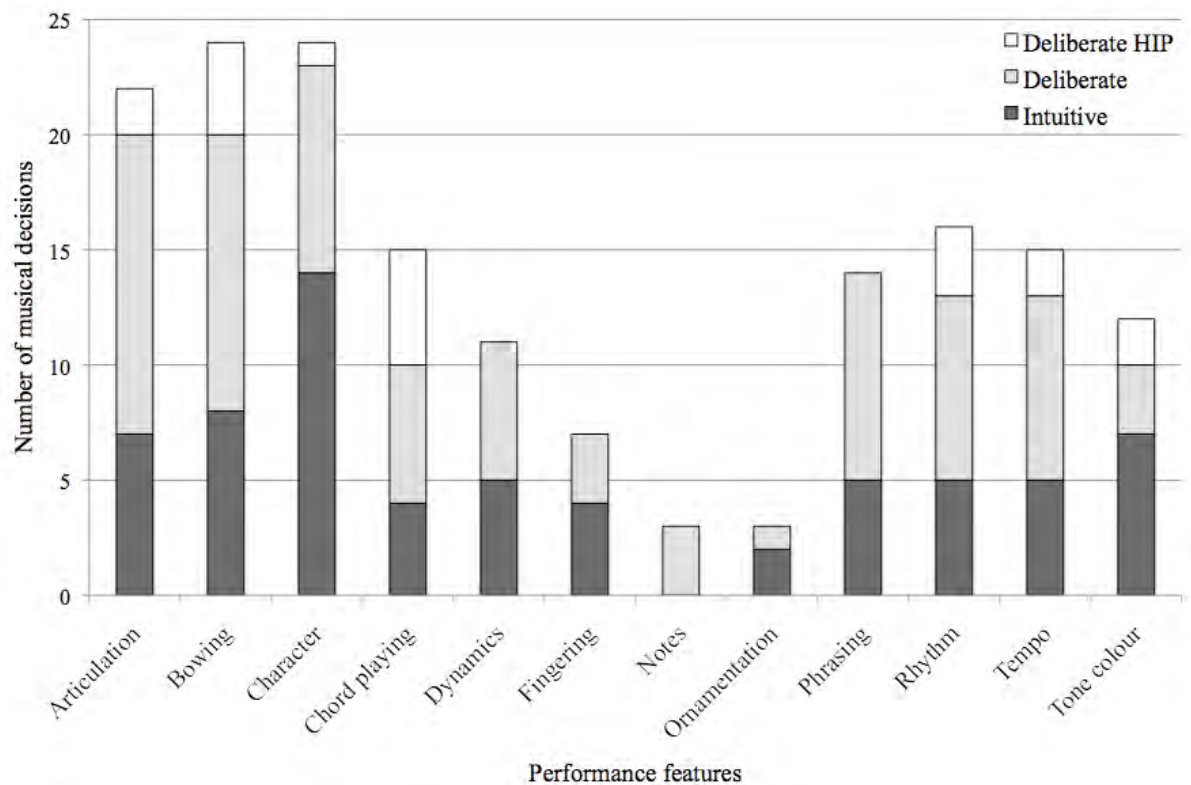
Figure 3.3.2 shows that most performance features were made using a deliberate process of decision-making. Twelve tests were carried out using Chi-square analysis with Bonferroni correction for multiple comparisons to determine if the difference between intuitive and deliberate decisions within each performance feature was significant. No significant difference was found between the number of deliberate (including deliberate HIP) and intuitive decisions in any performance feature (lowest p = .92 for notes category). Deliberate HIP decisions were made primarily in the areas of bowing and chord playing.

While decisions about most performance features were made deliberately, intuitive decision-making was used in over half of all decisions regarding character, fingering, ornamentation, and tone colour. The use of intuitive processes to make decisions about these issues could be because features like tone colour and ornamentation are less likely to be fixed and can vary between performances and performers. In addition, issues like character and fingering may be more difficult to explain through specific reasons and were therefore discussed using terms that imply intuitive processes.

The high number of decisions regarding the closely related areas of articulation and bowing suggests that performers manipulate these features, whether consciously or not, to deliver a stylistically appropriate and expressive performance. Based on extensive analysis of mid- to late-twentieth century recordings of works by J.S. Bach, Fabian (2003) proposed that "articulation should be regarded as the overarching principle in determining the style of a performance" because "versions in which a more clearly punctuated articulation can be observed sound more consistently different than if any of the other elements of performance practice is used as the overriding criterion" (p. 245). In addition, the related issue of whether phrasing is continuous or articulated has been found to be important in how listeners distinguish between recordings that are more stylish or less stylish by current HIP standards (Fabian & Schubert, 2009).

The prioritisation of articulation and bowing found in this study confirms the importance of these features in communicating a style of HIP that has been labelled "Baroque-expressive" (Fabian & Schubert, 2009, p. 40) or "Eloquent" (Haynes, 2007, p. 14). Developed by European Continental musicians such as Leonhardt, Brüggen, and Harnoncourt in the mid-1960s, this style has become the dominant HIP aesthetic since the mid-1990s. The Eloquent style has been described as playing in an "impassioned oratorical manner" and aiming for rhetorical or gestural phrasing: "phrasing based on gestures and figures rather than on the overarching long-line" (Haynes, 2007, p. 14). A quotation from Matthews about the Allemande from Partita No. 2 exemplifies the aims of rhetorical performance and the idea of 'music as speech':

> Almost always, when people play for me I find myself wanting to hear more punctuation. I think about that a lot when I'm working on a piece. In reading, there's always punctuation everywhere and we don't even think about it. We don't say to ourselves, "oh, look at that comma; there's a period; there's a colon," and yet punctuation is so powerful. It gives text its meaning. A piece like this Allemande, to me, is a prime example of why this is important in music too: if you were to play it without what I think of as punctuation, you would come out with a very strange and rambly piece. But when the notes are grouped by harmony (into words and sentences and phrases), and those groupings set apart (sometimes by an almost imperceptible comma, sometimes by a semi-colon, or a colon, maybe a period or a question mark), then it makes sense. It has meaning. It isn't just like language, it IS language.

In contrast to articulation, bowing, and character, decisions about ornamentation, fingering, and dynamics for example seemed to be less of a priority. In the case of ornamentation, several performers discussed their reluctance to ornament much in solo Bach by referring to pieces that are more sparsely notated such as the Violin Sonatas by Corelli (Op. 5). For McGillivray, Bach's music doesn't invite or require additional ornamentation by the performer:

> I don't find I can add any ornaments to Bach. Very rarely a few creep in but there's plenty there already. I don't think there's better than what he's got so I don't tend to do any of that.

The comparison across performance features demonstrates the relative importance of various issues and tendencies as to whether a particular decision-making process is favoured overall. While some general trends emerged, the degree of individual difference is unclear and requires analysis comparing the data from each interviewee.

Performers

By comparing intuitive and deliberate decision-making in each interview, the proportion of each type of decision can be compared across interviewees. In Figure 3.3.3, the categories of deliberate and deliberate HIP have been combined and converted to a percentage to show the overall proportion between intuitive and deliberate decision-making for each performer (performers intentionally not identified). One performer was omitted from this analysis as they chose to speak in general terms and did not make reference to any specific musical decisions.

Figure 3.3.3: Percentage of intuitive versus deliberate decisions per performer
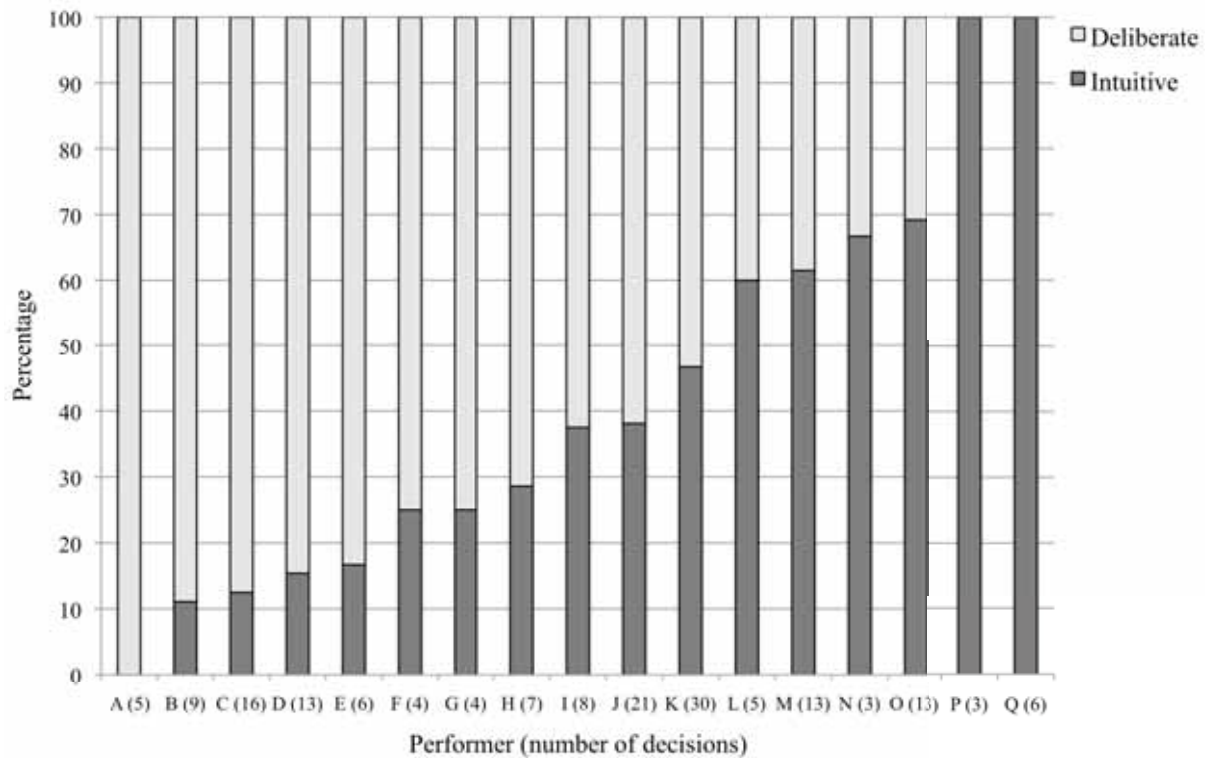
Figure 3.3.3 demonstrates a variety of decision-making approaches, ranging from an apparent complete reliance on deliberate decision-making to discussing only the use of intuitive processes. The performer representing the median (37.5% intuitive, 62.5% deliberate) is close to the result for the overall percentage (40% intuitive, 60% deliberate). Such a graph may be misleading however, due to the variation in the number of decisions mentioned by each of the interviewees. This ranged from between 3 to 30, with an average of only 9 decisions per interviewee. In Figure 3.3.4, only interviewees who discussed more than the average number of decisions have been included. In each case, these performers explained 13 or more specific decisions.

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Figure 3.3.4: Percentage of intuitive versus deliberate decisions per performer (interviews with 13 or more decisions)
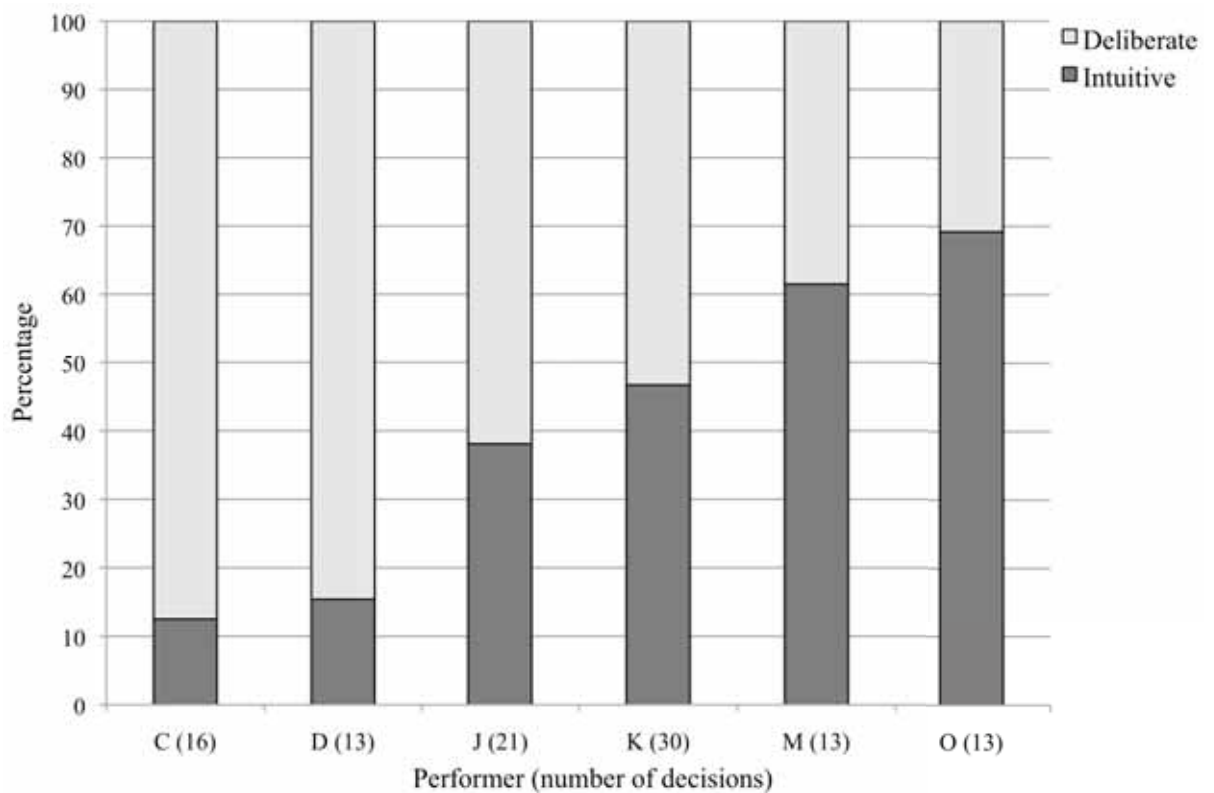
By excluding performers who gave only a few examples of decision-making, Figure 3.3.4 may be a more accurate reflection of the performer's way of working and like Figure 3.3.3, shows a variety of approaches between performers. Chi-square analysis of the actual decision count (6 tests with Bonferroni correction) indicated that Performer C made significantly more deliberate decisions than intuitive decisions, X^2 $(1, N = 16) = 9, p = .02$. It is interesting to note that the performer with the most intuitive approach still has a deliberate percentage of 30.8, perhaps demonstrating that these elite performers may have a maximum or minimum figure for the use of intuitive decision-making. In other words, musicians may have to deliberately work out a certain number of decisions in advance to feel comfortable in performance.

The reasons for a performer talking about certain decisions in a way that implies either deliberate or intuitive decision-making can be many and varied. Various suggestions will be offered throughout this chapter, but one that relates to Figure 3.3.4 is the age of the performer. The first three performers starting from the left of Figure 3.3.4

(Performers C, D, and J) were born in the late 1940s to mid 50s, whereas the next three performers (Performers K, M, and O) were born in the 1960s. Although the sample size of performers and number of decisions analysed is small, this result may have implications for the history of HIP more generally.

Changing attitudes within HIP were addressed in the interview with cellist Susan Sheppard:

> I'm beginning to wonder now if there is actually a movement towards thinking that the rules don't matter. You may discern that some people who know the rules have decided that they are going to discard the rules. Not totally, but they want to get back to this idea of music being an expression of oneself, of personal expression rather than an expression of the composer although they wouldn't put it like that because it sounds very hubristic. They want to get more of the personal into it whereas I'm not interested in the personal. I hope I sound as though I have a character that I am putting across in some way but that is not what I'm trying to do. I am not thinking "how can I make this sound like Sue?" I am not doing that at all. I'm trying to make it sound as good as I can in a way that I hope that Bach would have at least recognised as being something he was aiming at. There was a very authentic movement where you had to do everything absolutely according to the rules and then people started breaking away from that and feeling a bit more comfortable with it. It's also to do with the instruments one plays on. There was a very hardline time when you had to play on an absolutely perfectly authentically set-up instrument.

The changes in historically informed performance raised by Sheppard have been noted in the literature since the 1990s. For example, in 1993 Dulak described what might be termed a "postmodern performance practice" (p. 61), characterised by changes in both the rhetoric and sound of HIP:

> The rhetoric of "authenticity," as found in concert and record promotions, has declined dramatically both in force and frequency since its heyday several years ago… The artistic pronouncements of early-instrument performers now routinely invoke such values as imagination, communication, and "phantasy"… The past several years have seen the emergence of a distinctly luxuriant, even voluptuary, attitude toward the sound-worlds of early music (pp. 36-38).

For Butt (1999), "If postmodernism means a more liberated attitude toward historical evidence, a less guilty (and more conscious inclination) to follow one's own intuitions, then there are certainly more postmodern performers around than there were ten years ago (p. 194).

Having presented the overall results in a primarily quantitative manner, this section will explore the musical decision-making process in greater depth by giving examples of each category of decision-making.

Intuitive decisions

Decisions categorised as intuitive were those raised by the performer that were not explained in a reflective or analytical manner. These were usually decisions that "felt right" or were liked or preferred for no specific reason. If deeper reflection was offered to explain the basis of a feeling, the decision was coded as deliberate. In the following quotation, Matthews discusses the second half of the Allemande from Partita No. 2, explaining various aspects of her interpretation while demonstrating on the violin. The letters on the left are references that correspond with places in Figure 3.3.5.

A	So I feel that's a really important place to have a comma [plays bar 18 with a comma after the first beat]	Phrasing
B	and that E flat [second beat of bar 19] I feel it needs to be played in such a way that it rings through for a long time because all this material that follows for the next three beats, or two beats at least, is still coming out of that E flat [plays bars 19-21].	Articulation
C	Here [third beat of bar 21], again the E flat needs to be played strongly, and then this stuff [melodic figures] actually shouldn't interfere because what I really want to hear is [plays bars 21-23 emphasising E flat, D and G].	Articulation
D	Then here's a place to take time [plays bar 23 with a comma after the first note].	Phrasing
E	The harmony to me suggests something else… it's hard to even find words for this. It feels to me so emotionally real this [plays last two beats of bar 22-23]. We got something off our chest there.	Character
F	Then so much more innocent [plays from third beat of 23-24]. Circle of fifths,	Character
G	then a little darker [plays last three notes of bar 24 until end of third beat of bar 27]	Tone colour
H	and again I feel again that's the end of a thought. Although often you hear [plays last two beats of bar 27 without pausing], I don't feel that those two beats belong together at all. When I look at this whole passage, it strikes me that it's not a sequence with an entirely obvious destination, so it's harder to	Phrasing

define a reason for which bars should be more or less. I feel that each harmony has a particular quality to it, either more intense or less intense, more introvert or more bold, and I just want to reflect all those felt changes. As though it's leading us through dappled light or something, moving through a landscape, a cloud passes over the sun. I'm just trying to really show how I experience each of those harmonies qualitatively.

Figure 3.3.5: Allemande from Partita No. 2 in D minor, bars 17-32

The quotation by Matthews captures her struggle to put some of her choices into words and demonstrates a largely intuitive reliance on the feeling of certain harmonies. A strikingly similar approach to the same piece was articulated by McDonald:

> I really let the harmonies carry me when I play this music so yes one can analyse kind of where the harmony is going and where it goes in the dominant, but actually there's a real sort of sense of the darkness of the D minor… Then in the second half where there is more harmonic complexity, it's continuously shifting ground so I like to try not to control all that or know, so it's really outside of analysis. It's more feeling the quality in each chord, how the

instrument resonates with the quality of each chord and how they relate to each other, and if they feel dark or if they feel light. You know like where it lightens up at 23 and 24 the instrument actually starts resonating more because there are less sharps and flats so there's actually that light even just in the way the instrument resonates.

Like Matthews' characterisation of the moment labelled F in Figure 3.3.5 as "innocent," McDonald described this passage as a "light at the end of the tunnel" with the series of major chords bringing "more warmth." While the actual harmonic changes were usually not made explicit, these performers were able to intuitively follow and react to moments of more or less tension and increasing or decreasing remoteness from the tonic. Their responses to these feelings were manifested through decisions regarding numerous features such as phrasing, articulation, character, and tone colour.

Somewhat surprisingly, further similarities can be drawn by comparing Matthews' comments with suggestions for performing this piece by Joseph Szigeti. In *Szigeti on the violin* (1969/1979, pp. 98-100), the violinist marks a luftpause (breath mark) in only three places in the second half of the Allemande. These moments correspond exactly with Matthews' suggestions (see A, D and H in Figure 3.3.5), and Szigeti marks a tenuto on the E flat in bar 19 (see B in Figure 3.3.5), where Matthews suggests the note "needs to be played in such a way that it rings through." The fact that similarities can be found between players, including across the mainstream/HIP divide, suggests that certain decisions are 'obvious' or 'natural' to experienced performers. It is perhaps the case that it is mainly these decisions that are the result of intuitive rather than deliberate decision-making.

Intuitive decisions were often moments that had not been thought through and the process of talking about their interpretation would prompt the performer to realise the absence of a fixed decision. For example, Van der Voort talked about not knowing how she bowed a particular rhythmic figure in two bars from the Chaconne of Partita No. 2 (see Figure 3.3.6):

> It's about the slurring of this [plays bar 9 slurring the second beat]. I think I keep changing that. How do I do it here? [plays bar 8 as written and then slurring the second beat] Yeah, I don't even know what I do anymore [plays bar 8 as written and then slurring the second beat]. I don't know.

How would you decide if you had to play it now?

Well, I did it automatically without a slur when I played it through but did I do it because I always did it? [plays bar 8 slurring the second beat] I would do it with [the slur] now. When I think about it especially now when I played it milder here [plays bar 9 slurring the second beat]. That would be a reason to slur it, and the bar before? [plays bar 8 as written]. Maybe because it's a bit stronger I would not slur it [plays bar 8 slurring the second beat] but in the end it doesn't matter at all, does it? Something to say for both. I didn't write anything in.

Figure 3.3.6: Chaconne from Partita No. 2 in D minor, bars 8-9

This quotation shows a process of experimentation with bowing where the performer seems to be thinking aloud. The decision was categorised as intuitive since Van der Voort was unable to recall how she bowed the passage, but a process of deliberation was activated by the question posed to her. She then offered a reason for one bar to include a slur and the other bar to be separate. By the end of her reflection, the bowing still seemed unresolved and her final comment implied that she wouldn't fix this decision, letting it remain intuitive.

This example of intuitive decision-making reflects Van der Voort's overall approach, which can be summarised in the following quotation:

When you think too much about decisions you can go crazy. You don't want to think about music, you just want to play well. That's my way of doing it, you know? When it feels good it's okay.

In addition, the fact that this decision was only raised to her conscious attention during the interview implies that she makes many more decisions in an intuitive way than just those discussed during the interview. According to Van der Voort, "There are about a million ingredients that make a performance and you can't think or feel about it all. You don't even know how many decisions you make do you? I don't think so."

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The idea that in the end the decision about bowing discussed above "doesn't matter at all" may be a sign that some performers do not feel the need to justify their musical decisions. Whether a decision is made intuitively or deliberately, performers have an idea of what needs to be communicated in performance and individual decisions are made with that in mind. For example, Suzuki discussed slurring in the Prelude of Suite No. 2, but stressed the importance of bringing out the harmonic tension and release in the phrase regardless of bowing:

> What I think often about this Suite is that everybody minds too much about the slurs as if the decision of the slur is the goal, but the language of Bach or the music of that period is made both with or without slurs. It is true that there are so many places in the Anna Magdalena slurs where the writing is unclear and then you are puzzled, like the beginning of the second Suite. If in the second bar, the first four notes are a four-note slur or one then three it does not make a big difference musically. Of course C sharp is an important note and if you think the bottom D starts from the first bar until the beginning of the fourth bar as a pedal then this C sharp and also bar 3 the E is a dissonance. So you have to emphasise it and you can do it within one slur, and you can also emphasise it a little more by breaking it to one and three, but it is more important that you hear or you feel this dissonance and this diminished seventh going up to E and resolving in bar 4. The construction is the first thing and the most important thing to let the audience understand.

Figure 3.3.7 is from Anna Magdalena Bach's copy of the Prelude with the unclear slur marking appearing above the first beat of bar 2. In his book *Bach, the fencing master* (1998), cellist Anner Bylsma reads this marking as indicating one separate and three slurred notes (p. 48, also see p. 182).

Figure 3.3.7: Prelude from Suite No. 2 in D minor, bars 1-4

Decisions categorised as deliberate demonstrated a degree of planning or reasoning, usually based on an underlying concern for communicating the harmonic movement or structural elements of the piece. In the following example, Sheppard discusses harmony as the reason for a decision about tempo in the Prelude from Suite No. 3 (see Figure 3.3.8):

> Then he's on to E [in bar 15] and he's got a new idea so those two bars [13-14] I would not do any particular rubato or anything but I would, when I got on to the E I would do very, very small rubato. Just a tiny bit longer note so I make a point of that.

Figure 3.3.8: Prelude from Suite No. 3 in C major, bars 12-15

Sheppard's decision regarding rhythm (timing) in this passage is likely to affect other elements such as phrasing, articulation, and tempo. From this example it is clear that while decisions were categorised as primarily about a particular performance feature, often the decision actually involved a subtle interplay between a combination of musical elements.

Another example of a deliberate decision is Coin's discussion of tempo in two Courante movements. Coin suggested thinking of the Courante from Suite No. 2 as a Double (variation), which could be rewritten in a version where the main rhythmic value is running quavers instead of semiquavers (see Figure 3.3.9).

Figure 3.3.9: Courante from Suite No. 3 in C major, bars 1-3, 'Double' and proposed 'Simple'

Conversely, he noted the brief use of semiquavers in bars 8 and 56 of the Courante from Suite No. 3 and proposed that an alternative version could be played in which the movement consists of mostly semiquavers instead of quavers (see Figures 3.3.10 and 3.3.11).

Figure 3.3.10: Courante from Suite No. 3 in C major, bars 8-9, 'Simple' and proposed 'Double'

Figure 3.3.11: Courante from Suite No. 3 in C major, bars 56-57, 'Simple' and proposed 'Double'

His analysis of these movements naturally led to a perspective on tempo:

> It is logical for me to play this Courante [Suite No. 3] in a tempo where you could possibly play a Double. It is important harmonically but also rhythmically to examine very carefully each piece because in each piece

sometimes Bach gives you a key, gives you a little trick. Then you can understand a little more.

The decision discussed above refers to knowledge of Simple and Double forms, which leads to some ambiguity about whether such a decision should be coded as deliberate HIP. It was decided to code the decision as deliberate since the basis of the decision was general in nature and not connected to a specific rule or convention of historical performance practice. This decision demonstrates the level of subjective interpretation in the coding process, although the examples given in the next section should make the differences between deliberate and deliberate HIP decisions more clear.

Deliberate HIP decisions

Decisions categorised as deliberate HIP can be considered a subset of deliberate decisions. These decisions were cases where the performer made reference to specific historical performance practices and based their decision on this information. For example, Holloway discussed the application of Georg Muffat's observations of Lully's performance style with regard to bowing. Muffat's *Florilegium Secundum* (1698/2001, pp. 33-41) contains a detailed explanation of various rules of French bowing and stresses the use of the down-bow on the first beat of the bar. Muffat writes, "when three notes in compound time comprise a complete beat-unit, and the first is dotted, it is generally played down-bow" (p. 38). Following these rules, Holloway explained how retaking a down-bow at every half bar affects both the articulation and character of the Loure from Partita No. 3. He noted that this is an example of "the rules having a radical effect on the interpretation," going on to state:

> That gives you a very strong character which isn't apparent from the printed page as it were. You have to know things to read the text as it is in my opinion intended to be read.

Stowell (2001, p. 126) has also applied Muffat's rules to this movement and suggests similar bowings to Holloway. Stowell however recommended playing the very first two notes of the Loure with a down-bow followed by an up-bow while Holloway suggests using an up-bow followed by a down-bow (see Figure 3.3.12). The fact that the same historical source led to slightly different solutions highlights the subjectivity involved in interpreting historical information. It also leads to a role for intuitive

processes, if after having consulted a source, the performer is faced with at least two choices as shown below.

Figure 3.3.12: Loure from Partita No. 3 in E major, bars 1-4

Holloway: ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐯ ᐱ ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐯ
Stowell: ᐱ ᐯ ᐱ ᐯ ᐱ ᐱ ᐯ ᐯ ᐱ ᐯ ᐱ ᐱ ᐯ ᐯ ᐱ ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐱ ᐱ ᐯ ᐯ

Holloway also discussed how to interpret the rhythm in bar 12 of the Loure, where the principle of overdotting the dotted notes in French Baroque dance music has interesting implications (see Figure 3.3.13). By playing the top and bottom lines of this bar separately he suggested that since the E in the bottom line should be overdotted, the D and E which are written together would not be played together. This example again shows the level of interpretation involved in issues of performance practice as it could be argued that the F sharp and E following the trill is part of an ornament and therefore rhythmically flexible.

Figure 3.3.13: Loure from Partita No. 3 in E major, bar 12

Other examples of deliberate HIP decisions were discussions regarding chord playing. Several performers contrasted violin technique to playing the lira da braccio which has a flat bridge, as well as referring to historical treatises by Galeazzi (1791-1796), Geminiani (1751/1995), Mattheson (1739), Quantz (1752/1966), and Rousseau (1768).

This section has discussed the specific musical decisions raised by the interviewees by noting overall results and providing examples of each category of decision-making. The variation across performance features and individual performers suggests that the decision-making process is influenced both by the issue at hand and the approach of each performer, while the examples demonstrate the complexities of various decisions by considering the options available to the performer within a specific musical context.

4. Results and discussion B: Themes

This section will discuss the data pertaining to broad issues of decision-making. These issues constituted the majority of coded quotations in the study ($N = 413$) and were grouped as either relating to influences on musical decision-making or processes of decision-making. These categories could be thought of as factors that lead to the specific decisions discussed in the previous section. During the interviews, some performers emphasised particular issues above others. For example, if the performer did not raise many specific decisions, they would often focus on their influences regarding Bach performance. The questions or prompts used during the interviews were usually to guide the interviewee towards discussion of processes or specific decisions.

Influences on musical decision-making

The category of influences on musical decision-making includes quotations about the types of issues that performers pay attention to when preparing or performing Bach solo string works. These range from studying the structure of a piece, finding a physical gesture that works for a passage, reacting to the acoustic of the venue, drawing on information from historical treatises, or recalling information learnt in lessons or previous collaborations. Most of the time the issues were discussed in a general sense and were therefore not necessarily linked to a specific performance feature or decision. Any musical examples given in this section therefore are not examples of musical decisions, but have implications for decision-making in a general sense.

The forty-one themes were grouped into seven super-ordinate themes: harmony, analysis, physical/technical, historical information, performance context, specific experiences, and repertoire and scores. In Table 3.4.1, the number of quotations has been included as this is one way of indicating the relative importance of themes. As Smith et al. (2009, p. 98) note however, frequency is not the only indicator of importance and an important theme may sometimes be evidenced only once.

Table 3.4.1: Influences on musical decision-making

Super-ordinate themes	Themes	Number of quotations
Harmony	Harmony	27
	Implied harmony	5
	Bass line	5
	Harmonic rhythm	3
Analysis	Structure	13
	Motif	9
	Polyphony	7
	Beat hierarchy	2
Physical/technical	Baroque bow and instrument	16
	Technical difficulty	3
	Intonation	2
	Physical gesture	2
	Convenience	1
Historical information	Performance prac lit (historical)	11
	Rhetoric	11
	Historical context	10
	Baroque dance	9
	National style	5
	Perf prac lit (contemporary)	4
	Affekt	4
	Pitch	3
	Inequality	3
	Temperament	2
	Baroque improvisation	1
Performance context	Acoustic	14
	Audience	11
	Mood	2
	Performance anxiety	2
	Preparation time	2
	Humidity (strings)	1
Specific experiences	Collaboration with other musicians	10
	Recordings by others	10
	Performances by others	9
	Lessons	7
	Masterclasses	4
	Collaboration with a dancer	4
	Performance tradition	1

Repertoire and scores	Other Baroque repertoire	17
	Scores and editions	12
	Other pieces by Bach	10
	Transcription by Bach	2

When graphed according to number of quotations, the category with the highest number is historical information (see Figure 3.4.1). This reflects the number of overall quotations in this category ($N = 63$), but as a super-ordinate theme it is made up of 11 separate themes (see Table 3.4.1). Figure 3.4.1 signifies individual themes by divisions within the columns of the graph. Within the category of historical information the most frequently cited influences were historical performance practice literature such as period treatises, the concept of rhetoric, the historical context, and knowledge of Baroque dances including the character and steps of various dances. Historical context includes knowledge about the social, religious, and cultural norms of the period as well as biographical information about Bach and other composers.

Figure 3.4.1: Number of quotations per super-ordinate theme
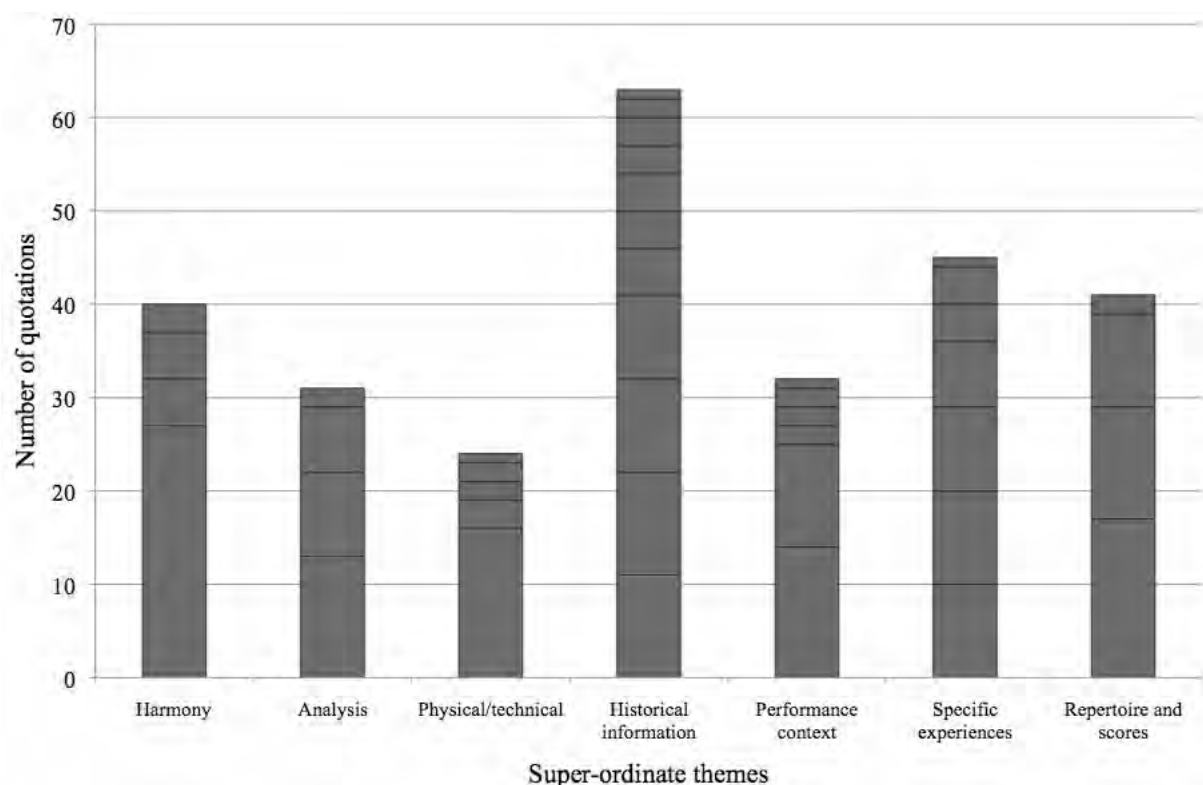
By ordering the individual themes by the number of quotations, the emphasis shifts from historical information to other important influences. The most influential single

themes were harmony, other Baroque repertoire, the Baroque bow and instrument, acoustic, and structure (see Table 3.4.2). Many of the themes relate to how performers learn and communicate their knowledge about style. For example, the interviewees compared pieces with other Baroque repertoire including other works by Bach, referred to historical treatises and different editions, drew on influential performance experiences, collaborations and recordings, and talked about being familiar with the possibilities afforded by the Baroque bow and instrument. They raised more piece-specific issues such as understanding the harmonic language and analysing structure, and discussed how they react to the acoustic and audience.

Table 3.4.2: Influences on musical decision-making by individual theme

Themes	N		Themes	N
Harmony	27		Perf prac lit (contemporary)	4
Other Baroque repertoire	17		Affekt	4
Baroque bow and instrument	16		Masterclasses	4
Acoustic	14		Collaboration with a dancer	4
Structure	13		Harmonic rhythm	3
Scores and editions	12		Technical difficulty	3
Performance prac lit (historical)	11		Pitch	3
Rhetoric	11		Inequality	3
Audience	11		Beat hierarchy	2
Historical context	10		Intonation	2
Collaboration with other musicians	10		Physical gesture	2
Recordings by others	10		Temperament	2
Other pieces by Bach	10		Mood	2
Motif	9		Performance anxiety	2
Baroque dance	9		Preparation time	2
Performances by others	9		Transcription by Bach	2
Polyphony	7		Convenience	1
Lessons	7		Baroque improvisation	1
Implied harmony	5		Humidity (strings)	1
Bass line	5		Performance tradition	1
National style	5			

Harmony

The principle influence on musical decision-making was harmony. Harmony was mentioned as either the harmonic progressions within a piece, the harmony implied in single line passages, the movement of the bass line, or the rate of harmonic movement (harmonic rhythm).

There seemed to be a broad consensus about the need to understand, react to, and communicate harmony. Evans raised this point during a discussion of musical instinct. She talked about the need to question her instincts, particularly in an ensemble context when another musician has a very different idea. She then went on to describe how many performers place similar importance on harmony:

> I find it's very interesting that people on a broad scale do seem to have similar reactions to the music. Maybe it's because I tend to play with musicians that I get on well with, but I find that there does seem to be a common thread with experienced Baroque players. It's amazing how unanimous is the idea of the music coming from the bass and the importance of understanding the chords.

Evans identified the bass line in particular as an important influence in her musical decision-making, suggesting that the bass line being doubled in Baroque repertoire made her also realise "in a subconscious way the importance of the bass line." In the following quotation, Evans talks about how her instinct is guided by what is happening in the bass. Her awareness of this influence means that she can either rely on her instinct or access information about the bass line in a more conscious way:

> Quite often I have an immediate instinct about the music; I feel it should be played a certain way. Then I ask myself why it should be that way and the answer I come up with is most often because of what's in the bass line. I started as a violinist who focussed mainly on the treble voice then realised that more and more of my choices were subconsciously coming from the bass. Now I start immediately from the bass line because I find it's a short cut!

While many performers talked about responding to the feeling of the harmony rather than analysing the harmonic progressions, harmony was discussed as an influence in both intuitive and deliberate decision-making. For Comberti, communicating the musical argument as it unfolds with a piece is about "consciously or otherwise feeling the journey of the keys."

The high number of quotations about harmony is likely due to its influence on a range of performance features. The following examples demonstrate how harmony influences different elements of an interpretation. These performers discuss the use of tools such as articulation, rubato, dynamics, and tone colour to emphasise harmonic changes:

Harmony influencing articulation and rubato (Morsches):
There's a physical sensation that I think goes with the harmonic movement. Specifically you can play with more weight, depth of sound for the more intense harmonies. You can really stress a jagged interval by not reaching the top too soon, for instance in the Prelude of the fourth Suite in E flat. The weight with which you play the first note already signals an aural sense of the physicality of the interval or harmony.

Harmony influencing dynamics (McGillivray):
I see dynamics as being incidental in a way as in if you write them on with a pencil it's not going to have a great effect but if you listen to the harmony and play, inflect the harmony, you'll get a more integrated dynamic effect. So I found previously if I was trying to do dynamics, it just wouldn't work.

Harmony influencing tone colour (Ter Haar):
When I play the Suites I'm always very aware of the harmony that is going on. I am colouring the harmony with the different sounds I can make on the cello. Part of that is unconscious probably.

A more specific example of the influence of harmony is McGillivray's discussion of the Allemande from Suite No. 3. She talks about the interrupted cadence in bar 21 of the piece (see Figure 3.4.2) and the difficulty of communicating what she thinks the character of the passage to be:

That's one thing I have a problem with in this piece. This is the interrupted cadence just there [plays bars 20-21]. I'm so desperate for it not to be interrupted. I'd love if it wasn't interrupted, I'd love it if it was a perfect cadence but it's not. It's interrupted in all sources, annoyingly. So how to get that feeling of disappointment that would give an interrupted cadence? That's one of the things that I haven't quite solved yet. I've got lots of 'yeses' in this piece apart from that moment. I've tried making it long, making it sad. It's not quite convincing. I'll see if I can give you my best one [plays bars 20-21]. That was okay, that worked quite well, there was a sudden last minute disappointment, a crestfallen C [plays bars 20-21]. It's really hard to do, that sudden…just change of the eyebrows. I haven't managed that in performance yet. I've managed it a few times when I've been practising.

Figure 3.4.2: Allemande from Suite No. 3 in C major, bars 20b-22

This decision was categorised as being a deliberate decision about the character of the cadence since McGillivray talks about trying to communicate a "feeling of disappointment," "a crestfallen C." Her reference to 'yeses' in the piece relate to a so-called "'yes' feeling" in response to certain musical decisions. This seems to be a way of expressing the nature of intuitive processes and originates in a physical sense of rightness:

> It's not anything that I get from a book. I can find way of justifying it, justifying the 'yes' feeling, but I figure if something fits in with my physical sense or where I am at any given point…if it feels like a 'yes' for me, I'm going to be more convincing to the audience just because I'm in my element, whatever that is. I suppose the 'yes' comes out of lots of 'nos' as well.

This decision in the Allemande is one in which the "'yes' feeling" has been elusive and reference to 'yeses' resulting from 'nos' suggests a continuing process of experimentation. In the quotation about bars 20-21, the difficulty of achieving a sudden, yet subtle change of character at the cadence is compounded by McGillivray's discomfort with playing an interrupted rather than a perfect cadence at that moment. She seems to be searching for an intuitive verification that what she is trying to achieve is the right decision, but struggles to make it convincing. This decision could be considered an example of when a performer wants a deliberate decision to become more fluent and intuitive. Once McGillivray has found a way of making the change of character convincing, this will presumably become just another "'yes' feeling." In other words, the decision is currently deliberate and the subject of practice, but may become more automatic and intuitive over time.

Analysis

The category of analysis contains influential elements of the musical text besides harmony that were discussed by the performers. The themes identified were the structure of the movement, specific motifs within the piece, the relationship between different voices in polyphonic movements, and the hierarchical structure of the bar.

Many of these quotations were brief references to the structure of a movement or a particular motif within the composition. For example, McDonald pointed out a

"crucifixus motif" in the Allemande of Partita No. 2 while several violinists talked about fugal subjects in connection to decisions about articulation or bowing.

Although usually discussed in relation to fugues, an example of the influence of polyphony was Comberti's analysis of the Prelude of Suite No. 2. In a discussion about "keeping a sense of the accompaniment line and trying to find the different strands," he suggested one could argue that there are three lines throughout the piece:

> A broader line at the top, a bass line and a moving part in the middle. That is going on pretty well all the way through and sometimes the edges are a bit clouded. Occasionally you could argue that one part is serving two functions at the same time.

He also stressed the rising arpeggio figure that begins the movement, which in his opinion "provides the backbone of all the musical argument in the piece." A statement like this may affect various performance features such as articulation, phrasing, or rhythm (timing) if he chose to bring out this figure throughout the movement. There is no explanation of a specific musical decision arising from considering the importance of the arpeggio figure, but it does demonstrate in a general way that the analysis of motifs is an influence on what musical decisions are made.

Physical/technical

This category grouped themes associated with physical or technical influences on decision-making. This mainly concerned the relationship between the performer and their instrument, but also included the gesture associated with a particular musical idea, intonation and other technical challenges, and the convenience or comfort of a particular solution.

The idea that the Baroque bow and instrument informs the way the music should be played was a common issue in many of the interviews. This was usually described as a sense of how the tapered shape of the Baroque bow affected articulation, the search for tone colours on gut strings, and the resonance of the instrument. For Evans, "the instrument and the bow teach me so much about how I should approach the music. It's a very basic starting point but it's a good one." When asked about significant

experiences or turning points in their interpretation of Bach's music, performers would often cite their first time playing and experimenting with the period bow and violin or cello. As the following quotations illustrate, this initial exploration of what is possible with these tools was sometimes a confirmation of what they felt about the music and what they were already trying to do with the modern bow and instrument.

> McGillivray:
> I remember when I started playing on gut strings, that was a really big moment for playing things like Bach for me because lots of things suddenly made sense whereas before they really hadn't. Talking about instinct again. I'd had lots and lots of questions with no answers when I was playing on modern setup because I knew that I wasn't happy but I didn't know what to do. When I started playing on gut strings and a Baroque bow it felt a lot of questions answered themselves.

> Napper:
> There was one very singular turning point. When my father died, I inherited my viol. It arrived on the morning of a day when I was playing a solo Bach cello suite recital at night; three of them. I couldn't play the viol but I took out the viol bow and started fooling around with it on one of the cello Preludes. It took two seconds for me to realise that the bow did everything I had been trying to do with my heavy modern bow but with no effort whatsoever. That was a huge revelation.

Another way of highlighting the importance of the bow was Van der Voort's suggestion that "the bow makes many of the decisions for you." Van der Voort described her approach to playing Bach as based on her dialogue with the instrument and bow, and informed by experiences of hearing and playing this music:

> I think I have a strong idea of how I want it and that's partly what I heard from other people, what I liked and what I didn't like and partly what the bow and the violin dictates in the music I think. That combination. For me it should always be as simple, as natural as possible.

Many of the influences from the physical/technical category seem to feed into feelings that guide intuitive decisions. The conductor and cellist Nikolaus Harnoncourt (Klein, 2012, 30:27-30:44) has said that he found the historical instruments a "kind of inspiration to playing… I found out what this instrument or that instrument wanted to produce. I think I had a good feeling for the ability of the instrument itself." An affinity and familiarity with the Baroque bow and instrument gives the player a sense of what is possible, enabling them to draw on physical gestures that have been used

successfully in the past to achieve a certain tone colour, articulation, or way of phrasing. For example, Schmitt described the opening of the Adagio from Sonata No. 1 in G minor as being shaped using one's breath and a flexible pulse; a quest for gesture rather than rhythmic accuracy.

Historical information

The influence of information about historical performance practice included direct references to literature as well as concepts specific to Baroque music. Foremost in this category were cases in which historical treatises were quoted in support of various decisions, descriptions of the historical context including cultural and biographical information, and information about the character of Baroque dances.

While the number of quotations regarding rhetoric is relatively low, several performers discussed the rhetorical nature of Baroque music at length, including how to communicate this in performance. For example, Gatti compared the musical structure of the Adagio from Sonata No. 1 to the components of a speech:

> It is a small speech, short speech but everything is in a rhetorical mode. Bach was studying rhetoric when he went to school. It was a normal main subject of study in schools of this time so it is quite logical that his music is written in this mentality.

Table 3.4.3 outlines the terms used by Gatti to describe sections of the movement alongside explanations of these terms and the purpose of each section (Tarling, 2004, p. 153; based on writings by Cicero and Quintilian).

Table 3.4.3: Structure of Adagio from Sonata No. 1 in G minor

Bars	Part		Purpose
1-2	Exordium	Introduction	To conciliate the audience
2-9	Narratio	Statement of facts	To instruct the audience
9-14	Confutatio	Refutation	To overthrow arguments
14-20	Confirmatio	Proof	To confirm our own propositions
20-22	Peroratio	Peroration	To refresh the memory and appeal to the emotions of the audience

Other performers emphasised the principle of Bach's music as speech in a more general way to advocate persuasive performances that communicate by punctuating and varying the musical phrase. The following quotations highlight the similarities between period treatises and the way in which interviewees discussed musical performance as oratory:

> Quantz (1752/1966, p. 119):
> As to delivery, we demand that an orator have an audible, clear, and true voice; that he have distinct and perfectly true pronunciation, not confusing some letters with others, or swallowing them; that he aim at a pleasing variety in voice and language; that he avoid monotony in the discourse, rather allowing the tone of the syllables and words to be heard now loudly, now softly, now quickly, now slowly; and that he raise his voice in words requiring emphasis, subdue it in others…I shall now try to show that all of these things are also required in good musical execution.

> Sheppard:
> You just have to use the notes as if they were words, as if when we are speaking to each other my voice goes up or down or I speak faster or I speak slower or I take a big breath. It's using the notes in the same way that we use words.

This overall concern for rhetoric without analysing the specific rhetorical devices within the music suggests that while the goal of rhetorical communication is deliberate, it is usually implemented at an intuitive level. A comparison of notes with words implies that performers try to imitate the "in the moment" nature of sentence structure and voice modulation. While relatively unplanned, this still tends to fall into certain rules based on grammar and cultural context. For period instrument performers, the challenge is to internalise and automate the rules of the musical grammar of the Baroque style: "like actors trying to speak a foreign language well enough that the audience is convinced they are native speakers" (Haynes, 2007, p. 225).

Performance context

Termed "the law of the situation" by Holloway, the immediate context in which the performance takes place was another influence on decision-making. The influence of the acoustic and the audience was often mentioned, as well as feelings of performance

anxiety, constraints on preparation time, the performer's mood, the time of the day, or the humidity at the performance venue.

Many performers claimed that the acoustic of the venue affects their interpretation, usually in relation to tempo, but also decisions about bowing and articulation.

> Acoustic influencing tempo (Beznosiuk):
> In performance the main things that would change I suppose would have to do with tempo, given what the room sounds. If it's a very echoey place you would have to play a bit slower than you would in a dry theatre.
>
> Acoustic influencing bowing (Van Dael):
> You practise all those different things and then you play them one concert not slurred because the acoustics are so good. You can suggest that you play the slurs because the acoustics help you, but if I play in a very dry acoustics I will slur them.

The influence of the audience was raised in McGillivray's discussion of her most recent performance of Suite No. 3 prior to the date of the interview. On that occasion she was struck by "the quality of silence, the quality of listening" which had an effect on how she played the work:

> I felt that everyone was listening very intently and calmly. I knew the concentration was there for me to expand, to have that subtlety with timing which I couldn't have had if they hadn't been listening. If there wasn't that concentration I'd feel more inclined to entertain rather than create space. I might go for something a bit more physical, a bit more visceral; dance.

McGillivray also noted that the time of the day can be an influence, stating, "if it's a morning concert I will play more quickly." This statement concurs with a study by Brown (1981) who observed that morning performances (between 8 and 9am) were significantly faster than evening performances (between 9 and 10pm).

The category of performance context demonstrates an awareness of how each performance can differ slightly, but whether this results in intuitive or deliberate changes is often unclear and may depend on degrees of difference. For example, if a venue is exceedingly dry or resonant, performers may be more likely to consciously change aspects of their interpretation whereas other venues may only result in an intuitive, subtler adjustment of performance features.

Specific experiences

References to specific experiences included musical collaborations, lessons and significant recordings, or performances by other musicians. The fact that the performers identified these as influential experiences suggests that they were particularly memorable and could be considered examples of explicit learning.

Examples from this category included experiences of working with Baroque and contemporary dancers. Holloway cited a project accompanying Baroque dancers, Schmitt talked about performing Bach with dancer Raphaël Cottin, and Coin discussed playing for Rudolf Nureyev's Bach *Suite No. 3* in 1984. Coin described how his ideas about articulation were influenced by the experience of working with Nureyev:

> Even if his [Bach's] music is not meant to be played for a dancer, it is full of energy and vitality from the way of dancing… For me what is important with a great dancer is to realise the importance of space. What you do with your bow in two directions can be completely amplified in a space and the way you use this space. That means if you want to go further in the space you have to jump quicker and higher for example. This can also be a great inspiration for a way of bowing.

Other examples linking Bach's music and contemporary dance include collaborations between cellist Claudius Herrmann and the Zurich Ballet, and cellist Yo-Yo Ma and the Mark Morris Dance Group. In the film *Falling Down Stairs* (1997, 14:23-14:40) by Barbara Willis Sweete, Ma discussed the influence of working with the Mark Morris Dance Group on his ideas of musical timing:

> Bodies have to follow the natural laws of gravity, and so if somebody launches themselves up in the air you know the timing and the feel it takes before they land again and that gives me a sense of timing, of what I have to do.

Concerning the issue of recordings, the most frequently cited were the Bach Cello Suites as recorded by Casals in the late 1930s and Bylsma's first recording from 1979 (see Discography). Laird (2004, p. 63) states that Bylsma's recording was "one of the releases that helped define the historical performance movement for the general public" and the influence of this recording and his teaching was clear in many of the interviews. One of Bylsma's students, Job ter Haar, discussed his approach to the Suites as being based primarily on research into Baroque tempi, but also influenced by

his collaborations with colleagues in the ensemble Musica ad Rhenum and "maybe a little bit wanting to do it different than my teacher." He then explained Bylsma's focus on slurring within the Suites and his own focus on tempo as different, but equally specific entrance points to these pieces which can lead to a process of "questioning your own beliefs, your own ego. In the end it will bring you a much richer interpretation."

Not all the experiences discussed related to HIP, but collaborations, performance and lessons with several pioneering period instrument musicians were mentioned, including violinists Sigiswald Kuijken and Monica Huggett, and conductors Christopher Hogwood, Roger Norrington, Andrew Parrott, William Christie, and Masaaki Suzuki.

Repertoire and scores

Themes related to repertoire and scores included quotations about the influence of other Baroque repertoire, scores and editions, other pieces by Bach, and Bach's own transcriptions.

The performer's knowledge of other Baroque repertoire and other pieces by Bach seemed to be key to understanding the style and context of the Bach solo string works. They often talked about coming to Bach from before Bach and understanding his music in the context of other earlier German Baroque repertoire. For Matthews, her familiarity with Schmelzer, Biber, and Muffat gave her an intuitive sense of what is expected and what is not:

> A lot of Baroque music, not necessarily the great pieces, but a lot of what there is, is kind of formulaic. Even some of the great pieces are, actually. Like the Corelli Sonatas. Everybody was influenced by Corelli in the eighteenth century and the Corelli Sonatas are extremely formulaic, also of course so supremely well crafted and so wonderful. But it becomes very clear that there are things that he'll do and there are things that he won't do. So when I run across something the earlier composers would not have done, it's like a red flag. It does stand out to me. It's surprising and calls for special consideration. But if I hadn't played so much of the earlier music, would these things still arrest my attention the same way? I don't know.

In terms of scores and editions, the discussion of slurring in the manuscript of the Suites by Anna Magdalena Bach (hereafter AMB) was a recurring subject in the interviews. Many performers cited Anner Bylsma's book *Bach, the fencing master* in which Bylsma makes a case for deciphering and following the often difficult to read slurs in the AMB manuscript. In psychological terms, this could be considered a case of difficulty or disfluency in processing information leading to the activation of more deliberate, analytical processes (Alter, Oppenheimer, Epley, & Eyre, 2007). One of the ways in which fluency can be affected is through difficult-to-read or easy-to-read text (Oppenheimer, 2006; Werth & Strack, 2003). When performers engage with a score like the AMB copy of the Suites, which has often been dismissed as inaccurate and unreadable, the difficulty experienced in reading the text may act as a cue to take a more deliberate approach to decision-making, particularly with regard to bowing.

As has been demonstrated, it is usually not clear which themes and super-ordinate themes identified as influences contribute to either intuitive or deliberate decision-making. The general nature of much of the discussion around influences suggests that this information remains primarily in the background and may not contribute directly to decision-making in a conscious manner. On the other hand, the fact that performers chose to raise these particular issues demonstrates a level of awareness and attention to these matters, which may result in deliberate decision-making. Influences on feeling-based decisions are more likely to be inaccessible to introspection and therefore left unsaid.

Processes of musical decision-making

The category processes of musical decision-making covers general ideas about decision-making and themes that relate directly to the experience of making either intuitive or deliberate decisions (see Table 3.4.4). Themes grouped under general often imply what the musicians' priorities, prerogatives, and values are for performance by revealing their position on issues such as the importance of spontaneity, the concept of flow, and the use of experimentation during practice. These themes are considered processes as they contribute to why and how decisions are made and are based on the act of musical interpretation as experienced by these performers.

Themes grouped into the super-ordinate themes of intuitive or deliberate go further than implying the use of either intuitive or deliberate process (previously analysed in specific decisions) by engaging directly with the meaning, nature, and role of these processes. For example, these quotations include attempts at defining intuition and suggestions of how expert intuition functions. The largely unconscious nature of intuitive decision-making led to a variety of opinions and definitions, which were sometimes coded using terminology from psychological literature such as pattern recognition or procedural. The imbalance between the number of quotations coded intuitive versus deliberate is probably due to the relatively straightforward nature of deliberate decision-making and the inaccessibility of intuitive processes. This led to more prompting and lengthier discussion when the interviewee raised issues relating to intuitive decision-making.

Table 3.4.4: Processes of musical decision-making

Super-ordinate themes	Themes	Number of quotations
General	Spontaneity vs planning	20
	Interpretation	17
	Experimentation	9
	Flow	6
	Taste	5
	Personal vs historical	4
	Habit	2
	Breaking with rules	2
	Storytelling	2
	Head vs heart	1
	Intuition vs intelligence	1
	Alternation between processes	1
	Balance	1
	Fluency	1
	Freedom	1
	Knowledge gaps	1
Intuitive	Intuition	14
	Instinct	9
	Difficulty verbalising	6
	Pattern recognition	5
	Procedural	5
	Automaticity	5
	Implicit learning	4
	Suspicion of intuition	4
	Trusting intuition	3
	Accumulated knowledge	2
	Questioning intuition	2

| Deliberate | Analysis | 3 |
| | Deliberation | 1 |

General

This category covers the issues performers often have to engage with or think about in relation to performing Baroque repertoire. Being more conceptual in nature, these quotations do not necessarily clarify how these ideas might be realised in practice. Themes clustered under general were those that did not relate directly to either intuitive or deliberate processes and include wide-ranging opinions about interpretation, the role of spontaneity and experimentation, definitions of taste and habit, and concepts of flow and fluency. These themes often related to overall goals or the performer's priorities for performance.

In the theme of interpretation a common issue raised was the role of the performer and what interpretation requires of the performer. In general there seemed to be agreement that one approach is for the performer's input to be minimal: "Don't get too excited, just do what it says" (McGillivray). Coin described this as "more a lecture than an interpretation. A way of reading I would say." The idea that some movements "play themselves" (Comberti) also suggests this mode of performance. For Evans, the challenge is therefore to find the subtle differences within the music:

> It is possible to play Baroque music very simply without a lot of attention to detail and for it still to be enjoyable for the audience. But as a musician and actually often for the audience without them necessarily realising it, it's far more satisfying if you find all the details you can, work them out in rehearsal then let go of them to a certain extent in the concert. Just finding the subtle differences, the details within the piece I believe is the difficulty with Bach.

Moving away from a 'literal' mode of performance involves a greater degree of perceived interpretative activity. Questioning a simple, possibly intuitive reading of a piece seems to lead to a more critical process of decision-making involving a greater degree of deliberate thought. Part of this process involves experimentation or trial and error, as the following statements explain:

> Van Dael:
> You have so many possibilities to give direction to a melodic line. First thing you always have to look for is where does it go? Where does it relax and what

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is it going to do after it relaxes? What happens exactly? All those things you can do in a chair. You don't have to play. If then something does not quite go with the bass then you must try out the different possibilities. What do we have? We have dynamics, we have timing, we have colouring and all those different possibilities. You are going to try it out. Then, for instance you have three or four different options. Before I go on stage I have been deciding about an option: "okay today I am going to do it this way." Every time after a concert, I sit down, I play the concert back in my mind and I think "well, that decision was not really a good decision. I'm going to do it differently next time." So little by little, things start growing.

Napper:
The way I work is by practising many different interpretative options until several of them feel comfortable. It's such fun to make something up in a performance just like a jazz performer. You have many recipes up your sleeve and whatever feels good at the moment is the one you choose. In a way I call it improvisation but in fact it's highly worked out just like jazz is. You have to know the music back to front in order to be able to do this.

The process of experimentation described by both performers is similar, except that how the decision is made during the performance differs. Van Dael talks about making decisions before the concert, while Napper reacts to what "feels good" in the moment. By delaying the final decision to the moment of performance, Napper is using a more intuitive process during performance even though her preparation may have been quite deliberate and analytical to begin with. The use of practice to make options "feel comfortable" means that these options have been internalised and automated to some extent prior to the performance.

Like Van Dael and Napper, Schmitt also emphasised the role of experimentation during practice to "improve" spontaneity:

For us musicians there is always the balance between decisions and spontaneity and I think we can improve our own spontaneity with work. So for example, I try to play the Gigue a bit more wild than normal or now a bit more sweet and now I try to combine sweetness and wildness. I try quicker or slower. It's stupid to think that the spontaneity comes just on stage. You can improve it also in your music room.

Experimentation during practice and the degree to which decisions are planned is closely related to the idea of spontaneity and whether performers aim for truly spontaneous decisions or the illusion of spontaneity. The theme of spontaneity versus planning emerged very strongly from the data (see Table 3.4.9) and included several

quotations from performers who aimed for a degree of difference from performance to performance:

> Ter Haar:
> I try to keep my mind open and make something different out of it all the time. If I played it twice, I hope it would be different both times.
>
> Comberti:
> How I would set about interpreting it? I guess it's going to change everyday. What I like about this music is not to set in stone and have my way of working at it. It might come out slightly differently every time.

For McGillivray, the element of spontaneity wasn't an aim of performance, but "an accepted feeling" based on her perceived inability to do the same thing twice. She talked about this inconsistency as partly based on letting certain musical elements such as slurs be a "grey area," as she often thinks of slurs as "flow rather than specific instructions."

In contrast to spontaneity versus planning, the opposition of the personal versus the historical is a more HIP-specific issue. For period instrument performers, knowledge of Baroque performance practice means that there is always a historical and personal dimension to what they are communicating in performance. Sheppard discussed the personal as being able to operate with freedom within what might be perceived as the constraints of HIP:

> There is so much that different people bring to different movements that there is always another point of view even within these so-called rules of Baroque playing. The rules of the diminuendos and the slurs and all the rest of it. Some people see that as terribly pedantic, restrictive, a restrictive set of rules but I don't see it at all like that. I see it as actually something that makes you free because you have these basic things but then within that you can express the words that Bach is speaking in many different ways.

Most performers were comfortable with idea of making personal choices, either to fill knowledge gaps or to judge when going against Baroque performance practice rules might be justified. Holloway argued that there is a lot that can be found out about historical style but "still you have to make some kind of instinctive, intuitive leap" when putting that information into practice. He acknowledged that making "personal" decisions cannot be avoided and occurs even in something as fundamental as tuning:

Already when you tune the violin you're making personal choices, even if you're playing with a keyboard instrument. If you decide okay I'm going to tune my four strings exactly to the keyboard instrument because I'm going to be using a lot of open strings in places where it will be audible whether I am [in tune] with the harpsichord or not. That's a choice because in most cases, you have the possibility of not using a lot of open strings. So if you are going to avoid them you don't have to tune all the open strings to the harpsichord. It's not "let the music speak for itself." Even by tuning up I'm making decisions, personal decisions.

Another issue frequently referred to in historical treatises and in relation to HIP is that of "good taste." According to Bayley (1991, p. 12), this term appears in the early fifteenth century to mean "sound understanding," but evolved to be a metaphor for judgment and aesthetic discrimination in the seventeenth century. The performers interviewed in this study offered several definitions of this concept, including the following:

Evans:
It's respecting the music and being aware of where in history it comes from that is very important; making decisions based on this information and knowing when to disregard it. That for me is a sense of musical taste.

Faultless:
It's a question of how much of any one thing is highlighted at any one time. It can be melodic line, harmonic tension, a particular colour or dynamic, articulation, rhythm, hierarchy - all existing in a constant ebb and flow. I'm absolutely sure that's what is meant by good taste. The idea of a master of good taste is of somebody who is a master of all these tricks, all these parameters and knows how to balance their use.

This section has given examples of some of the themes categorised as general processes of decision-making, although these ideas do overlap with and are implicit in some of themes discussed in the next sections (intuitive and deliberate).

Intuitive

This cluster of themes relates to intuitive processes of decision-making. This category includes views on what intuition is, how it is experienced, and the need to question one's instincts. These themes reveal various beliefs about the nature of intuition and how it might play a role in period performance. While the terminology used varied, many of the ideas can be linked to the psychological literature on intuition discussed in

Chapter 1. In particular, the themes of pattern recognition, procedural, automaticity, implicit learning, and accumulated knowledge provide further support for the literature on the nature of intuitive processes (see Table 3.4.4). Overall, intuitive processes were experienced as a feeling, with any explanation coming after the fact:

> McGillivray:
> My instinct is purely if whether it's a 'yes' or 'no' and that's about general feeling that has more to do with the flow and whether something is working or not.
>
> Matthews:
> I think it's more a recognition. I don't think it's so conscious. In the course of working on a piece, my felt sense of how I want it to go becomes stronger and stronger, and then I'll go back and think about it, kind of justifying myself after the fact. Or sometimes finding something that changes my mind.
>
> Van der Voort:
> You just have to do it. You find a way. It's just with the music as well I think it finds itself a way. Yeah I never think so much. I just do it and if it feels good, I don't know. That's the thing about intuition. You don't know how it works.
>
> Evans:
> For me there is an aspect of music which is accumulative learning; you do something automatically using the knowledge that you've gained up until that point without conscious thought. Therefore it can change; the more you learn the more your instincts towards a composer or piece can change. I think of instinct or intuition in music as being the opposite of thoughtfulness in that you make musical choices in the moment without being conscious of why.

McDonald talked about accumulated knowledge in terms of having a "library of mind" consisting of "everything that I know up to this point, that I've read or that I've learnt from other players or I've heard about Bach, about Baroque style, about Baroque violin." Folkestad (2012) has used a similar phrase, the "personal inner musical library," to describe the accumulated musical experiences of a person's mind and body (pp. 198-199). This metaphor illustrates that "while individual musical compositions and performances might draw on specific musical experiences, the full musical library still forms and functions as a backdrop of implicit references to the totality of musical experiences in the process of musical creation" (Folkestad, 2012, p. 198). Therefore, experienced performers benefit from an extensive inner library from which to draw, whether intuitively or deliberately. McDonald described the intuitive use of this material during a state of performance in which the mind is free:

In a way, intuition means that the mind can find whatever's most appropriate of its own accord without having to search for it. So without having that library of mind and just being purely intuitive, something's lost because there's no real palette to choose from but with the library of mind there is a much richer palette. It's also possible to take a step up from that point. Once the intuition and mind are working together in an integrated way, and if one is present enough, a kind of 'force' comes in which can create something entirely new. It can surprise us with the experience: "I don't know where that came from" and break us out of old patterns into a more original voice.

Having access to knowledge accumulated over time was also discussed by Sheppard. For her, this resulted in the development of a "sensibility" or inner musical idea that is stylistically appropriate for HIP:

I'm not an academic. I'm not a scholar. I tend to have picked it up over the years rather than read every word of all the treatises but I have for a long time now, since my mid-20s, played nearly entirely in period instrument groups. So I feel I have a sensibility which tells me, mostly rightly, what is simply not allowed. Occasionally there will be a particular case where you might think you can justify breaking some of the so-called rules but mostly I have an idea inside me, rightly or wrongly. I see the rules as helpful guidelines and within those guidelines I will make my decisions. It won't even occur to me to want to do a whacking great upbeat. It might have done when I was 16 but it certainly doesn't now. It's not part of my musical idea for this sort of music. It just doesn't happen.

The idea of educating one's instinct was sometimes raised due to suspicion of relying too heavily on intuition. Gatti explained his reluctance to rely on intuition by discussing how his instinct has changed over time:

When I was young I was doing most of the things by instinct because I didn't know all the sources that I have been collecting for many, many years. When you know more, you are more conscious. When you read many original sources then you know; you can reconstruct in yourself a feeling of style. Then you can trust your instinct more but it's sure that in the beginning, my instinct was much more influenced by modern violin playing.

Questioned further about the concept of instinct, Gatti broadened his discussion to include factors outside of music that contribute to one's subjective feeling of what is beautiful, bad, and so on:

What is the origin of our instincts? I think it's your education. I think it's your surroundings. It's what you have learned from your birth. You have to think about what made an important influence on your perception of music. What is

beautiful? What is bad? What is possible to do? What could be interesting and all the things that you heard. I think everybody has favourite player, favourite musician, favourite composer, favourite style and all these make an influence so the instinct, it's never objective. It's always personal which is the interesting part of performing, of performance because instinct comes to a personal performance.

The reconstruction of a "feeling of style" based on knowledge, culture, and education is an eloquent way of conceptualising the process through which knowledge about HIP becomes integrated and absorbed. Van der Voort had a similar perspective on the issue of training and trusting one's intuition, and spoke about being uncomfortable using intuitive processes when performing less familiar repertoire:

> I do only Baroque music. I hardly ever go to Classical music and if I do that it's orchestral work with an orchestra in Belgium, Anima Eterna. I will play a lot of later repertoire but then I will just follow the group and do what I am told. Sometimes I lead the second violins but that makes me already quite insecure because I don't know much about the music and the language is so different for me that I don't trust…yeah that's it about Baroque music that I trust my intuition for it and that's why I can make decisions. In Classical and later repertoire I don't trust my intuition so it's very hard to make decisions.

The security that comes from knowing that your intuition is based on deep knowledge, familiarity, and exploration of style leads to a trust that what is felt intuitively as 'right' will be appropriate and stylish. According to Holloway, the education of intuition can lead to that elusive ideal of "good taste" with a more informed intuition equalling better, or more reliable taste:

> Can we personalise the knowledge? Or if you want to put it the other way round, can we educate our instinct so that we instinctively do something which works? You know all the wonderful moments in eighteenth century treatises where they say the rest is obvious to anybody with good taste. What's good taste? I think the concept of good taste has a great deal to do with educating your instinct.

Whether aligned with feeling, recognition, instinct, intuition, sensibility or taste, the underlying process being described by the interviewees is usually one in which learnt behaviour becomes automatic over time. As Sheppard acknowledges: "I couldn't say that anything was my instinct without saying it's my instinct because I've done this so many times and now I feel instinctively that this is how it's got to be."

This concept of automaticity is crucial to understanding how expert intuition works and can be thought of as a process that occurs over a performer's lifetime, but also as something that happens over the course of preparing any one performance. This idea is also the basis for the theme labelled procedural in which decisions that were once deliberate become intuitive. Performers talked about some decisions being practised so that they happen intuitively during performance. In this scenario deliberate decisions eventually become intuitive and are therefore less likely to be affected by adrenalin or other factors during performance. As McGillivray notes:

> I tend to get taken over by a bit of adrenalin in the performance so all these rational thoughts go out the window and I have to trust that something is left from what I practised, some kind of sense.

The fluency that results from more automatic decision-making can be compared with language acquisition. Faultless proposed that what performers describe as intuition could be to do with being so well versed in the language (style) that "you no longer have to talk about certain aspects but it doesn't mean it's not there." While preferring not to use the term intuition, Faultless identified some key aspects of what is commonly thought of as part of intuitive decision-making, such as fluency and the influence of affect (the experience of emotion):

> Perhaps people talk about the performance of music being intuitive because they don't think of it as a language, or at least they happen not to talk about it in that way. I imagine having a fluency in a musical language whereby you don't need to process everything. Some people describe an emotional response to music which may be the same thing. I agree the response is emotional in terms of saying, "what does this do? What do I do? I adore this chord. It's got to be more, it's got to be passionate, it's got to be round and full or whatever it's got to be," but I think it's because one understands the language not because of an 'emotional' response that has bypassed an intellectual one.

A potentially negative side to fluency or automaticity could be the creation of unwanted habits. McGillivray explained that habits could form as the result of becoming complacent or too comfortable with how one plays. For her, instinct seemed to act as a way of connecting to a musical ideal and was a faculty that could become dulled by the influence of physical habits:

The comfort question is a tricky one though. I think comfort can get in the way of instinct. "This is the way I've always played and this is how it feels good" and it's quite easy to get complacent in that. I think instinct can get a bit dulled there.

Therefore, intuitions need not be disparagingly equated with habits (see Taruskin quotation in Chapter 1, Section 2); rather, habits could be those automatic behaviours that don't 'feel right.' A well-developed or 'informed' intuition would recognise these as habits, unless as McGillivray warns, the force of habit has dulled instinct. The high proportion of deliberate decision-making found in this study could be partially a check against the encroachment of any habitual responses. The process of experimentation to 'improve' spontaneity or asking why one feels a certain way about the music could be measures to detect an overreliance on automatic musical responses.

Other performers warned against using intuition in a way that could override the importance of the composer or the effort taken to understand the musical text. Gatti discussed using instinct as being of lesser importance than understanding the text, while Suzuki advised that personality could be a potentially distorting influence on communicating a composer's message:

> Gatti:
> I don't like that kind of instinct which is the performers who want to be in the most important place. The performers who want to be more important than the composer. That kind of instinct I don't like because it's an instinct which cancels the music. The instinct must be well conducted by your knowledge otherwise you become more important than the composer. My instincts should never be more important than the effort I do to understand.

> Suzuki:
> If you really base only on your intuition or your feeling of the day, then it can be one day red and one day blue and to me it sounds a little bit too irresponsible as a message sender. Musicians are like a transmitter. Bach is the message sender or generator and the receiver is the audience let's say. We are something like a mixture of amplifier and loudspeaker, possibly with a bit of generator as well. We try to hand over the message as clean as possible and as clear as possible and as undistorted as possible. In order to be a good amplifier or speaker you must be very sensitive to be moved by a slightest happening in music, and as transparent as possible to send it to the listener, just like a pair of wonderful speakers. You don't have to think of your personality because no one can play without personality. Your voice is different even using the same channel, the same instrument. If you play or I play, it sounds totally different. Musicians must believe that you don't have to think of your personality. It will appear anyway. You cannot be nobody.

To conclude this section, a few issues will be raised to summarise some of the themes that could be important in understanding the role of intuition in HIP. These will be discussed in response to two statements by Coin who raised the issue of intuition in a very direct and emphatic manner:

> I live on intuition. First of all we know very little about how Bach wanted…how he played. We have some commentaries about his playing of the organ, his way of accompanying and so on which was incredibly rich and genuine probably, but it tells very few [little] to a poor cellist how to play his music. So instinct, intuition is still the last argument I think. You can't play something against your will, even if some dancer says for example the Sarabande has to be played much faster because it was danced in this tempo and so on and we have proof. If this tempo is not your tempo, if it's against your intuition you won't be able to play it in this tempo. So you can't play as people oblige to play you or musicologists or books or treatises or whatever. What is important is to approach the sound, the complexity and the richness of the sound, to try to go deeply in a different tempo or a different way of playing the chords, a way of bowings, this is important but at the end the real master is your instinct I think. You can't go against it.

Later, Coin continued to stress the importance of trying different options:

> I think you can feel your instinct and your intuition when you sometimes force it to go in a different way, not always following your instinct but do opposite things to your instinct and then you will really understand what is your personality. I think it's important to experiment [with] a lot of things.

These quotations suggest that musicians can understand their instinct or personality more by going against their first intuitive feeling about the music and trying other options. This move away from an intuitive reaction to a deliberate process of exploring other possibilities could be an important idea in mapping the interpretative process and relates to previous discussions of experimentation during practice. The fact that for Coin, the role of intuition is to be the "last argument" means that this process of deliberate experimentation ends with a swing back to the use of intuition to make the final decision. This is similar to the idea of selecting what feels right in the moment based on options that have been practised and made fluent or somewhat automatic. The decision at the end of this process may differ only slightly, or indeed may not have changed from the performer's initial sense of 'how it should go,' but the process of deliberately trying out different options will have informed the final choice.

The alternation between intuitive and deliberate processes is also implied by Holloway who states, "We are left with huge holes which we have to fill with our instinct and then we come back to it, inform our instinct." This coming back and informing instinct means that there may be two qualitatively different types of intuition: an uninformed, or more immediately reactive type used when first encountering a piece or problem in order to fill gaps or holes in knowledge, and one which is more informed and whose role could be to confirm a final decision. It is likely that this difference is just one of degree, moving from a less informed to a more informed or mature intuition.

Deliberate

The themes in this category relate to making decisions based on analysis or deliberate planning. The numbers of quotations regarding this category are low and there was not much discussion about deliberate decision-making as this was usually clear and related to a specific, straightforward musical decision. Intuitive processes on the other hand are more difficult to explain and required more in-depth discussion and prompting.

Unlike the performers quoted earlier who spoke about wanting each performance to be different, Matthews explained her aim in performance as representing the work she has done during practice:

> I love the idea of spontaneity, and I want it to feel and sound spontaneous, but I don't really want to do it differently every time. Not Bach. Other things perhaps – things where I am improvising – but not this. I'm not even sure it would be possible for me, with Bach, to throw everything that I had thought about out the window and let something new happen. There is a process with Bach that takes time and thought. Having done that work, I'm going to try to manifest the ideal I've been working towards. I want to show the audience what I've found in the course of my work. That's what I feel a performance is for. To lead an audience through a landscape, with the performer as the guide who really knows that landscape. The D minor Partita [BWV1004] is the one that I have performed the most and it has certainly evolved. My tempos have definitely changed over the years. But however the interpretation evolves, it's incremental enough that I really don't notice it. It's as though I'm still working towards an ideal, and perhaps the ideal is changing slightly so I'm altering my course, but I'm still heading towards it. I am not looking to reinvent every time.

Although Matthews aims for a fairly consistent delivery of these works each time, she acknowledges that subtle shifts may be happening based on how her ideal for the piece continues to evolve. The "incremental" evolution of an interpretation means that a performer might not be able to talk about the changes that occur between performances. Performers may be aware of their overall concept for the piece, but many of the details will be difficult to articulate.

In the preparation process, deliberate processes of decision-making have been implied in many of the quotations about experimentation and analysis already discussed in this chapter. More detailed consideration of deliberation was rare, but was usually in the form of an interviewee calling for a greater degree of questioning, awareness of the musical context, and the implications of certain decisions. These issues were touched on in the previous section, but a more detailed example is provided through the following statements by Faultless that advocate a certain discipline and control over how decisions are made in practice and performance:

> It's not quite good enough to say, "because I say so" or "because I fancy it like this today." We have more responsibility to him [Bach] to understand the text and as soon as one looks at a bar and asks "well, okay, how do I play that chord and why?" one needs to ask more questions. What is its function in the piece? What is its function structurally or harmonically? What is happening to the phrase around it? Does it need balancing with other elements? All these things become clear and then all the technical, violinistic things come out of that. I'm not necessarily suggesting that all the questions have to be answered all the time. Also they vary. The interpretation of a piece develops the whole time.

Later in the interview she called attention to the control that a performer requires during performance in order to communicate their conception of the piece in an effective manner:

> Of course one can give the appearance of being 'lost' in or overcome by the music, but actually if one was really out of control it would be a disaster so that's simply a metaphor. The task as a performer, as a player is to be supremely in control of what's going on in order that the audience might get 'lost' or affected by the music. The idea that a performer can be so carried away as to be 'lost' is a rather worrying one for me and implies a lack of control of playing. The audience is going to be lost, and may want to go home at that point! It's a mistake to think that one can do a physical activity that's as difficult as playing a musical instrument and apparently be in some alternative universe, consumed by one's own artistry.

Although the emphasis shifted between different aspects of the decision-making process, the overall impression from the interviews is that both intuitive and deliberate processes play a part in the act of interpretation. As Matthews explains, there should be a balance between these elements to create a unified and coherent whole:

> A performance that's strictly by the books, in which everything is done very properly and in good taste, might be very correct and still very dry; and in a performance that's all emotion, rubato might distort the nature of the Allemande, for instance, and it might be moving but still feel off. For me the ideal is to find that balance. It has to be heartfelt, it has to be personal, it has to be intuitive and that's the part that you can't talk about. That's magic, it's opening yourself up and letting something come through. But you also have to have some mental discipline with the music to allow it to be true to what it is and the time and place that it came from.

5. Conclusion

Overview of study

This study of leading period instrument string players used data from eighteen semi-structured interviews to clarify how expert performers make musical decisions. Building on the themes identified in already published writings by performers (see Chapter 2), this study provides a detailed analysis of specific musical decisions and themes underlying the interpretative process.

Summary of results

Overall, this study found frequent reporting of deliberate decision-making with 60% of all decisions discussed in the interviews being categorised as deliberate (including deliberate HIP), with intuitive decisions accounting for the remaining 40%. Most of the decisions were to do with articulation, bowing, and character, reflecting some of the aims of the current HIP aesthetic that values a rhetorical approach to issues such as phrasing. Participants relied more on deliberate decision-making in all performance features except for character, fingering, ornamentation, and tone colour, while deliberate HIP decisions were made primarily in the areas of bowing and chord playing. The performers demonstrated a variety of approaches to the issue of musical

decision-making, resulting in differing proportions of intuitive and deliberate decision-making between interviewees.

Further analysis of themes in the data revealed a number of influences on how musical decisions were made. Chief among these influences was harmony, as well as knowledge of other Baroque repertoire, physical feedback from the Baroque bow and instrument, the acoustic of the performance venue, and structural elements within the musical work.

In terms of processes of musical decision-making, general goals and priorities included balancing spontaneity and planning, and experimenting with musical options during practice. Intuitive processes were experienced as a "feeling," "recognition," or "sensibility" based on accumulated experience and knowledge. Performers raised the concept of gaining automaticity as a part of preparing works for performance and noted the importance of questioning and informing intuitive processes in order to trust this type of decision-making. Deliberate decision-making was referred to in terms of having an awareness and control over the performance, leading to consistency and discipline in executing musical choices. A balance between intuitive and deliberate processes enables the performer to direct their attention towards musical elements or cues that require focus during performance while maintaining spontaneity, flow, and freedom.

Issues and limitations

The interview method concentrated on the subjective experience of performers while acknowledging that self-report data can present difficulties for the researcher. Musicians may inaccurately attribute their behaviour (Weiner, 1986), certain processes may not be introspectively available to them, or they may be "anxious, defensive, or unaware of what they do" (Chaffin & Crawford, 2007, p. 156). The nature of the topic being discussed led to difficulties for some participants in attempting to articulate what may well be a rich and complex experience, but one which resists full or comprehensive verbalisation. For example, Ter Haar spoke about the fact that musicians usually don't need to talk about what they do:

> You are not making up a story which fits with it but you simply do it or you feel it and when needed you can probably explain it but most of the time you don't. There are lots of things… it would be hard for me to talk about because by the nature of it it's not a very conscious thing.

The fact that intuitive processes are generally not available to consciousness means that researchers cannot expect participants to report how they make decisions with unfailing accuracy. Rather, the data represents how they attribute or choose to talk about decision-making (see Blume & Covin, 2011). Part of what comes across in the interviews is the participant's struggle to articulate and make sense of the experience of decision-making. It is in these moments that the complexity of elite musical performance is made clear. The richest data from this type of study is found in elucidating the experience of individual participants through their descriptions of the nature of decision-making processes. Any quantification or generalisation of the data from this study should include explanation of individual differences in the transcripts for the results to retain their complexity and meaning.

Although the format of the interview was always the same, the time available for each interview varied and there were differences in the way each interview unfolded. At a basic level these differences can be seen in the word count for the interviews. The average length of the interview transcripts was approximately 6700 words, but the length varied from just under 4000 words to over 16000 words. Some performers spoke in a detailed manner about their chosen movement, including playing excerpts, while others only had the time or inclination to speak quite generally, sometimes about several pieces. In addition, the style of each interview was semi-structured, but the amount of questioning varied between interviewees.

Implications

The differences between individuals found in the study could be thought of as points along a continuum ranging from a completely intuitive to a completely deliberate approach (see Figure 3.5.1). As Dunsby (2002) states, a differentiation should be made between "performers who are more inclined to the intuitive approach, and those who feel that some kind of thorough cognitive underpinning yields better results" (p. 226).

The approach for each performer might vary from piece to piece depending on familiarity and experience.

Figure 3.5.1: Continuum between intuitive and deliberate decision-making

$$\longleftrightarrow$$

Intuitive   Deliberate
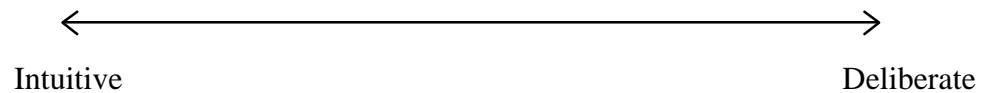
The reasons for a preference towards a greater or lesser contribution from either intuitive or deliberate processes are difficult to ascertain. The interviews revealed much about the nature and experience of intuitive and deliberate decision-making, but the reasons why performers might describe what they do in a certain way were not clear. Possible reasons could include the perceived acceptability of intuition, differences in metacognitive skill, or personal preference based on personality, training, culture, mood, or other factors.

In relation to the question of intuitive versus deliberate processes, the transcripts established that intuitive decisions were usually the result of a "felt sense" or "reacting without thought" which confirms the literature discussed in Chapter 1 (e.g., Betsch, 2008; Brien et al., 2011; Evans, 2012b). Intuition was thought to be based on accumulated experience and therefore could become informed through implicit or explicit learning (see Hogarth, 2001). Some evidence of "procedural" processes as a sub-category of Type 1 processing as theorised in the psychological literature (see Chapter 1, Section 3) was found in the analysis of themes, but this was only described generally rather than in terms of specific musical decisions. Elements of automaticity and affect within intuitive processes were noted and the use of practice to develop intuition led to a proposal that performers might alternate between intuitive and deliberate processes. This alternation might occur as the result of seeking new knowledge to inform one's intuition or by deliberately exploring interpretative possibilities: ideas that resonate with the movement between modes of thinking discussed in Chapter 1 (see Hammond, 2007; Nelson & Rawlings, 2007). Procedural processes and oscillation between methods of decision-making will be discussed in more detail in Part 3 of the thesis.

The interview study demonstrated that performers experience complex interactions between intuitive and deliberate processes when solving musical problems, and draw on a range of influences from their past and beliefs about how decisions are best made. The second part of the thesis will look at ways in which the experiences articulated by performers could be observed in real time.

Part 2:

Observing the process

Chapter Four

Introduction

Having examined the decision-making process through the lens of self-report in interviews with leading period instrument performers in the previous chapter, the second part of the thesis will discuss ways in which the decision-making process could be observed using more implicit measures. As an introduction to the design and analysis of an experimental study, it is helpful to briefly return to the conceptual framework and psychological literature discussed in Chapter 1.

1. Default-interventionist models

In *Educating intuition*, Hogarth (2001) likens consciousness (or conscious awareness) to attention by defining it as the contents of working memory that change from moment to moment (pp. 16-17). Hogarth goes on to propose a two-systems framework for learning and doing, labelled the tacit and the deliberate. Like the theories discussed in Chapter 1 (see Table 1.3.1), this framework could also be described using Type 1 (tacit) and Type 2 (deliberate) terminology. According to Hogarth, the deliberate system involves the effortful and relatively slow processing of information through deliberate, conscious mechanisms. The tacit system covers all thought processes that are neither deliberate nor conscious and therefore accounts for "the lion's share of mental life" (p. 193). Hogarth suggests that the tacit system is the "default" system, while the deliberate system is invoked either when the tacit system cannot solve the problem at hand or when a conscious decision is being made (p. 200).

Hogarth's view of how dual processes interact seems to be a version of the default-interventionist model, a model that has been briefly discussed in Chapter 1 in contrast with views of dual processes as mutually exclusive or as activated concurrently (parallel-competitive). The default-interventionist model proposes that heuristic (intuitive) processes generate a default response: the response that will be given unless

there is intervention by analytic (deliberate) processes (Evans, 2007; Glöckner & Witteman, 2010a; Kahneman & Frederick, 2002; Stanovich, 1999).

Evans (2007) has outlined the default-interventionist model as a heuristic Type 1 process that generates response R or response N (not-R), with analytic Type 2 intervention either leading to a confirmation or alteration of R or N. In Figure 4.1.1, Evans' diagram has been adapted to use the terms intuitive and deliberate, with letters to indicate the probability of an intuitive response R (a) or response N (1-a), the probability of deliberate intervention (b), and the probability of R or N being confirmed intuitively (1-b) or deliberately (c or 1-c). Therefore, there are three routes to R: 1) intuitive R, no deliberate intervention, 2) intuitive R, deliberate intervention, leading to R, and 3) intuitive N, deliberate intervention, leading to R. For example, a performer could intuitively decide to slur a sequence of notes (intuitive R), but this decision could be brought to conscious attention and analysed at a later point, then either confirmed (deliberate R) or changed (deliberate Not-R). The process of decision-making could continue after this in a number of ways, but according to the model, always begins in reaction to the initial, intuitive response.

Figure 4.1.1: Default-interventionist model of dual processes (adapted from Evans, 2007, p. 328)[2]
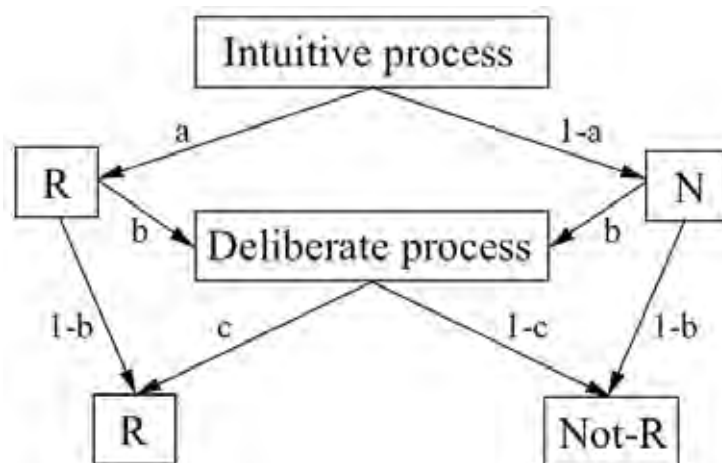
More recently, Evans (2011) has described a "new general model of intervention on default intuitive responses" (p. 95). Termed the Intervention Model, this model attempts to give a more detailed account of factors that lead to the intervention of deliberate Type 2 processes. For example, the Intervention Model includes the idea that "Type 2 processing is engaged with a *variable* degree of effort" and the degree of effort engaged is influenced by motivational factors and cognitive resources (Evans, 2011, p. 95). In Figure 4.1.2, Evans' Intervention Model has been adapted to use the terms intuitive and deliberate instead of the original intuitive and reflective.

The motivational factors that influence the intervention of Type 2 processes include a feeling of rightness (FOR): the "affective experience of confirmation or sense of confidence" that accompanies an intuition (Thompson & Morsanyi, 2012, p. 94; also see Hogarth, 2010, p. 339; Thompson, 2009; Thompson, Turner, & Pennycook, 2011). According to Thompson and Morsanyi (2012), the strength of the FOR that accompanies the answer generated by Type 1 processes affects the probability and extent of Type 2 engagement (p. 94). This appears to be a refinement of theoretical positions such as the measure of confidence in intuitive and analytical answers proposed by Hammond et al. (1987, see Table 1.3.4). Mangan (1993) connects this feeling of rightness to aesthetic experience:

> Aesthetic phenomenology appears to have at its core an especially intense experience of rightness. It is this feeling that gives aesthetic experience its phenomenological profile: the sense of immediate correctness, of an especially well-integrated or "right" relation of parts, of a primary and metaphysical YES! of cognitive disclosure (p. 97).

According to the Intervention Model (see Figure 4.1.2), if an intuitive answer 1 (A1) is not justified deliberately, an attempt will be made to rethink the problem and lead to an answer 2 (A2). Evans (2011) points out that A1 may actually be the same as A2 and such cases reflect confabulations or justifications for the initial intuition (p. 96). The attempt to rethink the problem may fail if it is constrained by cognitive resources, resulting in a reversion to the initial A1, a random guess, or no answer altogether.

Figure 4.1.2: The Intervention Model (adapted from Evans, 2011, p. 94)[3]
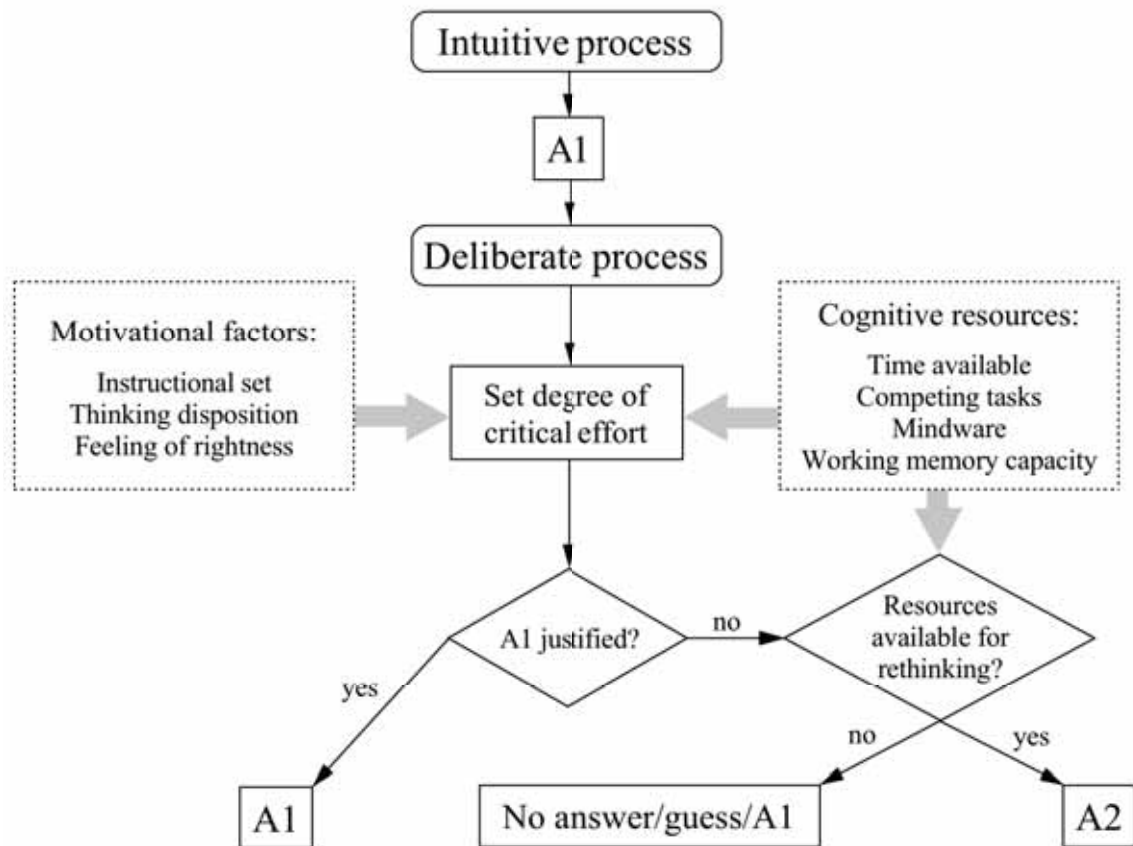
Default-interventionist models can provide the basis for measuring intuitive and deliberate processes of decision-making in an implicit, relatively objective way. One manipulation would be to choose tasks that necessitate the use of either intuitive or deliberate process; tasks that lie closer to the intuition-inducing pole or analysis-inducing pole of Hammond's task continuum (see Figure 1.3.1). For example, the Intervention Model predicts that sight-reading an unfamiliar piece of music would be highly intuition-inducing since the task would capture a performer's first, default reaction to the music (intuitive A1 in Figure 4.1.2). In contrast, a practice session with a goal of performance at the end would be analysis-inducing since this task would enable and encourage the intervention of deliberate processes (deliberate A1/A2 in Figure 4.1.2). The next chapter will demonstrate how a study designed around these principles was able to explore the process of musical decision-making in a laboratory setting.

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[3] Adapted from *Developmental Review, 31*, J. St. B. T. Evans, Dual-processing theories of reasoning: Contemporary issues and developmental applications, Copyright 2011, with permission from Elsevier.

Chapter Five

Musical decision-making in solo Baroque violin music

1. Aims

This chapter explores the musical decision-making processes of Baroque violinists within three different, but familiar settings: a sight-read, a practice period, and a performance. Over a time period of between ninety minutes and two hours, participants in this study were asked to carry out a condensed version of the interpretative process, making what is typically a private process of many hours, weeks, or months observable to the researcher in a relatively controlled, experimental procedure. This study differs considerably to the interview study (Chapter 3) in that it aims to distinguish between intuitive and deliberate decisions through observed actions and not solely self-report (see Hodgkinson & Sadler-Smith, 2011).

The term sight-read is defined in this study as performing from a score without any preceding practice on the instrument of that score (Gabrielsson, 2003, p. 243). According to Lehmann and Kopiez (2009, p. 349), sight-reading provides a complex problem-solving situation with an intricate interplay of bottom-up mechanisms (driven by the input stimulus of the score and auditory feedback) and top-down processes (driven by expectations and cognitions).

Hypotheses

Based on default-interventionist models of dual process theories, sight-read decisions were assumed to be wholly intuitive in nature. In contrast, practice was assumed to represent wholly deliberate processes; a task in which performers make deliberate musical choices based on their analysis of various issues involved in performing the piece. Performance decisions were therefore predicted to contain a mixture of decisions made intuitively (not planned) and deliberately (planned during practice).

The Intervention Model discussed in the previous chapter (Evans, 2011; see Figure 4.1.2) suggests that various factors related to motivation and cognitive resources affect the degree of Type 2 processing effort. Factors related to motivation in this study include the directions given to participants (instructional set), preference for Type 1 or Type 2 thinking (thinking disposition), and degree of trust in intuition (feeling of rightness). Factors related to cognitive resources include the time allocated for practice (time available), the complexity of the task and piece (competing tasks), the availability of relevant explicit rules and procedures (mindware acquired through education), and individual differences in cognitive ability (measured by working memory capacity). Due to the relatively short practice period, the technical challenges involved and the experience of the participants, it was hypothesised that the majority of performance decisions would be made intuitively.

2. Method

In their review of the literature on intuition, Hodgkinson, Langan-Fox, and Sadler-Smith (2008, p. 18) suggest that a promising approach to studying intuitive processes would be through time-pressured decision tasks, accompanied by knowledge elicitation techniques (also see Horstmann, Hausmann, & Ryf, 2010, pp. 224-226). This combination of techniques has the potential to "reveal the ways in which individuals' representations of decision problems differ when switching from System 1 (intuitive) type processing to System 2 (analytic) type processing" (Hodgkinson et al., 2008, p. 18). This study introduced time-pressure in the form of reading a technically challenging piece at sight to induce intuitive, default processes of decision-making. As Evans (2011) notes, "speeded tasks reduce Type 2 intervention" (p. 96). A forty-five minute practice session then gave participants the opportunity to engage deliberate, analytical processes. Following this, participants were required to perform the piece. All three stages of the study were accompanied by the knowledge elicitation technique of thinking-aloud, a method that will be explained later in the chapter.

This study defined deliberate performance decisions as those that were planned by the performer. These intentions were observed through verbalised thoughts or marks on the score during the practice session. All other performance decisions were considered

intuitive. Therefore, intuition was defined by the absence of any observed deliberate processes. Before explaining the procedure and method of data analysis in more detail, this section will outline the participants and materials used in the study.

<u>Participants</u>

Professional Baroque violinists based in Australia were approached to take part in the study. While highly experienced specialists in Baroque performance were the target participants, the relative lack of such performers currently based in Australia who were available to take part in the study meant that participants varied in period instrument training and experience. The seven violinists who participated in the study had an average of 5.7 years of training in Baroque performance practice (range: 1-10, $SD = 6.6$). Training was defined as the number of years since they started taking regular lessons on Baroque violin. There were five female and two male participants, with an average age of 31 (range: 22-40, $SD = 3$).

Differences in the amount of training and regularity of period instrument ensemble employment led to the grouping of participants into three categories according to their level of expertise at the time of participation in the study. Table 5.2.1 outlines three levels of expertise with expertise group 1 (E1) defined as participants with more than five years of Baroque violin training and regular period ensemble employment (performed mainly as part of period ensembles). Participants in expertise group 2 (E2) also had more than five years of Baroque violin training but only worked on a casual basis in period ensembles (performed mainly as part of mainstream ensembles). Expertise group 3 (E3) were participants with less than five years of Baroque violin training and casual period ensemble employment.

Table 5.2.1: Background information on participants

Participant	Baroque violin training				Period ensemble employment	
	< 5yrs	> 5yrs	In Australia	Overseas	Casual	Regular
P2		✓		✓		✓
P3		✓	✓	✓		✓
P4		✓		✓	✓	
P5		✓	✓		✓	
P6	✓		✓	✓	✓	
P7	✓		✓		✓	
P1	✓		✓		✓	

▇ E1: Participants 2 and 3
   More than 5 years Baroque violin training, regular period ensemble players
▇ E2: Participants 4 and 5
   More than 5 years Baroque violin training, casual period ensemble players
▢ E3: Participants 6, 7 and 1
   Less than 5 years Baroque violin training, casual period ensemble players

Participant 1 was the subject of a pilot study carried out at the University of New South Wales in December 2008. As there were no significant alterations to the methodology following the pilot study, the results of the pilot have been included in the main study. Data collection with a further six participants was carried out between April 2009 and February 2010. These six participants were given the option of taking part on university premises but opted to use their own homes as the location for the study. Participants were recruited by email and were told that they would be taking part in a study about musical decision-making in period performance. This generic description was designed to explain the need for collecting retrospective and concurrent think-aloud data.

All participants were given informed consent forms to sign and were paid AUD$120 for taking part. The experiment took approximately ninety minutes to two hours so the payment was calculated to remunerate participants for two hours of their time. The remuneration was slightly more than an average professional rate for two hours rehearsal but less than for two hours of teaching (according to Musicians Union of Australia website, July 2008).

<u>Materials</u>

The piece used in the study was the Grave from Assaggio in C minor BeRI 310 for solo violin by the Swedish composer Johan Helmich Roman (1694-1758). As Principal Conductor of the Royal Orchestra in Stockholm from 1727 to 1745, Roman is considered one of the most important figures in Swedish music of the Baroque period. Known as "the Swedish virtuoso" (Helenius-Öberg, 1994), Roman studied in London from 1716 to 1721 where he worked in Handel's opera orchestra and met Pepusch, Ariosti, Bononcini, and renowned violinists Geminiani and Veracini.

Roman's Assaggi (essays, attempts, experiments) are structured like sonatas of three or four movements and were composed mainly during the 1730s (Bengtsson & Frydén, 1958/1976, p. vi), possibly during Roman's second period of study abroad from 1735 to 1737 (Helenius-Öberg, 2000). The solo compositions by J.S. Bach were not known to Roman and the stylistic influences on his Assaggi are thought to be works by Geminiani and perhaps Locatelli and Telemann (Bengtsson & Frydén, 1958/1976, p. vi; also see Bengtsson, 1987). The Assaggio in C minor has been recorded on three occasions, by Jaap Schröder, Peter Csaba, and Tobias Ringborg (see Discography).

Performing the Grave involves dealing with several technical difficulties and issues of performance practice. The features of the piece include:
- Three distinct sections marked by changes in time signature: seven bars in common time, thirty-four bars in simple triple (3/4), and twenty-three bars in common time.
- Extensive double stopping, including some chromaticism.
- Frequent variation of melodic and rhythmic ideas, combined with changes in articulation.
- Trills, mainly at cadence points.
- Chords written as triple and quadruple stops in the third section of the piece, which can be arpeggiated in numerous ways.

The score used in the study was created using the notation software program Sibelius (Version 6), based on several manuscripts and editions of the piece (see Table 5.2.2).

These sources included the autograph manuscript accessed online (source A in Table 5.2.2). Importantly, the score given to participants was altered so that it did not identify the composer's name and did not include any expressive markings such as dynamics and ornamentation (see Appendix A). Bowings were left in, as was the initial tempo indication of Grave. This was done to leave the basic directions for the performer intact while providing more opportunities for varied musical decision-making on more complex issues of interpretation. With some information removed, on what assumptions would performers base their musical decisions?

Table 5.2.2: Grave from Assaggio in C minor BeRI 310, manuscripts and editions

Source	Description
A	Roman autograph manuscript MAB: Ro no. 61. Scanned images accessed through the database of the Roman Collection of the Music Library of Sweden http://www.muslib.se/ebibliotek/roman/index.php?lang=en
B	Copy by Per Brant (1714-1767), Roman's pupil and successor at the Royal Orchestra MAB: Ro no. 60. Scanned images accessed through the database of the Roman Collection of the Music Library of Sweden http://www.muslib.se/ebibliotek/roman/index.php?lang=en
C	Modern edition by Ingmar Bengtsson and Lars Frydén, published in 1958. Monumenta Musicae Svecicae, Vol. 1. Stockholm: Almqvist & Wiksell. Reprinted in 1976 by Edition Reimers ER 107001.
D	Modern edition by Johan Tufvesson, released online in 1999. PDF file accessed at http://www.runeberg.org/rassavln/index_e.html

The selection of the Assaggio in C minor by Roman for this study was made on the basis that participants were not likely to be familiar with this repertoire since the Assaggi are not as well known as other solo violin works from the period. During the study all participants confirmed that they had not seen, played, or heard this music before. The Grave was chosen for its various technical and musical challenges, making the piece similar to one that participants could encounter as part of their professional practice.

The study was video recorded for transcription and analysis purposes with a Canon XHA1 High Definition video camera with RODE Stereo VideoMic, a MacBook Pro laptop, and a Zoom H4 digital recorder for audio backup. Video was captured using Final Cut Pro (Apple Inc., Version 6.0, 2007) and played back to participants using QuickTime Player.

<u>Procedure</u>

A three-step procedure of sight-read, practice, and performance was conducted with each participant. As each step of the procedure involved the collection of verbal data from participants by asking them to think-aloud, a brief overview of this method below precedes a detailed procedure outline.

Think-aloud protocols

Verbal protocol analysis is a procedure used to identify psychological processes involved in solving tasks through analysis of a verbal record or protocol (Austin & Delaney, 1998; Ericsson & Simon, 1993; Newell & Simon, 1972; Richardson & Whitaker, 1996). As Yang (2003) notes, "in protocol studies, the researchers' interests lie not just in the solution to a sequence of actions, but in the processes underlying the sequence itself" (p. 98). Protocol studies collect data by asking participants undertaking a task to 'think-aloud' in order to capture the thought processes and strategies being used to complete the task. Think-aloud methods have previously been applied in music research to study various processes involved in listening, composition, practice, and performance (e.g., Bundra, 1993; Chaffin & Imreh, 2001; Collins, 2005; Davidson & Welsh, 1988; London, 1982; Reitman, 1965; Whitaker, 1989; Younker & Smith, 1996; Zerull, 1993).

The standard reference in think-aloud methodology is Ericsson and Simon's *Protocol analysis: Verbal reports as data* (1984, Rev. ed. 1993). Ericsson and Simon differentiate between concurrent verbal reports, which are articulations of thought processes as they occur, and retrospective reports gathered after a task has been completed. They conclude that concurrent think-alouds need not affect the process being studied and can provide a good indication of the processing in performing a task, while retrospective think-alouds are more subject to error. Retrospective think-alouds are particularly subject to error when the respondent reports about implicit processes (Ericsson & Simon, 1993). In addition, a study by Kuusela and Paul (2000), reported that more data are collected through concurrent rather than retrospective reporting. The authors also found that concurrent reports focus on the decision-making

process, whereas retrospective reports focus on decision outcomes (Kuusela & Paul, 2000, p. 400).

The think-aloud methods used in the current study were designed with reference to Ericsson and Simon (1993; also see Ericsson, 2006; Trickett & Trafton, 2009; Van Someren, Barnard, & Sandberg, 1994), while the specific instructions for the think-alouds were adapted from Renwick's (2008, p. 132) use of verbal reports in the field of music education. The current study required three verbal reports from each participant, one concurrently during practice and two retrospectively with the aid of video playback. While concurrent protocols have the advantage of not relying on the participants' ability to accurately recall their processes of thinking, the need to articulate thought processes may alter the activity in which the participant is engaged.

Procedure outline

The three-step procedure used in the study was as follows:

1. a. The participant was given ten to thirty seconds to look at the piece before being asked to sight-read it. After the sight-read, the participant was asked if they had seen, played, or heard this piece of music before.

    b. A think-aloud was then conducted using the following instructions based on Renwick (2008):

    > I'd like you to watch the video of yourself sight-reading and tell me what's happening. You might see something on the video that reminds you of what you were thinking at the time. I want you to tell me everything that you remember thinking when you were playing, even things that seem irrelevant, trivial or obvious. You don't need to explain or speak in complete sentences: just think aloud. You are welcome to pause or rewind the video at any time.

    The participant had access to the score during the think-aloud. During the think-aloud, the researcher asked brief questions about the thought processes being verbalised such as "can you explain that further?" or clarifying questions such as "what do you mean?" Specific questions about intuitive or deliberate process of decision-making were avoided.

2. The participant was given up to forty-five minutes to practise the piece in private. During this time, the participant was encouraged to talk while practising. The instructions for this concurrent think-aloud was again based on Renwick (2008):

> When I leave the room you will have up to forty-five minutes in which to practise the piece and mark the score, after which you will be asked to perform the piece as if to an audience as part of a solo recital. During your practice, speak whatever is on your mind as if talking to yourself. Try to articulate what you are thinking now instead of thinking for a while and then describing your thoughts. If you fall silent for an extended period of time I may prompt you to keep talking. You don't need to justify things and you don't need to speak in complete sentences: just think aloud.

The participant was given a pencil to mark the score.

As noted above, the participant was encouraged to mark the score as much or as little as they liked. This was designed to keep the practice session close to a real situation and to avoid showing any preference for a particular method of decision-making. The aim was not for the participant to create an annotated score of all decisions, but to use what occurred during the practice period as a way to distinguish between types of decision-making.

3. a. When the participant had completed their practice session, they were asked to perform the piece as if to an audience as part of a solo recital.

   b. A think-aloud was then conducted using the same instructions as outlined in step 1:

> I'd like you to watch the video of yourself performing and tell me what's happening. You might see something on the video that reminds you of what you were thinking at the time. I want you to tell me everything that you remember thinking when you were playing, even things that seem irrelevant, trivial or obvious. You don't need to explain or speak in complete sentences: just think aloud. You are welcome to pause or rewind the video at any time.

The participant had access to the score during the think-aloud, but did not make further markings. During the think-aloud, the researcher asked brief questions about the thought processes being verbalised. After the think-aloud, further discussion was prompted by the following questions:

- What do you think the main differences were between the sight-read and the performance?
- During the sight-read, practice, and performance, were you aware of how and on what basis you made the interpretative decisions that you did?
- If you had to perform this piece in a month's time, what would you do to prepare?

Data analysis procedure

While verbal protocol analysis is generally applied to tasks that involve little overt behaviour, the performance data in this study provides valuable information about the kinds of decisions the performer made over time. Once the verbal protocols for each participant were transcribed in full, the performance data were analysed using a three-step process of annotation, tabulation, and categorisation.

The first step involved the creation of three music scores representing the three stages of the study for each participant. Sight-read and performance scores were created through a process of repeated close listening. Using the audio and video recordings, two blank music scores were marked with features heard and observed in the participant's playing that deviated from the written score. The practice score refers to the score used by the participant during the study and includes all the markings made during the practice period. This resulted in three music scores: an annotated score representing the sight-read (SR score), the score marked by the performer during the practice session (P score), and an annotated score representing the final performance (PF score). Each score was created after listening to the audio and video files numerous times and two weeks after the initial analysis, a second listening either confirmed or altered what was marked during the first analysis.

The second step was to enter all the information from the scores into a Microsoft Excel spreadsheet. The spreadsheet aligned every marking from each score with a bar reference. In addition, the spreadsheet included any relevant thoughts verbalised by the performer during the practice session. Three example decisions selected from various bars are provided in Table 5.2.3. To clarify the first example, the entry under bar 2.1 refers to a performer who accented the first beat of the second bar during the

performance but not in the sight-read and marked the score with an accent during the practice session.

Table 5.2.3: Examples of data analysis procedure

Bar	Sight-read	Practice mark	Practice comment	Performance
2.1	[no accent]	accent	[none]	accent
6.4	[no trill]	trill	Definitely some sort of ornament…	trill
39.1	slurred	[none]	[none]	separate bows

The final step in the quantitative analysis procedure was to identify and categorise the musical decisions. Categorisation was informed by dual process theories that distinguish between intuitive decisions made without conscious awareness and deliberate decisions made with conscious awareness (e.g., Betsch, 2008; Evans, 2012a; see Chapter 1). The characteristic of conscious awareness was used to differentiate between musical decisions resulting from intuitive processes and those due to deliberate processes. The study assumed that markings by the participant in their practice score or comments on decisions during the practice period were indicators of conscious, deliberate thought processes. Based on default-interventionist models of dual process theories (Evans, 2007, 2011), any decisions not marked in the score or commented on during practice were classed as intuitive. This is a conservative approach theoretically biased towards coding as deliberate since a performer may not be able to give an explicit reason for an action such as marking the score. A marking may just be an expression of an intuitive, feeling based decision, but it does indicate some externalisation and awareness of that decision. In other words, there may have been Type 1 processes occurring during practice but what was coded was assumed to be manifestations of Type 2 thinking.

By comparing the final performance with the practice period, three types of decisions were identified: intuitive, deliberate, and deliberate not executed. It is important to note that these categories refer to decisions in the final performance condition (PF score) since the sight-read condition was assumed to reflect wholly intuitive processes and the practice condition wholly deliberate processes. The three categories were defined as follows:

1. Intuitive decisions: Performance decisions that were not marked or commented on during the practice period.

2. Deliberate decisions: Performance decisions that were marked or commented on during the practice period.

3. Deliberate decisions intended but not executed: Markings in the score or performance intentions verbalised during the practice period that were not executed or were not perceptible to the researcher in the final performance. As these decisions were made deliberately, this category can be considered a sub-set of deliberate decisions.

The categories were then divided further by considering whether the performance decision matched the sight-read, resulting in six groups of decisions. In Table 5.2.4, the six categories are explained through the example of a decision about a slur. This hypothetical example would be in response to a group of separately bowed notes.

Table 5.2.4: Six categories of decision-making observed in the study

Observations (example)			Analysis	
Sight-read	Practice	Performance	Outcome	Process
Slur	No mark/comment	Slur	1. Same	Intuitive
Slur	No mark/comment	No slur	2. Different	Intuitive
Slur	Mark/comment to slur	Slur	3. Same	Deliberate
Slur	Mark/comment not to slur	No slur	4. Different	Deliberate
Slur	Mark/comment not to slur	Slur	5. Same	D not executed
Slur	Mark/comment to slur	No slur	6. Different	D not executed

Categories
1. Intuitive decision, performance decision same as sight-read
2. Intuitive decision, performance decision different to sight-read
3. Deliberate decision, performance decision same as sight-read
4. Deliberate decision, performance decision different to sight-read
5. Performance decision intended to be same as sight-read, but not executed
6. Performance decision intended to be different to sight-read, but not executed

The data coded as specific musical decisions will be discussed in Section 3, including musical examples, while the think-aloud protocols and their broader implications will be discussed mainly in Section 4. Like the interview study (Chapter 3), the discussion sections employ a mixed method approach to analyse the results, using both quantitative and qualitative techniques.

3. Results and discussion A: Musical decisions

This section will discuss specific musical decisions made by participants during the study, based on analysis of the sight-read (SR score), practice session (P score), and final performance (PF score). In total, the study identified 551 musical decisions in the final performances, which were categorised as intuitive, deliberate, or deliberate not executed. Overall results will be reported first in this section, followed by examples of intuitive and deliberate decision-making discussed in relation to the specific musical context.

<u>Overall results</u>

Categories

The study found a large proportion of intuitive decision-making overall. 451 performance decisions were classed as intuitive, 67 as deliberate, and 33 as deliberate but not executed. Therefore, intuitive decisions accounted for approximately 82% ($N =$ 451) of all performance decisions made across all participants, with the remaining 18% ($N = 100$) representing more deliberate decision-making (deliberate and deliberate not executed combined).

The overall percentages demonstrate a far greater proportion of intuitive decision-making than the 40% intuitive decision-making overall in the interview study (Chapter 3). This could be interpreted as reflecting the difference between the initial stages of learning a new piece (a movement by J.H. Roman) and bringing to mind years of interpretative choices regarding a familiar piece (solo works by J.S. Bach). In addition, this study used the more implicit measure of performance analysis and annotation to code musical decisions, rather than coding self-reported decision-making by language use.

Performance features

Table 5.3.1 shows the number of performance decisions made for each performance feature and divides overall results into the six categories of decisions outlined in the

previous section. The results for each individual participant with the same subdivisions are provided in Appendix B.

Table 5.3.1: Intuitive versus deliberate decision-making by performance feature

	Intuitive (I)		Deliberate (D)			
	I decision		D decision		D not executed	
Category						
PF vs. SR	1. Same	2. Diff.	3. Same	4. Diff.	5. Same	6. Diff.
Articulation	16	24	2	3	0	4
Bowing	96	143	10	16	3	8
Chord playing	0	4	3	5	0	0
Dynamics	0	8	0	2	0	11
Note duration	65	1	3	0	1	0
Ornamentation	17	22	2	5	0	0
Phrasing	14	26	8	6	0	5
Tempo	6	9	1	1	0	1
Total	214	237	29	38	4	29

Categories
1. Intuitive decision, performance decision same as sight-read ($N = 214$)
2. Intuitive decision, performance decision different to sight-read ($N = 237$)
3. Deliberate decision, performance decision same as sight-read ($N = 29$)
4. Deliberate decision, performance decision different to sight-read ($N = 38$)
5. Performance decision intended to be same as sight-read, but not executed ($N = 4$)
6. Performance decision intended to be different to sight-read, but not executed ($N = 29$)

The performance features listed above incorporate the major elements of musical interpretation that were either heard or observed in the video recordings. The selection of these features was influenced by the analysis of the interviews in Chapter 3 and includes seven of the twelve performance features discussed by the interviewees. The eight performance features in Table 5.3.1 include a new category of note duration that refers to difference between the written value and performance duration of notes. These decisions usually occurred within double or triple stops, for example the shortening of a lower note in a double stop. For the decision to be annotated, the note would have to be shortened by more than half its notated length. For bowing decisions, only the initial bow change was counted, not subsequent natural deviations resulting from the initial decision. Chord playing refers to any variation on playing triple or quadruple stopped chords, usually through a form of arpeggiation. The category tempo refers to new tempi at the beginning of sections or a rallentando or accelerando. Tempo was calculated from audio recordings by dividing the overall duration of a

section by the number of beats (bars with a rallentando or accelerando were omitted from the calculation).

Figure 5.3.1 shows the number of performance decisions for each performance feature and the process by which the decisions were made, collapsed across participants.

Figure 5.3.1: Performance decisions categorised by performance feature
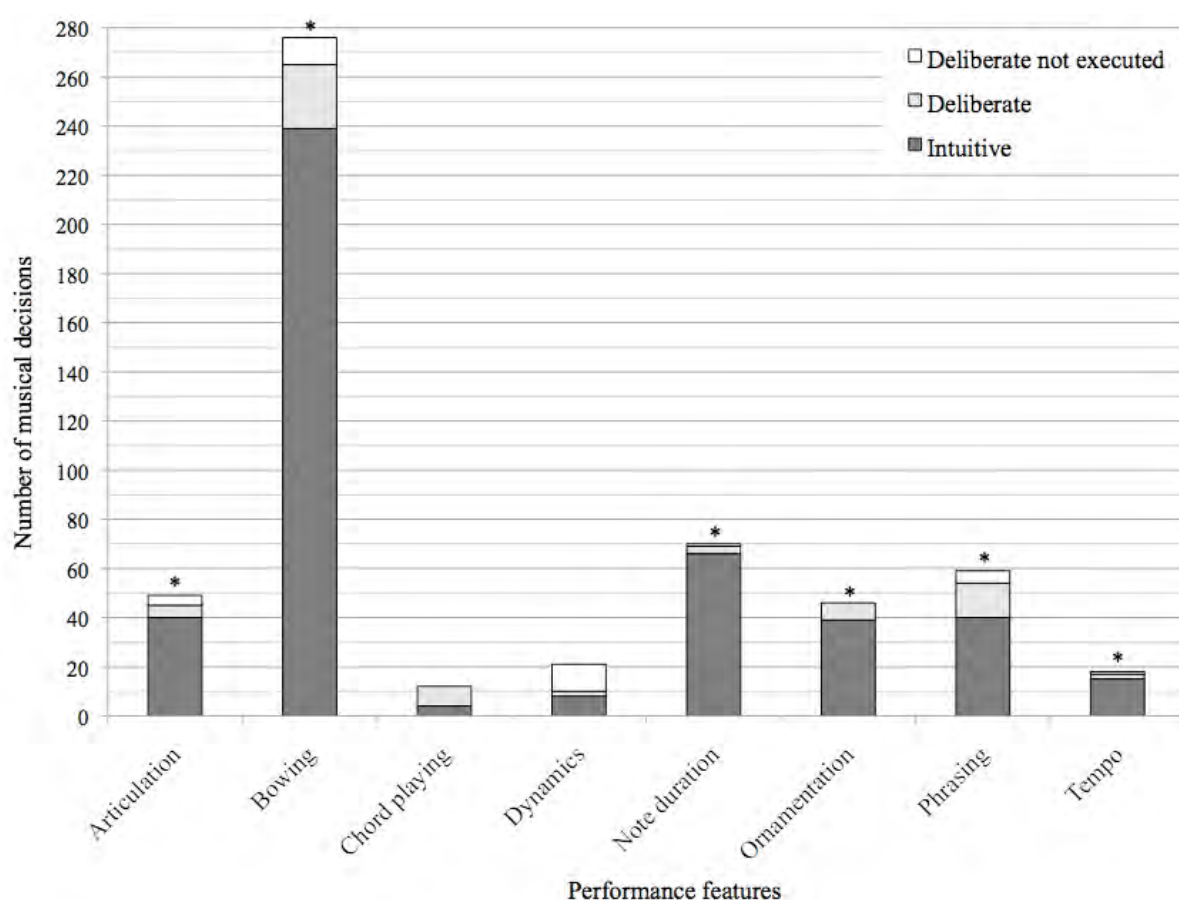
* $p < .05$ for Chi-square test for difference between intuitive and deliberate (including deliberate not executed) decision count

The highest number of musical decisions related to bowing, one of the most basic issues involved in string playing. In fact, bowing accounted for just over half (50.1%) of all decisions. The dominance of bowing contrasts with the interview study in which there was a much more even spread of decisions across performance features (see Table 3.3.1). It may be that over time and with more practice other performance features come to the fore, particularly those that communicate Baroque style and expression. In the initial stages however, it is necessary to focus on basic issues to

achieve a proficient performance at the end of a set practice period. For example, Participant 6 described their approach to practice as primarily focused on technical issues: "I guess my decisions were based mainly on just getting the physics of it, like being able to play the notes. I guess most of my focus was on that rather than musical aspects for me."

Given the technical difficulty of the piece, it is not surprising that participants concentrated on the most immediate technical aspects of the composition. A related finding was reported in a longitudinal study of pianist Gabriela Imreh, in which the pianist worked primarily on issues of musical structure and basic dimensions in early practice sessions, and comments during practice were predominantly about basic issues of technique (Chaffin, Imreh, & Crawford, 2002; Chaffin, Imreh, Lemieux, & Chen, 2003). A similar study involving a singer and conductor also found that the highest proportion of comments during first practice sessions were about basic issues (Ginsborg, Chaffin, & Nicholson, 2006; also see Ornoy, 2008, pp. 12-14). Therefore, the distribution of decisions across certain performance features is likely due to a combination of participants having to perform an unfamiliar piece after a relatively short practice period, the specific challenges of the piece, and the limitations of the coding process.

As shown by Figure 5.3.1, some performance features were more often the result of a particular process of decision-making. Eight tests were carried out using Chi-square analysis with Bonferroni correction for multiple comparisons to determine if the difference between intuitive and deliberate decisions within each performance feature was significant. The analysis demonstrated that there were significantly more intuitive than deliberate decisions (including deliberate not executed) in five of the eight performance features: articulation, $X^2 (1, N = 49) = 19.61$, $p < .001$, bowing, $X^2 (1, N = 276) = 147.84$, $p < .001$, note duration, $X^2 (1, N = 70) = 54.91$, $p < .001$, ornamentation, $X^2 (1, N = 46) = 22.26$, $p < .001$, and tempo, $X^2 (1, N = 18) = 8$, $p = .04$. The finding that decisions about chord playing and dynamics were mainly made deliberately suggests that these features require more deliberation even at the very beginning of learning a new piece.

The category of deliberate decisions not executed occurred mainly in relation to dynamics and bowing, and raises the question of why these cases occurred. There are several possibilities, such as the participant forgetting to clearly mark their decision in the score, lack of practice time, or the intrusion of unwanted, habitual responses. It may also be that these cases were just mistakes or a failure to deliver the intention with sufficient clarity to be perceived in the coding process.

Bar number

To clarify how the choices made by performers was distributed across the piece, the processes of decision-making was examined bar by bar. Analysis of sections or bars in which a larger number of decisions were made may give further insight into the priorities of the performers. In Figure 5.3.2, the three categories have been collapsed into intuitive and deliberate (including deliberate not executed) to show decision-making in the final performance graphed by bar number. Grey columns mark the phrase boundaries in the piece with the two darker columns representing section changes (changes in time signature).

Figure 5.3.2: Intuitive versus deliberate decision-making by bar number
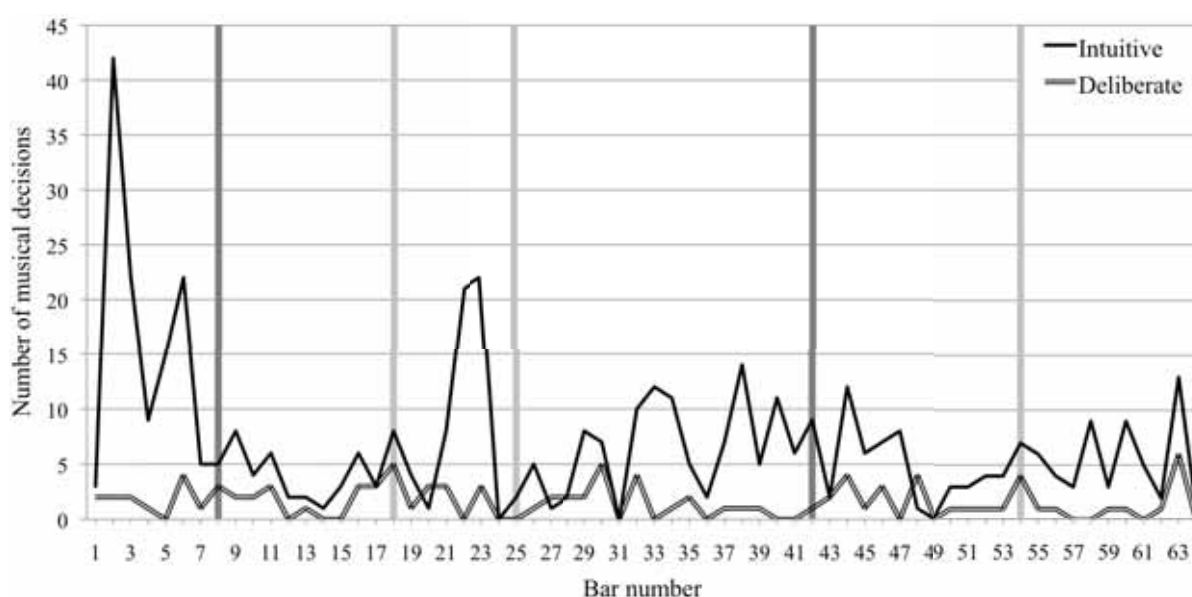
In almost all bars, more intuitive decisions were made when compared to deliberate (the exceptions being bars 20, 27, and 48). The widening of the gap between intuitive

and deliberate in certain passages can be explained by the specific challenges in those bars. For example, bars 22-23 consist of double stops in which the lower note was usually shortened while ornamentation was often added in bars 32-34. As discussed earlier, intuitive processes primarily directed decisions about both note duration and ornamentation. In contrast, a place where deliberate decision-making became more prominent is bar 48, the bar at which quadruple stops are first introduced. This bar will be discussed in more detail later in this section.

The number of deliberate decisions is fairly consistent across the piece, but the number of intuitive decisions varies greatly between certain bars. Bars with a large number of intuitive decisions seem to coincide with musical material that involves the manipulation of several performance features. For example, the first section of the piece (bars 1-8) has a high number of intuitive decisions, reflecting opportunities for shaping these bars by manipulating phrasing, articulation, bowing, and note duration. Even though a high number of decisions were made in the first section, this section was practised less than the rest of the piece (see Figure 5.3.3). This could indicate that while the first section was musically interesting and delivered quite intuitively, the rest of the piece required more technical consolidation.

Figure 5.3.3: Number of times each bar was practised (all participants combined)
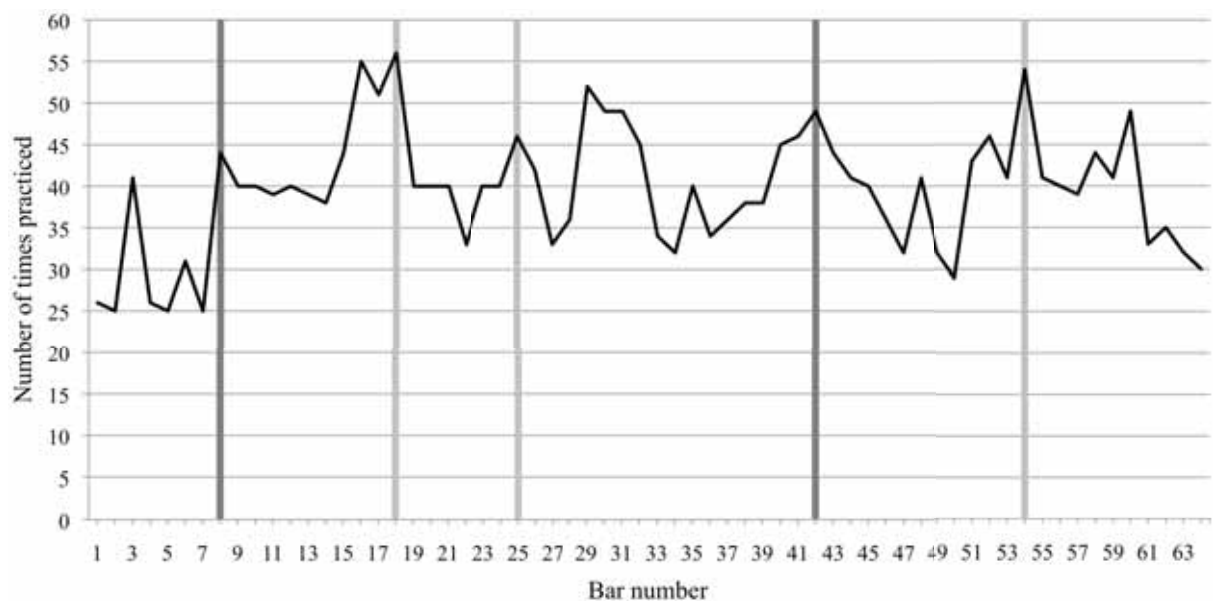
A comparison of the number of decisions in each bar (Figure 5.3.2) with the number of times practiced (Figure 5.3.3) reveals a corresponding peak in a few bars (bars 6, 16, 18, and 54), but generally there is no overall pattern or relationship between the two. This result would be expected if the practice session were mainly used to gain greater technical fluency rather than to engage with or manipulate musical features in the piece. The peaks in Figure 5.3.3 also suggest an attitude of 'playing through' for comfort during practice without making specific decisions. For example, peaks at phrase boundaries were due to the performer starting and stopping at structural boundaries rather than in the middle of sections, a result also found in a study of piano practice by Chaffin and Imreh (1997). There were also certain technically difficult passages that were practised several times involving double stops and quick string crossings (bars 16 and 29-31). If there was more practice time given or if the piece has less technical difficulties, practice sessions may have focused on more musically challenging bars. If another study was conducted using a simpler piece for example, practice time may be used more as an opportunity to experiment with musical possibilities using deliberate strategies of decision-making to a greater degree than found in the present study.

Participants

The total number of musical decisions made by participants ranged from 44 (P6) to 122 (P2), but for all participants, the preferred method of musical decision-making was an intuitive, rapid process requiring no observed conscious deliberation (see Figure 5.3.4). The average percentage of intuitive/deliberate decision-making by participant was 83.5/16.5, a figure close to the overall result of approximately 82% intuitive and 18% deliberate. In Figure 5.3.4, the results are graphed according to participants with the total number of decisions for each participant shown at top of each column.

Figure 5.3.4: Performance decisions categorised by participant
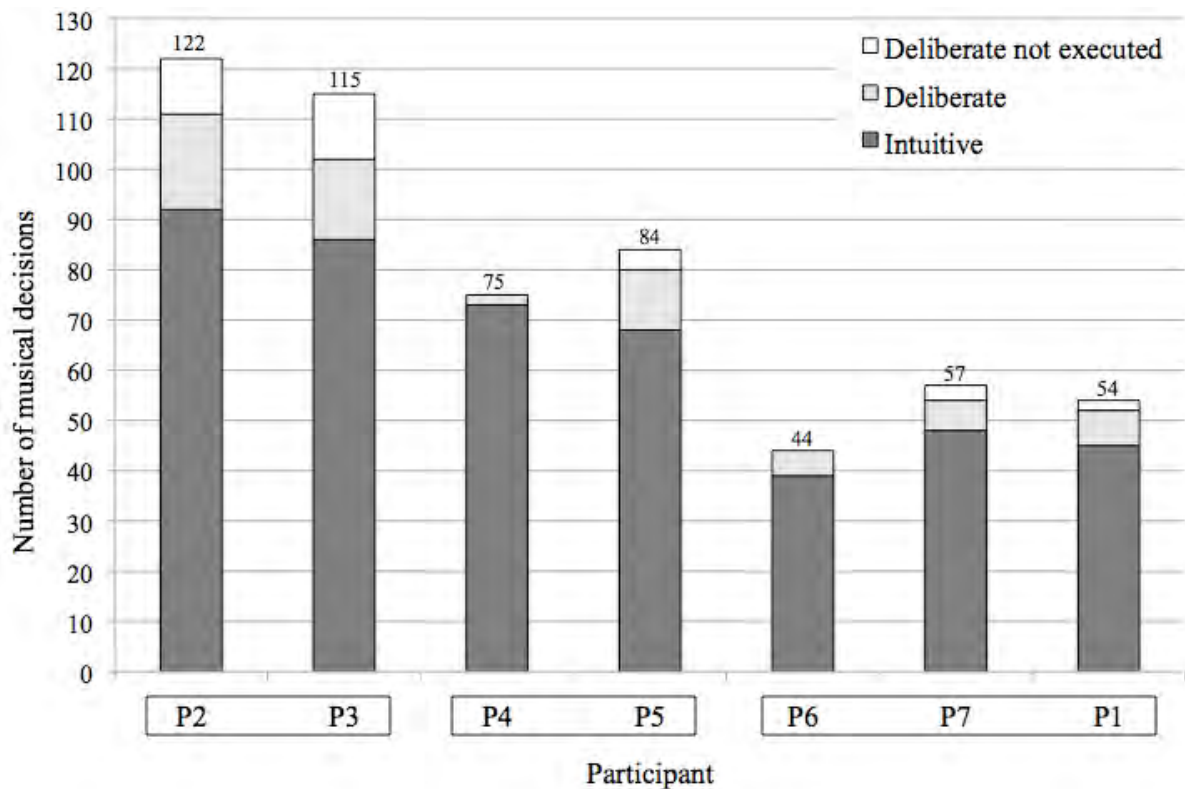
Participants grouped by level of expertise: E1 (P2 & P3), E2 (P4 & P5), E3 (P6, P7 & P1)

As suggested in Chapter 3, individual participants could lie along a continuum representing differing proportions of intuitive and deliberate decision-making. In this study however, the results suggest that some of the variance between participants may be due to levels of expertise. All three paired combinations of expertise groups were tested using Chi-square analysis with Bonferroni correction for multiple comparisons to determine if the differences between total numbers of decisions were significant. The analysis found that the most experienced players (E1) made significantly more decisions in total than players in E2, X^2 (1, $N = 396$) = 15.36, $p < .001$. In turn, players in E2 made significantly more decisions in total than those players categorised as E3, X^2 (1, $N = 314$) = 14.80, $p < .001$. In addition, Chi-square analysis (6 tests with Bonferroni correction) of intuitive and deliberate decisions collapsed within expertise groups found that players in E1 made significantly more deliberate decisions than players in E2, X^2 (1, $N = 77$) = 21.83, $p < .001$.

It should be noted that the difference between deliberate decisions in E1 and E2 could be the result of the significantly higher total number of decisions in E1. It is therefore

useful to compare the proportion of intuitive and deliberate decisions by participant. Table 5.3.2 demonstrates that players in E1 made a higher percentage of deliberate decisions (approximately 25%) in comparison to all other participants.

Table 5.3.2: Performance decisions categorised by participant

	Intuitive (I)	Deliberate (D)		Total I vs. D	
Participant	I decision	D decision	D not executed	I %	D %
P2	92	19	11	75.4	24.6
P3	86	16	13	74.8	25.2
P4	73	2	0	97.4	2.6
P5	68	12	4	81	19
P6	39	5	0	88.6	11.4
P7	48	6	3	84.2	15.8
P1	45	7	2	83.3	16.7
Average	64.4	9.6	4.7	83.5	16.5

Legend
■ E1: > 5yrs Baroque violin training, regular period ensemble players
■ E2: > 5yrs Baroque violin training, casual period ensemble players
□ E3: < 5yrs Baroque violin training, casual period ensemble players

In brief, the results suggest that more experienced performers make significantly more decisions, and a greater proportion of deliberate decisions than less experienced performers. For this finding to be verified, further studies with larger numbers of participants would have to be carried out.

Since the process of learning a new piece is ongoing and dynamic, differences between expertise groups could be explained as a different rate of movement along the intuitive/deliberate continuum. The sight-read condition would represent the intuitive pole, with E1 players moving further towards the deliberate pole than other players by the end of the practice session (to a point representing a percentage of approximately 75/25 intuitive/deliberate).

The think-aloud data suggests that the higher proportion of deliberate decision-making for participants in E1 could be the result of more efficient practice strategies. Their greater experience and training in comparison to other participants may have led to a greater availability of relevant mindware (explicit rules and procedures) that could be

applied to the task. In contrast, less experienced players may have been constrained by various factors related to cognitive resources, leading to less decisions overall, less deliberate processing effort, and a greater reliance on intuition. As suggested by the Intervention Model (Evans, 2011; see Figure 4.1.2), these factors could include competing tasks, mindware, working memory capacity, and time available. For example, Participant 4 commented on needing more time to reach decisions about chord playing, "I find that the passage from 42 the end I'd probably need a lot more time to think about what I want to do there. If I want to add things or do arpeggios…" For less experienced players, the practice session may have created more questions than answers if they became aware of various issues without being able to reach a decision relatively quickly. Just before having to perform the piece, Participant 6 stated, "so it almost feels less familiar now than when I first sight read it at this point. I'm starting to notice all the different intricacies of the piece going on."

Performance versus sight-read

As shown in Table 5.3.1, decisions were also separated into those that were the same in the performance and sight-read, and those that were different. Overall, 55.2% ($N = 304$) of performance decisions were different to the sight-read. Similarities and differences between the performance and sight-read conditions are graphed in Figure 5.3.5 by performance feature, collapsed across participants.

Figure 5.3.5: Performance versus sight-read categorised by performance feature
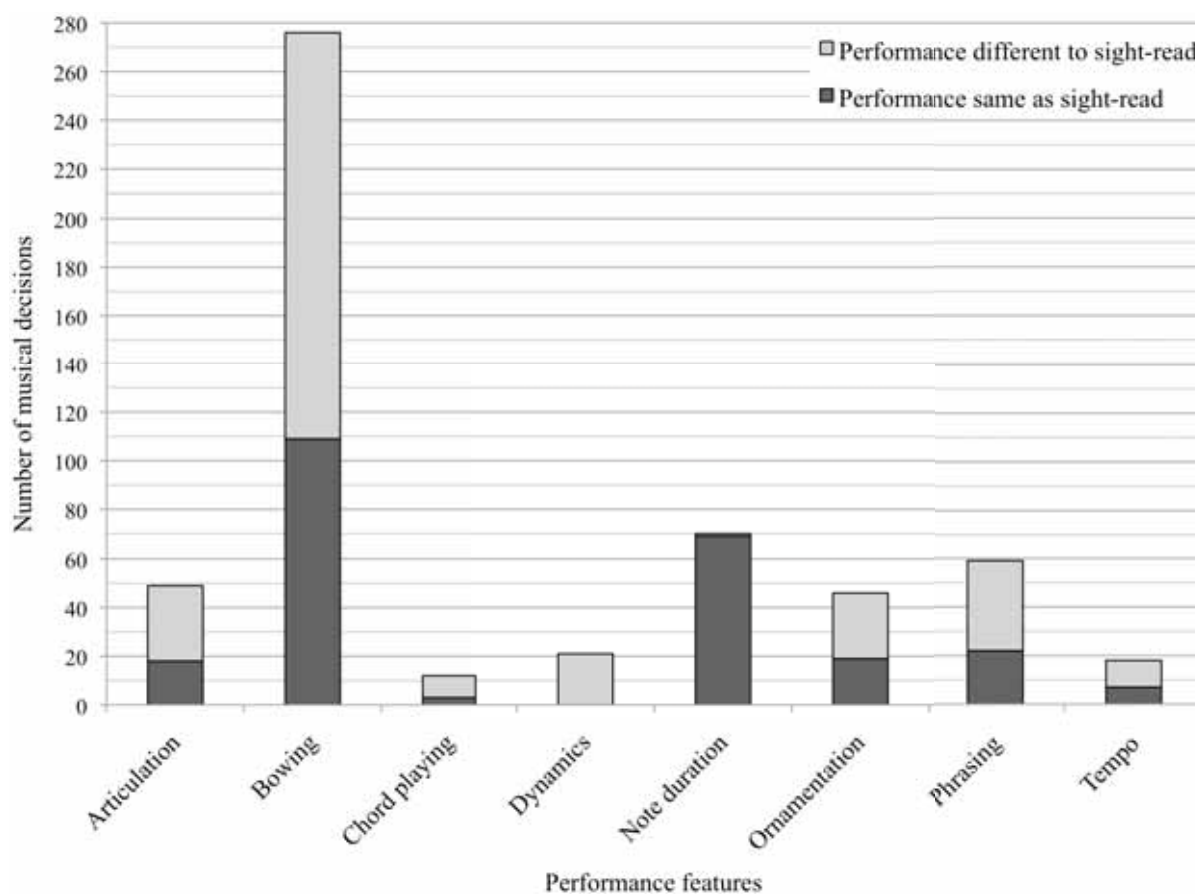
In all performance features apart from note duration, the performance decision was usually different to the sight-read. The result that out of the total 70 decision about note duration, only one decision was different to the sight-read indicates the reliability of the participant's first decisions about this issue. While sight-read decisions regarding note duration were almost always confirmed in performance (mostly intuitively), performance decisions about dynamics ($N = 21$) were always different to the sight-read. This finding reflects the lack of dynamics added in the sight-read and the addition of dynamic markings during the practice period.

When performance and sight-read decisions are analysed by participant, performance decisions were usually different to the sight-read in all cases except for Participant 3 (see Table 5.3.3).

Table 5.3.3: Performance versus sight-read by participant

Participant	Same (S)	Different (D)	S %	D %
P2	52	70	42.6	57.4
P3	60	55	52.2	47.8
P4	35	40	46.6	53.4
P5	36	48	42.8	57.2
P6	15	29	34.1	65.9
P7	25	32	43.8	56.1
P1	24	30	44.4	55.6
Average	35.3	43.4	43.8	56.2

Legend
■ E1: > 5yrs Baroque violin training, regular period ensemble players
■ E2: > 5yrs Baroque violin training, casual period ensemble players
□ E3: < 5yrs Baroque violin training, casual period ensemble players

It may be noteworthy that Participant 3 was the only performer to repeat their sight-read decisions in the performance over 50% of the time. This performer was grouped in E1 and could have developed the ability to draw on informed, appropriate solutions to musical problems even when sight-reading. If intuitive sight-read decisions were judged to be musically satisfying and accompanied by a strong "feeling of rightness" (Thompson & Morsanyi, 2012), it is likely that these decisions would be repeated in a performance given after a short practice period.

Performance decisions different to the sight-read imply a dissatisfaction with and rejection of initial intuitions. Most of the 304 performance decisions different to the sight-read were made intuitively ($N = 237$) and it is unclear why so many decisions would be rejected using intuitive processes. A possible explanation is that some of what was being categorised as 'decisions' was the result of somewhat random elements of chance and mistakes. This could have affected both the sight-read and performance, but is likely to be present in the sight-read to a greater degree. For example, some of the high number of performance decisions different to the sight-read could be due to the correction of mistakes made in the sight-read. If not all performers were equally proficient or experienced in sight-reading, this may also explain some of the differences between individual participants. Another possibility is that intuitive decisions different to the sight-read indicate changes in the participant's intuitions.

Over the practice period, their sense or feeling for how the piece should be interpreted could have altered as familiarity with the style and details of the piece increased.

<u>Decision-making categories</u>

Having presented the overall results analysed in terms of categories of decision-making, performance features, bar number, participants, and performance versus sight-read, this section will give examples of intuitive and deliberate decision-making with reference to passages in the musical score.

Intuitive decisions

As already reported, the majority (82%) of all decisions were made intuitively, which is also reflected in the average percentage of intuitive decision-making per participant (83.5%). The overall preference for an intuitive approach is most clearly demonstrated by Participant 4 who made only two deliberate decisions in a total of seventy-five decisions. This player used words like feeling and emotion to describe their response to the music: "Obviously, I am technically doing stuff but I think I am doing what emotionally it feels to me." Participant 4 spoke very little during the practice concurrent think-aloud and acknowledged having difficultly in explaining how they went about making musical decisions:

> I suppose when I say emotionally, it's probably just like a feeling. Does it feel sad? The music sort of says it itself and maybe that's totally what I'm going by. I'm not sure. I'm not great with words.

An example of intuitive decision-making regarding a particular performance feature was the area of ornamentation, in which 85% ($N = 39$) of all decisions about this issue were made intuitively. The performer with the highest number of ornamentation decisions was Participant 3 who made twenty-five decisions about this issue in performance, all using intuitive processes. These decisions consisted of eleven decisions about trills and fourteen regarding more elaborate ornaments. All nine trills in the source score were removed prior to the study and of the eleven trills added by Participant 3 in the performance, four were placed in the same place as the original

score. Figure 5.3.6 shows all decisions about trills during sight-read and performance conditions in comparison to the original notated trills.

Figure 5.3.6: Placement of trills by participants compared to original score during sight-read (SR) and performance (PF)

Bar	2.3	6.4	12.3	17.3	21.1	29.2	31.3	40.3	41.1	44.4	46.4	48.2	52.4	58.4	61.4	62.2	63.4
Roman				☑	☑		☑		☑	☑	☑		☑	☑		☑	
P2 SR	✓											✓				☑	
P2 PF								✓								☑	
P3 SR	✓	✓						✓	☑	☑	☑				✓		✓
P3 PF	✓	✓	✓		☑	✓		✓	☑	☑	☑				✓		✓
P4 SR																	
P4 PF		✓															✓
P5 SR																	✓
P5 PF		✓															✓
P6 SR																	
P6 PF																	
P7 SR																	
P7 PF		✓								☑	☑						✓
P1 SR																	
P1 PF																	

Legend
■ E1: > 5yrs Baroque violin training, regular period ensemble players
■ E2: > 5yrs Baroque violin training, casual period ensemble players
□ E3: < 5yrs Baroque violin training, casual period ensemble players

As demonstrated by Figure 5.3.6, only a few players added trills during the study, and mostly during the performance condition. This suggests that for most players, ornamentation is left to a later stage in the interpretative process, once some familiarity with the piece has been gained. Apart from P7, the only players to place trills in the same place as the original score were the two players in E1. The two performers in E1 (along with P4) made their decisions about trills intuitively, while P5 and P7 marked these decisions in the score. It may be that more experienced performers can predict where trills are likely to be written in a score with greater accuracy than less experienced performers and do so intuitively rather than deliberately. The two places where a trill was most frequently added (bars 6.4 and 63.4) are identical moments in the score where sections come to a close (see Figure 5.3.8).

One of the few places in the score where more elaborate embellishments can be added due to the relative simplicity and sparseness of the writing is bars 32-34. The spontaneous ornaments played by Participant 3 in this section for both the sight-read and performance are transcribed in Figure 5.3.7 and compared with the original score and ornamentation from three commercial recordings. The three recordings are by Jaap Schröder (recorded 1986, Caprice), Peter Csaba (recorded 1994, Chamber Sound), and Tobias Ringborg (recorded 1999, Nytorp Musik).

Figure 5.3.7: Ornamentation in bars 32-34

The fact that Participant 3 added numerous trills and embellishments in the sight-read and performance suggests that a highly developed sense of ornamentation is part of their playing style. Other performers may not have prioritised ornamentation in their interpretation of the piece to the same degree. Speaking about how they decided to ornament in the piece, Participant 3 stated:

I can't really describe how I formulated it, but you have general ornaments that you like to use I think or I have used before in pieces and some of them come more naturally to me than others and so when playing a particular figure, I just add them in when I feel like it. It just happens. It feels purely intuitive. I didn't decide. I decided to ornament some sections but you know, it just happened.

This statement describes the results of the process by which learnt behaviour becomes automatic. When presented with a new piece in a recognisable style, performers identify places where a type of ornament can be added and adapt a suitable ornament to fit the specific context. The ornaments that "come more naturally" are those that have become familiar through playing or hearing similar embellishment in other repertoire. Even in this short excerpt there are certain similarities between the sight-read and performance embellishments, including elements that would be expected in stylistically appropriate embellishment of this music. For example, the use of arpeggiation in the third bar of Figure 5.3.7 by Schröder and P3, or the use of passing notes by Ringborg and P3.

Another example of intuitive decision-making was the issue of note duration, which had the highest proportion of intuitive decision-making (94% of all decisions about note duration were made intuitively). The alteration of the length of notes mostly involved the shortening of certain notes within double stops, which may be expected to come 'naturally' to an experienced player.

Deliberate decisions

Having presented examples of intuitive decisions, deliberate decision-making will be considered in more detail to reveal how performers practised the piece during the allocated practice period. For example, although the vast majority of decisions about note duration were made intuitively, Participants 5 and 6 both made deliberate decisions about this issue. More specifically, both participants questioned the length of the low A flat in two identical bars: bars 6 and 63 (see Figure 5.3.8).

Figure 5.3.8: Grave from Assaggio in C minor BeRI 310, bars 63-64

It should be noted that holding the A flat for a full minim is technically not possible and all seven participants decided to shorten the note to a quaver or less. It could therefore be argued that the issue does not represent a 'decision' since there is really only one viable solution. On the other hand, two participants articulated thoughts regarding the issue, showing that for them this was an issue requiring deliberation.

Participant 5 outlined a number of clear, conscious steps involving a process of elimination (trial and error) that resulted in their final decision. This process is demonstrated by the following quotations with headings added to summarise each step:

1. Tries to sustain the A flat
    "Okay, so definite slow started trill on F sharp final cadence but you want to have that A flat sustained underneath it to give it a really rich, full kind of solid sound" [plays bars 63-64].
2. Tries to use the acoustic of the room
    "I kind of hit the dissonance on that penultimate note but maybe more rely on an acoustic space, rely on the room to infer that" [plays bars 63-64].
3. Tries to sound the A flat twice
    "That's not going to happen so it seems unless I voice the A flat again I lose that double stop on the second last note" [plays bars 63-64].
4. Decides to shorten the duration of the A flat
    "The trill doesn't work with the A flat. It's too harsh a dissonance anyway. It's too cheesy, too cheesy so we have to let the A flat go."

Participant 6 reached their decision through a more succinct analytical process:

> So first question mark there of length - to hold on in bar 6 [identical to bar 63] and I also need to think whether or not I am meant to somehow sustain the A flat. There's no other way I can see of doing it immediately so I guess it's not meant to be held on.

Another example of deliberate decision-making was the area of chord playing. Two-thirds of all decisions about this issue were made deliberately, perhaps demonstrating

the need for explicit thought processes when dealing with this more complex problem. The issue of chord playing arose in the third section of the piece where the composer has written three and four note chords. When Roman introduces four-note chords (quadruple stops) at bar 48 the number of deliberate decisions overtakes intuitive decisions by the most significant margin for the entire piece (see Figure 5.3.9).

Figure 5.3.9: Intuitive versus deliberate decision-making by bar number (bars 42-64)
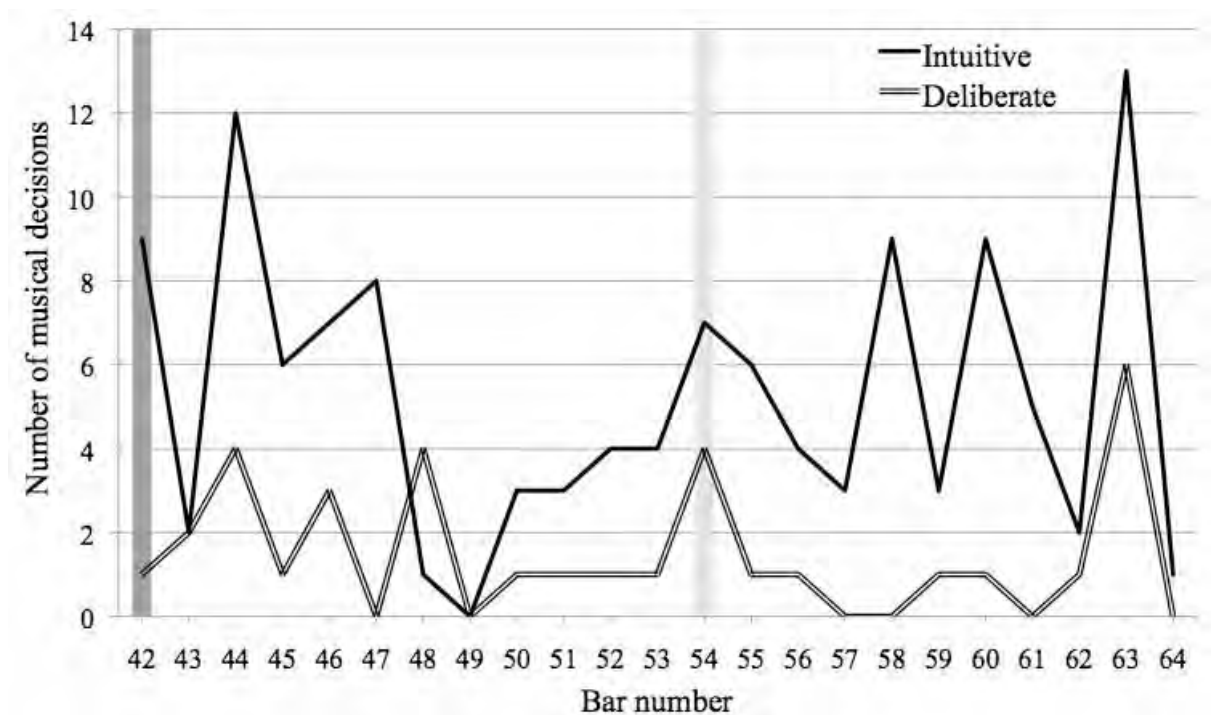
At bar 48, participants had to make a decision about how to arpeggiate the quadruple stops in this and subsequent bars. Methods of chord playing are discussed in several historical sources, including treatises by Jean-Philip Rameau (1741) and Jean-Jacques Rousseau (1768). For instance, Rameau (as cited in Donington, 1977, pp. 59-60) writes:

> At places where one cannot easily perform two or more notes together, either one arpeggiates them, stopping on that [note] from the side of which the melody continues; or one gives the preference, sometimes to the notes at the top, sometimes those at the bottom.

Bengtsson and Frydén (1958/1976, p. xxv) suggest three solutions to performing bars 48-52 in their edition of the piece, labelled in Figure 5.3.10 as A, B, and C. Solution D

was the method used by all participants in this study who arpeggiated these bars (no participant attempted solutions A, B, or C). This could be because solution D is relatively easy to execute and avoids double-stopping or switching to sextuplets. This solution is also the choice of Jaap Schröder and Peter Csaba in their recordings of the piece.

Figure 5.3.10: Grave from Assaggio in C minor BeRI 310, bar 48
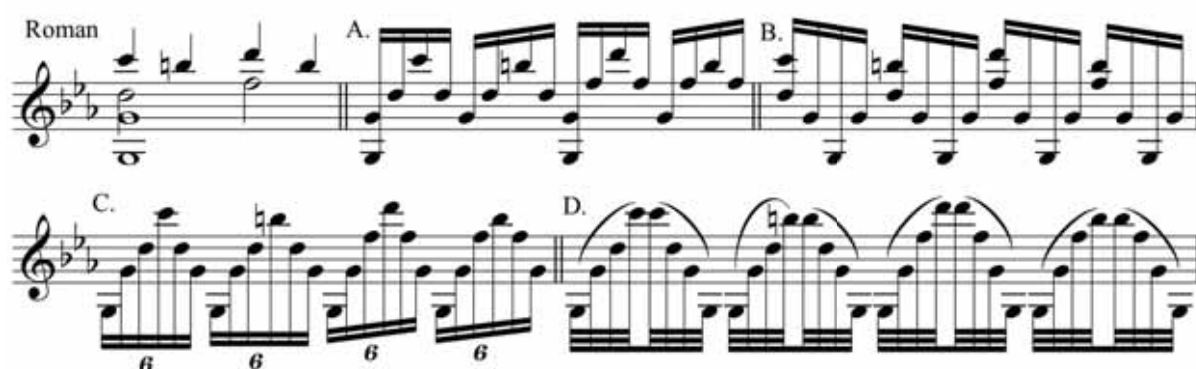
In the final performance, most participants chose to arpeggiate some bars within the chordal section of the piece (bars 42 to 60). Figure 5.3.11 shows which bars were arpeggiated by each participant and compares their decisions to three recordings of the piece.

Figure 5.3.11: Arpeggiated chords in final performance (bars 42-60)
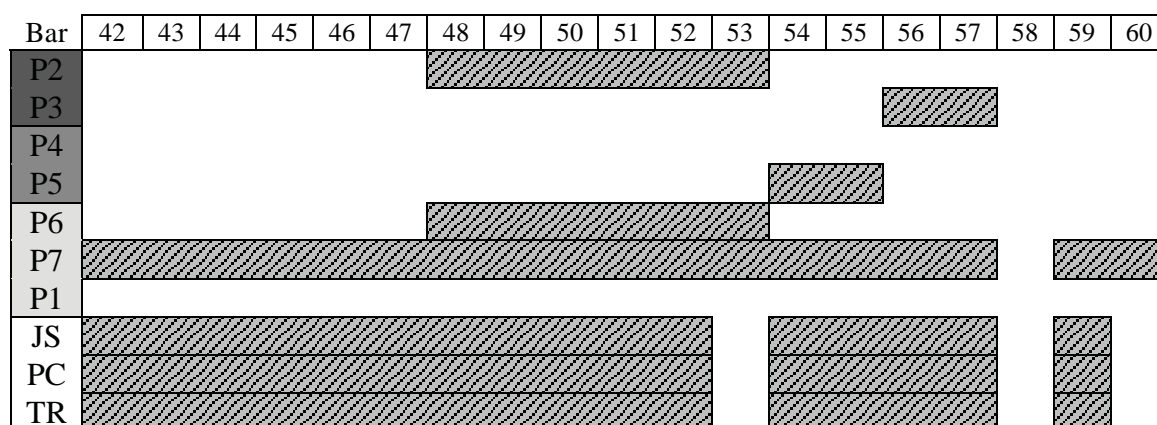
JS = Jaap Schröder (recorded 1987, Caprice)
PC = Peter Csaba (recorded 1994, Chamber Sound)
TR = Tobias Ringborg (recorded 1999, Nytorp Musik)

Legend
■ E1: > 5yrs Baroque violin training, regular period ensemble players
■ E2: > 5yrs Baroque violin training, casual period ensemble players
□ E3: < 5yrs Baroque violin training, casual period ensemble players

Participants 1 and 4 did not arpeggiate any chords and chose to play quickly rolled quadruple stops, sustained double stops, or legato melodic lines. Participant 7 arpeggiated the whole section while Participants 2 and 6 both arpeggiated only from bars 48 to 53. In the case of Participants 2 and 6, their decisions about chord playing were made during the sight-read and were repeated in the performance. While viewing the sight-read video footage, they both commented on thinking about the issue of chord playing whilst sight-reading the piece. These statements indicate the moment when the issue of chord playing came to their attention:

> Participant 2:
> The other thing, I got to bar 43 and I started thinking "mmm maybe this should be arpeggiated" but I thought, "ah, at this stage there's a lot of movement happening still with the little semiquavers and crochet movements so I thought I'd just keep it." But I'm pretty sure that already in 43 I was thinking "maybe I should be doing [sings arpeggios]" then and that became even more of a thought down in 48.

> Participant 6:
> Here [bar 48] I thought "maybe it is meant to be arpeggiated, I'll just try that out for a minute and see how that sounds."

A more complicated example of chord playing occurs in bars 54-57 where a two bar sequence of chords is presented twice with the first chord written as a broken chord (see Figure 5.3.12). The bars labelled A in Figure 5.3.12 represent the solution recommended by Bengtsson and Frydén (1958/1976, p. xxiv) and it is used for the full four bars (54-57) in the recording by Tobias Ringborg. In the recordings by Jaap Schröder and Peter Csaba however, this solution is used for bars 54-55 only, with bars 56-57 played as notated in the passage labelled B in Figure 5.3.12.

Figure 5.3.12: Grave from Assaggio in C minor BeRI 310, bars 54-57

Of the seven participants in the study, only Participant 5 maintained the rhythm of the first chord by using solution A in bars 54-55. This was a decision made deliberately as demonstrated by the following comment during practice:

> The notation in 54 (hums). Yes, that's the order in which the notes are played, probably the priority of length given to them but it should be a very loose interpretation. It's just a spread chord.

During the discussion at the end of the study, Participant 5 explained that their decision was based on an assumption and they would check for further clues if they had access to an original score:

> I'd go back to an original score to work out how it was actually notated, but if the composer had it explicitly written exactly what is on this first bar here and then followed it with the chords as such, I would assume there's an implication that you are to take the first as an example and then the on-going harmonies are just, well these are the notes that you should fill into that pattern. It would be based on looking at the minutiae of how it's been written in the original score. If it is quite as explicit as it is here then I'd probably play it directly in time, emotionally of course, but to follow that rhythm and then replicate it at least for the first two bars. It would seem a little boring to do it softer when the harmony repeats so either change the rhythm for the second two, from 56, 57, or actually voice them just as a broken chord as written.

Another performer, Participant 2, focused on the lines/daggers over the notes in bars 54-57 and came to the opposite conclusion to Participant 5. In the following quotation, Participant 2 explains why they thought the chords should not be arpeggiated:

In bar 55 you have the daggers over the notes which shows me that those chords are evenly placed, not split. I don't know, I guess that's where intuition comes in. I hope it's correct intuition.

This section has presented the overall results of the study and provided examples of intuitive and deliberate decision-making. The examples of decision-making suggest that the length and technical difficulty of the piece often contributed to participants relying largely on intuition during the study. In general there was little explicit deliberation made during practice, although there were differences between individual participants and expertise groups. The nature of the task and the coding procedure of comparing the performance to the sight-read led to large numbers of musical decisions per participant (compared to the interview study for example). This decreased the reliance on participants' perceptions of what they do in performance, but resulted in less detail about the actual processes of decision-making as discussed under themes in Chapter 3 (influences and processes). For example, the basis of or influences on decision-making remain unclear.

The concurrent think-aloud data collected during practice has been discussed through various examples of decision-making, but the next section will explore more general issues involved in the study by discussing the retrospective think-aloud data collected after the sight-read and performance.

4. Results and discussion B: Think-aloud protocols

Think-aloud protocols gathered retrospectively after the sight-read and performance give additional insight into the processes of decision-making used at different stages of the study. For example, the sight-reading task was designed to be intuition-inducing and was described by one participant as "just playing on instinct" (P6). In contrast, it was expected that participants would implement deliberate decisions made during practice in the performance condition. This was confirmed by approximately 18% of performance decisions being coded as deliberate and reports of the performance being "more intentional" (P5) than the sight-read: "I was concerned about all the things I practised" (P7).

The possibility of mistakes and chance 'decisions' during both the sight-read and performance was mentioned earlier in the chapter and some verbal reports confirm that this did occur. For example, Participant 5 commented on the feeling of not doing the right bowings when leaving this to chance:

> There's a whole stack of unwritten rules, of important beats and less important beats and how that relates to the violin bow. I didn't pay any particular attention to any of that. I know during the performance I had some of it backwards for sure and it felt very awkward where the start of a bar would be an up bow and it just doesn't have the right quality of sound and articulation to feel natural. It felt very backwards as well.

This could be considered an instance of a performer having a 'feeling of wrongness' instead of 'rightness,' a sense that the bowing is not working and doesn't "feel natural." As McGillivray discussed in the interview chapter, both 'yes' and 'no' feelings can be influential in making musical decisions. Both feelings are also considered in Elliott's (1995) definition of intuition as "what experts know as a strongly felt sense that one line of action is better than another, or not quite right" (p. 64). In the quotation by Participant 5, the "strongly felt sense" is traced to a physical sense of awkwardness and a reaction to the sound and articulation. These feelings presumably usually guide bowing decisions in quite an intuitive way, but have been articulated on this occasion to explain mistakes or unintended 'decisions' made in the performance.

In the think-aloud data, participants also reflected on what they did to practise the piece. As noted in the previous section, it seems that participants were primarily concerned with gaining a level of technical comfort or ease in order to meet the requirement of performing the piece at the end of the practice period. For example, Participant 3 described how they worked on basic issues to increase physical ease:

> A lot of the time I was just fixing up, making the piece more comfortable, sort of ironing out the edges so to speak by putting in just basic things to begin with. It's always the first sort of thing I feel like starting with, is just the basic stuff. So probably after sight-reading it I just want to play through it a bit to get a bit more of a feel. What influences me a lot is just the bowings and fingerings so putting in just a scaffolding if you like, just so I know what I am going to do. So a rough play of where I'm going to put my fingers and which notes I am going to do ups and downs, just giving me a basic guideline and making it more comfortable.

In a case study of pianist Gabriela Imreh's practice and performance of J.S. Bach's *Italian Concerto*, the initial read-through of the piece was labelled the "Scouting it Out" stage, the first stage in six stages of practice. The goal of this stage was to "simply hear the piece to get an idea of its overall shape," followed by stage 2a or "Section by Section" during which small sections were practised (Chaffin, Imreh & Crawford, 2002, pp. 100-102). Like Participant 3's focus on bowings and fingerings, much of Imreh's practice during stage 2a consisted of "making decisions about fingerings and working them into the fingers" (Chaffin et al., 2002, p. 102).

Developing a feeling of comfort in playing the piece also extended beyond the technical to more musical, interpretative dimensions where decisions were often the result of experimentation. During practice, the performers based many decisions on feelings, for example what felt "right," "comfortable," "natural," or "obvious." The following concurrent think-aloud quotation from the practice session of Participant 6 illustrates the process of finding what "works" or "feels comfortable" in relation to a possible tempo change at bar 8:

> I'm sort of wondering whether at this stage I'll stay on the same speed for the next bit or not. I'll play it a bit and see if it feels like the right thing [plays bars 8-12]. Seems like it is maybe not meant to be the same speed because it doesn't kind of feel like it is meant to go that speed to me somehow, I don't know but I'm going to try and play a bit faster and see [plays bars 8-9]. Or play it in 3 rather than…I was in 8 before. Maybe that will work with the same speed [plays bars 8-12]. It sort of works. Still not convinced though so I'm going to try again [plays bars 8-16]. Okay, so maybe not. Don't know. I'll just sort of play it a bit more and see what feels comfortable at this point.

This quotation also highlights the issue of having to hear solutions in order to make a decision, which was a frequently used practice strategy. Participant 5 resolved the same issue of tempo in bar 8 by playing the passage a few times. Their use of the word "natural" seems to refer to an organic feeling of coming to a close and then restarting in a new tempo:

> It's seems like a fairly safe thing and it feels natural once you play it a few times, just the closure of harmony at the end of 7 and that kind of rebirth again at 8.

Sometimes the player later explained on what basis a decision could feel "natural." For Participant 5, what felt natural was often based on the resonance of the instrument:

> There are things about the instrument which inform the possible solutions to the puzzle. For me something feels very natural when you get a sympathetic resonance out of the bow… The most important thing is that sympathetic resonance on the instrument I think.

The influence of the Baroque bow and instrument was also found to be important in the interview study (see Chapter 3, Section 4), in which players talked about experimenting with tone colours, resonance, and articulation. Interestingly, these considerations are not necessarily unique to the Baroque instrument but could be more significant in historical performance due to the use of gut strings and a greater emphasis on resonance rather than projection.

The resonance of the instrument is one example of an influence on the musical decision-making process, but participants also spoke about the influence of harmonic changes and musical structure. For example, Participant 3 explained their decision-making in the following way:

> Some bits felt more important to me on a musical level, but what made them feel more important to me or the bits I wanted to bring out in a particular way was for me the harmony and the notes. So for example some bits had, I felt, had particularly intense harmonic relationships because of the chords so that made me feel like I wanted to play them in a certain manner and some bits didn't, they weren't as important or had a different mood or were in a different key for example.

Harmony was also the most prominent influence on decision-making in the interview study and the quotation above confirms that harmony seems to guide intuitive processes. For Participant 3, feelings about the relative intensity, importance, or mood of particular chords or passages led them to "play them in a certain manner." Other participants found it difficult to articulate why they did certain things:

> Participant 2:
> Why do I make those decisions? I don't know, I guess it's just experience. I think I recognise other things. I haven't played it, I haven't heard it before but it certainly reminds me of other things.

Participant 6:
I guess they're just based on knowing my instrument and figuring it out and then I suppose there is a certain percentage of stylistic understanding is built-in, in terms of what you would do. So for instance if you were playing Bach, that element of it doesn't necessarily need to be thought out because it's in there, built into you. If you are playing a certain style of music, something similar to that there is a level of intuitive knowledge based on your experience which I don't even know how to describe.

The inability to 'know why' in the quotation by Participant 2 indicates the use of intuition since intuitive responses are typically made "without conscious awareness; they involve little or no conscious deliberation" (Hogarth, 2001, p. 14). The reference to experience and recognising "other things" provides further evidence for the characteristics of intuitive decision-making as discussed in the interview study under the themes of pattern recognition and accumulated knowledge (see Chapter 3, Section 4). In addition, recognition based on experience is central to several definitions of intuition, including that of Klein (2003):

Intuition is the way we translate out experiences into judgments and decisions. It's the ability to make decisions using patterns to recognise what's going on in a situation and to recognise the typical action scripts with which to react. Once experienced intuitive decision makers see a pattern, any decision they have to make is usually obvious (p. 13).

The quotation by Participant 6 suggests that stylistic understanding in particular is an aspect of interpretation that can be applied intuitively based on what's "in there, built into you." Similarly, the historical keyboard performer Robert Levin has discussed the development of a vocabulary appropriate to different composers through processes that are not conscious. Levin states that he can explain the differences between what he does in performing Beethoven as opposed to Mozart, but this is not how he actually does it: "I was simply depending on the subconscious information that I have assimilated through my entire life as a listener and performer and student, which I still am, of music…" (Berkowitz, 2010, p. 91).

A final point regarding the think-aloud data is that some participants expressed a desire to know more about the composition in order to apply a more deliberate decision-making process. The assumption in the following statements is that knowing

who composed the piece or if the edition is reliable would enable the player to access prior knowledge in a more explicit manner:

> Participant 5:
> I'm feeling like it would be helpful to have some context of the music in terms of who wrote it and when it was written. Whether or not this particular edition is true to the original score would make a significant difference potentially in terms of how one interprets it.

> Participant 6:
> I'm going to look now at 41 into 42 because some of the repertoire I've played before, earlier sort of Baroque, when it has a tempo change within it it's connected. It'll go slow-faster-slow so I'm thinking that maybe that's what this is meant to do but that's based on prior knowledge of other pieces I've played. Without knowing what the piece actually is I don't feel I know enough about that to guess.

It seems that removing information and markings from the score made participants a little reluctant to guess or make decisions, which could have contributed to the high overall percentage of intuitive decision-making in the study.

5. Conclusion

<u>Overview of study</u>

The study used an experimental, implicit approach to distinguish between the types of decision-making processes used by Baroque violinists when interpreting an unfamiliar piece of solo Baroque violin music. The piece chosen for the study was the Grave from Assaggio in C minor BeRI 310 for solo violin by the Swedish composer Johan Helmich Roman.

The study began with a sight-read, a task designed to force the performer to rely on intuitive processes and make rapid decisions about how to perform the composition. This was confirmed by descriptions of the sight-read as "just playing on instinct" (P6). After this, participants were given forty-five minutes to practise the piece and mark the score while concurrently verbalising their thought processes. This task was designed to observe deliberate decisions being made in preparation for the final step of performing the piece. A performance of the piece was then given consisting of a mixture of

intuitive (not planned) and deliberate (planned) decisions. The performance was described as "more intentional" (P5) than the sight-read: "I was concerned about all the things I practised" (P7).

In line with default-interventionist theories of dual processes (e.g., Evans, 2011), intuitive decisions were defined as an absence of any observable deliberate processes (a mark in the score or relevant comment during practice). Categorising any marking or comment as deliberate was a conservative interpretation of the results biased towards deliberate decisions. The degree of deliberation or analysis required for a particular decision varied but all markings or comments led to a classification as deliberate.

Summary of results

Overall, there was a clear reliance on intuitive decision-making with an average of 82% of all performance decisions being made without any observed conscious attention. The difference between this result and the high proportion of deliberate decisions found in the interview study (Chapter 3) can largely be explained by differences in methodology. The interview study relied solely on self-report data while the sight-read study used more implicit measures of decision-making by comparing think-alouds with action. In addition, the sight-read study represents the initial stages of learning a new piece while the interviews asked performers to bring to mind years of interpretative choices.

The study found significant variation in the number of musical decisions made between groups of participants. More experienced players made a greater number of decisions overall when compared to less experienced players. In addition, while participants made an average of 83.5% of performance decisions intuitively, the most experienced players (E1) made a greater proportion of deliberate decisions when compared to less experienced players.

Intuitive processes dictated decisions about most performance features (articulation, bowing, phrasing, note duration, ornamentation, and tempo), while decisions about dynamics and chord playing were mainly made deliberately. There were also

deliberate decisions made during practice that were not executed during performance, a category that included 52% ($N = 11$) of decisions about dynamics. Decisions about basic technical components of the piece, particularly bowing, dominated the musical decision-making process. Performance decisions were usually different to what was done in the sight-read, apart from decisions about note duration, which were consistent between both conditions.

Further analysis of think-aloud data largely confirmed the characteristics of and influences on musical decision-making discussed in Part 1 of the thesis. For example, quotations regarding the lack of conscious awareness and role of pattern recognition in intuitive decision-making were closely aligned with definitions in the psychological literature, while the influence of harmony on decision-making was again found to be important in guiding the interpretation of Baroque music.

Issues and limitations

The aim of the study was to observe and collect data on musical decision-making using a reasonably objective procedure and more implicit measures of decision-making than in the interview study. While this was achieved, there are various issues that should be noted. Although the participants were professional musicians with training in both mainstream and Baroque violin performance, the sample size was relatively small and the technical difficulties of the chosen piece may have prevented some participants from achieving their intended musical results. Technical challenges may have delayed the participant's engagement with the interpretative dimensions of the composition. This was a larger issue than originally anticipated due to the variation in training and experience of the Baroque violinists who were able to participate in the study.

Other variables in the study included:

1. Sight-reading ability, experience, and comfort level of the participants. Sight-reading is a challenging task that usually occurs in private and being observed may create discomfort. In fact, one violinist who was approached to participate declined on the basis of not feeling comfortable with being videotaped in this situation.

Participant 3 commented on the simulated circumstance of the sight-read, suggesting that they would not normally sight-read from beginning to end:

> If I was sight-reading at home for myself, for myself, it would have been very stop-start I think. I would have done several bars over and over again just to explore some of the bits that I enjoyed more…If my teacher gave me this and said have a go at this, I wouldn't be doing much of that because I was sight-reading it for the benefit of someone else so they can see how I'm sight-reading it. So it really depends on context. The context of why I am doing this and what situation I am doing this in. That was something that fazed me a little bit.

Variation between participants based on comfort, ability, or experience in sight-reading would affect the quality of sight-read decisions and any comparisons made between the sight-read and performance (see Lehmann & McArthur, 2002, pp. 142-143).

2. The think-aloud ability or comfort level of the participants. Some participants felt more at ease with thinking-aloud than others, creating variation in the amount of talking versus playing time during the practice session. This is demonstrated through the word count for the transcripts, which varied from just over 1000 words to close to 7500, with an average of approximately 4100 words. Difficulties of having to think aloud while practising were articulated by Participant 1, who implied that the process of practising is itself a form of thinking:

> Towards the end [of the practice session] I just was getting… I was just playing things and I think my mind moves really quickly so I couldn't… I was finding it hard to talk and play at the same time because I think that's where the actual thinking happens. So maybe I missed out on saying some of that stuff.

3. Analysis of performance data. The analysis of performance features was a subjective process and variables in noticing, describing, and coding the exact characteristics of subtle musical nuances should be acknowledged. For example, analysis of tempo, dynamics, and note duration only captured the clearest, most obvious decisions made in these areas. As mentioned in Section 2, coding was done in two stages with multiple checks to improve the validity of the annotated scores. Therefore, the annotated scores are representations of important deviations that the performer made from the original score as determined by the researcher.

<u>Implications</u>

The findings of the study were consistent with the default-interventionist view of the role of intuitive and deliberate processes, and the study successfully identified several processes of musical decision-making with varying characteristics. The six categories of decision-making identified in the study (see Table 5.2.4) have been depicted in Figure 5.5.1. Based on the Intervention Model of dual process theories discussed in Chapter 4 (Evans, 2011; see Figure 4.1.2), Figure 5.5.1 uses the example of a slur made in response to two separately bowed notes to illustrate possible decision-making processes in the sight-read study. This diagram is a more detailed, graphic representation of the examples of decision-making given in Table 5.2.4.

Figure 5.5.1: Example of musical decision-making in the sight-read study (based on the Intervention Model by Evans, 2011, p. 94)
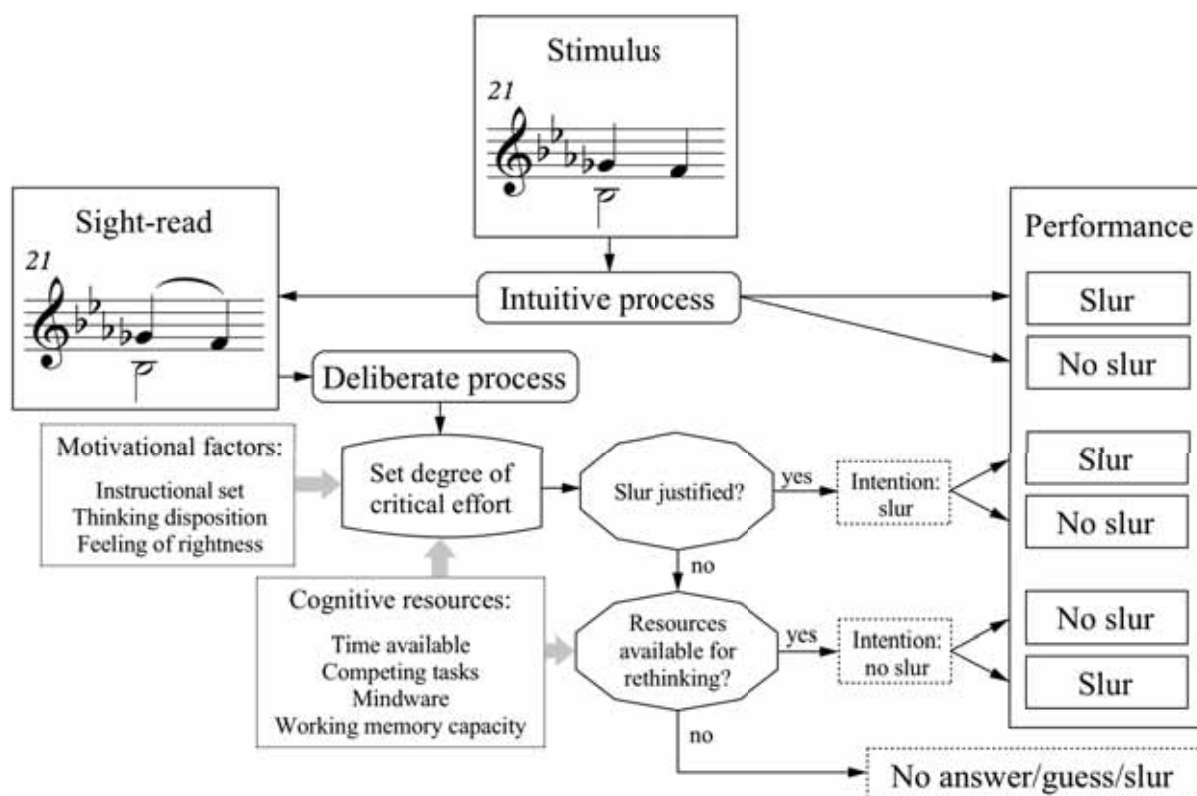
The stimulus for the example of musical decision-making in Figure 5.5.1 is the first two notes from bar 21 of the Grave from Assaggio in C minor by J.H. Roman (see Appendix A). If the participant slurred the passage in the sight-read (far left of Figure

5.5.1), the performance (far right of Figure 5.5.1) could repeat this decision by following three difference paths: 1) through an intuitive process with no deliberate intervention, 2) by deliberately confirming the decision and carrying this out, or 3) by deliberately rejecting this decision but unintentionally slurring in performance.

A fourth way of repeating a slur in performance is suggested by Figure 5.5.1: if a decision is deliberately rejected but cognitive resources are not available for rethinking, then the decision would be left to chance and may revert to the initial intuition (see no answer/guess/slur in Figure 5.5.1). This process may have occurred if the participant was unable to make a decision during the practice session due to time constraints or having too many other decisions to attend to. However, no instances were found of a participant explicitly rejecting a sight-read decision and not being able to arrive at an alternative. It might be that this process did occur but was not verbalised and therefore coded as an intuitive performance decision. For the simple decision of whether to slur two notes used in Figure 5.5.1, this category may not be applicable.

Figure 5.5.1 extends the Intervention Model by differentiating between intention and action. The performance decisions were actions, but the process of coding deliberate decisions (marks and comments) relied on intentions that were not always realised in performance. There were therefore six categories of decision-making observed, but only two outcomes: intuitive slur/no slur, deliberate slur/no slur (intention carried out), and deliberate not executed slur/no slur (intention not carried out).

Factors related to motivation and cognitive resources in Figure 5.5.1 were found to influence the degree of deliberate processing, particularly time available and mindware. The availability of relevant mindware (explicit rules and procedures acquired through education) may have resulted in more effortful or efficient deliberate practice in experienced performers when compared to less experienced performers. This could explain the higher number of decisions and greater proportion of deliberate decisions made by the most experienced performers. The influence of these factors and others such as personal thinking disposition and metacognitive feelings of rightness could be the subject of future research in this area.

The sight-read study demonstrated that musical decision-making could be observed in real time and proposed a coding method for distinguishing between intuitive and deliberate decision-making based on default-interventionist models of dual process theories of cognition. The third part of the thesis will return to a more qualitative-based methodology to gather detailed data about the decision-making processes of a single expert period instrument performer.

Part 3:

A case study

Chapter Six

Introduction

Having explored some of the differences between participants of varying expertise in the previous chapter, the third part of the thesis will examine the decision-making processes of a single expert musician. Like the sight-reading study, the case study outlined in the next chapter uses think-aloud procedures to collect data, but analyses musical decisions made over a two-year period. An additional issue that a longitudinal study may be able to explore that has not been addressed in the first two parts of the thesis is whether there are different types of intuition. Data demonstrating the use of different types of intuitive processes or categories of intuition would provide new evidence for models of musical decision-making as well as understandings of intuition more generally.

1. Types of intuition

As noted in Chapter 1, some authors have proposed that Type 1 processes may consist of several subsystems (Evans 2008; Hogarth, 2001, p. 209) and intuition may be a multifaceted rather than a unitary construct (Glöckner & Witteman, 2010a; Pretz & Totz, 2007; Sinclair, 2010). To explore this possibility, Gore and Sadler-Smith (2011) outlined a conceptual framework based on Dane and Pratt's (2007) distinction between an intuitive process (intuiting) and its outcome (intuitions). Gore and Sadler-Smith (2011) posit that processes of intuiting lead to intuitions (outcomes) of either a primary or secondary nature. The intuiting processes can be domain-general such as heuristics or domain-specific such as expert pattern recognition. Primary outcomes are categorised as problem-solving, creative, social, or moral intuitions (see Table 6.1.1), while secondary outcomes are composites of primary types and are manifested in applied areas such as healthcare or law.

Table 6.1.1: Primary types of intuition (Gore & Sadler-Smith, 2011, p. 308)

Primary type	Behavioural description
Problem-solving intuition	Domain-specific, expertise-based response to a tightly structured problem based on nonconscious processing of information, activated automatically, eliciting matching of complex patterns of multiple cues against previously acquired prototypes and scripts held in long-term memory.
Creative intuition	Slow-to-form affectively-charged judgment occurring in advance of an insight that combines knowledge in novel ways based on divergent associations, and which orients behaviour in a direction that may lead to a creative outcome.
Social intuition	Rapid and automatic evaluation of another person's cognitive and/or affective state through the perception and nonconscious processing of verbal and/or nonverbal indicators.
Moral intuition	Automatic, rapid, affect-based judgment made in response to an ethical dilemma, arrived at nonconsciously, rationalised post hoc, and relatively impervious to disconfirmation.

From the descriptions above, the types of intuition most relevant to elite musical performance seem to be problem-solving and creative intuition. The rest of this chapter will discuss various studies related to these two "primary types" of intuition, followed by a brief discussion of musical intuition as a "secondary type" of intuition.

2. Problem-solving intuition

This type of intuition has been the main focus of the thesis and is the most common conception found in the literature. Problem-solving intuition (Dane & Pratt, 2009; Gore & Sadler-Smith, 2011) is closely related to notions of "intuition as expertise" (Hogarth, 2001, pp. 204-206) and "intuitive expertise" (Kahneman & Klein, 2009) in that these concepts all involve pattern matching based on experience. Expertise and problem-solving intuition should not be conflated however, since comparison with past experiences can occur "no matter what the complexity of one's cognitive structures" (Dane & Pratt, 2009, p. 6).

With this in mind, research across many domains has demonstrated that experts often make decisions intuitively. For example, studies of chess players have shown that chess grand masters are generally able to identify the next best moves more rapidly than less-expert players (DeGroot, 1946/1978). This skill is based on their ability to access a repertoire of an estimated 50000 to 100000 immediately recognisable patterns (Chase & Simon, 1973). This fact of recognition can be identified, but the detail of the

process by which this is accomplished is not accessible (Simon, 1992, p. 155). Simon (1992) outlines the chain of events involved as follows:

> The situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition (p. 155; also see Simon, 1983, pp. 23-29).

The study of expert board game players has continued (Charness, 1981; Charness, Tuffiash, Krampe, Reingold, & Vasyukova, 2005; Gobet & Campitelli, 2007; Gobet & Simon, 1996) and recently expanded to include neuroscientific perspectives. An fMRI study (Wan, Nakatani, Ueno, Asamizuya, Cheng, & Tanaka, 2011) examined the neural basis of intuitive best next-move generation in professional shogi players and concluded that the precuneus-caudate circuit appears to be responsible for the automatic, yet complicated, process of generating the best next move (p. 346).

Expert decision-making in other domains has been studied using an approach known as naturalistic decision-making (NDM). This approach was based on research examining the decision-making of commanders of fire fighting companies (Klein, Calderwood, & Clinton-Cirocco, 1986). This study found that the commanders usually generated a single option by drawing on their extensive repertoire of patterns, evaluated the option by mentally stimulating it, and then either implemented or modified it. This was labelled the recognition-primed decision (RPD) strategy, which Klein (2011) explains as a blend of intuition and analysis, with intuition defined as the experience of using tacit knowledge to notice something or recognise a pattern (also see Klein, 2009, pp. 90-93). The RPD strategy of intuitive pattern matching followed by a deliberate, analytical mental simulation has been found in multiple domains, including military command and control (Klein, 1998), managers (Hodgkinson, Sadler-Smith, Burke, Claxton, & Sparrow, 2009, pp. 283-284; Patton, 2003) and nurses (Benner & Tanner, 1987; Crandall & Getchell-Reiter, 1993; King & Appleton, 1997; Lyneham, Parkinson, & Denholm, 2008).

A contrasting approach to studying expertise has been the heuristics and biases (HB) approach. This approach was based on experiments beginning in the late 1960s and early 1970s that studied the systematic biases and intuitive errors resulting from mis-

computations in human information processing (Kahneman & Tversky, 1973; Tversky & Kahneman, 1974). These studies found that "judgment under uncertainty often rests on a limited number of simplifying heuristics rather than extensive algorithmic processing" (Gilovich & Griffin, 2002, p. 1). For example, judgments under conditions of uncertainty are generally attributable to one of three main heuristics: the representativeness heuristic (i.e., 'what is typical'), the availability heuristic (i.e., 'what comes easily to mind'), or adjustment and anchoring (i.e., 'what happens to come first') (Akinci & Sadler-Smith, 2012, p. 108).

Kahneman (2011, p. 239) suggests that some of the differences between the heuristics and biases (HB) approach and studies of naturalistic decision-making (NDM) could be due to the subjects and situations studied. NDM research observes "professionals who have real expertise" such as fireground commanders or clinical nurses, while Kahneman studied stock pickers and political scientists "trying to make unsupportable long-term forecasts" and was therefore more sceptical of those claiming an intuition (Kahneman, 2011, p. 239).

In a co-authored paper, Kahneman and Klein (2009, pp. 524-525) compared the naturalistic decision-making (NDM) and heuristics and biases (HB) approaches, finding several points of concurrence. These included the following:

- Intuitive judgments can arise from genuine skill, but they can also arise from inappropriate application of heuristic processes.
- Skilled judges are often unaware of the cues that guide them, and individuals whose intuitions are not skilled are even less likely to know where their judgments come from.
- True experts know when they don't know. However, non-experts certainly do not know when they don't know. Subjective confidence is therefore an unreliable indication of the validity of intuitive judgments and decisions.
- The determination of whether intuitive judgments can be trusted requires an examination of the environment in which the judgment is made and of the opportunity that the judge has had to learn the regularities of that environment.
- Task environments have "high-validity" if there are stable relationships between objectively identifiable cues and subsequent events or between cues and the outcomes of possible actions.

- An environment of high validity is a necessary condition for the development of skilled intuitions. Other necessary conditions include adequate opportunities for learning the environment (prolonged practice and feedback that is both rapid and unequivocal). If an environment provides valid cues and good feedback, skill and expert intuition will eventually develop in individuals of sufficient talent.

- Although true skill cannot develop in irregular or unpredictable environments, individuals will sometimes make judgments and decisions that are successful by chance.

Working within the field of management studies, Salas, Rosen, and DiazGranados (2010) have illustrated the components of intuition and expertise that are unique and overlapping (see Figure 6.2.1). According to their model, the defining characteristics that are common to both intuition and expertise are the use of extensive domain-specific knowledge, reliance on pattern recognition, and the automatic nature of the decision-making process.

Figure 6.2.1: Venn diagram depicting the overlap and distinction between the constructs of intuition and expertise (Salas et al., 2010, p. 945)[4]
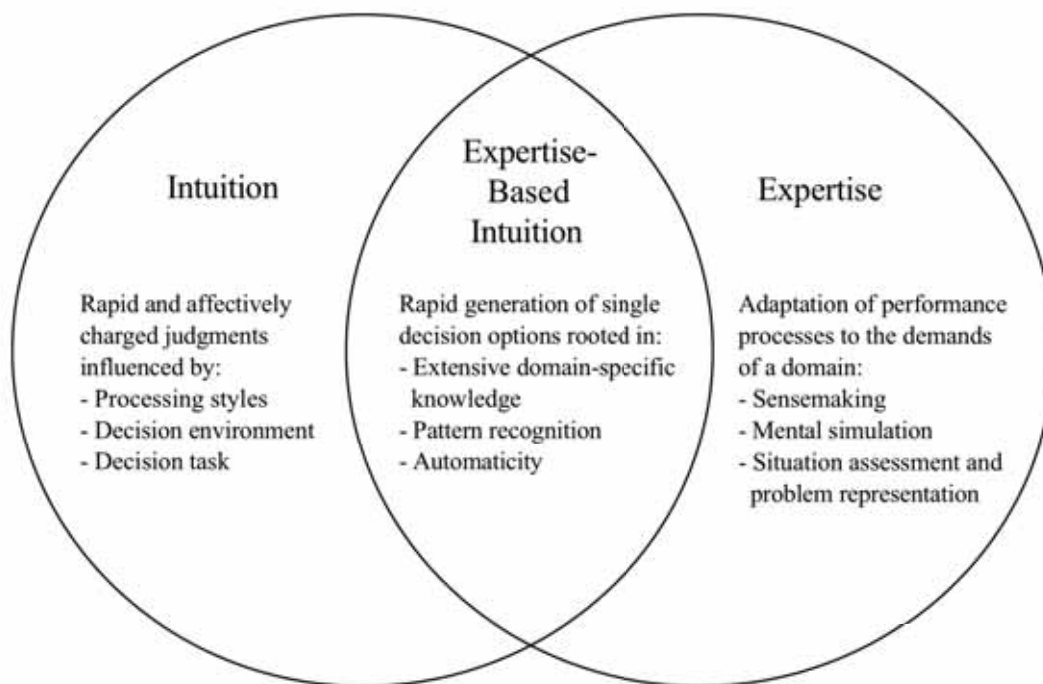
The use of domain-specific knowledge, shown in Figure 6.2.1 to be characteristic of both expertise and intuition, has been found to be the result of "deliberate practice." According to Ericsson and Towne (2010), "this type of practice requires intense concentration on improving particular aspects of performance and thus leads to modification of mechanisms responsible for improvement" (p. 409). In a study of expert violinists (Ericsson, Krampe, & Tesch-Romer, 1993), it was shown that by the time the best musicians had reached twenty years of age, they had accumulated more than 10000 hours of deliberate practice, which was several thousand hours more than their less accomplished peers (also see Sloboda, 1996, pp. 111-114).

While the use of intuition may be a feature of expert decision-making, expertise is not a prerequisite for intuition. Indeed, intuitive processes are used everyday by non-experts and experts alike to make any number of important and unimportant decisions. Therefore, is there a specific kind of intuition that is characteristic of experts? For Hamm (2008, p. 56), "expert judgment qualifies as intuition because it is fast, usually accurate, and in its details is out of the expert's conscious awareness." Hamm (2008, p. 56) then questions whether expert judgment is one of two types of intuition:

> It may be argued that expert cognition is distinct from the intuition that is based on instinctual or emotional response tendencies or learning processes because expertise is postulated to be based on explicit analytic processes that have become chunked and automatised. Are there two distinct types of intuition?

The question raised by Hamm concerns the process of intuiting rather than relating to the four types of intuition proposed by Gore and Sadler-Smith (2011). This raises the possibility of identifying types of intuitive processes as well as types of intuition. For example, the automation of "explicit analytic processes" (Hamm, 2008, p. 56) might be decisions that can be retrospectively explained as having been conscious at one point, but repeated through deliberate training in order to become automatic. This could be termed a trained intuition in which procedural memory can be articulated.

In her model for the development of intuition by level of expertise, Baylor (2001) suggests that intuitive processes are frequently employed by novices that bring no knowledge to the problem at hand, and experts who have developed knowledge about the problem. The use of deliberation and metacognitive strategies in becoming an

expert develops a type of intuition Baylor labels "mature intuition." In contrast, the intuitions of a novice are qualitatively different, rely on less-expert knowledge structures and can be considered "immature intuition." Baylor proposes a maturing of intuition over time in the U-shaped manner illustrated in Figure 6.2.2.

Figure 6.2.2: U-shaped developmental progression of intuitive thinking (Baylor, 2001, p. 240)[5]
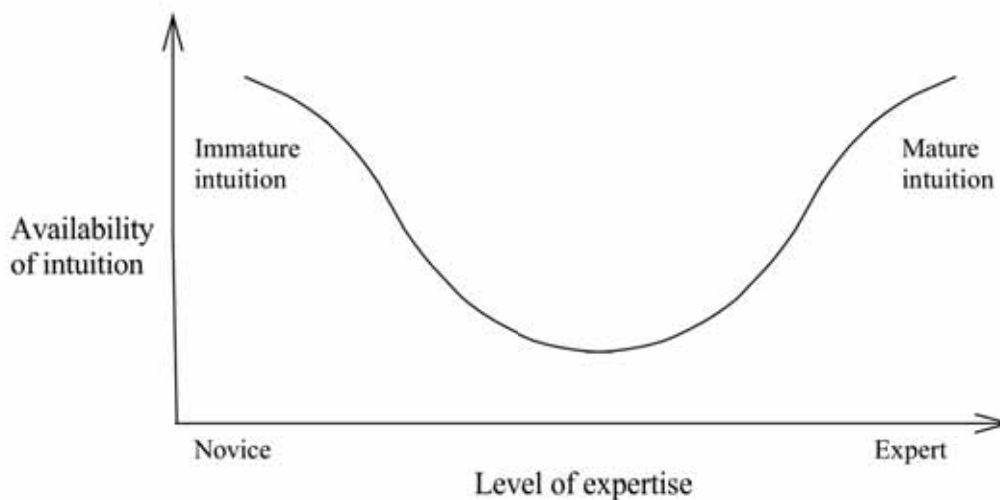
Baylor (2001) states that "the 'available intuition' within a given subject area refers to the potentiality for intuitive thinking to exist at a given point in development of an individual's level of expertise" (p. 239). In the first half of the curve, an intuitive understanding in the form of immature intuition moves to a more analytical and less intuitional understanding. In support of this shift, Baylor cites Bamberger's work on musical intelligence which shows that children appear to lose a figural grasp of phrases when they develop a formal understanding of musical notation. Baylor (2001, p. 241) interprets this finding as an immature intuitional understanding moving to an intermediate or analytical stage. This intermediate stage is similar to Dreyfus and Dreyfus' (1986) characterisation of the "proficient performer" as a person who intuitively organises and understands their task, but still finds themselves "thinking analytically about what to do" (p. 29). This stage is the mid-point in their influential

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[5] Redrawn from *New Ideas in Psychology, 19*(3), A. L. Baylor, A U-shaped model for the development of intuition by level of expertise, Copyright 2001, with permission from Elsevier.

five-stage model of skill acquisition, consisting of novice, competent, proficient, expert, and master stages (Dreyfus & Dreyfus, 1980).

In the second half of Baylor's curve, a person may relinquish some metacognitive control over reasoning and access more mature intuition based on new knowledge structures (Baylor, 2001, p. 242). A mature type of intuition is also implied in the work of Hogarth (2001), who suggests that intuition can be educated by learning from experience and developing skills through observation, speculation, testing, and generalisation (pp. 214-247).

Baylor's U-shaped model seems to apply to a general, lifelong development from novice to expert, but could also be considered in terms of developing expertise or proficiency when learning any new skill, such as a performer learning a new piece of music. It could also be argued that the exact shape of the U-shaped curve (depth and rate of descent/ascent) would depend on several factors, including the complexity of the specific task. In the context of musical performance, variables would include the technical difficulty of the piece or the level of existing familiarity with the style or composer.

A related attempt to model changes in cognitive processes over time has already been discussed in Chapter 1. Hamm (1988) used a think-aloud method to study the moment-by-moment variation in the analytic and intuitive cognitive activity of six highway engineers. During the judgment tasks, Hamm (1988) found evidence for a pattern of alternating between intuition and analysis, either in a curve moving from intuition to analytic to intuition (I-A-I), or vice versa, from analytic to intuition to analytic (A-I-A) (pp. 766-768).

Through a review of several approaches to studying and theorising the use of expert intuition, it is clear that problem-solving intuition is commonly employed by experts, but may also be a significant strategy for novices. The individual experience brought to a specific task and context may impinge on the outcome, but the process resulting in problem-solving intuitions has several common elements, including nonconscious processing, pattern matching, and use of domain-specific knowledge.

3. Creative intuition

Dane and Pratt (2009) note that expertise may also relate to other types of intuition other than problem-solving intuition, "particularly creative intuition" (p. 5). As with expertise, there is a danger that creativity and intuition can become conflated since creativity is often thought of as resulting from intuitive processes. For example, in his Theory of Intuitive Thought, Bastick (2003) describes the creative process as being made up of an intuitive stage involving preparation, incubation, and illumination, followed by a stage of verification (p. 310-11). As Bastick goes on to discuss, part of the problem of establishing a link between intuition and creativity is defining creativity itself. In particular, definitions of creativity can differ in the importance placed on originality and whether the creation was the result of a purposeful act or random process (Bastick, 2003, pp. 311-312).

According to Johnson-Laird's (2002) NONCE definition of creativity, the result of a creative process must be *N*ovel for the individual, *O*ptionally novel for society, *N*ondeterministic, dependent on *C*riteria or constraints, and based on *E*xisting elements (pp. 419-420; also see Johnson-Laird, 2006, pp. 351-352). Several authors have discussed the concept of creative intuition in terms that relate to Johnson-Laird's conception of creativity as nondeterministic and satisfying pre-existing constraints or criteria of the paradigm or genre. The term nondeterministic describes a system that "can yield different outcomes when it is in the same internal state and has the same input, if any" (Johnson-Laird, 2002, p. 419). Goldberg (1989) differentiates creative intuition from other types of intuition by suggesting that creative intuition involves "alternatives, options, or possibilities" rather than "singular truths, facts, or verifiable information" (p. 65). In addition, Policastro (1995) defines creative intuition in a phenomenological sense as "a vague anticipatory perception that orients creative work in a promising direction" (p. 99; also see Voss & Means, 1989, p. 404). This "promising direction" is presumably a direction that fits within an individual's understanding of a particular genre and their personal style. As Johnson-Laird (2002) notes, "the individual creator is not a closed system, but is influenced by mentors, collaborators, and leaders" (pp. 419-420). In more technical terms, Policastro (1995)

also defines intuition as "a tacit form of knowledge that broadly constrains the creative search by setting its preliminary scope" (p. 100).

While there are many theories linking intuition and creativity, empirical studies examining this connection are scarce (Shirley & Langan-Fox, 1996, p. 575; see Lubart, 2001; Raidl & Lubart, 2000-2001). One example of an experimental study is research that sought to identify the effects of intuition, positive affect, and training on creative problem-solving (Eubanks, Murphy, & Mumford, 2010). In this study, a positive or neutral affect was induced using music after which 320 participants completed a number of reference measures and training exercises. Participants were then asked to make a series of 20 decisions about starting a psychology club at a university. The results of this task were later assessed by a panel of psychologists to categorise individuals as either intuitive or non-intuitive based on the correctness of their decisions, time taken to decide, and the use of additional materials. A final task required participants to write a plan for establishing a new club at a university and these answers were assessed for quality, originality, and elegance. Assessment of quality was based on the level of logic and coherence, elegant solutions were defined as "coherent, well organised plans that would have maximal impact on the student body with minimal investment," while "unexpected surprising plans that might prove workable" were classed as original (Eubanks et al., 2010, p. 178). The study found that intuition contributed to higher quality and more elegant solutions to creative problems, but had less impact on the originality of these solutions. The authors suggest that this may have been due to the demand for active, elaborative processing required when people generate original solutions (Eubanks et al., 2010, p. 181).

The main difference between problem-solving intuition and creative intuition as defined by Gore and Sadler-Smith (2011) is that creative intuition is a relatively slow or suspended process that results in a moment of insight and novel combinations of knowledge. Musical performance may be a suitable domain to study such processes since performers are thought to work towards an interpretation based not just on efficiently solving musical problems, but reaching and communicating insights into the music that are novel for them or perhaps even human history (p- or h-creative; see Boden, 1990).

4. Musical intuition

It may be constructive to conceptualise musical intuition as a secondary type of intuition, resulting from a composite of the four proposed primary types of intuition (problem-solving, creative, social, and moral). Gore and Sadler-Smith (2011, p. 312) define secondary types as "deployed in specific and nonrecurrent (i.e., less frequently encountered) domains in occupational and other settings (e.g., business management, education, medicine, law, etc.)."

If musical intuition draws on different types of intuition, most likely problem-solving and creative intuitions, it would be useful to delineate these in the data. Do performers experience moments of insight brought about by creative intuition or does their experience of intuition revolve around the need for rapid decision-making in performance and perhaps also practice contexts? As discussed earlier, it might also be possible to discriminate between the mechanisms involved in intuiting, particularly if they can be distinguished by an expert's ability to articulate procedural memory or implicit learning. It is hypothesised that if an expert musician has reached the stage where they rely on so-called "mature intuition," they might be able to articulate some intuitive decisions that were deliberately made automatic through practice.

To explore these questions further, the next chapter will discuss a longitudinal case study with an expert period instrument string player in which a variety of data was collected. This study builds on the previous two studies and offers a detailed analysis of different types of musical decision-making, including the musical context and outcome of various decisions and how these can change over time.

Chapter Seven

Performing solo Bach: A case study of musical decision-making

1. Aims

This chapter aims to examine the musical decision-making processes of an expert period instrument performer, the cellist Daniel Yeadon. The study compares Yeadon's musical intentions, performances, and reflections on these performances to build a rich description of an evolving musical interpretation as well as his musical priorities. Within this description of Yeadon's artistic process, the chapter focuses on the use of intuitive and deliberate musical decision-making.

Since experts develop mature intuitions over time (Baylor, 2001; see Figure 6.2.2), Yeadon may draw on his knowledge of and experience in historical performance practice in a primarily intuitive manner. This could be particularly the case for issues of technique learnt during Yeadon's early training on the cello or in matters of performance practice on the Baroque cello, which he has studied intensively since 1990. The previous chapter suggested that an expert performer may be able to articulate how previously conscious, learnt behaviour became automatic, but this may depend on the extent to which Yeadon is aware of his influences and learning processes. In addition, the study examines Yeadon's interpretation of the J.S. Bach Suites for Solo Cello, pieces he has studied and played over many years on both Baroque and modern cello, which may have led to a degree of ingrained or automatic behaviour.

On the other hand, the context of this study was Yeadon's performances and planned recording of the Suites, which could result in a greater level of analysis, explanation, and justification than would normally be the case. In particular, the creation of a personal and to some extent original interpretation of these works for a recording project could lead to a greater reliance on deliberate decision making. It may be that

for Yeadon, as other artists have found, "the process of recording has a way of isolating each person in a bell jar of self-consciousness" (Tomes, 2009, p. 11).

As discussed in Part 1 of the thesis, there is a range of attitudes and approaches to musical decision-making in historically informed performance (HIP). Of particular relevance to this case study is the trend in HIP since the late 1980s towards a more personal, subjective, luxuriant, expressive style of HIP, described as "less ideological, more self-critical, and increasingly tolerant both of unorthodoxy and of forthright expressivity" (Dulak, 1993, p. 31). An example of a relaxing of ideology relates to the idea that performers should separate themselves from the influence of modern technique by pursuing a period instrument only career, a belief Dulak dates as strongest in the 1970s and early 1980s. In the decades since, it has become increasingly common for performers to have dual careers on Baroque and modern instruments, leading to an attitude in which "style becomes less like a part of the music's 'body' and more like the clothes one might choose to dress it in" (Dulak, 1993, p. 50). Yeadon's training in the 1990s and status as a period and modern instrument performer suggest that his musical decision-making will reflect the ideals of this more subjective, expressive brand of HIP.

Hypotheses

While individual differences were found in the results of the interview and sight-read studies, it was hypothesised that Yeadon would make deliberate musical decisions in a similar percentage to the 60% found overall in interviews with leading period instrument string players. Like Yeadon, the players interviewed in Chapter 3 were highly experienced and had studied and performed Bach's solo works for their instrument for many years. It may be that deviation from this figure, either towards greater use of intuition or deliberation, could result from several factors including personality or thinking disposition, goals or philosophy of performance, and the context in which the study takes place.

2. Method

The methodology was based on previous studies of individual musicians (see Chaffin, Imreh, & Crawford, 2002; Chaffin & Lisboa, 2009; Emmerson, 2006; Lisboa, Chaffin, & Logan, 2011) and was also influenced by case study research as described by Gruber and Wallace (1991), Reinders (1991), and Stake (1995, 2003). The main data collection tool used was think-aloud protocols (TAP), which were described in Chapter 5 and have been previously employed in numerous studies of musical composition, performance, practice, and listening (e.g., Bundra, 1993; Chaffin & Imreh, 2001; Collins, 2005; Davidson & Welsh, 1988; London, 1982; Reitman, 1965; Whitaker, 1989; Younker & Smith, 1996; Zerull, 1993). A series of meetings with the case study participant yielded think-aloud protocols regarding many aspects of musical decision-making, informed in part by the researcher's knowledge of previous interview studies on historically informed performance (Sherman, 1997), Baroque cello performance (Laird, 2004), and Bach interpretation (Baumgartner, 1999, 2002).

Participant

Daniel Yeadon has been described as part of the "new generations" of period instrument performer, defined as musicians that "had clear models with whom they could study" (Laird, 2004, p. xiii). Yeadon emerged on the London period instrument scene as a co-founder of Florilegium in 1991, after training at the Royal College of Music and playing with the European Union Baroque Orchestra. As well as playing in many of the leading period instrument groups in the UK, Yeadon has continued a career on modern cello, mostly notably with the Fitzwilliam String Quartet (1995-2000) and the Australian Chamber Orchestra. In an interview with Laird (2004), Yeadon spoke about differing priorities of Baroque playing, with the first generation of period instrument players being "more concerned with setups and playing techniques, probably out of necessity to differentiate their work from other players" (p. 319). This implies that Yeadon has other priorities of equal or greater significance in performing Baroque music than setups and techniques, and reveals an attitude towards HIP that values subjectivity.

The following biography is taken from the website of the Australian Chamber Orchestra (http://www.aco.com.au/about/musicians/daniel_yeadon) and further biographical information can be found in *The Baroque Cello Revival* by Paul Laird (2004, pp. 316-321):

> Daniel Yeadon has a worldwide career as a cellist and viola da gamba player; his repertoire ranges from Renaissance to contemporary. His regular chamber music collaborators in Australia include Neal Peres Da Costa, Genevieve Lacey, Ironwood, Romanza, Kammer, Elision and The Collective. He is a part-time member of the Australian Chamber Orchestra, he has appeared as soloist with the Australian Brandenburg Orchestra, plays every year with Pinchgut Opera and records regularly for ABC Classics. He is in much demand as a teacher.
>
> Originally from the UK, Daniel read physics at Oxford University and then completed a postgraduate diploma in performance at the Royal College of Music in London. For many years Daniel was a member of the renowned period instrument ensemble Florilegium and later joined the Fitzwilliam String Quartet, performing in major venues throughout the world and recording many award-winning CDs. Daniel continues to be guest principal cellist with many of the period instrument ensembles based in London, including the English Baroque Soloists and the Orchestra of the Age of Enlightenment.

The selection of Yeadon as a case study participant was based on his depth of experience in historically informed performance and his plans to record the complete Suites for Solo Cello BWV1007-1012. This will be his first commercial recording of these works, having previously recorded Bach's Sonatas for Violin and Keyboard BWV1014-1019 with violinist Richard Tognetti and harpsichordist Neal Peres Da Costa, and the Sonatas for Viola da Gamba BWV1027-1029 with Peres Da Costa (see Discography). Initially the case study was to include the recording sessions, but due to delays, the sessions had not begun by the time the case study was scheduled to end. The study ran over a period of two years (October 2008 – September 2010), and the various types of data collected were designed to depict Yeadon's preparation and performance processes in great detail.

Like the interviewees in Chapter 3, Yeadon was told that he was participating in a study about the interpretation of the solo string works by J.S. Bach. Yeadon signed an informed consent form and agreed to the use of quotations with the author identified in text. He viewed a draft of the study and was offered the opportunity to verify, edit, or expand the quotations used. This process led to no amendments.

<u>Materials</u>

As was done for capturing the think-aloud protocols in the sight-read study, the equipment used was a Canon XHA1 High Definition video camera with RODE Stereo VideoMic, a MacBook Pro laptop, and a Zoom H4 digital recorder for audio backup. Video was captured using Final Cut Pro (Apple Inc., Version 6.0, 2007) and played back to Yeadon using QuickTime Player. Yeadon's practice (DS9) was recorded using a Sony HDR-XR500VE Handycam Camcorder with ECM-HST1 stereo microphone.

<u>Procedure</u>

Most of the data for the case study was collected in a series of eight meetings between the researcher and Yeadon, held approximately every two or three months. Usually one and a half to two hours in length, these meetings were structured in two parts. Firstly, Yeadon was filmed playing a movement or suite of his choice from the J.S. Bach Suites for Solo Cello. Secondly, a retrospective think-aloud protocol was conducted immediately afterwards while he watched his performance of the movement or Suite. This part of the meeting usually included some discussion of various topics that had been raised in the think-aloud and Yeadon's perspective on how his musical ideas were developing. To avoid creating a demand characteristic any direct questions about intuitive or deliberate processes were only asked if the participant raised the subject first. To supplement these data, Yeadon wrote about any significant events that occurred during practice sessions in a journal and an extended period of practice over one month was also recorded. It should be noted that Yeadon's journal entries were sporadic and consisted mainly of one period of practice in December 2009.

Table 7.2.1 explains the sequence and context in which the data were collected and further details are outlined below the table. Sources of data in this study are referred to using the abbreviations DS1 (Data Source 1), DS 2 etc.

Table 7.2.1: Summary of data collected in Yeadon case study

DS	Date		Event	Piece	Location	Data type
1	Oct 15	2008	Meeting	S3: Prelude	SCM	Video
2	Dec 8	2008	Meeting	S3: Allemande	UNSW	Video
3	Mar 30	2009	Meeting	S4: Prelude	UNSW	Video
4	May 22	2009	Meeting	S1: Sara. Cour.	UNSW	Video
5	July 29	2009	Meeting	Suite 5	UNSW, Clancy	Video
6	Aug 2	2009	Concert	Suite 5	SOH, Utzon Room	Video
7	Oct 16	2009	Meeting	Suite 4	SCM, Verbrugghen	Video
8	Oct 18	2009	Concert	Suite 4	SCM, Verbrugghen	Video
9	Dec	2009	Practice	Various	Home	Video, journal
10	Jan 3	2010	Concert	Suites 1 and 4	PSMF	Video, ABC
11	Jan 4	2010	Concert	Suites 2 and 3	PSMF	Video, ABC
12	Jan 5	2010	Lecture	Various	PSMF	Video
13	Mar 27	2010	Meeting	Suite 1	SCM	Video
14	Mar 28	2010	Concert	Suite 1	SCM, Verbrugghen	Video
15	Sept 17	2010	Meeting	Suite 5	SCM	Video
16	Sept 19	2010	Concert	Suites 1, 2 & 5	Villa Music, Berry	Video

List of abbreviations:
ABC: concert recorded by the Australian Broadcasting Corporation (audio only)
PSMF: Peninsula Summer Music Festival (Mornington Peninsula, Victoria)
SCM: Sydney Conservatorium of Music (meetings held in ensemble rooms, concerts in Verbrugghen Hall)
SOH: Sydney Opera House
UNSW: University of New South Wales (meetings held in lecture rooms or John Clancy Auditorium)

1. Meetings (DS1-5, 7, 13, 15)

   Think-aloud protocols provided insight into the mental processes occurring during performance by gathering data regarding Yeadon's musical intentions and what he was paying attention to while playing. In contrast to the think-aloud protocols collected in the sight-read study, more follow-up questions were asked in the case study as time allowed for greater discussion and dialogue. In the first four meetings (DS1-4), Yeadon performed only one or two movements from the Bach Suites, resulting in a level of detail in the think-aloud data not often reached in later meetings. This is because later meetings (DS5, 7, 13, 15) took place a few days before various scheduled public performances and complete Suites were played as the basis for the think-aloud procedure. In addition, the initial 'performances' at each meeting on which the think-aloud procedure was based were collected in order to compare Yeadon's words and actions.

2. Concerts (DS6, 8, 10, 11, 14, 16)

    Recording of concert performances allowed for additional comparison with the
    think-aloud data and Yeadon's 'performances' during the meetings. When the
    same piece was performed on more than one occasion, similarities and differences
    between earlier and later performances demonstrated how Yeadon's conception of
    the piece had evolved. The performances took place at the Sydney Opera House
    (Utzon Room), the Sydney Conservatorium of Music (Verbrugghen Hall), Villa
    Strachanus in Berry (Villa Music), and the Church of St John-the-Evangelist in
    Flinders (Peninsula Summer Music Festival).

3. Other (DS9, 12)

    A public lecture given by Yeadon at the 2010 Peninsula Summer Music Festival
    captured similar data to what was covered in the meetings (DS12). A sustained
    period of practice during December 2009 was self-filmed by Yeadon and he also
    kept notes in a journal during this period (DS9). This intensive practice period was
    in preparation for two solo concerts of the Bach Suites given at the 2010 Peninsula
    Summer Music Festival, which were also recorded by the Australian Broadcasting
    Corporation (DS10 & 11). Yeadon's performances were broadcast on ABC Classic
    FM on September 28 and 30, 2010.

Data analysis procedure

The data analysis procedure followed the method already outlined in the interview
study (see Chapter 3, Section 2), resulting in the coding of quotations in two distinct
groups: firstly, quotations regarding specific music decisions and secondly, themes
describing more general discussion. Although the case study primarily collected think-
aloud data in contrast to the semi-structured interview format used in Chapter 3, the
data analysis procedure was deemed appropriate for both studies. Although the
interviews had a similar focus to the case study, the think-aloud procedure and
repeated meetings meant that the data from the case study was more detailed, more
centred around specific decisions, and discussion was prompted by video footage
rather than a score.

An important difference between the two preceding studies and the case study was the
emergence of a new category of musical decision-making. As hypothesised in Chapter

6, Yeadon spoke about some decisions that were made deliberately in the past but had become automatic over time. The decision was experienced as intuitive, but the description of previously explicit knowledge becoming procedural over time provided an opportunity to create a sub-category of intuitive decision-making, labelled procedural. As Hogarth (2001) has suggested, investigating differences between intuitions that are acquired explicitly and implicitly may help in understanding the extent to which intuitive skills are domain-specific (p. 274). Data from this category may also contribute to the development of theoretical models that argue the existence of different types of intuition (Gore & Sadler-Smith, 2011; Glöckner & Witteman, 2010a; Pretz & Totz, 2007; Sinclair, 2010). Procedural processes had been previously discussed as a theme in the interview study (see Chapter 3, Section 4), but in that study there were no examples of specific musical decisions given that necessitated the creation of a new category.

Therefore, the data analysis procedure described in the interview study was altered to the steps outlined below.

1. Coding of specific musical decisions by a) performance features (articulation, bowing etc.) and b) category of musical decision-making. The category of musical decision-making assigned to the decision was based on the language used within the quotation. This approach resulted in four categories of musical decision-making:

    i.   Intuitive: Decisions that were based on a feeling, sense, or preference and were not explained further.

    ii.   Procedural: Intuitive decisions that were described as having been conscious deliberate choices at some point in the past. For example, "I practised," "it's built-in," or "I've assimilated."

    iii. Deliberate: Decisions that were explained by a reason. For example, "I look for," "I'm aware of," "I notice," "it should be," "I read," or "he/she said."

    iv.   Deliberate HIP: Deliberate decisions that were explained with reference to specific knowledge of historical performance practices. For example, "according to (treatise author)" or "in my experience of HIP…"

2. Coding of more general discussion resulted in a list of themes. The themes were anything that was not an actual musical decision and were generally more conceptual in nature. The themes related to two areas:

    i.   Influences on musical decision-making

    ii.   Processes of musical decision-making

The list of themes regarding influences and processes was then analysed to create super-ordinate themes (higher level codes). This was done through a process of abstraction that involved identifying patterns between themes and developing names for each cluster (Smith et al., 2009, p. 96).

Just as in the interview study, if a single quotation contained more than one decision (e.g., discussed changes to articulation and tone colour) it was coded multiple times. Therefore, the total number of musical decisions includes decisions that relate to the same passage of music (see quotations discussed under decision-making categories in Section 3 for examples).

The clustering of musical decisions and themes was achieved using the code manager and families functions in Atlas.ti. Like the interview study, the final codes were discussed and confirmed in consultation with the supervisory team to ensure that the quotations were accurately coded. The members of the supervisory team brought both musicological and psychological perspectives to this task.

In this chapter, the data coded as specific musical decisions will be discussed in Section 3, and the data coded by themes related to decision-making will be discussed in Section 4. These sections employ a mixed method approach to analyse the results, using similar quantitative and qualitative techniques to the previous two studies.

3. Results and discussion A: Musical decisions

This section will discuss specific musical decisions raised by Yeadon in the meetings, journal and lecture (DS1-5, 7, 9, 12, 13, 15) that relate to his interpretation of the Bach Suites. In total, 134 musical decisions were identified and categorised as intuitive, procedural, deliberate, or deliberate HIP. The total number of decisions ($N = 134$) is

similar to the total number of decisions in the interview study ($N = 166$), a result that shows the much greater level of detail that can be achieved though a longitudinal study of a single performer. Overall results will be reported first in this section, followed by examples from each category of decision-making discussed in relation to the specific musical context and Yeadon's performances (DS6, 8, 10, 11, 14, 16).

<u>Overall results</u>

Categories

The study found a large proportion of deliberate decision-making overall. Decisions categorised as deliberate (including deliberate HIP) accounted for 65% ($N = 87$) of the total number of decisions ($N = 134$). Decisions categorised as intuitive (including procedural) accounted for the remaining 35% ($N = 47$). Figure 7.3.1 shows the breakdown of musical decision-making using the four categories.

Figure 7.3.1: Number of decisions according to category of musical decision-making
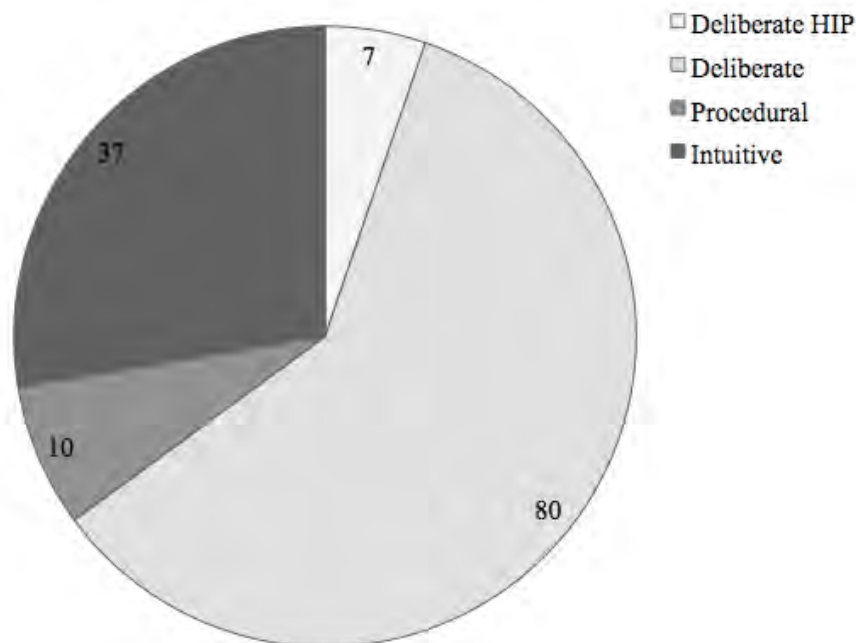
If the four categories are collapsed to just deliberate and intuitive, the resulting proportion of 65/35 is similar to the 60/40 overall finding in the interview study. Both these findings have a far greater percentage of deliberate decision-making than the

18/82 overall finding in the sight-read study, perhaps implying that many musical decisions become conscious choices over time. The similarity between the case study and the interview study findings in terms of overall percentage in each category provides further evidence that there may be a generalisable figure or limit to the proportion of decisions that expert performers make deliberately or intuitively.

Performance features

When analysed by performance feature, the highest number of musical decisions were regarding the issues of articulation ($N = 22$) and phrasing ($N = 22$). Although 12 performance features were analysed in the study, decisions about articulation, phrasing, and character accounted for 48% ($N = 64$) of all decisions. Figure 7.3.2 graphs the number of musical decisions by performance feature, including whether the decisions were categorised as intuitive, procedural, deliberate, or deliberate HIP.

Figure 7.3.2: Number of musical decisions by performance feature
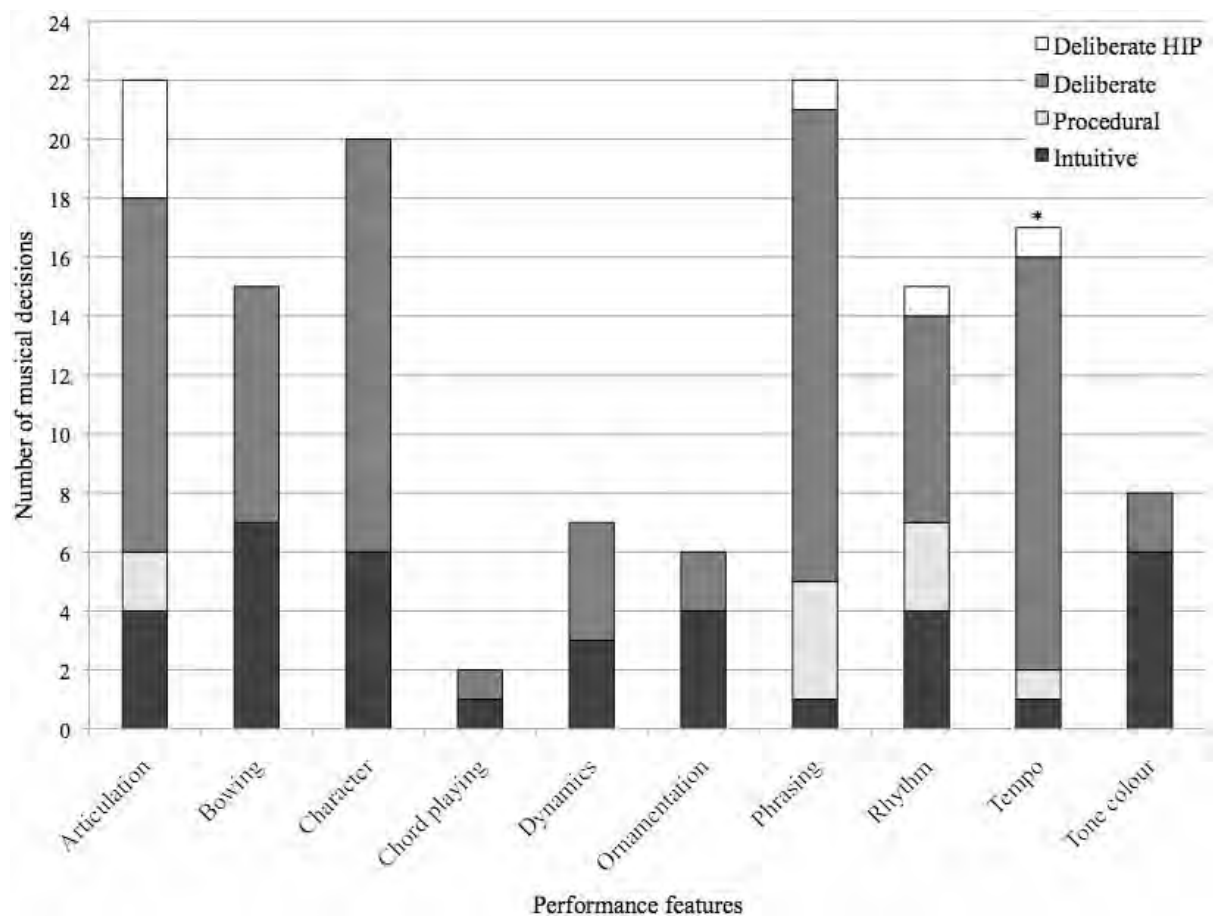
* $p < .05$ for Chi-square test for difference between intuitive (including procedural) and
deliberate (including deliberate HIP) decision count

Analysis of how decisions were made according to performance feature shows a greater proportion of deliberate decision-making in most features of the piece. Ten tests were carried out using Chi-square analysis with Bonferroni correction for multiple comparisons to determine if the difference between intuitive and deliberate decisions within each performance feature was significant. For these tests, the four categories were collapsed to two: intuitive (intuitive and procedural combined) and deliberate (deliberate and deliberate HIP combined). The analysis found that Yeadon made significantly more deliberate than intuitive decisions in the area of tempo, X^2 (1, $N = 17$) = 9.94, $p = .01$.

Interestingly, articulation and phrasing had the highest number of musical decisions overall and were two of only four features (with phrasing and tempo) to include deliberate HIP and procedural decisions. This would suggest that Yeadon had carefully considered these issues, had drawn consciously on his knowledge of historical performance practice, and had practised his musical choices to reach a degree of ease and automation in performance. These two features seem to be important to Yeadon for achieving his musical goals, such as striving to highlight harmonic shifts and the rhetorical nature of the music. The role of articulation and phrasing in achieving a rhetorical, gestural style of HIP was also a key finding of the interview study. In the following quotation (DS12), Yeadon talks about phrase lengths and silence in connection to both architecture and language:

> Each movement of Bach has one or more harmonic high or low points. When there are several of these I try to decide on their relative strengths and this kind of serves as a route map for the movement. At this point I also try to identify the phrase lengths just like sentences during a talk. The moments of silence between phrases are of course just as important as the sound itself, rather like the empty spaces or voids in the architecture of buildings. The silence in music is something that needs the most persuasion of students to do, to inject into the music. When I encourage students to leave more and more space, usually by the end of the discussion, they can't believe that it's possible to leave that amount of silence but it's just like rhetoric in a speech, exactly the same thing.

In terms of intuitive decisions, only decisions about tone colour and ornamentation were coded as being made intuitively over half the time. These two issues could be considered features of the piece that are most likely to vary from performance to performance, and therefore would be subject to more spontaneous, intuitive decision-

making. This finding replicates the interview study (Chapter 3) in which decisions about tone colour and ornamentation were also made intuitively in the majority of cases.

Pieces

When analysed by piece, the results show that the highest number of musical decisions were made about Suite No. 3 (see Figure 7.3.3). While each Suite shows a greater reliance on deliberate decision-making, Chi-square analysis (5 tests with Bonferroni correction) found that Yeadon made significantly more deliberate than intuitive decisions when discussing Suite No. 4, X^2 (1, $N = 30$) = 8.53, $p = .02$.

Figure 7.3.3: Number of musical decisions by piece
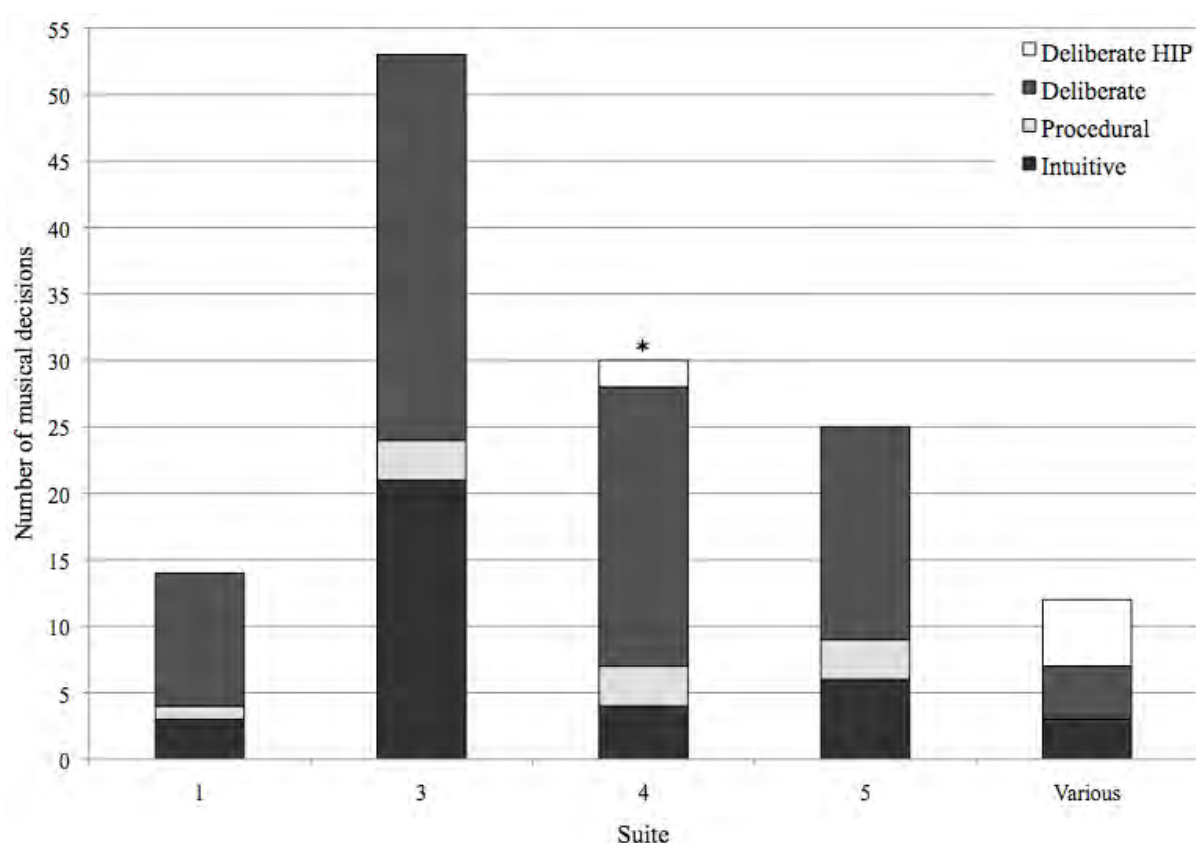
* $p < .05$ for Chi-square test for difference between intuitive (including procedural) and
deliberate (including deliberate HIP) decision count

The four Suites that were covered in the meetings (Suites 1, 3, 4 & 5) were the subject of two meetings each, with eight meetings in total. The diary (DS9) and the lecture (DS12) account for the "various" column in Figure 7.3.3 as Yeadon discussed all the

Suites in a general manner within these two data sources. Most of the decisions categorised as deliberate HIP are in the "various" column, demonstrating a tendency to refer to detailed performance practice explanations when talking more generally about interpreting these pieces. The public nature of the lecture may have also contributed to a greater degree of explanation with reference to historical sources.

<u>Decision-making categories</u>

Having presented the overall results in a primarily quantitative manner, this section will explore the musical decision-making process in greater depth by giving examples of each category of decision-making. Where appropriate, decisions will be discussed with reference to the specific musical context (score excerpt) and musical outcome (performance analysis). Score excerpts are taken from the copy of the Suites made by Anna Magdalena Bach (AMB) between 1727 and 1731.

Intuitive decisions

Intuitive decisions were characterised by phrases such as "I feel," "I get the sense," or "it seems right" ($N = 37$). These decisions relied on a feeling or sense of rightness and were sometimes moments in the piece where a firm decision had been avoided or not yet made. For example, in the Prelude from Suite No. 3, Yeadon (DS1) described a passage that can vary in character and tempo during performance (see Figure 7.3.4):

> There's another long sequence from 21 and there's many number of ways in linking 19 to 21. 20 being a harmonic relaxation after 19 so I can either think of the whole thing as relaxing, of 19 being quite intense and relatively dark for this movement and then kind of relaxing both in tempo and in mood through into 21, or I can choose at that point to keep the intensity up well into bar 20 and then just relax at the very last minute. So just as I'm talking through it, I realise that I do make decisions about the broad picture on how I want things to go but then there are certain turning points where I might give myself more than one option. Bars 19 and 20 are a good example of that. So I'll just go with how I'm feeling at the time.

> *And how did it go today?*

> I think today in 19 and 20 I relaxed once I'd reached that point, once I'd reached the beginning of 19. As I was playing it I was thinking, "should I be a bit more intense here? Should I keep the bow pressure up and work these notes

a bit more and then relax at the last minute?" but I sensed that what I was doing was just backing off over those two bars. Which brings up a point of, of course I know what's going to happen in bar 21, and sometimes I wonder whether I should give the impression that I don't know what's coming, so those two bars (19 and 20) could have a much more exploratory feel somehow. I could probably get that with taking more time, being freer with them. I think today I backed off in the intensity but I kept up the momentum. It seemed quite flighty when I heard it back. When I get to 21 usually I rest on that first semiquaver and then I take off from the second, which is not the only option of course. If I've really been very free with 19 and 20, then I could choose to start the sequence in time from 21 and just keep that going more like clockwork.

Figure 7.3.4: Prelude from Suite No. 3 in C major, bars 19-21

In his analysis of this piece, Winold (2007a, p. 26) cites bar 21 as a "possible point of arrival" due to the first note representing the tonic harmony and the rest of the bar representing a deceptive cadence on V/V (Winold, 2007b, p. 14). Yeadon may have felt these harmonic shifts, but did not articulate a specific reason for his interpretative options in this passage. Through differing processes, Winold and Yeadon reached the same conclusions about the performance of bar 21:

> Winold (2007a, p. 26): Performers may choose to emphasise the 'arrival' function of the resolution of pitch A by lengthening this note, or to emphasise the deceptive cadence by playing bar 21 strictly in time.

> Yeadon (DS1): When I get to 21 usually I rest on that first semiquaver and then I take off from the second, which is not the only option of course. If I've really been very free with 19 and 20, then I could choose to start the sequence in time from 21 and just keep that going more like clockwork.

This example also shows how one decision may be dependent on another since the timing of the sequence in bar 21 is explained as being influenced by what occurs in bars 19 and 20. The use of the word "usually" in relation to resting on the first note of

bar 21 also hints at some awareness of previous decisions even though there had been no final decision made ("I'll just go with how I'm feeling at the time"). It could be that this issue was only fully brought to Yeadon's attention at the meeting itself and following the meeting he may have consolidated his thoughts about timing in this passage, whether consciously or not.

The decision to rest on the first semiquaver of bar 21 is clearly demonstrated in Figure 7.3.5, which shows the duration in seconds between each semiquaver in the passage discussed by Yeadon. Although Yeadon describes alternatives for rhythmic flexibility in bars 18-21, recordings from the meeting referenced above (DS1, October 2008), a practice session the following year (DS9, December 2009), and a concert (DS11, January 2010) show that very similar decisions were made in each instance. Overall, the January 2010 concert performance demonstrates an exaggeration of the timing differences between semiquavers in this passage when compared to the earlier, slower practice and performance conditions.

Figure 7.3.5: Rhythmic flexibility in Prelude from Suite No. 3 in C major, bars 18-21 (DS1, 9, 11)
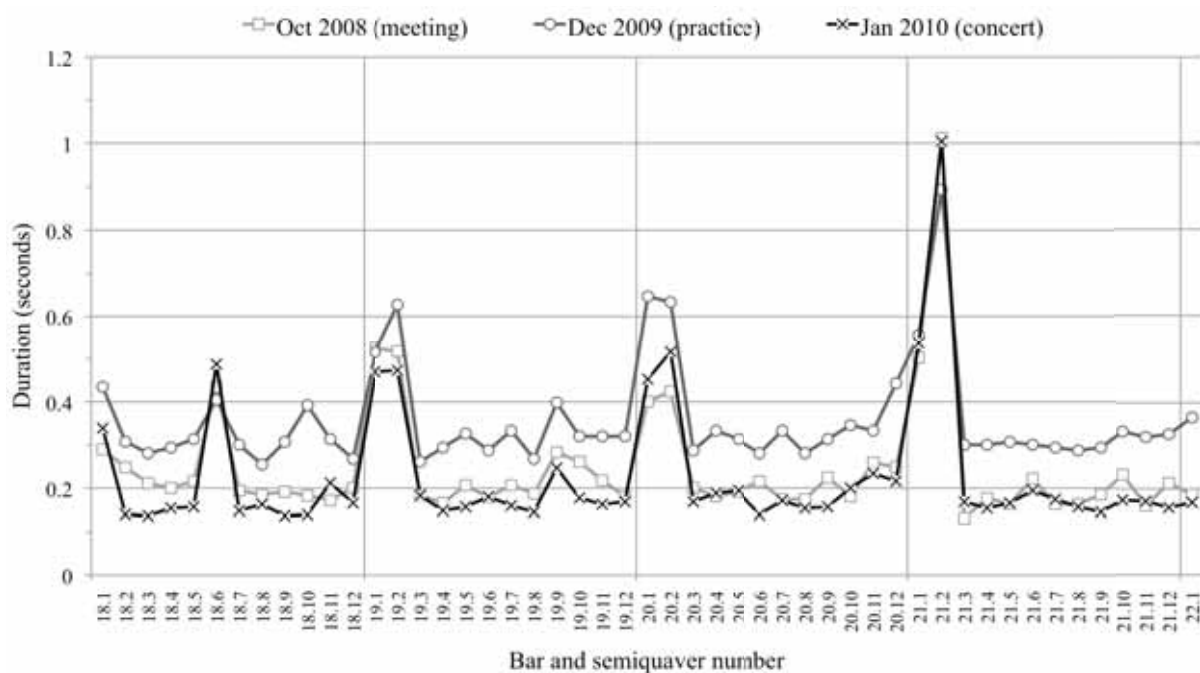
At the slow practice speed there is an additional small breath taken after the ninth semiquaver in bar 18, resulting in the bar sounding like three groups of four semiquavers: from the second semiquaver to the fifth (D to A), the sixth to the ninth (F to C), and the tenth to the first note of bar 19 (B to F). In the two performances however, the main variation occurs between the fifth and sixth semiquavers, a decision that is clearest in the concert performance from January 2010. These timing differences demonstrate how Yeadon manipulates the interrelated features of articulation, phrasing, and rhythm to achieve the rhetorical space between notes referred to earlier in the chapter, even in a movement which is made up almost exclusively of semiquavers.

The repetition of these timing decisions, particularly during practice, could demonstrate part of the process by which decisions become automatic. Yeadon may have started making these decisions intuitively, but the quotation from the meeting demonstrates awareness of what he does as well as what he could do. The decision to stick with the same decision seems to have been consolidated through practice (deliberately or not) in order to become automatic during performance. The first part of this process shows a move from intuitive processes towards deliberation in bringing the decision and other options to mind while the second part shows a move from deliberate processes back to intuition in making the behaviour automatic. This process has the potential to be repeated several times, for example if at a later date this passage was re-examined and other options brought to mind.

Later in the same movement Yeadon (DS1) cites another example where he has at least two options to chose from during performance (see Figure 7.3.6):

> Going from the C major in 56 to C minor in 58, I'm experimental with doing that; getting stronger there and also getting softer and I think both work so I'm usually spontaneous about that.

Figure 7.3.6: Prelude from Suite No. 3 in C major, bars 56-58

Although he leaves the final decision to the performance there still seems to be an element of premeditation in the examples of intuitive decision-making given so far. A more spontaneous decision was raised in relation to the Menuet I from Suite No. 1 (DS13):

> There were moments in this one where I brought a phrase out a bit more than I normally do. That was one just then [bars 13-16], and the thought I had was "oh this might feel a bit bombastic for the concept that I have in my head. Is that coming across as a little egotistic moment?" and it doesn't come across that way. I think it just gives it a bit of extra life. That's something I'd like to do more of, just spontaneously give more dynamic. Earlier I was thinking about more and that's one way it could be more at times actually, just get more into the string and produce more sound.

The spontaneous decision to "give more dynamic" to a phrase is likely to have been driven by harmonic changes. In the phrase referred to above (see Figure 7.3.7), the melody starts by outlining a diminished chord based around V/vi before resolving to chord vi. The tension created by the harmony is one explanation for why Yeadon felt that an increased dynamic would be appropriate for this phrase.

Figure 7.3.7: Menuet I from Suite No. 1 in G major, bars 13-16

As discussed earlier in this section (see Figure 7.3.2), decisions about tone colour and ornamentation were usually made intuitively. In his lecture (DS12), Yeadon spoke about varying tone colour through bow speed and adjusting the bow's contact point with the string:

> There's so much scope for the storytelling that you can get from the kinds of sounds that you make from gut. Deciding where to make a really intense sound with a slow bow or where you're going to make a more transparent sound using a swifter bow nearer the fingerboard. It's something I now leave to

spontaneity because I'm realising the more I play the Suites, the more I can do what I like really.

A more specific example of tone colour is Yeadon's decision to change the quality of the sound during the Prelude of Suite No. 5. In the following quotation (DS15), he talks about making subconscious changes to where in the bow and where on the string he is playing as a reaction to the acoustic of the room:

Just noticing that I'm tending to play over the fingerboard quite a lot but that's probably because it felt like quite a harsh sound under the ear in here so I was coming up over the fingerboard to create a nicer sound...

Was that a conscious thing?

No, I think it was happening quite subconsciously, the bowing. I was making an adjustment for the sound. I was aware of not getting the same contrast of sounds in here than I can get in Verbrugghen [Hall]. Also I tend to subconsciously start playing from the tip for the same reason that it feels more subtle, bow changes feel a bit more subtle.

While he identifies the decision to change the tone colour as subconscious, he is still able to explain the decision as being influenced by an awareness of the acoustic in comparison to larger venues and the feeling of ease or subtlety when playing at the tip. Decisions explained by a specific reason, whether made prior to performance or 'in the moment,' would usually be coded as deliberate but this quotation makes it clear that Yeadon experienced this decision as an intuitive one. His retrospective "noticing" of the change and subsequent explanations demonstrate that he was not fully aware or attentive to the decision being made. As with all data collected using self-report techniques, the analysis relies on Yeadon's attribution of the decision to a subconscious process and his justification of what occurred.

A general statement regarding ornamentation was made in Yeadon's lecture (DS12), implying the use of intuitive processes. The use of "feel" in the following quotation describes a process of responding to the musical affect and then acting according to certain rules of thumb:

In general with ornamentation what I try and do is aim for the ornaments to exaggerate the feel in the music so if a moment is very heartfelt I would add a longer appoggiatura and if it's more flippant I would do a shorter appoggiatura.

Yeadon's statement echoes the instructions of violinist and composer Francesco Geminiani who wrote the following in his treatise *The art of playing on the violin* (1751/1995, p. 7):

> The Superior Appoggiatura is supposed to express Love, Affection, Pleasure, &c. It should be made pretty long, giving it more than half the Length or Time of the Note it belongs to…If it be made short, it will lose of much of the aforesaid Qualities.

If Yeadon applied this convention in performance he would probably be able to articulate why he played the ornament in a certain way. Since the connection with a specific decision or historical practice was not made explicit in Yeadon's statement, the quotation above was categorised as intuitive. While this decision may well have been the result of learning a convention to the point of it becoming intuitive, this process would need to have been clearly described within the quotation in order to warrant categorisation as procedural.

Procedural decisions

These decisions describe the assimilation and automation of previously deliberate decisions ($N = 10$). This is achieved through practice and exemplifies the process of conscious, learnt behaviour becoming unconscious. As the details of individual actions recede, procedural knowledge of performance rules are experienced as automatic and apparently spontaneous by the performer (Lehmann, Sloboda, & Woody, p. 103; also see Sloboda, 1985, pp. 216-223). The identification of procedural decisions was only possible through Yeadon's reference to certain decisions being "built-in" or "assimilated" through practice. For example, in the following quotation (DS15), Yeadon discusses phrasing and tempo within the Prelude of Suite No. 5:

> It's breathing more than it felt so it might have been a mindset that I was in during the performance. The whole thing felt a little bit breathless to me but actually it's coming across with as much space as I'd want.
>
> *Breathless meaning?*
>
> Meaning not enough time between phrases and just a feeling of hurry. A lot of these things I have built-in in my practice so even if I'm in a slightly strange mindset the phrasing and the breathing is coming across more than I think it is.

During the think-alouds, Yeadon sometimes mentioned that aspects of his interpretation were coming across clearly even though he felt unsure while performing. This suggests some mistrust of or need to evaluate the results of procedural decision-making, although he usually expresses confidence in his preparation processes after finding the performance satisfactory. For example, in the following quotation (DS5) Yeadon implies that he is able to rely on a procedural process to communicate the structure of the Prelude from Suite No. 5 and can therefore aim for more spontaneity within this framework:

> So the thought I'm having now is the slightly daunting thing about this movement is just its length and the fact that the theme is stated so many times. I've been in my head quite a lot about this movement about whether I'm clear enough about the structure of it in my head but interestingly seeing the playback, I think the structure is there. I think I've assimilated it and I think I could be a little freer in general with the rhythm and a little more playful. A little more spontaneously imaginative.
>
> *How do you know you've assimilated the structure on viewing it back?*
>
> Because what I'm hearing, what I'm seeing is what I was hoping to put across in terms of structure so that's encouraging. It's always hard to know when you are preparing something whether that is going to come across somehow as the same story to an audience.

The category of procedural also relates to Yeadon's goal of accessing a state of "flow" or "the zone" during performance. In this quotation (DS3), Yeadon talks about achieving his intended articulations in the Prelude from Suite No. 4 without having to pay attention to the specific moment-to-moment decision-making process:

> I felt really in the flow with those last I don't know however many bars that we listened to. I think there was not a lot going on mentally during those bars compared with the opening. That's what I'm aiming for ideally, to be free of all the mental stuff and just to flow with the music. So I was pleased.
>
> *What was that feeling if you compare that to the opening perhaps? What was going on that was different?*
>
> Wherever there were arpeggio sequences I was less self-conscious about what bow stroke. I think I was in the groove, I was settled with the bow strokes so I wasn't obsessing about it. I was letting myself go with the pacing, with the semiquaver bits again without thinking about what was going on or trying to control what was going on. It felt natural to me. As if I'd assimilated all the stuff I had been thinking about all those bars and I was just playing.

The next quotation also relates to the concept of flow and trying to achieving intended articulations and phrasing subconsciously during performance. In this meeting (DS7), Yeadon performed the complete Suite No. 4 followed by a second take of only the Prelude. After watching the second take back he began reflecting on the differences between the first and second performances of the Prelude:

> I think it was a little bit more spacious and a little less angsty and the way I played each bar was subtly varying all the time which is what I hoped to achieve. Sometimes the second note was quite strong and other times it was more gentle and reflective and the last note of each bar is a similar sort of thing. Sometimes it was just in parenthesis at the end and other times it led a little bit to the next bar and that's what I would like to do. It's one of these things that when I am too conscious of it, it doesn't work. It's like I have to try and achieve it subconsciously. Being in the zone again.

> *So that's definitely a feeling sort of thing?*

> Yeah. I've thought about what I want in each bar but when I'm actually playing it I don't really have time to nourish those thoughts and put them into practice. I think occasionally I'll refer to one of those thoughts I've had about how to play a bar and I'll do it, but in other bars I'm thinking about tuning or the overall architecture, but it's best when I'm not obsessing about any of those things really. That's when it seems to flow.

> *But you do have an idea for each?*

> Yes I have. I could go through and say exactly what I'd planned. When I see the playback and I do something slightly different from planned it often works beautifully and that's quite encouraging because I have more freedom of artistic expression than I think I have.

> *The planned bar by bar is a baseline?*

> Yeah a baseline from which to spring and do other things. I guess when it feels like it's flowing I've let go of the concept that I have of it and something else might take over. I think the architecture will always remain in place. My concepts of phrase lengths and the overall architecture of the piece is going to be there but it's just what happens in the minutiae that might vary and might be spontaneously successful or pleasing.

This quotation raises a number of issues related to Yeadon's goals, what he is able to articulate, and what he chooses to articulate. It suggests that if Yeadon was asked to note every cue or decision, he may well be able to explain his interpretation on a bar by bar basis. In contrast, the collection of think-aloud data related to specific performances reveals that Yeadon aims to pay attention to very few cues. By doing

this he is able to access a flow state primarily directed by intuitive processes and based on ideas that have been planned and practised in order to emerge in the moment of performance without needing to "nourish" or be conscious of those thoughts. Therefore, Yeadon's aim of flow in performance is closely linked to the generation and reliance on procedural decisions. This keeps the interpretation of the piece relatively consistent over time, particularly "concepts of phrase lengths and the overall architecture" although Yeadon remains open to varying the "minutiae." He even states that when he does feel in flow he has let go of his concept of the piece to some extent in order for new ideas to arise spontaneously. In once meeting he suggested that much of his playing is directed by procedural decisions by stating, "I think I have built-in quite a lot of my interpretation as an almost automatic thing now" (DS13). This statement was made in the context of discussing the Suite No. 1, a piece that he described as the one he knows best (DS13) and could be directed more by procedural memory than the other Suites.

Deliberate decisions

Deliberate decisions were categorised as those that were explained by a specific reason, implying a degree of conscious planning or deliberation during performance. This category accounted for a large proportion (60.6%, $N = 80$) of all decisions analysed. As Table 7.3.1 shows, most of the deliberate decisions were regarding phrasing, character, tempo, and articulation.

Table 7.3.1: Deliberate decisions grouped by performance feature

Category	Language examples	Performance feature	N
Deliberate ($N = 80$)	I look for	Phrasing	16
	I'm aware of	Character	14
	I notice	Tempo	14
	It should be	Articulation	12
	I read	Bowing	8
	He/she said	Rhythm	7
		Dynamics	4
		Tone colour	2
		Ornamentation	2
		Chord playing	1

An example of a deliberate decision is Yeadon's predetermined decision to vary the dynamic in two bars of the repeat of the Courante from Suite No. 1. This quotation (DS4) also demonstrates that Yeadon would often critique his performances during the retrospective think-aloud, rather than solely focus on remembering and articulating his thoughts processes from the performance:

> In the repeat of that I was getting a bit self-conscious about whether the repeat was different enough and I think I could be bolder in doing something very different on the repeat. It comes across more similar than I thought.
>
> *Did you have something in mind?*
>
> I really only had something in mind for those bars 14 and 15 which I like both as a crescendo and going towards 16 but also as a diminuendo and doing the opposite. I had it in my head I was going to do one the first time and a different thing the second time.

As might be expected from a deliberate decision, recordings of subsequent meetings and performances (DS10, 13, 14, 16) show the same decision regarding dynamics being made each time. For example, Figure 7.3.8 shows the intensity level for bars 14 and 15 from a concert performance in January 2010 (DS10). This analysis demonstrates a relatively clear crescendo going towards bar 16 the first time and a decrescendo on the repeat.

Figure 7.3.8: Intensity (dB) in Courante from Suite No. 1 in G major, bars 14-15 (DS10)
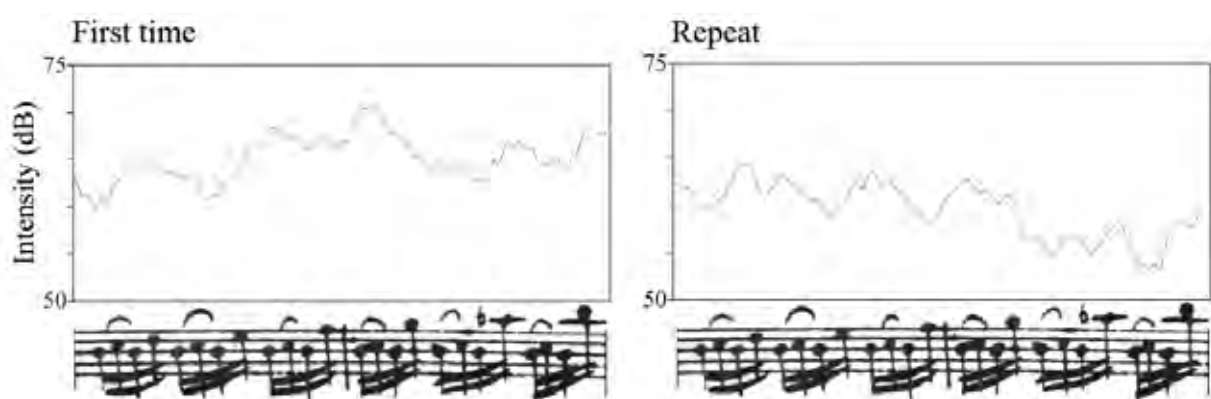
This example demonstrates that deliberate decisions were sometimes to do with varying the music during the repeat. As Neumann (1994) points out in relation to

Bach's unaccompanied violin and cello works, when repeats are made "a measure of variation is generally desired" (p. 36). He goes on to suggest various possibilities that the performer could consider such as changing the dynamic, articulation, bowing, tempo, or adding ornamentation.

A case of varying ornamentation during a repeat arose during discussion of the Sarabande from Suite No. 5. In this case Yeadon refers specifically to vibrato (DS5), aiming to highlight harmonic changes and make a difference between playing a passage for the first and second time:

> I'd consciously decided to do it [vibrato] at the beginning of bar 7 just to add a bit of warmth to that B flat. Just wonderful to arrive in E flat major at that point and on the second half, the first time, I decided to do something in the beginning in bar 17. My thinking was to make that an arrival point the first time and then to be more reflective on the repeat…
>
> *Those points that you mentioned, they are not marked or anything?*
>
> Just something I've thought of and carry around in my head. I generally don't mark up vibrato.

While Yeadon often highlighted the first note of each bar in this Sarabande by vibrating a little at the start or in the middle of the note, he made a conscious, predetermined decision to bring out the "climatic" first note of bar 17 in particular (Ledbetter, 2009, p. 224). On the repeat, Yeadon's use of the word "reflective" indicates a change of character at that point, which when listening to the recordings is also accompanied by a slight backing away and stretching of time before the note. This was done in all meetings and performances of the piece (DS6, 15, 16). Figure 7.3.9 shows a spectrogram analysis of bar 17 from a concert performance in August 2009 (DS6), demonstrating a more intense vibrato on the first note of bar 17 the first time through. The first time contains more pronounced vibrato throughout the bar while the repeat shows only a very subtle use of vibrato on select notes. The arches at the top of Figure 7.3.9 indicate the slurring pattern used and it should be noted that the top string of the instrument is tuned to a G instead of an A in this Suite so the first note of bar 17 sounds as an E flat and so on.

Figure 7.3.9: Spectrogram of Sarabande from Suite No. 5 in C minor, bar 17 (DS6) with enlarged detail of first note
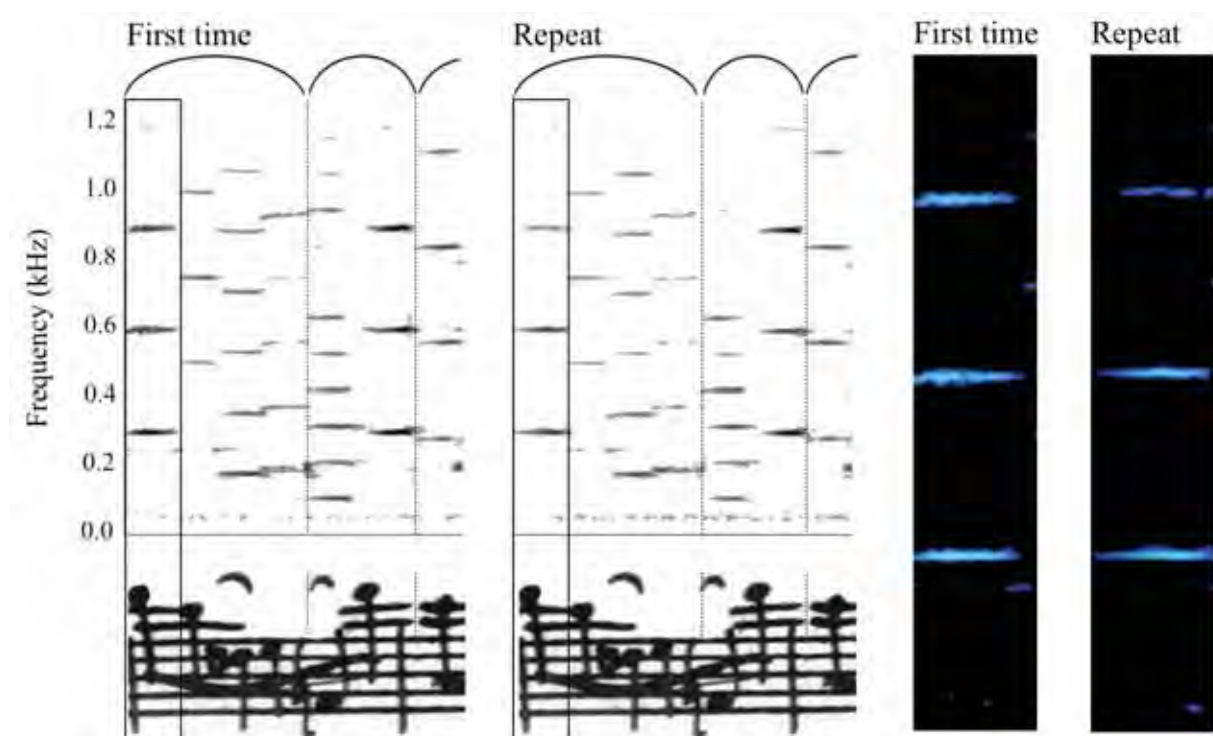
In another meeting (DS3) Yeadon talked about vibrato sometimes resulting from technical rather than musical considerations. In the quotation below (DS3) he talks about using vibrato in the Prelude from Suite No. 4:

> Another thing that was on my mind at this point was the character of the second note in each bar, the second quaver in each bar. I was aware that I was putting a little bit of vibrato on some of those second notes and on others it was plain and I think at that point I was thinking "how much of that is a conscious thing and how much of that is to do with again the physicality of moving around the cello?" Yeah, that was what was on my mind and I think another thing that was flashing through my mind was "does it matter whether that is a conscious thing for me?" Should I go through and work out which notes sound good with a little bit of vibrato and a bit of emphasis or should I just let that happen in the way that the physicality dictates?

He then explained the influence of physicality on vibrato as an "automatic countering" to gauge notes during "an insecure shift or an awkward shift." This relatively unintended use of vibrato was contrasted with planned moments in which vibrato could be used to emphasise shifts in harmony or musical character. This example demonstrates that Yeadon is aware of his decision-making being guided by both

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intuitive and deliberate processes, aligning technical or physical considerations with non-conscious processes. This awareness results in a question of whether the degree of conscious decision-making actually matters. As he states later in the same meeting (DS3), "It's often in my mind when I'm playing Bach is how fussy to be with things that I've predetermined in my head or whether just to let it flow."

Many of the musical decisions made by Yeadon affect more than one performance feature even though this was not always made clear in the quotations. There were several cases when multiple decisions were coded within the same quotation, usually resulting from musical aims that required the manipulation of several factors. For example, the following quotation regarding the Prelude from Suite No. 4 (DS3) was coded as a decision about dynamics and tone colour:

> So just then, that point going to the G minor, bar 45. There, looking back at that I was thinking, "could I make this softer, could I make this point the beginning of a sequence down to the low C sharp in bar 49?" I was thinking, maybe I could make a really, really special soft sound here and then grow a lot more. Looking back at it, I'm thinking I could have done that.

> *So that was something you were thinking at the time?*

> I was thinking that at the time, yes. Looking back at it now is confirmation that I was thinking, seeing myself. I was also thinking I'd like to get that really transparent, gut sound at that point and I was wondering "is that coming across?" That was what I was wondering.

> *How did that idea come about?*

> That came about from listening to the recordings, particularly more recent recordings which I think are quite closely miked. I love that sound when I'm aware, listening back to it, that the performer is really experimenting with the limits of the instrument. I really love that. That's the origin of that thought, its "oh I want to do that myself." Copying it if you like. There's more, I could go on with that thought process but it's probably not strictly related to the thought I had.

> *No, that's okay. Keep going.*

> Yes, going on from that, I'm still working out how extreme, what kind of contrast I would like in the recording that I do eventually. Whilst I really like hearing those contrasts, there are some recordings where I think "oh that's just too much, that would get irritating on repeated listening." There's a difference between a recording and a performance, I think. I think it's always really exciting to hear those extremes in a performance but in a recording I think my

head tells me that I need to temper those things somewhat to make it a bit more timeless.

In the above quotation, Yeadon's search for contrast prompted the deliberate experimentation with dynamics and tone colour. The four bars referred to by Yeadon (see Figure 7.3.10) are a sequence in which tension is created by the "insistent repetition" of the mediant chord (G minor) while the bass line descends to pause on a low C sharp (Ledbetter, 2009, p. 206). Starting softly with a "transparent, gut sound" would enable the sequence to building to the final note (leading note to V/iii).

Figure 7.3.10: Prelude from Suite No. 4, bars 45-49

This example is similar to the category of a deliberate decision not executed in the sight-read study (Chapter 5) as the decision might be considered more of a reflection of what could have been done than what was achieved in the performance. Listening to the recording however, reveals that the descending bassline is emphasised by changes across a combination of performance features including dynamics, tone colour, rhythm, articulation, and phrasing. The coding as deliberate took into account the evidence of the decision in performance and the citation of specific reasons in response to the question of how the ideas came about. At the end of the quotation, the discussion of what is suitable for a performance versus a recording suggests that a recording situation requires greater conscious control over musical decision-making. Yeadon's acknowledgement that he may have to "temper" aspects of his playing means that he had already been thinking about the aim of recording these pieces, prompting a conscious examination of various performance features.

In terms of how deliberate decisions are made, Yeadon spoke mostly about having something "in mind" with only the occasional reference to externalising these decisions by marking the score. This highlights the importance of exploring both score markings and unmarked cues when studying musical decision-making, as was done in the sight-read study (Chapter 5). In the following quotation (DS15), Yeadon talks about how he plans phrasing and articulation decisions:

> Well, I've worked particularly on putting a lot more space between phrases than feels comfortable and the advantage of that is in a bigger space things really breathe and it just helps the music breathe in a way that it should… In some of the Suites I've marked them with big sort of tramlines between phrases and commas and dots and lines for articulation. In this one [Suite No. 5] I haven't done that but I made a mental note of where all the phrases start and finish. I've realised that there's practically no end to how much time can be put into a movement of Bach and it can still make sense. It's quite a liberating thing.

Deliberate HIP decisions

This category encompasses deliberate decisions that had a foundation in historically informed performance practice ($N = 7$). For Yeadon, this was mostly to do with issues of articulation ($N = 4$), sometimes in relation to beat hierarchy or the "relative weight given to each bar" based on the steps of Baroque dance (DS12). An example of a deliberate HIP decision is Yeadon's discussion of a passage in the Courante from Suite No. 4 (see Figure 7.3.11). In the following quotation (DS7), Yeadon explains how he wants to articulate the quavers:

> I was also concerned with the articulation of those quavers from bar 13, whether just to play them all quite short or whether to vary the articulation. I tried them long and short and concluded that on the short side is good. When there is a sequence like that there is always this worry "is it boring, should I do more with it?"

> *And the reason behind that decision?*

> I think it's because there's the contrast of the slurred triplets in this. Maybe because there's been quite a lot of slurred writing in the Allemande by contrast… The descending scale. Actually I'm thinking more of the second half where there's a descending scale on the up bow off-beats [bars 49-54] and I think that comes across better with short notes. It's easier to bring out. There's quite a lot of wide intervals in that sequence as well. In terms of performing practice it's a good idea to keep them short.

Are those reasons coming to you now?

Good question. No I think I had thought of that before. Particularly making the last two shorter where the intervals are at its widest.

Figure 7.3.11: Courante from Suite No. 4 in E flat major, bars 49-54

This quotation also demonstrates that a musical decision may be the result of several of the decision-making processes categorised in this study. The decision to play the quavers shorter in this passage was described as being influenced by several factors and the process described below includes headings added to summarise each step:

a. Experimentation: "I tried them long and short and concluded that on the short side is good." If no further explanation were given this would imply an intuitive preference for shorter quavers in this passage.

b. Variation: Yeadon talked about a general worry of making sequences boring and a particular need for contrast here due to the slurred triplets in the Courante and the slurred writing in the Allemande.

c. Communication: Yeadon mentioned bringing out the descending scale on the up-bows and said that they are better and easier with short notes. The term easier here implies an additional technical benefit of the shorter quavers (perhaps due to the string crossings involved).

d. Performance practice: Yeadon then connected his decision to play the wide intervals shorter to his knowledge of Baroque performance practice. While Yeadon does not specify a text or author, the practice of playing adjunct notes more smoothly than disjunct passages is a recommendation found in several eighteenth century treatises:

> Sustained and flattering notes must be slurred to one another, but gay and leaping notes must be detached and separated from one another (Quantz, 1752/1966, p. 123).

> If the melody moves by step, the passage is cantabile and should be performed legato; if, on the contrary, the melody moves by leap, the passage is allegro and a detached style of playing is required (Tartini, as cited in Stowell, 1985, p. 75).

On other occasions Yeadon made direct reference to treatises by Leopold Mozart (1756), Carl Philip Emmanuel Bach (1753-1762), and Clive Brown's *Classical and Romantic performing practice 1750-1900* (1999).

This section has discussed the specific musical decisions raised by Yeadon, presenting both the overall results as well as examples of decisions coded under each category. The examples demonstrate that the coding process was dependent on how Yeadon described or explained his decision-making processes, requiring a degree of subjective interpretation. Decisions were not always clearly the result of just intuitive or deliberate processes, particularly those made in the moment of performance. It may be useful to think of the decisions themselves as often containing elements of both intuition and deliberation. Using the default-interventionist model of how Type 1 and 2 processes interact (see Chapter 4), one could argue that since intuition acts as a default response it is always contributing at some level, after which deliberation is used to varying degrees as a way of confirming, altering, or adjusting the initial response.

4. Results and discussion B: Themes

This section will discuss the data pertaining to broad issues of decision-making. Like in the interview study (see Chapter 3, Section 4), this data was coded thematically and grouped as either relating to influences on musical decision-making or processes of decision-making. These categories contribute to why and how Yeadon made the specific decisions discussed in the previous section. The themes constituted 41% ($N =$ 93) of the total quotations analysed, demonstrating that Yeadon covered a wide range of topics apart from specific musical decisions and was not limited by the methodological approach or guided conspicuously toward certain topics.

Influences on musical decision-making

The influences on Yeadon's musical decision-making included reacting to the Baroque bow and instrument, taking the acoustic of the performance venue into account, recalling historical performance practice information, or finding a harmonic basis for a decision. As the themes represent discussions of a general nature, these influences were not always linked to a specific musical decision. The seventeen themes were grouped into six super-ordinate themes: harmony, physical/technical, historical information, performance context, specific experiences, and repertoire and scores. The interview study used the additional super-ordinate theme of analysis, but coding of the case study data found no quotations that were best described by this category. Table 7.4.1 contains the list of themes related to influences on Yeadon's musical decision-making, including the number of quotations for each theme.

Table 7.4.1: Influences on musical decision-making

Super-ordinate themes	Themes	Number of quotations
Harmony	Harmony	8
Physical/technical	Baroque bow and instrument	2
	Physical gesture	2
	Intonation	1
	Memory	1
Historical information	Baroque dance	2
Performance context	Acoustic	6
	Visual	4
	Audience	3
	Performance anxiety	3
	Humidity (strings)	2
	Lighting	1
Specific experiences	Performances by others	6
	Recordings by others	5
	Collaboration with other musicians	2
	Lessons	2
Repertoire and scores	Other pieces by Bach	3

When analysed according to super-ordinate themes, the highest number of quotations ($N = 19$) relate to performance context (see Figure 7.4.2). This result could be a reflection of the fact that meetings usually took place a few days before a concert. Part of Yeadon's preparation process close to a concert was to get used to playing in a larger venue and to think about the impact that may have on his interpretation. For

example, in the following quotation (DS1) Yeadon talks about how the acoustic affects the tempo, which in turn affects the character of the piece:

> In here [ensemble room, Sydney Conservatorium of Music] it's a relatively small space and it's quite dry so that gives me the freedom to take it at quite a fast tempo, but if I were playing this same piece, in say the Verbrugghen Hall, I might be considering taking the tempo down. The basic tempo that I choose has a knock-on effect for me in terms of the freedom I have with it. I find this Prelude [Suite No. 3] is more whimsical at a faster tempo; I can play around with it a lot more. If it's broader for me it becomes more studied and more study-like and I feel more straight-jacketed.

The super-ordinate theme with the lowest number of quotations was historical information ($N = 2$). As demonstrated by the low number of decisions categorised as deliberate HIP, it could be that for Yeadon it was not important for him to articulate his knowledge of historical performance practices as the basis for making musical decisions. Rather, he drew on a rich body of experiences, harmonic understanding, and considered the physical and technical challenges of the works. It may also be that his knowledge of Baroque style has become procedural over time and is accessed in an unconscious manner when playing the Baroque cello.

Figure 7.4.1 graphs the various influences on musical decision-making by super-ordinate themes, with individual themes signified by divisions within the columns. In contrast to Figure 7.4.1, the interview study found that historical information was the super-ordinate theme with the highest number of quotations (see Figure 3.4.1). It should be noted that this was an overall result for data across eighteen performers so comparison with the distribution of quotations in the case study may be misleading.

Figure 7.4.1: Number of quotations per super-ordinate theme
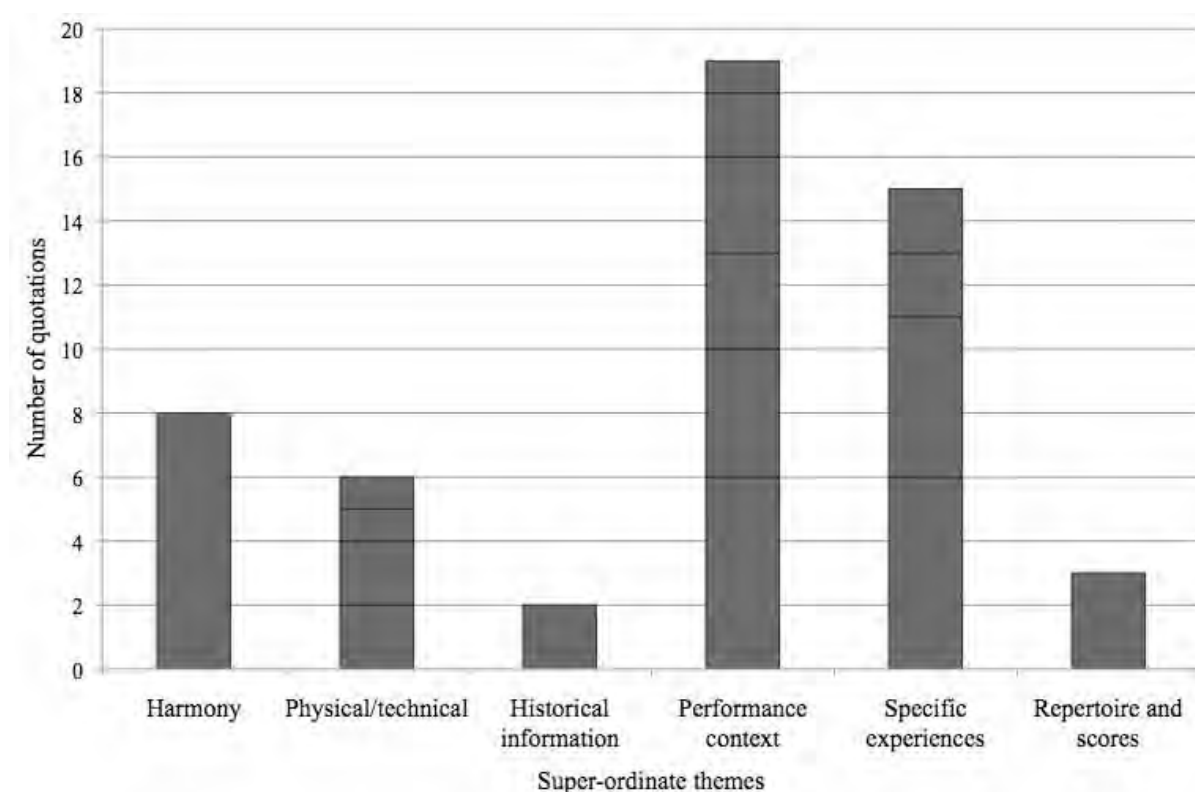
When analysed by individual themes, the single theme with the largest number of quotations was harmony ($N = 8$). This demonstrates the prominence of reacting to and understanding harmony in the performance of these works, a result that is consistent with the interview study (Chapter 3). In addition, the importance of harmony confirms Yeadon's statement in an article for *The Strad* magazine in 2000 that "the harmony in Bach's works is often so rich that it becomes the determining factor in shaping a performance" (p. 616). While Yeadon talked a couple of times about having worked out the harmony at the piano when learning a piece, he often described harmony as influencing his feelings rather than being part of an analytical process. For example, in this quotation he speaks about reacting to a relatively abstract, perhaps emotional feeling coming from the harmony:

> Harmony influencing character in Suite No. 3 (DS2):
> I think there's something very joyous about that moment. It's partly the chord itself, the joyous harmony and the physicality of that moment, of going across all three strings. It's also the highest point in the movement. There's just a feeling of a release there so maybe I can bring that across as well.

Several other themes were also described as influencing Yeadon's feeling about certain passages. It may be that even though Yeadon demonstrated a large proportion of deliberate decision-making, the decision-making process in general was usually at some level influenced by feelings. Compared to the quotation about harmony cited above, the following two statements focus more on feelings of physical ease and comfort:

> Gesture influencing bowing in Suite No. 3 (DS1):
> It's very satisfying to do on the cello, that bowing. It does make it technically more easy. I like the gesture that comes with the three and the one. I find it easier to bring out the whole arch of that phrase with some slurring in than I do if it's all separate notes.

> Baroque bow and instrument influencing dynamics in Suite No. 1 (DS13):
> I think it was to do with a physical response to the instrument. Just noticing that actually it was responding and was less squeaky when I put more arm weight into the string. So I think there were a couple of times where I thought I'll give it a bit more weight and be a bit meatier with this section and just see what happens.

As well as harmony and acoustic, other prominent themes were the experience of hearing performance or recording by other musicians. For example, he mentioned hearing Anner Bylsma's seminal recording of the Suites in 1987 (recorded in 1979) as being "an absolute revelation" (DS2). Other cellists discussed in the data include recordings or concerts by Pablo Casals, Paul Tortelier, Mstislav Rostropovich, Richard Tunnicliffe, Steven Isserlis, Pieter Wispelwey, and Bruno Cocset. An example of the influence of other performances was Yeadon's discussion of the Gavotte II from Suite No. 5 (DS15):

> I was trying to give the impression of wind. That came across.

> *Was that a new thing, that thought?*

> Relatively new, yeah. I think I'd heard a performance that was very whispery that I really liked so it's probably gone into my head and has been percolating.

> *This year?*

> When was it? No, I think it was when I was [living] in the UK. So it was either my old teacher Richard Tunnicliffe or it could have been Pieter Wispelwey. It was just very imaginative. It was all on one hair of the bow so it was good to have that image in mind when I was playing it.

Of all the performers mentioned, the most frequently cited was period and modern cellist Pieter Wispelwey, with whom Yeadon has collaborated many times. Perhaps most relevant for this case study is the fact that Yeadon played cello continuo for Wispelwey's recording of Bach's Gamba Sonatas BWV1027-1029 on violoncello piccolo (see Discography). Unusually, Richard Egarr plays a different keyboard instrument for each of the three sonatas (organ, fortepiano, and harpsichord). Yeadon discusses Wispelwey's influence in the following quotation (DS2):

> I have been very much influenced by Pieter Wispelwey as a player and I think I really admire his spontaneity. There's something I find fascinating in watching and hearing him. It's as if he could do anything with the music and lead you on any journey and he does sometimes a quite outrageous variety of articulations within any one movement. Actually, in a live performance there have been times when I've heard him play and losing sense of what the overall structure of the music is, but as a player he really draws me in and I know he draws a lot of other people in. I think because I find that quite gripping I would love to have an element of that in my playing, but to be a bit stricter about an overall, an overview of the movement.

Processes of musical decision-making

The themes grouped under processes of musical decision-making cover general ideas about musical decision-making, including aims and goals of performance (see Table 7.4.2). There was no extended or repeated direct discussion of intuitive or deliberate processes of decision-making during the case study so the subcategories of intuitive and deliberate used in analysing the interview study were not required.

Table 7.4.2: Processes of musical decision-making

Themes	Number of quotations
Spontaneity vs planning	8
Rules vs imagination	7
The zone	6
Interpretation	4
Storytelling	4
Head vs heart	4
Freedom	3
Being 'in the moment'	2
Feeling precedes analysis	1
Flow	1

As in the interview study (see Chapter 3, Section 4), the theme of spontaneity versus planning was again prominent in Yeadon's discussions of musical decision-making. In one of the few places intuition is explicitly mentioned, Yeadon talks about balancing intuition with predetermined decision-making (DS3):

> I think my main goal is to go with intuition and instinct and my innate musicianship if you like but it helps me to have predetermined some things using my head beforehand. That's the balance I'm still trying to find.

In the above statement Yeadon hints at a definition of intuition as "innate musicianship," something that comes spontaneously from within as opposed to something predetermined coming from the "head." The feeling that the performance is driven by an innate sense enables Yeadon to trust in the uniqueness of his interpretation. In one meeting (DS4) Yeadon spoke about "owning the music" as opposed to "feeling that I'm acting in some way or that some element of the interpretation is not really mine." In the same discussion he said that when the music is "coming from within" it's to do with "having absolute integrity and it being completely heartfelt," "like everything is flowing and organic," and "almost like I'm making up the music as I'm playing it."

The goal of spontaneity was also seen as a way of breaking out of a conception of the piece that has more to do with what is comfortable or familiar as opposed to what Yeadon would like to do with the piece. For example, while discussing a passage in the Allemande from Suite No. 2 in which a final decision had not yet been made (DS2), the following question was posed:

> *Do you think you will eventually decide on something to do there?*
>
> I'm not aiming to make a definitive decision. That is a good question in terms of the recording because I think if I make every little micro decision before I go in it's going to lose a spontaneous feel. But what I would like to do is explore more of the possibilities of articulation, slurring, and phrasing. I'll need quite a lot of self-discipline to do that. Again, with the Suites I know best I tend to have settled into a pattern of what's comfortable, what works easily on the Baroque cello and it's not necessarily what I want to do.

Yeadon touches on wanting to explore different possibilities, something discussed at length in the interview study under the theme of experimentation (see Chapter 3,

Section 4). What's "comfortable" or what "works easily" suggests the use of procedural decisions, but here is flagged as a potentially negative influence on performance. This is made clearer in another quotation where Yeadon questions whether his interpretation of the Suite No. 1 has become formulaic or habitual (DS13):

> I am just starting with this Suite [No. 1] because it's the one I know best, I'm just starting to wonder whether I am just playing it in a very formulaic way. I've got to that stage with it where I think maybe I've sort of formed habits with all the phrases. Little moments. Not so much in that movement [Prelude] but in the dances I was thinking "am I being in the moment and spontaneous enough?" and then I'd bring myself back to the moment and be in the moment. So that little battle was going on for most of the rest of the Suite.

Later in the same meeting (DS13) he addressed this issue again in response to a follow-up question:

> I think the feeling of doing things automatically is a relatively recent thing and yeah, the solution to it is to definitely be in the moment, to try not to worry. I think if I can allay the fear and just trust in my musical instinct then that's the way out of that.

In this case it seems that being "in the moment" brings awareness and trust in the operation of "musical instinct" as opposed an automaticity that is being driven primarily by habit. Being "in the moment" was also linked to being in a "heart-space" as opposed to a "head-space." For Yeadon, "heart-space" involves spontaneity, going with his intuition, and being in flow, whereas "head-space" is connected with planning, being analytical, and being out of flow. In one instance Yeadon equated being in his "head-space" as being "out of the performance" (DS13). An example of the theme of head versus heart is from his lecture (DS12), where he explained the different states of mind required for preparation or practice compared to performance:

> For me, Bach is the ultimate mixture of head and heart and it's essential to get into that heart-space before playing. So often with all the analysis that goes on before a performance, we're in our heads and so it's how we make that shift from our heads and all the preparation that we've done in our practice into the heart space.

Another aspect of head versus heart is the prioritisation of musical or technical considerations. In the following quotation (DS4), Yeadon connects technical concerns to the head and the musical to the heart:

More recently I've been trying to, as well as doing all that detailed preparatory work, rational left brain stuff, I try and focus purely on the music and not to let that technical stuff worry me. So I'll play the music through with different heads on if you like. The head and heart thing that we've talked about because I've sometimes found if I've obsessed too much about technical perfection before recording, then when I come and record it, it just sounds clinical. It doesn't have quite the right spirit. So there are times when I've gone in to play a piece and I've tried to be very, very in my intuitive, imaginative space and then of course little technical blemishes come up then I'll go in and fix those afterwards. That seems to work well rather than having the thing absolutely technically precise.

Other quotations articulating similar thoughts were usually categorised under the theme of "the zone." For example, in the following quotation (DS3) Yeadon speaks about a "zone of pure creativity" in which he becomes disassociated from any mental, preparatory processes:

And often before playing Bach, I'm conscious of getting into that zone of pure creativity where I could take the audience on any journey so I try to disassociate from all those mental things that have been going on in the preparation process. I don't always successfully disengage from that. Sometimes I've got that strong thought process going on still.

When asked to describe the feeling of being in the zone (DS2), Yeadon answered as follows:

It's a feeling as if I can do anything. Physically I feel completely relaxed, I feel as if I am being massaged. Feeling very at one with myself and almost spacey, floaty. I feel as if the instrument is just an extension of me. When I'm in that zone I feel that it's absolutely fine to be me whatever that means in that particular moment in time. So no fears, it's fine just to play the music really simply and portray it as honestly and as simply as possible. I don't need to put across anything fancy. I can just let things roll and happen. Great feeling.

In the same meeting (DS2), Yeadon spoke about experiencing being in the zone as being "fully present" and "not letting any distractions come into one's mind."

"The zone" was also discussed in Yeadon's lecture (DS12). While answering questions from the public, Yeadon asked if audience members had experienced the feeling he was referring to. During the subsequent discussion, Neal Peres Da Costa (historical keyboard player and regular musical collaborator of Yeadon) described

being in the zone while performing Bach's *Goldberg Variations BWV988* the previous evening (January 4, 2010):

> Well I can say this because last night I had, probably for the first time in my life, the feeling of getting into the zone. Finally I felt what that is. I don't know how it happened but it did and it stayed with me for the whole of that performance. It was just this sense that I could do anything really and it wasn't about technique or having to think about exactly what I wanted to do. It was just happening and I had the feeling that it was just pouring or flowing out. I had the most unusual feeling of calmness and connection with something out there in the universe. It's a really magical feeling. It's hard to put into words.

The feeling of being in the zone or in flow described by Yeadon and Peres Da Costa has been the subject of many studies (see Sinnamon, 2008, pp. 5-29). Jackson and Csikszentmihalyi (1999) have defined flow as "a state of consciousness where one becomes totally absorbed in what one is doing, to the exclusion of all other thoughts and emotions. …[It] is a harmonious experience where mind and body are working together effortlessly, leaving the person feeling that something special has just occurred" (p. 5). For example, if improvisational musicians achieve concentration, control, unself-conscious, and flexibility of time during a musical session, "the process of improvisation becomes intrinsically rewarding" (Csikszentmihalyi & Rich, 1997, p. 49).

The role of unconscious processes in musical performance has also been studied using neuroscientific methods. An fMRI study of professional jazz pianists found that spontaneous improvisation is characterised by "widespread deactivation of lateral portions of the prefrontal cortex together with focal activation of medial prefrontal cortex" (Limb & Braun, 2008, p. 3). Limb and Braun (2008, p. 4) go on to suggest the following:

> The idea that spontaneous composition relies to some degree on intuition, the "ability to arrive at a solution without reasoning," may be consistent with the dissociated pattern of prefrontal activity we observed. That is, creative intuition may operate when an attenuated DLPFC [dorsolateral prefrontal cortex] no longer regulates the contents of consciousness, allowing unfiltered, unconscious, or random thoughts and sensations to emerge. Therefore, rather than operating in accordance with conscious strategies and expectations, musical improvisation may be associated with behaviours that conform to rules implemented by the MPFC [medial prefrontal cortex] outside of conscious awareness. Indeed, in other domains it has been shown that focused attention

and conscious self-monitoring can inhibit spontaneity and impair performance. In short, musical creativity vis-à-vis improvisation may be a result of the combination of intentional, internally generated self-expression (MPFC-mediated) with the suspension of self-monitoring and related processes (LOFC- [left orbitofrontal cortex] and DLPFC-mediated) that typically regulate conscious control of goal-directed, predictable, or planned actions.

The description of how "creative intuition" may operate in the quotation above has many similarities to how Yeadon described procedural decision-making and flow: "when it feels like it's flowing I've let go of the concept that I have of it and something else might take over" (DS7). As well as being characteristic of musical improvisation, the use of rules implemented "outside of conscious awareness" and the "suspension of self-monitoring" may also be important processes involved in the performance of notated music.

The themes of spontaneity versus planning, head versus heart, being in the moment, the zone, and flow can be connected to how intuitive and deliberate decision-making have been defined in the thesis. Yeadon's experiences of musical decision-making may have not been explicitly discussed in terms of intuition or deliberation, but his explanation of various terms make it possible to link themes to these categories. The relationship between intuitive and deliberate processes and the concepts and terms discussed so far are summarised in Table 7.4.3.

Table 7.4.3: Concepts associated with intuitive and deliberate processes

Intuitive	Deliberate
Spontaneity	Planning
Heart space	Head space
Performance	Preparation
Imaginative/free	Preconceived
Innate/instinctive	Mental/analytical
Unconscious	Conscious/self-conscious
Musical focus	Technical focus
Being 'in the moment'/in 'the zone'	Being out of 'the zone'

Other themes grouped under processes of musical decision-making relate more specifically to historically informed performance rather than performance in general. As hypothesised, Yeadon's views on HIP reflect a more open acknowledgment of the role of personal judgment and opinion than was often the case in the 1960s until the

early 1980s (see Butt, 1999; Dulak, 1993; Fabian, 2003; Kivy, 1995; Ornoy, 2008). In 1999, Butt suggested that "there is a more liberal mood in the air with regard to HIP: historical evidence can be treated critically, and one can acknowledge that there is no absolute distinction between the choice of personal insight – or opinion – and historical accuracy" (p. 191; also see Stauffer, 1997, p. 217). The tension between the personal and historical are reflected in the theme of rules versus imagination, in which Yeadon attempts to reconcile or balance these two, seemingly competing priorities. Quotations coded as rules versus imagination include the following:

> DS12:
> A tricky thing about doing this in Baroque music is that we often do a lot of reading around how the music was performed, reading Leopold Mozart, Quantz and C.P.E. Bach, and we're often trying to fulfil a lot of instructions in our heads and sometimes instructions from teachers. It's the same with all music and the trick is to find a way of letting go of all that. To feel like you can do anything and not fear doing something that's wrong. It takes practice like anything else.

> DS13:
> I think in the back of my mind there's a fear that somehow I'm breaking with some of the rules. It's that whole thing of a lot of early music rules.

> *That if you do something just on the spot it might just...*

> It might actually come across as unstylish. There is a little bit of fear there.

> DS15:
> There's a dichotomy between being a good boy in terms of my performing practice and leaning on each of the slurs in the right place and then just throwing all that out and actually just being very in the moment and possibly doing some crazy things.

> DS9 (journal):
> I'm conscious of the performing practice 'rules' when I play, sometimes this <u>still</u> hinders me in terms of imagination. Has this generation moved on from the 'rules' i.e., assimilated them?

These quotations demonstrate the challenge of trying to assimilate the 'rules' of historically informed performance practice, even for a performer as experienced as Yeadon. Being conscious of the rules can be a hindrance in performance and a potential cause of fear. Therefore, Yeadon's aim is to let go of any instructions or rules, be in the moment, and aim to respond more imaginatively to the music.

Another potential connection between HIP and the themes listed under processes of musical decision-making is what Yeadon labelled the "storytelling aspect of performance" (DS12). The concept of Baroque musical rhetoric was not discussed much by Yeadon, but his prioritisation of storytelling implies similar aims to performers who speak about achieving a rhetorical delivery of this music. In the following quotation (DS7) he discusses the feeling of telling a story through music and how the audience and the performer experience this:

> There was just a hint of telling a story there which I would like to do more of [Courante from Suite No. 4]. I'm just starting to be a bit more poetic and get out of the worry, the fear, which is how I was consistently yesterday. It's that elusive factor.

> *There's something there?*

> Yes there is something, I think at that point when I went back to do the repeat [of the first half]. Looking back at myself playing this, I lose a bit of self-consciousness and there's something in my body language that shows that I'm really getting into it and I'm starting to leave all the technical concerns behind and really that's what I would like to be able to do if I'm in my fear space at the beginning of a performance. I would like to be able to just say "look, it doesn't matter, I'll just play and make music and enjoy the music, live the music."

> *And the hint of the story?*

> There's a frame of mind which is very similar to the frame of mind one gets into when reading a story or being read a story as a child. It's quite hard to describe but there was something there, there was just a flash of something that reminded me of childhood and stories. When I observe other musicians really in the flow, the impression I have is that they're telling a story in their heads and if that's not a literal story in their heads I don't quite know what it is but it's the same. Maybe it's to do with loss of self-consciousness.

The final theme that will be discussed was only mentioned once by Yeadon, but has important implications for modelling intuitive and deliberate processes of decision-making. In a discussion about harmony of the Prelude of Suite No. 4 (DS3), Yeadon explains that feelings precede analytical processes:

> *What tells you that that bar is important?*

> If we go back to bar 27, we have two bars of C minor so C minor being an intense key and the relative minor of the key of the piece, I'm thinking of those bars as being intense and quite big. So then moving through to bar 29, that

seems stronger. We're moving out of C minor into something even stronger. This is just how I feel it. When I sat at the piano and played these harmonies, that was a bar that…and bar 30 of course, that's just the repeat or pretty much a repeat of bar 29 and then 30, 31 is a kind of arrival point and there's also a little bit of release in that bar from the intensity of the previous four bars. So that's what I'm trying to communicate in that bar is arrival, quite a big arrival point but also a feeling of "ah, I can breathe again." So in answer to your question, I think that's just I feel it that way, primarily and then when I look at it on the page and see exactly what's actually going on harmonically, there is a kind of a release. That's what I'm instinctively trying to put across.

So it's the feeling that comes first? Is that the process?

Yeah, I'd say the feeling always precedes the intellectual part of it. There are certain mental things that I think happen almost simultaneously with the feeling and so for example the diminished harmony is so strong that I see that on the page and know that it is strong at the same time as feeling it. I think that's how it works. In other situations, which I could talk about later on, there are some situations where I'm not sure whether I even feel it either way. So when we get to it, bar 62, for those few bars from there. That's something I could feel either way and actually if I look at it and intellectualise about it, it could go either way too.

Just thinking about that initial stage of playing it on the keyboard. Is that something you have done with other movements and you've found that has worked or what is the main purpose of that for you?

I think that that usually serves to solidify what I'm feeling. If I play a movement through without having sat and thought, "oh that's G minor, that's F major" I'll go with that pure flow, instinct thing so when I do then sit down at the piano it's… I'll always play it on the cello first and then I'll come to the piano and I think that's to back up what I'm feeling.

This idea that the intuitive feeling comes before an analytical response fits with default-interventionist models of dual process theories that argue that intuition is the default mode and deliberate processes are only engaged afterwards (Evans, 2007, 2011). Another period instrument performer who has discussed this idea is the violinist and conductor Sigiswald Kuijken. In an interview with Roderick Swanston (1997), Kuijken spoke about using intuition followed by more analytical processes:

Swanston: That sounds, in a sense, as though what inspires you is intuition. Would that be true for you, Sigiswald?

Kuijken: Well, I think intuition is the first thing, the very first thing. Intuition and, with an even less controllable word, inspiration, whatever that might be. Intuition is the first thing…and then documentation around what you are going to play. I mean, the instrument is the first document which is concerned, the

score you use and then whatever things you had to have been understanding from the time of the composition and so on and so on. But intuition is first.

Similarly, the composer Federico Ruiz (as cited in Policastro, 1995) has stated: "If I had to reflect on everything that I do, none of my works would ever be completed… Intuition always precedes reflection because it operates more rapidly" (p. 100).

This section has explored the themes coded as influences on Yeadon's musical decisions and discussed how Yeadon experiences various processes of musical decision-making. The themes reaffirmed the influence of harmony, performance context, and specific experiences in making musical decisions. Discussion of the processes of decision-making revealed a series of interrelated themes describing how Yeadon aims to disengage from deliberate decision-making processes during performance in order to enter a state of flow in which he accesses more spontaneous, intuitive, and imaginative responses.

5. Conclusion

Overview of study

In this case study of period cellist Daniel Yeadon, extensive think-aloud and performance data were collected to portray the musical decision-making processes of an expert musician in detail. It built on the previous two studies by continuing the emphasis on expert performance of Bach's solo string works from Part 1 and by using think-aloud procedures as introduced in Part 2. The collection of data over a two-year period enabled the analysis procedure to consider how decisions take shape over a longer time period than a performer's initial response to a musical score as studied in Part 2. The data were analysed in a similar way to the interview study, with decisions coded according to categories of intuitive or deliberate decision-making, and thematic coding of influences on musical decision-making or processes of musical decision-making. Within the category of intuitive decisions, a new category of procedural decision-making was formed to capture descriptions of decision-making that was once conscious and had become automatic.

Summary of results

Decisions categorised as deliberate in the study (including deliberate HIP) accounted for approximately 65% of the total number of musical decisions, with intuitive (including procedural) decisions accounting for the remaining 35%. This proportion is similar to the figure of 60% to 40% found in the overall results of the interview study. The lower proportion of deliberate decisions found in the sight-read study (Chapter 5) compared to the interviews (Chapter 3) and this case study can largely be explained by differences in task and method of data analysis, although there was considerable variation between participants in both the interview and sight-read study. The interviews (Chapter 3) and this case study capture decisions that have been made as a result of a long period of engaging with a piece of music while the sight-read study (Chapter 5) demonstrates what decisions can be observed in the early stages of learning a piece.

The performance features with the highest number of musical decisions were articulation and phrasing, which were two of only four performance features to include deliberate HIP and procedural decisions. The importance of these features in achieving a rhetorical style of HIP may have led to the prominence of musical decisions in these categories. Apart from issues of tone colour and ornamentation, Yeadon relied more heavily on deliberate decision-making in all performance features, making significantly more deliberate than intuitive decisions in the area of tempo.

Examples of decisions from each category of musical decision-making showed that several performance features were usually manipulated in an interrelated manner to achieve a certain musical goal. Many decisions involved aspects of both intuitive and deliberate processes, such as deliberate decisions that became intuitive (procedural) or intuitive decisions that were confirmed analytically. Comparison of Yeadon's performances over time generally found a high level of consistency, especially in the case of deliberate decisions.

Exploration of broader themes in the data found that for Yeadon, harmony, venue acoustic, and experiences of hearing other performers were significant influences on his musical decision-making. Many of the influences were experienced as affecting

Yeadon's feeling about a passage of music rather than being part of a conscious, analytical process.

Under processes of musical decision-making, a number of themes encapsulated Yeadon's aim to be in the zone or in flow during performance. This was described using various terms, but essentially involved the prioritisation of feeling-based, intuitive, or innate responses and disassociating from conscious, analytical thought processes. This was also reflected in Yeadon's attitude to HIP, which aimed to assimilate performance practice rules in order to let go of any instructions that could inhibit an imaginative response to the music.

Issues and limitations

Like the interview study (Chapter 3), the case study focused on the subjective experience of a performer while acknowledging that the data reflects the participant's perception of their experiences, which is in turn interpreted by the researcher. It is not easy to ascertain if self-reported data reflects the actual basis for a choice or are attributions or rationalisations of that choice (see Blume & Covin, 2011). As Elliott (1995) notes, "at best, words can only describe what may be going on; they cannot explain what is actually going on in performers while they perform or improvise" (p. 58).

The format of the meetings with Yeadon was always the same, but as in the interview study, the time available for meetings varied and the context of the meetings may have led to differences in the data collected. For example, the first four meeting (DS1-4) were based on one or two movements from the Bach Suites, whereas later meetings (DS5, 7, 13, 15) involved the performance and discussion of complete Suites. The later meetings took place a few days before public performances and led to less detailed think-aloud data and perhaps a conscious or unconscious shift of focus for Yeadon. The average length of the meeting transcripts was approximately 4400 words, but the length varied from just over 2000 words to over 6000 words. Transcripts from the first four meetings (DS1-4) were above the average length while the last four (DS5, 7, 13, 15) were below the average.

The other data used in the study such as the journal, video of practice sessions, and public lecture were collected as the opportunity arose. While video and journal data gave some insights into practice, a more systematic, detailed investigation of practice and performance data was beyond the scope of the study. Additional contextual data that could be the focus of future investigations include the participant's performance history of these pieces since first learning them, differences between their modern and period instrument performances, and discussion of the recording sessions and final recording in comparison to other commercial recordings.

Implications

The results largely confirm the hypotheses outlined at the beginning of this chapter. Yeadon was found to articulate his decisions in a manner that implied a large proportion of deliberate decision-making, perhaps as a result of having a goal of recording the works and being asked to verbalise his thought processes. Overall the data reflected an attitude towards historically informed performance that was consistent with the currently dominant expressive, subjective style of HIP.

The categories of intuition proposed by Gore and Sadler-Smith (2011) and discussed in Chapter 6 were not identified in the data, since the decisions made seemed to fall under the definition of problem-solving intuition. It could be that the score and performance conventions of this music limit opportunities for creative intuition, and this may also not be a priority when refining an interpretation for a recording. Yeadon's intuitive moments of creative or novel insight into the piece may have occurred earlier in the interpretative process and detailed comparative recording analysis would have to be done to gauge the originality of musical choices in this repertoire. The use of problem-solving intuition suggests that musical intuition as a secondary type of intuition mainly results from the use of problem-solving intuition within a musical domain. An important aspect of problem-solving intuition that emerged during the analysis of the data was the ability to distinguish between general intuitive decisions and procedural decisions. This theme was detected in the interview study (see Chapter 3, Section 4), but specific examples of procedural processes were not found in that study. As suggested in Chapter 6, the category of procedural can be

equated to an informed or mature intuition and defined as "explicit analytic processes that have become chunked and automatised" (Hamm, 2008, p. 56).

The process of conscious processes becoming procedural is most clearly articulated in a discussion of how Yeadon's goals for the J.S. Bach Suites for Solo Cello have changed over time. In the following quotation (DS2), Yeadon describes a process similar to Baylor's (2001) model of immature intuition developing into mature intuition:

> *How do you think your goals for these pieces have shifted over time?*
>
> I think I've probably come a full circle. I think when I first played them as a kid I found it easier… I always related to the music, so I found it easier just to play them in a really instinctive way. They're so well written as well, I never really found them technically, hugely challenging. So I think one of the reasons I loved them as a child was that I could play them without too much fuss and I didn't have to think about how to play them. I was just music that spoke to me and I felt that I could interpret them and be myself. Then I started studying early music and doing lots of reading of treatises, reading about how music was played at the time and what one should and shouldn't do. It's become a much more mental process and I've passed through that lens and done a lot of mental work, not on all of the Suites but on some of the movements and some of the Suites. That's been a really fascinating journey, fully realising what amazing music it is. In a way that's been, the mental aspect of it, has been quite painful because it's meant that I've been more self conscious in the way I play it. I've been more aware of other people's interpretations, aware of the greatness of the music. Now I'm coming back to being able to, as I was saying before, being in the zone and just making the music purely my own and heartfelt and not letting the mental stuff get in the way.
>
> *The mental work that you've done, do you mean performance practice research or…?*
>
> Yeah, and then just thinking more carefully about the minutiae of playing, about the articulation, slurrings, dynamics, overall phrasing arches, architecture.

These experiences articulated by Yeadon, Baylor's U-shaped model for the development of intuition by level of expertise (2001), Evans' default-interventionist model of dual process theories (2007, 2011), and Hammond's cognitive continuum from intuition to analysis (2007, see Figures 1.3.1 and 1.3.2), suggest the possibility of a theoretical model of the role of intuitive and deliberate musical decision-making. Such a model could take the form of a spiral, alternating between points of more

intuitive/less deliberate and more deliberate/less intuitive decision-making (see Figure 7.5.1). This model extends Baylor's U-shaped curve by acknowledging that the process of learning is a dynamic and continuous one in which a performer returns to musical problems within a piece with a fluctuating emphasis on either intuition or deliberation.

Figure 7.5.1: Theoretical model of the role of intuitive and deliberate musical decision-making
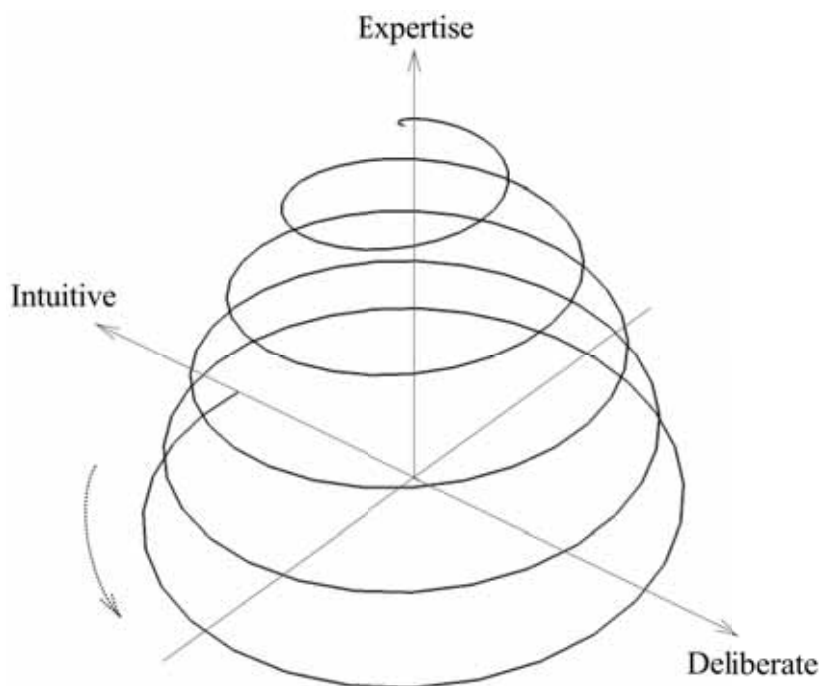
The x-axis represents the proportion of musical decision-making, contrasting a more intuitive approach with a more deliberate approach. The spiral starts from a point on the x-axis representing a primarily intuitive approach and moves alternately between phases of greater use of either deliberation or intuition. As the spiral moves upward along the y-axis representing increasing expertise over time, its shape tightens to signify a greater balance between the use of intuitive and deliberate processes. In addition, the spiral shape signifies an increasingly more mature, informed decision-making as the z-axis represents the quality of the information being accessed with the central, intersecting point of all axes signifying the performer's ideal conception of the musical work in which their musical knowledge has been integrated and applied in the most effective way possible.

This model acknowledges that most tasks require a mixture between intuitive and deliberate processes (also see Hammond's concept of "quasirationality," 1996, 2010). The spiral could refer to a performer's experiences to date with one piece or more generally as a theory of expertise or learning over a lifetime. It is important to recognise that any point along the spiral represents the use of a greater or lesser proportion of intuition or deliberation, not a sole reliance on one or the other.

The two main stages within this model, moving towards greater deliberation and then toward greater intuition are explained in the diagrams and text below (see Figure 7.5.2).

Figure 7.5.2: Stages within a theoretical model of the role of intuitive and deliberate musical decision-making

    a. Move towards greater deliberation   b. Move towards greater intuition
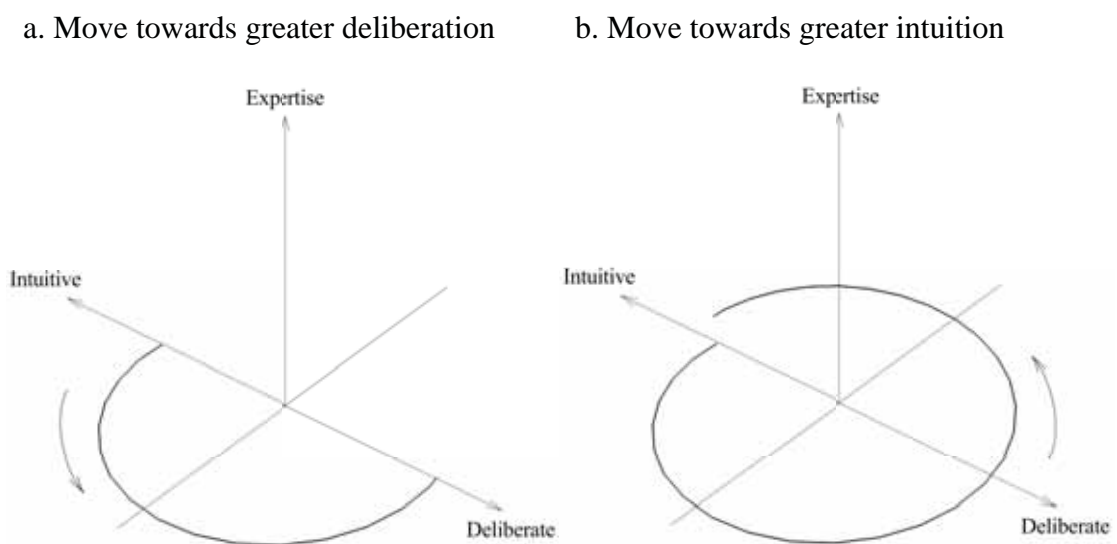
a. Move towards greater deliberation: A novice performer relies primarily on immature intuition at first (Baylor, 2001), and would start at the far left of the spiral. With intuitions that are informed by domain-specific knowledge and experience, performers with greater expertise move towards greater deliberation quicker than those with less expertise. This suggestion is based on the finding from the sight-read study (Chapter 5) that more experienced performers made a greater proportion of deliberate decisions during the time allocated for practice than less experienced performers. Through deliberate practice and analysis, musicians gradually make more and more deliberate choices about their interpretation.

b. Move towards greater intuition: Deliberate decisions start to become automatised through practice and increased familiarity with the piece, moving back towards the intuitive mode. As previously deliberate decisions become intuitive, other decisions need more deliberate attention, creating a spiral model alternating between intuitive and deliberate modes of decision-making. The types of decisions being made may move from the basic or technical considerations to the interpretative or expressive features of the piece, although for performers with greater expertise, these decisions are likely to be integrated to a greater degree than with novices. The intuitions of the performer become progressively more informed and mature through this process leading to a tightening of the spiral towards a point where most decisions have become procedural in nature, with deliberate processes used in performance to direct attention to performance cues. There is no fixed end point as the interpretation is likely to continue to develop indefinitely.

In Yeadon's case, the spiral model could be applied to reflect a 65% use of deliberate decision-making during the time of the case study (see Figure 7.5.3). This does not represent Yeadon's artistic practice at one particular point in time, but shows how an accumulation of musical decisions may have led to the result found and discussed in this chapter.

Figure 7.5.3: Results of case study as explained by a theoretical model of the role of intuitive and deliberate musical decision-making
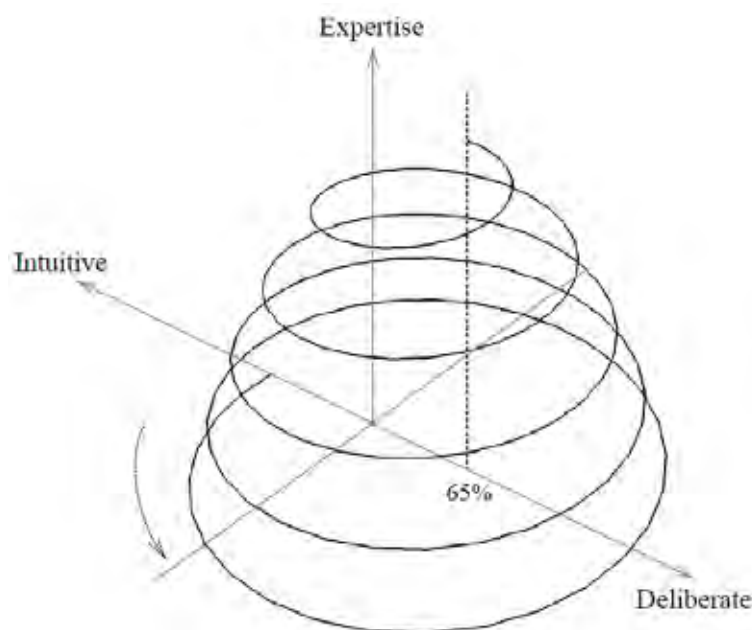
The implications of the case study will be expanded and discussed in relation to the other parts of the thesis in the concluding chapter. The conclusions address the results of each study and how they contribute to current understandings of the nature and role of intuitive and deliberate processes of decision-making.

Chapter Eight

Doing without thinking?

This thesis explored the musical decision-making processes involved in the performance of solo Baroque string music on period instruments. The focus of the research was the distinction between intuitive and deliberate decision-making, in particular the nature and role of these two processes. A tripartite, mixed method approach to data collection was employed, consisting of interviews with leading Baroque string players, an experimental study of Baroque violinists, and a detailed case study of a Baroque cellist. The issues and limitations of each study as discussed at the end of each part of the thesis are intended to assist future researchers in this area to develop and refine appropriate research tools.

1. Summary

Part 1: Musicians' voices

In the first part of the thesis, a review of writings by performers served as the basis for an interview study in which eighteen leading period string players discussed their approach to interpreting the solo string works of J.S. Bach. Overall, 60% of the musical decisions raised during the interviews were categorised as deliberate decisions, a figure that includes 11.5% of decisions coded as deliberate HIP (explicitly referencing historical performance practices). The highest number of decisions related to the issues of character, bowing, and articulation. Prioritisation of the interrelated areas of bowing and articulation could indicate familiarity and concern with achieving a rhetorical, gestural style of HIP. Decisions about most performance features were usually made deliberately (articulation, bowing, chord playing, dynamics, notes, phrasing, rhythm, and tempo) except for decisions about character, fingering, ornamentation, and tone colour, which were often the result of intuitive processes. It is important to note that each decision often affected several interrelated performance features in subtle ways that reporting of quantitative results fails to capture.

Analysis of the influences on musical decision-making revealed a large number of quotations about historical information ($N = 63$), including references to performance practice literature and the concept of rhetoric. Other important influences included harmony, the Baroque bow and instrument, the acoustic of the performance venue, and knowledge of other Baroque repertoire. Themes related to processes of decision-making included discussion of spontaneity versus planning and what 'interpretation' requires of the performer.

The main finding from the interview study was the variety of individual approaches to musical decision-making. Differences in the proportion of intuitive and deliberate decision-making between participants were conceptualised through a continuum from intuitive to deliberate.

Part 2: Observing the process

The second part of the thesis discussed an experimental study designed to induce a variety of processes of decision-making within three settings: a sight-read, a practice period, and a performance. Seven Baroque violinists of varying expertise participated in the study (grouped as E1, E2, and E3). The task involved playing a short piece of solo Baroque violin music and included the collection of retrospective and concurrent think-aloud data. By comparing the sight-read and performance with what was marked and verbalised during the practice session, the study found that decisions categorised as intuitive accounted for approximately 82% of the total decisions made. The category of deliberate included a subset of decisions labelled deliberate not executed to describe decisions intended by the performer that were not perceptible in the final performance. Decisions about bowing accounted for a large proportion (50.1%) of all decisions made. There were significantly more intuitive than deliberate decisions made in most performance features (articulation, bowing, phrasing, note duration, ornamentation, and tempo) while decisions about dynamics and chord playing were often the product of deliberate processes (including deliberate not executed). Analysis of the verbal reports found descriptions of the influence of various considerations such as harmony and the resonance of the instrument as well as the use of experimentation during practice.

The main finding from the sight-read study was that more experienced players made significantly more decisions than players with less experience (E1 compared to E2 and E2 compared to E3). In addition, the most experienced players (E1) made a greater proportion of deliberate decisions compared to less experienced players. The results of the study were discussed through an adaptation of the Intervention Model of dual process theories (Evans, 2011).

Part 3: A case study

In the third part of the thesis, a review of various types of intuition led to a case study with the period cellist Daniel Yeadon. Conducted over two years, this study involved the collection of extensive think-aloud and performance data to examine Yeadon's musical decision-making processes in relation to performing the Suites for Solo Cello by J.S. Bach. Overall, 65% of the total number of decisions were coded as being made deliberately, a figure that includes 5% of decisions coded as deliberate HIP (explicitly referencing historical performance practices). The remaining 35% of decisions were categorised as intuitive, including a subset of intuitive labelled procedural (7.5%). The highest number of decisions related to issues of articulation, phrasing, and character. Decisions about most performance features were mainly made deliberately (articulation, bowing, character, chord playing, dynamic, phrasing, rhythm, and tempo), except for ornamentation and tone colour, which were often the result of intuitive processes. All four categories of decision-making (intuitive, procedural, deliberate, and deliberate HIP) were only observed in the categories of articulation, phrasing, rhythm, and tempo.

Analysis of the influences on musical decision-making found a large number of quotations regarding performance context ($N = 19$), particularly the acoustic of the venue. Other important influences included harmony, and performances and recordings by other musicians. Themes related to processes of decision-making included discussion of spontaneity versus planning, rules versus imagination, and concepts associated with 'the zone.'

The main finding from the case study was the coding of procedural decisions that exemplified the assimilation and automation of previously deliberate decisions. This

process occurred through practice and supports the literature exploring different systems underlying Type 1 processes. Discussion of the case study data led to a spiral model of the role of intuitive and deliberate musical decision-making, a model that will be examined in further detail later in this chapter.

2. Discussion

All three studies were able to distinguish between intuitive and deliberate decision-making within the complex processes of interpreting solo Baroque string music. Decisions would often affect several performance features and be arrived at through various combinations of processes and influences. This section will discuss similarities and differences between the three studies under four headings: intuitive decision-making, deliberate decision-making, towards a theoretical model, and future research.

Intuitive decision-making

Intuitive decision-making was found in all three studies, with each study confirming the characteristics of intuitive processing as described in the psychological literature. In this thesis, intuition was equated with Type 1 processing and defined as follows:

> Intuition is a process of thinking. The input to this process is mostly provided by knowledge stored in long-term memory that has been primarily acquired via associative learning. This input is processed automatically and without conscious awareness. The output of the process is a feeling that can serve as a basis for judgments and decisions (Betsch, 2008, p. 3).

Intuitive decisions were those that were the result of a feeling or sense of a decision seeming right, obvious, or natural to the performer. These decisions were not explained further and were sometimes moments in the music where a firm decision had not yet been made. In general these decisions involved pattern matching rather than creative processes, indicating the use of problem-solving intuition. Within the category of intuitive, procedural decisions were those that had initially been made using conscious effort, but became automatic over time. This process was usually described in general terms, although Yeadon's reference to specific decisions being

"built-in" or "assimilated" during practice led to the coding of a small number of procedural decisions (see Figure 7.3.1).

Further data describing the nature of intuitive processes were found in quotations from interviews and think-aloud protocols such as the following:

> Accumulative learning:
> For me there is an aspect of music which is accumulative learning; you do something automatically using the knowledge that you've gained up until that point without conscious thought (Evans).

> Pattern recognition:
> Why do I make those decisions? I don't know, I guess it's just experience. I think I recognise other things. I haven't played it, I haven't heard it before but it certainly reminds me of other things (P1 from sight-read study).

> Feeling of rightness:
> It's not anything that I get from a book. I can find way of justifying it, justifying the 'yes' feeling, but I figure if something fits in with my physical sense or where I am at any given point…if it feels like a 'yes' for me, I'm going to be more convincing to the audience just because I'm in my element, whatever that is. I suppose the 'yes' comes out of lots of 'nos' as well (McGillivray).

> Automaticity:
> I couldn't say that anything was my instinct without saying it's my instinct because I've done this so many times and now I feel instinctively that this is how it's got to be (Sheppard).

The similarity between the overall percentage of intuitive and deliberate decision-making in the interviews and case study suggests that expert performers may have a maximum or minimum figure for the use of intuitive decision-making (perhaps between 30-40%; see Figure 3.3.4). Although there was variation between performers, most performers may have to make a certain amount of deliberate decisions to feel comfortable in performance. Differences between performers in the proportions of intuitive and deliberate decision-making are likely to be the result of preference, personality or thinking disposition, the demands of the task and repertoire, and mindware or level of expertise.

Intuitive decision-making resulting from a sense or feeling was found across a range of performance features, particularly regarding issues of ornamentation and tone

colour. This might be expected as these issues are among those that are more likely to be varied spontaneously in the moment of performance and need not be planned beforehand. Influences on intuitive decision-making included the Baroque bow and instrument as well as concern for communicating harmonic movement and principles of musical rhetoric. A rhetorical and harmonically driven approach to issues such as phrasing, articulation, and dynamics could be considered among the main differentiators between mainstream and HIP. Prioritisation of these themes indicates the continuing importance of these ideas to current HIP practitioners. Performers also discussed the importance of informing and questioning intuition to feel confident in accessing detailed and stylistically appropriate knowledge and experience through intuitive processes. The idea of educating intuition was found to be valid, indeed crucial to trusting in intuitions that were stylish and in 'good taste.'

Deliberate decision-making

In contrast to intuitive processing, deliberate processing was equated with Type 2 processes, which are "slower, involving manipulation of representations through working memory, at least part of which appears to be consciously accessible" (Evans, 2012b, p. 18). These processes involved an element of conscious planning and analysis and included decisions based explicitly on knowledge of historical performance practices (deliberate HIP). However, the relatively low percentage of deliberate HIP decisions in the interviews and case study indicates that performers did not feel the need to justify many of the decisions with explicit reference to historical performance practices.

The large proportion of deliberate decision-making in both the interview study and case study demonstrates that expert performers make a large number of deliberate decisions and are able to articulate the basis on which these were made. Deliberate decision-making was found across a range of performance features, particularly regarding issues of articulation, phrasing, tempo, and chord playing. Influences on deliberate decision-making included analysis of structure and musical motifs, historical information, and specific experiences. These results confirm assumptions about the deliberate, conscious effort required to develop an interpretation of challenging repertoire like the solo string works of J.S. Bach. As the following

quotations suggest, expert performers need to complement intuitive processes with experimentation and analysis in order to form an expressive, detailed concept of a work that can be communicated clearly during performance:

> Great performances do not just emerge spontaneously from intuition and impulse. They are always the result of much detailed work, even if, at the time of performance, many of these aspects can be experienced as automatic and effortless by the performer – and appear absolutely fresh and intuitive to the audience (Lehmann et al., 2007, p. 86; also see Juslin, Friberg, Schoonderwaldt, & Karlsson, 2004, pp. 249-250).

> The more we rely on our intuitions, the more our behaviours may be dictated by unacknowledged social norms and biological predispositions. Intuition is, and has been, indispensible in the arts. But intuition needs to be supplemented by knowledge (or luck) if artists are to break through "counterintuitive" barriers into new realms of artistic expression (Huron, 2006, p. x.).

Towards a theoretical model

The spiral model outlined at the end of Chapter 7 attempts to capture the dynamic and interrelated nature of intuitive and deliberate processes (see Figure 7.5.1). The model is mainly derived from the result of the case study, but builds on the continuum of intuitive to deliberate discussed at the end of the interview study (see Figure 3.5.1) and the principles of Evans' (2011) Intervention Model as adapted in the sight-read study (see Figure 5.5.1). The following discussion of the spiral model will draw on the results of all three studies with reference to relevant musicological and psychological literature.

As well as the psychological theories discussed in previous chapters (e.g., Baylor, 2001; Hamm, 1988), the overall shape of the model has been informed by Eggebrecht's encircling approach to musical understanding. This idea is explained in the following extract from *Understanding music: The nature and limits of musical cognition*:

> If we view musical understanding not just as a fleeting phenomenon but as a continuous educational process, we can describe it metaphorically as a spiralling, encircling motion around a central axis. The understanding self (or selves) is what is in motion and the axis is the music… as the spiralling motion climbs upwards towards its goal the radius continually lessens and we move ever closer to the axis (Eggebrecht, 1999/2010, p. 107).

Eggebrecht goes on to explain that it is one's aesthetic understanding (fed by aesthetic experience) that circles around the axis, ideally complemented by language-based cognitive understanding. The axis represents "a single work, a groups of works or the totality of all possible musics which can be imagined" (p. 107) and although the spiral tightens around it, the "moving self" never makes contact with the axis (p. 111). This is because "art does not permit definitive understanding: it knows of no attainable goal," meaning that a complete understanding of the artwork is inaccessible to an individual receiver:

> The self, as it searches and experiences, remains a self: a subject, limited, determined, individualised, moulded by its historical context, origins, and sensitivity to what is around it. However committed it is to seeking out and experiencing, it can never receive the totality of what is radiated, but only those emanations which trigger, ignite and renew its selfhood and which it is able and ready to receive (p. 111).

Therefore, the central axis in the spiral model of intuitive and deliberate decision-making could be the work or more specifically, a complete understanding of and ability to communicate the musical work. This is never achieved by an individual performer, but is the goal and core of the spiralling motion. Importantly, this idea applies wherever the spiral sits along the continuum, whether representing a mainly intuitive approach or near to the deliberate pole, as in Yeadon's case (see Figure 7.5.3). If the model were used to describe decision-making in relation to a single work, then the vertical axis would represent an understanding of that work. The model can also be applied to decision-making over a longer time period, group of works, or particular style, changing the nature of the central axis as a result.

The starting point in the spiral model close to the intuitive pole is based on default-interventionist models of dual process theories that predict an intuitive feeling first, with deliberate processes intervening afterwards (see Chapter 4). This process was described in several quotations from the interview study:

> Quite often I have an immediate instinct about the music; I feel it should be played a certain way. Then I ask myself why it should be that way... (Evans).

> In the course of working on a piece, my felt sense of how I want it to go becomes stronger and stronger, and then I'll go back and think about it, kind of

justifying myself after the fact. Or sometimes finding something that changes my mind (Matthews).

In the sight-read study, the task of learning a new piece was shown to be highly intuition-inducing, resulting in a large proportion of intuitive decision-making even after a forty-five minute practice session (see Table 5.3.1). In both the sight-read and performance conditions, participants drew on their feelings of 'rightness' or 'wrongness' and a sense of what worked, what seemed natural, obvious, or appropriate to guide their decision-making. However, there was movement toward more deliberate decision-making, particularly by more experienced players who brought key issues to conscious attention and provided solutions in an efficient manner (see Table 5.3.2). The difference between performers with more experience and those with less can be conceptualised in the spiral model as a difference in the rate of change in proportion from intuitive to more deliberate thinking.

The adaptation of Evans' (2011) Intervention Model in the sight-read study (see Figure 5.5.1) demonstrates what can occur at the moment-to-moment level for each decision while the spiral model proposes how the intervention of deliberate processes leads to a change in the proportion of intuitive and deliberate thinking over time. The sight-read study showed that even if a decision is made deliberately (verbalised or marked), the intention of the performer might not always be executed. This issue of intention versus action is specific to the sight-read study and would not apply to all problem-solving tasks. Whether executed or not, the role of deliberate decision-making grows with increasing expertise over time subject to varying degrees of critical effort according to the individual, task, and context.

In the spiral model, the move toward deliberate processes is crucial to the ability to inform one's choices and is achieved by experimenting with interpretative possibilities. It is through deliberate practice that decisions are consciously weighed up, reflected on, analysed, and other options explored. Performers may make various deliberate decisions based on a multitude of influences, such as the structure of the piece, technical challenges, knowledge of historical information, and specific past experiences. During this period of deliberation, decisions are gradually made comfortable, automatic, and accessible in the moment of performance. As Howat

(1995) puts it, "our reasoned, stylistic, analytical assimilation of a score is (ideally) followed by the lightning intuition that releases a performance into living sound" (p. 19).

The move from deliberation to intuition in the spiral model was demonstrated by the category of procedural that showed how over time, deliberate decisions become "more automatic, or procedural, in nature" (DeCaro & Beilock, 2010, p. 68). This process was first discussed as a theme in the interview study and was also implied in some quotations from the sight-read study, such as the reference to "built-in" stylistic understanding by Participant 6. It was only in the case study however, that specific decisions were articulated as being "built-in" or "assimilated" through practice. Harpsichordist Gustav Leonhardt has described the process of proceduralisation in relation to timing and articulation:

> When one is a student one does things consciously, but when one is more experienced one does not play intellectually any more. One doesn't *think*; one *has thought*. You must have done so before, but when you perform it is too late to think; you are only making music, without any thought of "now delay here" and "now articulate there." The only thing is music. It is like when we speak; we don't think, "Now this 'S' must be strong," or "Here let's pause." Those things are done automatically, depending on what you intend to say (Sherman, 1997, p. 198).

The importance of procedural processes has also been raised in previous studies of music performance (e.g., Elliott, 1995, pp. 53-60; Norgaard, 2011). Chaffin, Imreh, and Crawford (2002, pp. 102-107) discuss a "Gray" stage of practice in which the goal of the performer is to develop automaticity (stage 2b in six stages of practice). Referring to expert period keyboard performers, Berkowitz (2010) describes aspects of improvised performance that are reliant on the internal ear, fingers and experience: the performer has been "trained in the basic musical building blocks to such a degree of automatisation/proceduralisation that these elements can be performed without conscious awareness" (p. 124).

Therefore, the process of proceduralisation changes how a skill is executed and the quality of intuitions more generally, resulting in what Rink (1990, 2002) has termed "informed intuition." As Holloway states in relation to gaps in our knowledge of historical performance practice: "We are left with huge holes which we have to fill

with our instinct and then we come back to it, inform our instinct." Once relevant information or skills have been accessed and integrated, a performer can draw on reliable, appropriate intuitive responses to tasks or problems encountered within their specific domain. In addition to proceduralisation related to a specific task, each person's "inventory of intuitions" or "cultural capital" which they use to interpret the world is continually and mainly implicitly shaped and informed by their experiences (Hogarth, 2001, p. 9; also see Hogarth, 2008, pp. 93-98).

The articulation of procedural decisions in the case study suggests that recent procedural decisions may still be made explicit by the performer, while the basis for other intuitive decisions are not able to be explained either because they result from purely implicit processes, or the deliberate basis for the decision has faded from consciousness. As this change in the nature of intuitive decision-making occurs, the focus or content of decisions could also change. A performer may start by making decisions about basic features of the piece and gradually move to making more interpretative and expressive decisions (Chaffin, Lemieux, & Chen, 2006).

Therefore, as the spiral moves upward and tightens in radius, a number of things may change: the focus of decision-making (from basic to expressive features), the ability to articulate decision-making (from low/implicit to high/explicit), and the nature of decisions on the intuitive side (from intuitive/uninformed to procedural/informed). However, it is not clear whether the nature of decisions on the deliberate side of the spiral changes over time. There may be differences in the speed at which decisions are reached or in the strategies employed during practice to make deliberate decisions. As noted in Chapter 1, there is literature that explores differences between Type 1 processes while Type 2 processes are usually defined as singular system (Evans, 2009, 2012a). If there were multiple types of deliberation, differences between types could provide insight into the question of how deliberate decision-making changes over time.

Performance can occur at any point in the spiral, but would ideally take place when the spiral had tightened significantly around the vertical axis. At this point, the performer creates the illusion that they are creating their interpretation 'in the moment,' aiming for a state of flow and shaping or directing their actions to suit the specific aims and

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context of the performance. Emmerson (2009) suggests that the processes of decision-making made during practice are essential, but in the end should be transcended in performance:

> In practice and rehearsal, one plays with all sorts of variations – some obvious but many of them extremely subtle – and makes many conscious and unconscious decisions. But ultimately, most of these are in fact transcended in the act of music-making. At some point one hands the process over to the subconscious instincts to synthesise – to forge all those details into a coherent form, inevitably one that is your own. There may be a period where things don't seem to fit or settle well together but bit by bit, or sometimes very suddenly, a clarity emerges. But, when it comes to performance, that whole process is left behind and remains invisible to the audience, as it must if they are to experience the work directly without any apparent interference from the performers. One wants the music-making to appear spontaneous, for the interpretation to "feel right," for the process to be so transparent – so far transcended – that no-one is aware that anything is in fact being "interpreted." It is an illusion certainly, but one that is deeply embedded in and essential to our musical culture (p. 117).

The oscillation between periods of primarily intuitive or deliberate thinking can take place over varying time spans. For example, a finding that may fit the initial, lower phases in the spiral model is Holtz's (2009) interview study of seventeen professional musicians in which almost all participants reported "the need for an alternation between phases of deliberate construction and of intuitive experimentation" (p. 214; also see Nelson & Rawlings, 2007, p. 239; Howat, 1983, p. 181). On the other hand, songwriter and guitarist Richard Thompson has described a state during performance that may correspond to a higher, or ultimate point in the model in which the alternation between modes of thinking occurs from moment to moment:

> You get inside the music to such an extent that you kind of *are* the music, or the music's you. You're thinking about it but you're not thinking about it. Sometimes I think it's almost a flashing backwards and forwards of intellect and intuition: One minute you're thinking G flat, seven five, and then it's gone and you're doing something that you're not aware of really (Boyd, 1992, p. 162).

In summary, movement through the spiral creates an ever-deepening musical understanding of a work, group of works, or style, and represents shifts in the proportion of intuitive and deliberate decision-making over time. Performers begin by relying mainly on an immature intuition, but through deliberate decision-making

during practice are able to automate conscious choices and inform their intuitions. As the spiral moves upwards with increasing expertise over time it tightens to signify a maturing intuition and an increasing reliance on procedural processes. Eventually, the performer reaches a point in which both intuitive and deliberate processes have led to a highly developed concept of the work and created an ideal performance state in which the tension between the performer's conscious and unconscious is balanced from moment to moment (Sawyer, 2012, p. 351).

The spiral model supports the distinctions in the literature between Type 1 processes (see Chapter 1) and provides further data regarding the workings of expert intuition (e.g., Baylor, 2001; Evans, 2012a; Hamm, 2008; Pretz, 2011; Stanovich & Toplak, 2012; Weber & Lindemann, 2008). It should be noted that there is likely to be variation in the spiral model according to the characteristics and demands of specific tasks. Expert intuition is domain-specific and changes to the nature of the task such as the style of music, composer, or level of technical difficulty would affect how the spiral unfolds over time.

Future research

In the broad topic area of musical decision-making there are several avenues for future research. Experimental studies like the sight-read study could be replicated with larger sample sizes or altered in terms of task complexity to test predictions about the role of intuitive and deliberate decision-making. Various factors that are proposed to influence the degree of Type 2 processing effort (see Evans, 2011) could be explored by collecting data on thinking disposition, feeling of rightness, and cognitive ability. Other factors such as the instructional set, time available, and competing tasks could be manipulated to encourage or constrain Type 2 thinking. Such studies may provide further insight into the role of Type 1 and Type 2 processes in practice: is practice wholly deliberate and analytical or does it include an intuitive search for fluency, comfort, and creative solutions?

Variables in the interview and case studies such as age, repertoire, level of expertise, instrument, and style of performance (mainstream versus HIP) could also be manipulated to gather more varied data on musical decision-making. For example,

similarities between mainstream and HIP players might suggest that certain decisions are obvious to all experienced performers and are more likely to be decided intuitively.

In terms of different methods, studies could be designed that integrate interview and think-aloud methods with recording analysis, perceptual studies, or tests of personality. Detailed analysis of recordings would contextualise performance and interview data by critiquing self-report data in terms of what performers actually do and how this compares across performers and over time. The effect of decision-making processes on the effectiveness of musical performances could be tested through perceptual studies in which audiences rate moments in the music on a number of scales such as intuitive/deliberate or expressive/inexpressive. Lastly, tests of personality and processing styles might account for some of the individual differences found in the analysis of the interview data (for reviews see Betsch & Ianello, 2010; Koele & Dietvorst, 2010; also see Betsch, 2004; Böckenholt, 2012; Burns & D'Zurilla, 1999; Cools & Van den Broeck, 2007; Pacini & Epstein, 1999; Scott & Bruce, 1995; Decision-Making Individual Differences Directory at http://www.sjdm.org/dmidi/).

3. Conclusion

This thesis began by questioning the concept of intuition as raised in writings by performers. Intuitive decision-making is most obviously applicable in decoding the wealth of implicit information about musical features in a score but in HIP, intuition is also necessary due to the incomplete nature of historical information about stylistic practices:

> Notation captures very little about performance style; that is not its job. When words are added to it, as in the period treatises, the result is usually a series of tantalisingly disconnected clues which you have to link together through the exercise of judgment, imagination, guesswork, and musical intuition (Cook, 1998, pp. 96-97; also see Stowell, 2001, p. xiv; Kerman, 1985, pp. 200-202).

Through an interdisciplinary, mixed method approach to the topic of musical decision-making within the context of historically informed performance, the thesis has provided empirical data exploring the nature and role of intuition and deliberation.

Period instrument performers acknowledged the role of intuitive processes but its use fluctuated according to individual performer, various performance features, and the musical context. The qualitative data gave detailed insight into specific decisions and themes, demonstrating how types of decision-making are experienced and applied. Descriptions of intuition and deliberation, and the fluctuating emphasis between these processes resulted in some modelling of decision-making over time based on existing theories and the data from the thesis. By engaging with psychological theories and models, the results have been articulated in ways that contribute to understanding of these processes within music and psychology more generally. Far from doing without thinking, intuition comprises a complex, essential part of music cognition.

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Appendices

Appendix A:
Score used in sight-read study (Chapter 5)

Appendix B:
Results for individual participants in sight-read study (Chapter 5)

Participant 1

	Intuitive (I)		Deliberate (D)			
Category	I decision		D decision		D not executed	
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	1	1	0	0	0	0
Dynamics	0	2	0	0	0	0
Bowing	5	14	0	0	0	0
Phrasing	1	4	3	4	0	2
Ornamentation	0	0	0	0	0	0
Articulation	5	3	0	0	0	0
Note duration	9	0	0	0	0	0
Chord playing	0	0	0	0	0	0
Total	21	24	3	4	0	2

Participant 2

	Intuitive (I)		Deliberate (D)			
Category	I decision		D decision		D not executed	
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	2	0	1	0	0	0
Dynamics	0	2	0	1	0	3
Bowing	15	30	2	8	1	2
Phrasing	9	5	1	0	0	1
Ornamentation	1	7	1	0	0	0
Articulation	4	6	1	0	0	3
Note duration	11	0	0	0	1	0
Chord playing	0	0	2	2	0	0
Total	42	50	8	11	2	9

Participant 3

	Intuitive (I)		Deliberate (D)			
Category	I decision		D decision		D not executed	
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	2	4	0	0	0	0
Dynamics	0	0	0	0	0	7
Bowing	14	19	8	4	2	3
Phrasing	1	1	2	1	0	1
Ornamentation	16	9	0	0	0	0
Articulation	5	3	0	0	0	0
Note duration	10	1	0	0	0	0
Chord playing	0	1	0	1	0	0
Total	48	38	10	6	2	11

Participant 4

Category	Intuitive (I)		Deliberate (D)			
	I decision		D decision		D not executed	
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	1	1	0	0	0	0
Dynamics	0	3	0	0	0	0
Bowing	21	21	0	2	0	0
Phrasing	1	6	0	0	0	0
Ornamentation	0	3	0	0	0	0
Articulation	2	4	0	0	0	0
Note duration	10	0	0	0	0	0
Chord playing	0	0	0	0	0	0
Total	35	38	0	2	0	0

Participant 5

Category	Intuitive (I)		Deliberate (D)			
	I decision		D decision		D not executed	
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	0	2	0	1	0	1
Dynamics	0	0	0	0	0	1
Bowing	17	26	0	0	0	0
Phrasing	2	7	2	1	0	1
Ornamentation	0	0	1	1	0	0
Articulation	0	2	1	3	0	1
Note duration	12	0	1	0	0	0
Chord playing	0	0	0	1	0	0
Total	31	37	5	7	0	4

Participant 6

Category	Intuitive (I)		Deliberate (D)			
	I decision		D decision		D not executed	
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	0	1	0	0	0	0
Dynamics	0	1	0	0	0	0
Bowing	8	21	0	1	0	0
Phrasing	0	0	0	0	0	0
Ornamentation	0	0	0	0	0	0
Articulation	0	4	0	0	0	0
Note duration	4	0	2	0	0	0
Chord playing	0	0	1	1	0	0
Total	12	27	3	2	0	0

Participant 7

| | Intuitive (I) | | Deliberate (D) | | | |
| Category | I decision | | D decision | | D not executed | |
PF vs. SR	Same	Different	Same	Different	Same	Different
Tempo	0	0	0	0	0	0
Dynamics	0	0	0	1	0	0
Bowing	16	12	0	1	0	3
Phrasing	0	3	0	0	0	0
Ornamentation	0	3	0	4	0	0
Articulation	0	2	0	0	0	0
Note duration	9	0	0	0	0	0
Chord playing	0	3	0	0	0	0
Total	25	23	0	6	0	3