The treatment of conduct problems in children with callous-unemotional traits

Author:
Hawes, David

Publication Date:
2004

DOI:

License:

The Treatment of Conduct Problems in Children with Callous-Unemotional Traits

David J. Hawes

B. Beh. Sc., B. Psych (Hons)

Being a dissertation submitted to the School of

Psychology, University of New South Wales, for

the degree of Doctor of Philosophy, December 2004

Acknowledgements

I consider myself fortunate to have been supervised by Mark Dadds, and feel grateful for the guidance he has provided during my PhD research. His clinical and scientific expertise was integral to the completion of this study, as was his personal support. This project was reliant on a large team of therapists, home observers, and clinical interviewers, all of whom I am grateful to for their contributions. I am particularly grateful to Jenny Fraser and Annick Maujean for their assistance in first setting up the treatment trial at Griffith University. My partner Lucy has been a source of great support to me during the final years of this project, and has provided an inspiring example in her own approach to psychology. I am also grateful for the constant support of my family, and their encouragement throughout my post-graduate studies. Finally, I would like to thank all the families who participated in the treatment trial, for allowing us into their lives and their homes. Funding for this project was provided by the National Health and Medical Research Council.

Abstract

The aim of this study was to determine the impact of callous-unemotional (CU) traits on treatment outcomes and processes in a 10-week behavioural parent training intervention with young boys referred for conduct problems (n=55, mean age 6.29 years). The study represents the first investigation of this risk factor in an early intervention trial, and extends the body of research examining the predictive utility of childhood CU traits in relation to subsequent antisocial behaviour. As predicted, CU traits were associated with greater conduct problems at pre-treatment, and these traits were related to poor treatment outcomes at 6-month follow-up even when controlling for baseline conduct problem severity. Consistent with the low levels of fearful inhibitions characteristic of the CU temperament, the behaviour of boys with high CU traits was less responsive to time-out discipline than that of boys without CU traits. Boys with high levels of CU traits also reacted with less affect to this discipline. The effects of CU traits on treatment outcomes and processes were not related to differences in treatment implementation by parents. These findings provide evidence that conduct problems in boys with CU traits are less responsive to changes in parenting processes than those of boys without these traits, and present important implications for the role of child temperament in the treatment of conduct problems.

Table of Contents

List of Tables

List of Figures

List of Appendices

Parent training is considered highly effective in the treatment of conduct problems, especially when intervention is early and families are not overwhelmed by social adversity (Brestan & Eyberg, 1998). Despite a growing emphasis on developmental process and individual child factors in models of antisocial behaviour, little research has examined the factors characterising children who respond poorly to these treatments. With clinical trials reporting poor outcomes for approximately one-third of participant children (see Webster-Stratton & Hammond, 1997), the extent to which these children exhibit risk for chronic antisocial trajectories remains largely unknown. This study focuses on a set of child traits held to represent early indicators of an antisocial trajectory associated with psychopathy, and examines the relationship of these traits to parent training outcomes and processes in the treatment of young boys with conduct problems.

The following literature review commences by presenting the original theory upon which parent training is based, and the findings of research into parent training effectiveness and predictors of treatment outcomes. This is followed by a review of subsequent innovations in antisocial models and associated implications for treatment. Particular attention is placed on the literature addressing the interaction of child factors and parenting processes relative to antisocial outcomes, and recent developmental research guided by the application of the psychopathy construct to children.

Parent training: Theory and evidence

There is broad consensus that the interpersonal dynamics occurring in parent-child dyads are critical to behavioural outcomes in children, both directly and in mediating the effects of other risk factors such as poverty (e.g., Shaw, Bell, &

Gilliom, 2000). These social learning processes used to explain these dynamics form the basis for parent training interventions, and have guided much of the research evaluating these treatments.

The advent of Patterson's (1982) 'coercion' model was associated with both conceptual and methodological advances in the application of social learning theory to explanations of antisocial development. In an effort to collect objective behavioural data concerning family processes, Patterson, Reid and colleagues developed coding systems for recording the moment-to-moment interactions between parents and children during innovative naturalistic-observational studies (See Reid, Patterson, & Snyder, 2002 for detailed descriptions). These studies revealed that compared to families of non-conduct problem children, families with conduct problem children were more likely to initiate and reciprocate aggressive behaviour, and to persist in aversive behaviour once they had initiated it. Such families were described as highly coercive social systems, in which all family members contributed to bilateral and systemic coercion in relation to the target child (Snyder & Stoolmiller, 2002).

Patterson (1982) proposed that two main processes were operating in such families, which could be explained using operant conditioning principles. The first of these is the parental modelling of antisocial or aggressive behaviour. The second process involves 'reinforcement traps', which can occur in a variety of ways. A common chain of actions would involve a parent making an intrusive request of a child, the child protesting with aversive behaviour, and the parent then capitulating. In such an example, the child's aversive behaviour is positively reinforced by the parent's capitulation, which in turn is negatively reinforced by the termination of the child's aversive behaviour. In an alternative reinforcement trap, the more a child engages in conduct problems, the less likely the child will be reinforced for positive behaviours.

Parents who develop aversive associations with child interactions due to experiences related to problem behaviours will avoid involvement with the child and therefore be less attentive to positive child behaviours. Evidence in support of these processes has been reported in decades of observational studies (see review by Snyder & Stoolmiller, 2002), and a range of efficacious behavioural interventions have directly flowed from this model (see McMahon & Forehand, 2003; Sanders & Dadds, 1993; Webster-Stratton & Hancock, 1998). The application of operant principles to parent-child interactive therapies must be considered one of the most potent innovations of the mental health sciences.

Behavioural family interventions (BFI's) based on Patterson's (1982) coercion model are recognised as one of the most widely used and empirically supported therapeutic interventions for children and families (Serketich & Dumas, 1996). These interventions involve modifying the parenting behaviours hypothesised to maintain antisocial child behaviour through coercive parent-child interchanges. The process of therapy involves the functional analysis of parent and child behaviours occurring in these coercive cycles, and the use of practical techniques (e.g., role-plays, modelling) to teach parents how to implement techniques such as praise and time-out that may have been used ineffectively in the past. While based on conditioning principles, it is simplistic to describe this therapy as merely a matter of modifying behavioural contingencies. These interventions aim not only to improve child behaviour, but to also give parents insight into the effects of their own behaviour on that of their child, and the importance of warmth and boundaries in the parent-child relationship.

Treatments for conduct problems are among those recently evaluated by task force inquiries for the purpose of policy making and the development of professional guidelines (e.g. Farmer, Compton, Burns, & Robertson, 2002; Brestan & Eyberg,

1998), and have been the focus of recent meta-analytic investigation (e.g., Serketich & Dumas, 1996). Decades of efficacy studies have produced a rich body of evidence of the magnitude, generalisability, and duration of treatment effects for parent training, and the benefits of adjunctive and modified treatment formats.

Brestan and Eyberg (1998) conducted an influential review of treatments for conduct problem children and adolescents, applying criteria proposed by the Division 12 Task Force on Promotion and Dissemination of Psychological Procedures (1995). Eighty-two efficacy studies published between 1966 and 1995 were evaluated against the stringent criteria for well-established treatments (e.g. manualised protocol, comparison group, random assignments, reliable measures, independent replication). Only two treatment protocols demonstrated the requisite level of empirical support to be considered well-established, both of which were parent training interventions. Based in part on the Brestan and Eyberg (1998) review, Farmer et al. (2002) identified subsequent evidence in support of these conclusions. The two well-established treatments identified by Brestan and Eyberg (1998) were programs based on Patterson and Gullion's (1968) manual Living With Children, and video-tape modelling parent training (e.g. Webster-Stratton, 1994). These two 'treatments' therefore represent two categories of parent training, the first of which has been disseminated over time in many variants.

A meta-analysis of twenty-six well-controlled parent training outcome studies by Serketich and Dumas (1996) pointed to the large effects sizes with which this intervention is characterised. The authors calculated that the average child treated with PT in this research was better adjusted following treatment than approximately 80% of children in other treatment or control conditions. The treatment gains attributed to PT in such studies have been demonstrated across a range of outcome

criteria. These include change in DSM-IV diagnostic status assessed through clinical interview (e.g., Nixon et al, 2004), a drop from the clinical to normal range on self-report instruments of externalising behaviour (e.g., Webster-Stratton & Hammond, 1997), and decreases in oppositional behaviour and ineffective parenting assessed through methods of direct observation (e.g., Nixon, Sweeney, Erickson, & Touyz, 2004).

In well-controlled studies of recent years, treatment gains have been shown to be maintained at one year follow-up in samples of 4-8 year olds (Webster-Stratton & Hammond, 1997), and 2-3 year olds (Gross, Fogg, Webster-Stratton, Garvey, Julion, & Grady, 2003), while support for the maintenance of treatment effects at two year follow-up in preschool aged children is reported by Nixon et al. (2004). While the generalisability of PT treatment effects has been investigated less rigorously than the durability of these effects, research has demonstrated the generalisation of behavioural gains to school settings (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderbunk, 1991), community settings (Sanders & Glynn, 1981), and siblings of the target child (Webster-Stratton, Kolpacoff, & Hollinsworth, 1989).

Some of the most important developments in our knowledge of parent training effectiveness have come from the study of moderators and predictors of treatment outcomes. Consistent with the social learning theory foundation of parent training, this research has focused primarily on factors associated with disruption to parenting and family interaction (e.g., maternal depression, poor social support, marital problems, marital status, socio-economic disadvantage, negative life stresses) (Beauchaine, Webster-Stratton, & Reid, in press; Dadds & McHugh, 1992; Reid, Webster-Stratton, & Hammond, 2003). As evidence of such factors has grown, behavioural interventions have been adapted to address respective treatment barriers

by including adjunctive treatment components (e.g., Miller & Prinz, 1990), innovative formats for delivery (e.g., Sanders, Markie-Dadds, Tully, & Bor, 2000), and broader ecological interventions (e.g., Henggeler, Melton, & Smith, 1992).

Innovations in models of antisocial development

Contemporary models of antisocial behaviour recognise the risk for antisocial outcomes associated with a range of factors across multiple domains, including characteristics in children, parents, and family environments (Rutter, Giller, & Hagell, 1998). The trend in models of recent years has been toward an emphasis on the more complex interactive and transactional relationships between risk factors (See Greene & Doyle, 1999). Interactive models are based on the premise that risk factors only function to increase risk in the presence (or absence) of other particular risk factors. Alternatively, the magnitude of risk associated with one factor may vary across levels of another (Dodge & Pettit, 2003). For example, parental monitoring and supervision of child behaviour have been found to moderate the effects of family disadvantage on adolescent conduct problems (Pettit, Bates, Dodge, & Meece, 1999), indicating that the close involvement of parents in children's and adolescent's activities may mitigate some of the risk associated with socio-economic adversity.

Interactive effects however may also involve transactional processes. Such processes are typically seen in reciprocal influence between an individual and his or her environment, in which factors in both spheres are correlated with each other, as well as mediating the effects of each other on conduct problem outcomes (Dodge & Pettit, 2003). Patterson's coercion model (1982, Reid, Patterson, & Snyder, 2002) is one of the most enduring and clearly articulated examples of this. The potential for reciprocal influence between parenting and child factors such as temperament (e.g.,

Dadds & Salmon, 2003; Greene & Doyle, 1999) represents a more recent focus, and one that presents important implications for the role that parenting may play in pathways to antisocial outcomes.

Efforts to articulate interactive and transactional relationships between risk factors have also been accompanied by an emphasis on the heterogeneity of conduct problems. Current explanatory models of antisocial behaviour promote the idea that different factors and processes might relate uniquely to distinct groups of individuals exhibiting distinct antisocial outcomes (e.g., Dodge, 1991; Moffitt, 1993; Frick, O'Brien, Wootton, & McBurnett, 1994). For example, evidence indicates that the aggressive vs. non-aggressive conduct problem subtypes have different ages of onset, and genetic origins. It is well established that aggressive conduct problems, typically emerging in early childhood, appear to be more highly heritable than the non-aggressive conduct problems usually associated with adolescent onset (e.g., Edelbrock, Rende, Plomin, & Thompson, 1995).

Child factors associated with the development and course of antisocial behaviour are typically grouped into three broad domains. Behavioural factors have received the most attention in this literature, and emphasise characteristics and patterns of the observable behaviour (e.g., timing of onset; number of contexts in which the behaviour is displayed). Biological and psychophysiological factors have also been a major focus of this research in recent years (see Raine, 2002, for a review). Finally, child temperament has become the subject of a growing body of literature demonstrating the importance of individual differences in early childhood to the development of later antisocial behaviour.

Normative data from large scale longitudinal studies of child development such as the Dunedin Multidisciplinary Health and Development Study (Moffitt, Caspi,

Rutter, & Silva, 2001) have allowed researchers not only to study antisocial behaviour as an outcome, but also a predictor of future behaviour. Dimensions of this behaviour found to be most predictive of persistent antisocial behaviour include: 1) early age of onset, 2) the generalisability of the behaviour across multiple home school and community settings, and 3) the versatility of the antisocial individual, with those exhibiting both overt and covert forms of deviant behaviour likely to display a particularly severe and chronic pattern of antisocial behaviour (Loeber & Hay, 1997; Moffitt, 1993). Overt typically describes antisocial behaviours involving direct confrontation with victims, while covert describes non-violent forms of delinquency such as theft or fraud, involving concealment rather than confrontation (Loeber & Stouthamer-Loeber, 1998).

Findings from twin studies, adoption studies, and behavioural-genetic studies have provided clear evidence of genetic influences on antisocial behaviour (Raine, 2002; Rutter, 1997). Meta-analytic findings of such research indicate that approximately 50% of the variance in the measures of antisocial behaviour in these studies may be attributed to heredity (Mason & Frick, 1994). New evidence pertaining to genetic factors is helping to clarify the differential outcomes resulting from developmental contexts of abuse. Using a birth cohort of 1,037 participants followed from birth to age 26 as part of the Dunedin Multidisciplinary Health and Development Study, Caspi et al. (2002) tested the hypothesis that MAOA genotype could moderate the influence of childhood maltreatment on neural systems implicated in antisocial behaviour. A gene x environment interaction was reported for males, in which the impact of early childhood maltreatment on antisocial outcomes was moderated by a functional polymorphism in the MAOA gene. While requiring ongoing investigation,

such interactions help to explain why child abuse leads to antisocial behaviour in some children but not others.

While temperament has been implicated broadly in theoretical explanations of antisocial development, the notion that temperamental factors underlie and drive behavioural manifestations remains controversial (Bates, Pettit, Dodge, & Ridge, 1998; Dadds & Salmon, 2003). Caspi, Henry, McGee, and Moffitt (1995) investigated the importance of temperamental differences in early childhood to externalising and internalising outcomes in late childhood. Participants from the Dunedin Multidisciplinary Health and Development Study (n=800) were assessed at ages 3, 5, 7, and 9. The study utilised measures of temperament and behaviour problems based on independent reports and observations, and examined the relationship between specific temperamental characteristics and specific behaviour problems. Factor analyses revealed temperamental dimensions common to existing models of temperament (e.g., Bates, 1989; Rothbart, 1989). Three such dimensions were revealed at each age: Approach (i.e. extreme friendliness, self-confidence, and self-reliance), Sluggishness (i.e., reacts passively to changing situations, withdraws from novelty, fails to initiate action), and Lack of Control. This final dimension is consistent with typical descriptions of 'negative emotionality', or 'distress proneness', a dimension thought to influence both future levels of conduct problems (Owens & Shaw, 2003), and future trajectories of child-caregiver relationships (Clark, Kochanska, & Ready, 2000).

For both genders, lack of control in early childhood was the best predictor of conduct problems in late childhood. Furthermore, individual differences in early Lack of Control showed predictive specificity in relation to two trajectories of externalising behaviour delineated in Moffitt's (1993) taxonomy. These findings indicated that

while an early Lack of Control foretold an early-onset trajectory suggestive of a 'life-course persistent' pattern, antisocial behaviour with an onset during adolescence was not associated with such temperamental factors. These findings are consistent with the theoretical tenets of Moffitt's (1993) taxonomy, in which adolescent-onset conduct problems are thought to represent normative processes of socialisation, while an early-onset trajectory implicates neuropsychological factors.

Dodge and colleagues (Dodge, 1991; Dodge, Lochman, Harnish, Bates, & Pettit, 1997) propose a distinction between subtypes of chronic antisocial children and adolescents based on the nature of the aggression exhibited (reactive vs. proactive). The reactive aggression group is characterised by retaliatory hostility, while the aggression exhibited in the proactive group is instrumental in nature, driven by the expectation of reward. It is proposed that the developmental histories of these two groups implicate distinct causal factors and processes. Aggression in the reactive group is thought to develop through processes associated with early experiences of physical abuse and harsh discipline, a temperament characterised by emotional dysregulation, and deficits in social information processing. Alternatively, the aggression observed in the proactive group is suggested to develop primarily through social learning processes related to exposure to aggressive and coercive role models, and the development of a style of social information processing which favours the instrumental use of aggression. The reactive and proactive subtypes are therefore associated with distinct forms of child temperament, as well as implicating distinct family processes.

It is important to recognise that temperament has traditionally been conceptualised as part of an interactional process. Central to the seminal work of Thomas and Chess (1977) is the idea that temperament itself does not lead to

behavioural outcomes, but that such outcomes result from the goodness of fit between child temperament and the expectations and resources of the child's family and social environments. Subsequent research has demonstrated the importance of such conditions in shaping divergent outcomes related to a host of child risk factors, including biological variables (see Raine, 2002). Consistent with this premise, research is focusing increasingly on the interaction of child factors and parenting in the development of antisocial behaviour.

While the construct of attachment represents a relatively minor focus within the antisocial development literature, the contributions of attachment theory have received growing attention in recent years, and the integration of such theory with broader social learning based models appears to be an emerging trend. In a review of recent attachment-related studies of aggressive child behaviour, Lyons-Ruth (1996) comments that many of the family-related correlates of such behaviour can be identified in infancy, prior to the onset of coercive cycles. In contrast to the micro processes of family dynamics addressed in Patterson's (1982) coercion model, attachment models are concerned with parent-child relations at a more global level. While studies of middle-class samples have found association between externalising behaviour and avoidant attachment patterns (e.g., Erickson, Sroufe, & Egeland, 1985), it appears that disorganised attachment patterns are more strongly related to aggressive behaviour in populations characterised by broader risk factors. Infants with disorganised attachment patterns may exhibit unpredictable alternations of approach and avoidance, and a range of helpless, depressed, or conflict behaviours (Lyons-Ruth, Alpern, & Repacholi, 1993).

While the integration of attachment theory into social learning models of antisocial behaviour represents a relatively new idea, their similarities can be traced

back to classic experiments in psychology. Dadds (2002) suggested that a largely

forgotten series of animal experiments conducted by the Harlows (Harlow & Harlow,

1962) may elucidate the role that attachment may play in relation to processes such as

those in Patterson's coercion model. In these experiments, comfort and food (as well

aversive stimuli) was delivered to an infant monkey through a mechanical mother

monkey. The authors described 'approach-avoidance' conflicts in these dyads, with

the delivery of aversive stimuli from the mother resulting in increased clinging rather

than avoidance. Such infant behaviour in the real world would in some cases

alternately elicit comforting behaviours and displeasure in mothers. Reactions of

displeasure would be associated with further rejecting behaviours, which in turn

would increase the likelihood of further aversive clinging behaviour from the infant. It

makes theoretical sense that such attachment processes will play a role in the hostile

escalations observed in coercive dyads. For example, the emotional reactivity

observed in such dyads suggests a strong degree of closeness (albeit ambivalent), that

would not be expected in dyads who mutually avoid such aversive exchanges.

While attachment studies of fathers have been rare, they have contributed to

knowledge of the role that fathers play in the development of conduct problems.

Consistent with findings for infant-mother attachment, insecure attachments with

fathers have been associated with peer problems at age five (Youngblade & Belsky,

1992), as well as increased likelihood of referral for early-onset conduct problems

(Deklyen, Spelz, & Greenberg, 1998). Other evidence indirectly supports the

possibility that father-son attachments may be important in protecting against

antisocial outcomes than specific learning processes such as observational modelling.

Studies examining the relationship between father-son contact and conduct problems

in boys have consistently failed to support a modelling hypothesis in explaining the

intergenerational transmission of antisocial behaviour (see Frick, 2002, for a review). Alternatively, it appears that closer relationships are associated with fewer conduct problems, even when the father himself is antisocial.

Child predictors of parent training outcomes

As outlined above, recent models of antisocial behaviour have seen increasing importance placed on the interaction of systemic factors (e.g., social adversity, parent problems) with child factors such as temperament and neuro-cognitive characteristics (see Frick & Mason, 2004; Moffitt & Caspi, 2001). The trajectories of antisocial behaviour articulated in these models have presented increasingly specific predictions based on developmental processes beginning in early childhood. Despite this trend however, limited attention has been given to child factors in the treatment literature (Beauchaine et al., in press). In their review of 29 years of treatment research, Brestan and Eyberg (1998) concluded that no child factor had been investigated sufficiently to reliably establish or disconfirm their status as predictors of parent training outcomes.

Some of the strongest evidence for child factors important to treatment response is seen for child age, with treatment gains found to be greater in younger children (Dishion & Patterson, 1992; Ruma, Burke, & Thompson, 1996). There is also some evidence that children with more severe and pervasive conduct problems achieve fewer behavioural improvements and less generalisation of these changes (Ruma, Burke, & Thompson, 1996; Webster-Stratton, 1996). Using latent growth curve analysis, Beauchaine, et al. (in press) examined a number of child and family factors in relation to treatment outcomes at one-year follow-up across six randomised clinical trials involving a total of 514 children aged three to eight years. The treatments in these studies consisted of parent training interventions in various

combinations with other components (e.g. social skills training for children, a child management program for teachers). In addition to support for established social /family-based predictors of treatment response (e.g., maternal depression, socioeconomic status, paternal substance abuse, marital status), comorbid child anxiety/depression was also found to moderate treatment effects. Conduct problem children with elevated anxious/depressed scores on the Child Behaviour Checklist (Achenbach, 1991) were found to exhibit greater treatment gains at follow-up than those without these comorbid features. This finding is consistent with earlier research showing treatment outcomes to be associated with comorbid depression in children with conduct problems (Beauchaine et al., 2000). These findings demonstrate that the extent to which conduct problems improve through modifications to parenting are contingent on factors at the level of the individual child.

Psychopathy: A background to the construct

The emphasis on developmental trajectories in contemporary models of antisocial behaviour has focused much attention on the links between adult antisocial behaviour and childhood predictors of these outcomes. In recent years the construct of psychopathy has become influential in guiding this research, raising salient theoretical, measurement, and ethical issues in the process (see Johnstone & Cooke, 2004).

The psychopathy construct has undergone considerable revision since the personality-based criteria based on Cleckley's (1976) influential work first appeared in the DSM-II. While subsequent editions of the DSM have consisted largely of behavioural-based descriptions of antisocial disorders (e.g. APD, CD, ODD), the personality component of psychopathy has remained important to theoretical models

and related research. The most empirically supported conceptualisation of psychopathy is seen in Hare's (1991) two-factor model, comprising a personality component involving a callous and manipulative interpersonal style, and a behavioural component describing an antisocial and deviant lifestyle. This model also forms the basis for the Psychopathy Checklist (PCL-R; Hare, 1991), the measure most commonly used for clinical and research purposes.

It is this 'callous and unemotional' (CU) personality trait, characterized by lack of guilt and empathy, and the manipulative use of others for personal gain, which is held to distinguish the psychopathic subgroup within general antisocial populations. Compared to the majority of antisocial adult offenders, psychopathic offenders demonstrate a greater frequency and versatility in their criminal behaviour, with this antisocial behaviour more likely to be violent and premeditated (Hart & Hare, 1997). Psychopathic offenders also appear significantly more likely to re-offend following release from prison (Hemphill, 1991).

The notion that psychopathy is difficult, if not impossible, to treat, is prominent in the adult forensic literature. According to Hare (1996), no methodologically sound treatments or 'resocialisation' programs have been established as effective for psychopathy. Ogloff, Wong, and Greenwood (1990) found high that convicted adults scoring high on the PCL-R derived little benefit from a therapeutic community treatment for personality-disordered offenders, exhibiting higher rates of drop-out and few clinical improvements than other offenders. Evidence is also available of adverse outcomes resulting from prison treatment programs for psychopaths, with Rice, Harris, and Cormier (1992) reporting higher recidivism rates in treated psychopaths (77%) than untreated psychopaths (55%). It has been hypothesised that such outcomes may be in part the result of the manipulative ability

of psychopaths to convince therapists and parole personnel of reform, with insight-oriented treatment potentially resulting in the learning of more effective methods of exploitative manipulation (Hare, 1996).

The presumption that psychopaths are untreatable has however been challenged in recent research. Salekin (2002) conducted a meta-analysis of 42 studies examining treatment effectiveness in psychopaths ranging in age from 8 to 55 years, some dating back to the first half of the 20th century. Contrary to the idea that psychopaths are unresponsive to treatment, Salekin (2002) reported findings of clinically significant treatment outcomes in a range of these studies. An analysis of treatment and participant characteristics revealed that the most effective treatments were intensive programs based on cognitive-behavioural principles, while participants who were younger were more likely to benefit from treatment. The involvement of other family members in treatment also appeared to be associated with improved success rates. While these findings should be considered tentative due to the small number of published studies and a range of methodological limitations in this research, they are encouraging, and support ongoing research into the factors associated with treatment responsivity in psychopathic populations.

The measurement of CU traits in adolescents and children

Apparent anxieties associated with the childhood application of psychopathy include the fear that the assumption of untreatability associated with adult psychopaths will be extended to children and youth, with the consequence of exclusion from treatment. Concerns have also been expressed that attaching the psychopathy label to a juvenile offender may drive judicial decision making in a punitive direction (Petrila, & Skeem, 2003). Issues of treatment and management

however also feature prominently in arguments for the early identification of psychopathy. The developmentalist principle that malleability decreases with age suggests that childhood intervention may be vital to preventing the entrenched patterns of psychopathy seen in adults (Gretton, Hare, & Catchpole, 2004). This argument is supported by clinical evidence that the successful treatment of antisocial behaviour may depend on early intervention, with treatment impact seen to be greatest with children in the pre-school to elementary school years (Dadds, 1995). While the common belief that psychopaths are untreatable represents one objection to applying the psychopathy construct to children, the most contentious issue is whether stable traits such as these can be measured meaningfully in childhood (Johnstone & Cooke, 2004).

Some of the most notable innovations in psychopathy research have been seen in the development of screening versions of the PCL for use with adolescents and children. Measures such as the Psychopathy Checklist: Youth Version (Forth, Kosson, & Hare, 2003), the Antisocial Process Screening Device (APSD; Frick & Hare, 2002), and the Childhood Psychopathy Scale (CPS; Lynam, 1997) assess age-appropriate manifestations of psychopathy in adolescents and children, and have facilitated the study of the developmental correlates of CU traits and trajectories of antisocial behaviour.

Frick, Bodin, and Barry (2000) analysed the factor structure of the APSD in both a community sample (n=1136; mean age 10.6 years) and comparison clinic sample (n=160; mean age=8.5 years). Psychometric analyses were conducted using a multi-informant composite comprising both parent and teacher reports. In both samples support was found for a two-factor structure analogous to that seen in adults, consisting of a callous-unemotional (CU) factor, and an impulsive/conduct problems

(ICP) factor. Data from the community sample however demonstrated a better fit with a three-factor solution in which ICP divided into impulsivity and narcissism factors. Correlations between the subscales in both samples were moderate to high, indicating considerable overlap between the CU, Impulsivity, and Narcissistic dimensions. Less is known about the ASPD youth self-report version, however preliminary evidence supports its convergent and discriminant validity (e.g., Vitacco, Rogers, & Neumann, 2003).

Measurement overlap in the APSD has been subject to some criticism, with Burns (2000) pointing to the numerous items in the APSD that share features of the disruptive behaviour disorders in young children. As noted by both Burns (2000) and Frick (2000), this issue stems for a lack of research investigating the unique characteristics of the APSD, especially the CU factor, against related measures of child adjustment. Following this debate, Dadds, Fraser, Frost, and Hawes (in press) evaluated the reliability and validity of measuring CU traits using the Antisocial Process Screening Device (Frick & Hare, 2002) concurrently with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), an established measure of general child psychopathology. In a community sample of 4-9 year old children (n=1359), Dadds et al. (in press) pooled and factor analysed the items from the APSD, and SDQ (Goodman, 1997). This joint factor analysis produced a distinct CU factor, in addition to factors representing antisocial behaviour, hyperactivity, anxiety, and peer problems. In a regression model, scores on the CU factor were found to add small but significant improvements to the 12-month prediction of antisocial behaviour, after controlling for time-1 measures. It was concluded that while CU traits demonstrated substantial overlap with features of the disruptive behaviour disorders, they demonstrate a unique predictive relationship once the overlap is parsed out.

The predictive validity of CU traits in the sample of 4-9 year olds reported by Dadds et al. (in press) is consistent with that seen in research with adolescents conducted by Frick Cornell, Bodin, Barry, and Dane (2003) using the Psychopathy Checklist: Youth Version (Forth, Kosson, & Hare, in press). Furthermore, the validity of the joint ASPD-SDQ measurement structure employed by Dadds et al. (in press) has been supported in twin research showing genetic risk for CU traits in 7-year old children (Viding, Blair, Moffitt, & Plomin, 2004). The findings reported by Dadds et al. (in press) add to a growing body of evidence supporting the measurement of CU traits in childhood, and demonstrate that CU traits can be measured validly and reliably in the age group typically targeted in parent training interventions.

Correlates of childhood CU traits

Children and adolescents exhibiting high levels of CU traits (e.g., empathy and guilt, a manipulative use of others, and constricted emotionality) demonstrate a particularly severe and chronic pattern of antisocial behaviour, and share a number of characteristics consistent with the construct of psychopathy as applied to adult offenders (Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003). Much of the research into correlates of childhood CU traits has been conducted with late-childhood / adolescent samples. This research has found that children with conduct problems and CU traits show a preference for novel and dangerous activities (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999), and compared to conduct problem children without these traits exhibit more instrumental aggression (Frick, Cornell, Barry, Bodin, & Dane, 2003) and less concern for the effects of this behaviour on others (Blair, Jones, Clark, & Smith, 1997; Pardini, Lochman, & Frick, 2003). Laboratory research has found that conduct problem children with CU traits are less sensitive to

cues of punishment when a reward orientated response set is primed, and show

reduced reactivity to threatening and emotionally distressing stimuli (Blair, 1999;

Frick, et al., 2003a). Evidence also indicates that they experience greater difficulty

recognising sadness in the faces and vocalisations of others (Blair, Colledge, Murray,

& Mitchell, 2001; Stevens, Charman, & Blair, 2001).

As most psychopathy research with adolescents and children has concentrated

on the measurement of the construct, little attention has been given to investigations

of the impact of these traits on treatment outcomes in these populations. While a

couple of recent studies could be located examining the relationship of psychopathy to

indices of treatment response in samples of antisocial adolescents, no such research

has been published for pre-adolescent children. Falkenbach, Poythress, and Heide

(2003) examined rates of recidivism and re-arrest following release from a juvenile

diversion program in which adolescent offenders (n = 69; mean age 14.4 years) were

required to complete a set of individually assigned mandatory sanctions (e.g.

community service, psychoeducational activities). These measures of poor program

response correlated positively with total scores on the self-report APSD and CPS.

However, as partial correlations controlling for the antisocial factor were not

conducted, it is not clear to what extent these outcomes were related to CU traits

versus severity antisocial behaviour.

Spain, Douglas, Poythress, and Epstein (2004) studied treatment response in

sample of male adolescents offenders between the ages of 11 and 18 (n=85; mean age

15.77 years) in a residential treatment facility. These adolescents participated in multi-

level treatment program based on Rational Emotive Behavioural Therapy, with

advancement in treatment contingent on mastery and appropriate behaviour. A

number of psychopathy measures were administered prior to commencement of

treatment, including the PCL-YV and the APSD. Treatment response was operationalised using indices of treatment advancement, including the time taken to reach successive levels, whether treatment levels were dropped. CU traits, as measured using the CPS, were found to be associated with delays in treatment progress, and greater instances of disciplinary infractions during treatment. While Impulsivity/Conduct Problems factor scores on the APSD were associated with these indices also, the APSD CU traits factor was not. Interestingly, it was found that the self-report psychopathy measures (e.g., APSD) were more consistently and strongly related to treatment progress than the clinician-administered PCL-YV. From these preliminary investigations into the impact of CU traits on treatment response in antisocial adolescents it appears that ongoing research is necessary to establish this relationship.

Parenting and conduct problems: The moderating effect of CU traits

It has been theorised that the low fearful inhibitions characteristic of children with CU traits interacts with their responsiveness to typical parenting practices, thereby interfering with moral socialisation and the development of conscience (Frick & Morris, 2004, Dadds & Salmon, 2003). This model of CU traits draws from research by Kochanska and colleagues demonstrating the moderating influence of child temperament on the relationship between parenting practices and the development of conscience. Fowles and Kochanska (2000), for example, found that young children with a fearful temperament (operationalised using measures of electrodermal reactivity) responded well to gentle discipline practices which capitalized on the child's internal discomfort, whereas for those with a fearless

temperament (consistent with CU traits) attachment security was a stronger predictor of conscience and prosocial behaviour.

The possibility that coercive parenting processes may interact reciprocally with child temperament to shape reward-dominant/punishment-insensitive style characteristics has also been proposed. Dadds and Salmon (2003) have speculated that the same ineffective punishment practices seen in the coercive family processes contributing to conduct problems (e.g., inconsistency punishment, non-contingent punishment, gradual increases in severity of punishment), may, in children characterised by a fearless temperament, also diminish a child's sensitivity to punishment. It is suggested accordingly that punishment insensitivity may exacerbate coercive cycles, and therefore consolidate a punishment insensitive style even further (Dadds & Salmon, 2003).

The moderating effects of CU traits on the relationship between parenting practices and conduct problems has been examined specifically in only a handful of studies. In a clinical sample of conduct problem boys (aged 6-13 years), Wootton et al. (1997) examined the relationship between concurrent measures of conduct problems, CU traits, and parenting practices. The relationship between ineffective parenting and parent/teacher reports of conduct problems was moderated by CU traits, with poor parenting only associated with conduct problems in boys without high CU traits. Alternatively, boys with high CU traits exhibited high rates of conduct problems regardless of the quality of parenting received. This finding has since been replicated in a mixed gender sample (mean age 8.24 years), in which CU traits moderated the relationship between ineffective parenting and peer/teacher-rated conduct problems (Oxford, Cavell, & Hughes, 2003).

Recent evidence of heritability from twin research appears consistent with these findings. In a representative sample of 7-year old twins (n=3687), Viding, et al., (2004) compared conduct problem children exhibiting high versus low levels of CU traits. For those with high CU traits, genetic influence was found to be high relative to that of shared environment, while for conduct problem children low in CU, only moderate influence was seen for both genetics and shared environment. In addition to demonstrating support for the moderating effect of CU traits on the relationship between parenting and conduct problems, these findings provide important support for the valid measurement of CU traits in childhood.

The theory and evidence presented here indicates a number of implications for the use of parent training interventions to treat conduct problems in young children. First, if CU traits moderate the influence of parenting practices on the development of conduct problems, these traits will presumably also moderate the impact of changes to parenting practices on prospective conduct problems. While CU traits have not previously been evaluated directly in the context of a standard clinical trial for conduct problems, clinical evidence that children with comoribid features of anxiety/depression benefit more from parent training than those without this comorbidity (Beauchaine et al., 2000, Beauchaine et al., in press) is consistent with the proposition that CU traits may moderate the effectiveness of parent training. That is, children with features of anxiety/depression match the profile of emotional dysregulation associated with low CU conduct problem children, for whom aggression is often impulsive and reactive. Alternatively, children with high CU traits are characterised by low levels of anxious arousal and are more likely to exhibit instrumental or proactive aggression (Dodge & Pettit, 2003; Frick & Morris, 2004).

24

Second, the low fearful inhibitions characteristic of conduct problem children with CU traits suggests that these children may respond uniquely and differentially to the individual components of parent training treatments, which are based on principles of reward (e.g., praise, token reinforcement) or discipline (time-out, response cost) respectively. The presence of CU traits in conduct problem children therefore suggests specific processes that my limit the overall effectiveness of parent training by reducing responsiveness to disciplinary components of treatment.

To summarise the literature reviewed, parent training is considered highly effective in the treatment of conduct problems, especially when intervention is early and families are not overwhelmed by social adversity. Despite the growing emphasis on developmental child factors in models of antisocial behaviour, however, little research has examined the factors characterising children who respond poorly to these treatments. Recent child research guided by the psychopathy construct has supported the predictive validity of childhood CU traits in relation to future antisocial behaviour. Conduct problem children with CU traits exhibit a distinct temperament characterised by reduced reactivity to cues of threat and distress, and a sensation-seeking reward drive. These correlates suggest adverse implications for the treatment of conduct problems in children with high levels of CU traits using conventional parent training interventions, and present testable hypotheses regarding the mechanisms through which CU traits may impact on treatment processes.

Aims and hypotheses

The aim of this study was to determine the impact of callous-unemotional (CU) traits on treatment outcomes and processes in a parent training intervention with young boys referred for conduct problems. The study of early childhood CU traits in

relation to parent training outcomes and processes promises not only to inform ongoing theoretical developments in antisocial models, but also to inform the treatment and prevention of these problems.

The first hypothesis pertained to the relationship between CU traits and severity of conduct problems upon presentation. Based on previous evidence of a relationship between CU traits and conduct problem severity, it was predicted that participants' CU traits would be positively associated with the severity of conduct problems exhibited upon presentation. The primary prediction regarding treatment outcomes was that participants high in CU traits would demonstrate fewer improvements at follow-up than those with low CU, after controlling for differences in initial levels of conduct problems, socioeconomic status, age, and treatment dose. As CU traits have not previously been studied in relation to treatment outcomes, the impact of treatment on CU traits was also examined. Based on the stability implicit in the trait-like conceptualisation of the CU construct, and follow-up data supporting this stability in a young community sample (Dadds et al., in press), it was predicted that CU traits would remain stable across treatment despite change in levels of conduct problems.

A number of predictions were also made regarding treatment process. Based on the correlates of CU traits reviewed, it was hypothesised that boys with high CU traits would be more responsive to treatment components based on reward than those imposing discipline (e.g. time-out). Furthermore, boys with CU traits were predicted to exhibit reduced affective reactions to this discipline. In order to ensure that differences in outcomes and processes attributed to CU traits were not confounded by other variables, independent observations of parents' implementation of child management techniques were conducted. It was hypothesised that the differential

outcomes and processes predicted in relation to CU traits would not be due to differences in the quality of treatment implementation by parents.

<center>Method</center>

Participants

The treatment trial was conducted in the psychology clinics of two universities in Brisbane and Sydney, Australia. Participants self-referred or were referred by local treatment services for the treatment of conduct problems, from the beginning of the year 2002 to the end of 2003. Participants were boys between the ages of 4 and 8 years inclusive who met DMS-IV criteria for either oppositional defiant disorder (ODD) or conduct disorder (CD). Cases meeting full ODD/CD diagnoses represented 93% of the sample, while 7% (n=4) were assigned borderline diagnoses. Children receiving concurrent psychological treatment were not eligible, nor were those with developmental disabilities. In order to focus on conduct problems most suited to behavioural (rather than pharmacological) intervention, cases with primary diagnoses of ADHD were excluded. Secondary features of ADHD were permitted if currently medicated. This criterion applied to three participants in the sample. The results of the substantive analyses did not change when the data from these cases were excluded, indicating that medication status was not a confounding factor in the study.

Fifty-five families commenced treatment, with the target children having a mean age of 6.29 years (SD = 1.55). Total family income ranged from <$20,000 (7%), $20-30,000 (12%), $30-50,000 (26%), to over $50,000 (55%). Education in parents ranged from junior certificate (16%) through a mode of 'finished high school' (40%), to tertiary educated (44%). The majority of families (76%) comprised two caregivers. Six families dropped out of treatment within the first three sessions, with

therapist documentation suggesting that these families had chaotic or complex daily routines incompatible with regular attendance. The data from one further case were excluded due to significant deviation from the manualised treatment protocol, necessitated by significant discord in the parental relationship. The sample (n = 55) was split into those who completed treatment (n = 48) and non-completer (n = 7) groups. Treatment completion was defined as attending at least 7 sessions, in which all core content was delivered. Completer and non-completer groups were compared across socio-demographic variables (i.e., mother's education, family income), child age, and pre-treatment conduct problem measures in a MANOVA. As no between-group differences were found, non-completers were excluded from the subsequent statistical analyses. Follow-up assessment was completed for 46 cases.

Measures

Diagnostic interviews: Diagnostic interviews were conducted using the Diagnostic Interview Schedule for Children, Adolescents, and Parents (DISCAP) (Holland & Dadds, 1997). This semi-structured interview is based on DSM-IV (American Psychiatric Association, 1994) criteria for childhood disorders, and demonstrates good reliability and validity (Johnson, Barrett, Dadds, Fox, & Shortt, 1999). The DISCAP provides both categorical (i.e., diagnosis/no diagnosis) and continuous (i.e., clinical symptom severity from 0-6) data. The presence of ODD diagnoses at follow-up was the primary measure used to analyse treatment outcomes, and ODD symptom severity a secondary measure. Pre-treatment DISCAP interviews were conducted by the treating therapist, while those at post-treatment and follow-up conducted by clinical psychologists unfamiliar with the case.

Thirty percent of interviews were conducted by two independent interviewers to check inter-rater reliability. Inter-rater reliability for the diagnostic interviews was high, with Cohen's Kappa values of 1 at both post-treatment and follow-up indicating perfect agreement between inter-rater diagnoses. Strong correlations were also obtained between inter-rater diagnostic severity ratings at post-treatment ($r = .90$) and follow-up ($r = .98$).

Home observations: Each family was visited in their home on four occasions during treatment, and observed in structured play interactions (30 minutes) as well as during the family's typical dinner routine (30 minutes) at each visit (i.e., a total of four hours across treatment). Observational data were collected using the Behavioural Observation Coding System: Family Observation Schedule (FOS 5th edition) (Dadds & McHugh, 1992). The complete protocol and record form are presented in Appendix 1. This time-sampling protocol has consistently demonstrated good reliability and validity, with earlier versions evaluated extensively in the research that culminated in the development of the Triple-P program (e.g., Dadds, & McHugh, 1992; Dadds, Schwartz, & Sanders, 1987; Sanders & Dadds, 1982; Sanders, & Christensen, 1985). The system provides a framework for the scheduling of family interaction tasks, and the recording and categorising of both parent and child behaviours. Observation periods were divided into 'observe' and 'record' intervals, lasting 20 seconds and 10 seconds respectively. This cycle repeated for the total duration of the observation. Observers listened to a CD through headphones, which signalled the start and end of each time interval with a series of tones. During the 'record' interval, observers ticked the codes for the behaviour occurring in the previous 'observe' interval. Using this method, only the presence or absence of these behaviours was noted, not the frequency of each behaviour during the interval.

The following variables were calculated from the individual behaviours recorded for the raw data. 'Child deviant behaviour' was the percentage of total observation intervals during which time any child behaviour codes were recorded. 'Aversive parent behaviour' was the percentage of total parent-child interaction intervals during which any parent behaviours with negative affect indicators were recorded. 'Descriptive praise' was the percentage of total parent-child interaction intervals during which praise was used by parents, and 'correct implementation' was the percentage of child deviant behaviour intervals in which parents correctly implemented the discipline techniques presented in treatment, while refraining from aversive behaviour. As 'correct implementation' was calculated only for observations in which 'child deviant behaviour' occurred, observations without such child behaviour were therefore not included in the overall rates of 'correct implementation' reported. One third of all observations were recorded by two observers to check inter-rater reliability.

Parent-report measures: The 20-item Antisocial Process Screening Device (APSD; Frick & Hare, 2002) (see Appendix 2) is a measure of psychopathy-like features in childhood, consisting of three subscales. The first measures the CU interpersonal style consisting of lack of guilt and lack of empathy or remorse (e.g. "Is unconcerned about the feelings of others; feels bad or guilty when he has done something wrong"). The second subscale, Conduct Problems / Impulsivity (ICP), includes poor impulse control (e.g., "Becomes angry when corrected"), and delinquent behaviours (e.g., "Intentionally breaks rules"). The third subscale, narcissism, contains items such as "Thinks he/she is more important than others". This study used the parent-report Pre-K version of the APSD. See the introductory literature review for psychometric details.

The Strengths and Difficulties Questionnaire (SDQ: Goodman, 1997) (see Appendix 2) is a 25-item screening device for general child psychopathology. It produces a total score as well as five subscales: Hyperactivity, Conduct Problems, Emotional Symptoms, Peer Problems, and Prosocial Behaviour. The SDQ has been shown to have good psychometric properties and to converge well with other checklist measures and independent diagnoses of child disorders (Goodman, 2001). The validity and reliability of the measure has also been established with Australian children of the same age as the participants in this study (Hawes & Dadds, 2004).

The measurement of CU traits and Antisocial Behaviour used in the current study was based on that reported by Dadds et al. (in press) using pooled APSD and SDQ items (see Appendix 2 for item listings). This system produces a CU traits factor consisting of the original APSD items plus items from the Prosocial behaviour scale of the SDQ, an Antisocial factor based on items from the ICP and Narcissism scales of the APSD and Conduct Problems scale of the SDQ, as well as factors measuring Hyperactivity, Anxiety, and Peer Problems. Consistent with Dadds et al (in press), the use of this joint factor structure in the current study indicated significant improvement to measurement over that provided by the original APSD and SDQ scales in isolation. That is, alpha coefficients for internal reliability for the new scales were: CU traits, α = .79, Antisocial, α = .78, compared to alphas of α = .57, and α = .66 for the original scales respectively.

Behaviour monitoring and treatment process scales: A number parent-report scales were developed for the purpose of monitoring child behaviour and affect during treatment, as well as parent adherence to the treatment components. These monitoring scales (see Appendix 3) were administered to parents by telephone at 5 points during the study, at pre-treatment (between the assessment session and first treatment

session), following the introduction of reward strategies (week 3 of treatment), following the introduction of the discipline strategies (week 5 of treatment), at post-treatment, and at follow-up. To maximise reliability of these monitoring reports, scales were administered twice at each assessment point, three days apart, and the averages of these data used.

Each set of monitoring scales corresponded to a particular stage of treatment, with items pertaining to particular treatment components only administered once these components had been completed in treatment. The first set of these scales measured conduct problems, and consisted of items chosen to assess the key features of ODD and CD (non-compliance, aggression, disruptive behaviour), in addition to parental satisfaction with child behaviour. The second set of scales assessed parental implementation of the reward strategies (e.g., descriptive praise, child-centred time), and child response to these strategies. The third set consisted of items assessing parental implementation of the discipline strategies related to time-out, and child response (both affective and behavioural) to these strategies. To assess child affect parents, were asked "Which of the following best describes your child when he is going into time-out". The parent then selected one of four alternative affect categories (angry, scared, sad, calm and cooperative).

Procedure

Newspaper articles and advertisements were published for the purpose of participant recruitment. Following a screening interview by telephone in which inclusion criteria were addressed and the ODD component of the DISCAP administered, eligible families attended an initial assessment session. During this session a comprehensive diagnostic interview was conducted, including full

administration of the DISCAP in order to confirm the diagnosis made during the

screening interview, and identify additional psychopathology relevant to the inclusion

criteria (e.g., developmental delay, ADHD). The parent-report measures were also

completed by mothers at this time, as was the first set of the behaviour and treatment

process monitoring scales, and the first home observation assessment. The subsequent

home observations occurred following the introduction of reward strategies (week 3),

following the introduction of the discipline strategies (yet prior to the delivery of the

planned activities component, week 5), and at post-treatment. The monitoring scales

were also administered at these same time points.

Post-treatment assessment also included the same parent-report measures

completed pre-treatment, and a diagnostic interview. Post-treatment diagnostic

interviews were administered by phone by a clinician unfamiliar with the target child,

as were the behaviour monitoring and treatment process scales. A follow-up

assessment was conducted six months after completion of treatment, at which time the

complete assessment battery was repeated minus the observational component.

Observational measures could not be completed at follow-up due to logistical

difficulties associated with the inter-state relocation of the project. At all times,

therapists and assessment staff were blind to measures of participants' CU traits, as

were participating families.

Intervention

Treatment consisted of a fully manualised parent training intervention (Dadds

& Hawes, in press) (see Appendix 4) based on the empirically-validated intervention

by Sanders and Dadds (1993). This treatment, conducted individually with families

and addressing systemic issues such as marital distress, equates to the most intensive

level of intervention (i.e., level five) provided in the Triple-P model (Sanders, Markie-

Dadds, & Turner, 2003). This level of intervention was chosen in order to evaluate the impact of CU traits on the best possible treatment available within the limits of brief intervention. The components of treatment are presented in Table 1.

      The intervention commenced with a 90-minute assessment session with parents, followed by nine weekly 1-hour sessions. The first six sessions focused exclusively on child behaviour management, beginning with reward-based strategies used to encourage desirable behaviour (e.g., descriptive praise, token reinforcement), following by disciplinary strategies such as time-out response cost. Following this, systemic issues impacting on child adjustment were addressed (e.g., parent stress management, relationship discord). While these components were selected and delivered based on their relevance to the family system, a planned activities component ('Boredom Busters') was delivered to all cases.

      In order to maintain the flexibility with which parent training is delivered in the real world, treatment sessions were repeated with participants when appropriate, up to a limit of 3 repeated sessions. Conversely, participants considered to be responding optimally to treatment prior to the completion of 10 sessions could finish earlier. Once again, this modification was limited to no more than 3 sessions. The repeat delivery of manualised sessions was avoided where possible, and the decision to do so based on discussion of the case in supervision. Cases receiving between 7 and 10 sessions represented 42% of the sample, while 24% received between 10 and 13 sessions. An emphasis was placed on facilitating treatment attendance and participation, with sessions scheduled in and out of business hours to accommodate parents' availability, and to encourage fathers to attend. Childcare was provided when necessary.

Table 1

Treatment components comprising the manualised parent training intervention

Session	Content
1	Assessment with parents
2	Psychoeducation: Causes of child behaviour
	Reward-based strategies (positive reinforcement using descriptive praise, affection, tangible rewards, child centred time)
3	Review of reward strategies
4	Discipline strategies (time-out, response cost)
5	Review of discipline strategies
	Contextual focus 1:
	▪ Fighting with siblings ▪ Family rules
6	Boredom busters/high-risk settings
7&8	*Contextual focus 2.* Choice of modules:
	▪ Partner support training (n=31) ▪ Problem-solving skills (n=12) ▪ Time management (n=8) ▪ Anger management (n=7) ▪ Pleasant events & social support (n=4) ▪ Cognitive Coping Skills (n=5)
9&10	Review & relapse prevention

Note. Number of cases receiving each 'contextual focus 2' module in brackets

Treatment was conducted by clinical psychologists with at least one-year clinical experience in child and family therapy. All clinicians received formal training in behavioural parent training, in addition to training in the research protocol.

Therapists attended regular group supervision meetings with a senior psychologist, as well as peer supervision meetings. These meetings were used to review case progress and ensure consistency in treatment delivery.

Treatment integrity was monitored using therapist self-report scales, previously developed and validated for use in controlled trials using multiple therapists (e.g., Barrett, Dadds, & Rapee, 1996). These scales assessed adherence to each session plan, knowledge of session material, interpersonal effectiveness, and participant engagement and comprehension. Ratings were monitored by the project coordinator in supervision sessions, with any reports of deviation from the treatment protocol or related problems addressed directly with the clinician. Using this method, one case was excluded from the sample due to an excessive departure from the treatment protocol due to the parents' concurrent marital stress.

Results

Reliability and distribution of measures

Inter-rater reliability for the observational assessments was high, with inter-rater correlations of $r = .71$ for observations of deviant child behaviour, $r = .80$ for aversive parent behaviour, $r = .78$ for correct implementation of discipline strategies, and $r = .79$ for correct implementation of descriptive praise (the primary reward strategy).

Correlations between each of the key measures are presented in Table 2. Antisocial factor scores from the pre-treatment parent-report measures correlated

Table 2

Correlations showing convergence between key measures

	Antisocial	CU	ODD severity	Child deviant (D)	Parent aversive (D)	Praise (D)	Child deviant (P)	Parent aversive (P)	Praise (P)
Antisocial	1.00								
CU	.43**	1.00							
ODD severity	.40**	.31*	1.00						
Child deviant (D)	0.05	0.14	0.24	1.00					
Parent aversive (D)	-0.05	0.09	0.23	.60**	1.00				
Praise (D)	0.02	0.10	-0.05	-0.03	0.22	1.00			
Child deviant (P)	.31*	.26*	0.15	.27*	0.17	0.04	1.00		
Parent aversive (P)	0.07	.26*	0.23	.37**	.54**	.24*	.24*	1.00	
Praise (P)	-0.15	0.14	-0.04	0.11	0.23	.46**	-0.16	.24*	1.00

**. Correlation is significant at the 0.01 level

*. Correlation is significant at the 0.05 level

Note. CU = callous unemotional traits; (D) = Dinner observation setting; (P) = Play observation setting

significantly with both ODD severity as assessed by diagnostic interview ($r = .41$, $p <$ .01), and the severity of child deviant behaviour assessed through direct observation of parent-child play ($r = .31$, $p < .05$). The significant correlations between these three forms of assessment (self report, diagnostic interview, direct observation) support the validity in these measures of conduct problems.

Convergence was also seen across the play and dinner observation settings for assessments of aversive parent behaviour ($r = .54$, $p < .01$), as well as parents' use of descriptive praise ($r = .46$, $p < .01$). These correlations further support the reliability of these observational data, indicating that behaviours recorded in these assessments are relatively stable across settings. The significant correlations between observations of deviant child behaviour (dinner) and aversive parent behaviour in the both the dinner ($r = .60$, $p < .01$) and play ($r = .37$, $p < .01$) are consistent with those typically reported in observational studies of families with conduct problem children. Such findings can been seen as support for the coercive family processes described in Patterson's (1982) model, with families of children with conduct problems found to exhibit patterns of interaction whereby aversive parent behaviour and oppositional child behaviour escalate reciprocally in response to one another.

Distribution normality was examined for pre-treatment scores on the Antisocial and CU traits factors, and ODD severity ratings, with skewness and kurtosis statistics reported in Table 3. For each of these variables, z values calculated for skewness and kurtosis did not exceed +2.58, supporting the assumption of distribution normality at $p < .01$. The distributions observed for these variables are presented graphically in Figures 1 to 3.

Table 3

Skewness and Kurtosis Values for Key Measures of Conduct Problems and CU Traits

Variable	Skewness Statistic	Std. Error	z	Kurtosis Statistic	Std. Error	z
ODD Sev.	-0.29	0.34	0.82	-0.60	0.67	0.94
Antisocial	-0.37	0.34	1.08	-1.10	0.67	1.27
CU	0.07	0.34	0.20	0.02	0.67	0.17

Note. ODD Sev = ODD symptom severity; CU = callous unemotional traits

Figure 1

Distribution of Pre-treatment ODD Severity Ratings
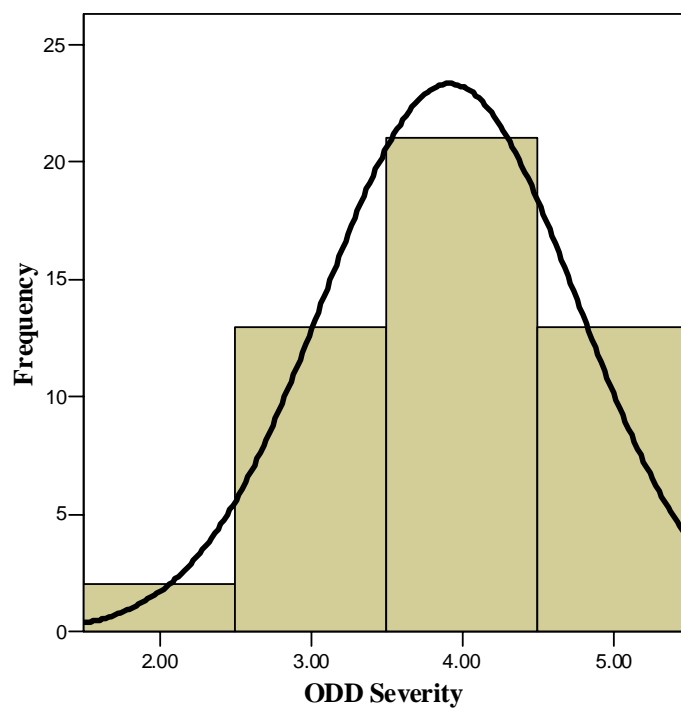
Figure 2

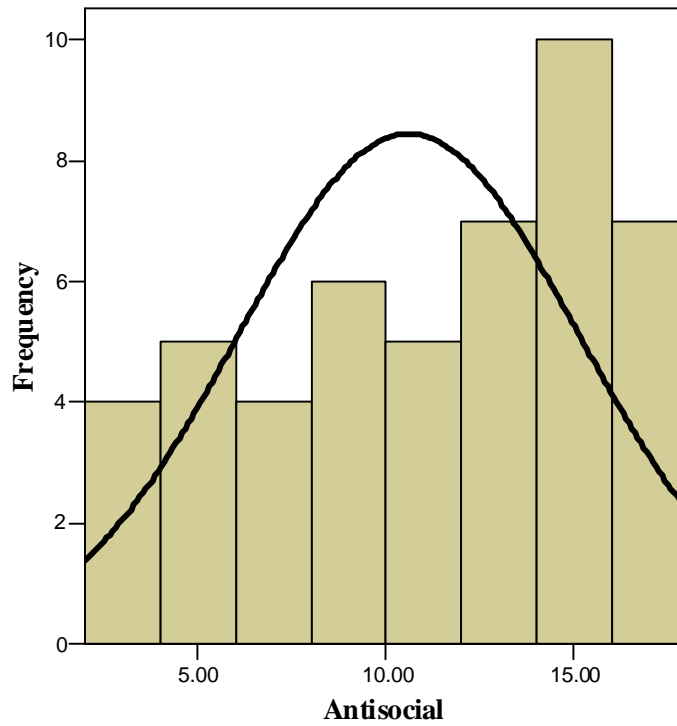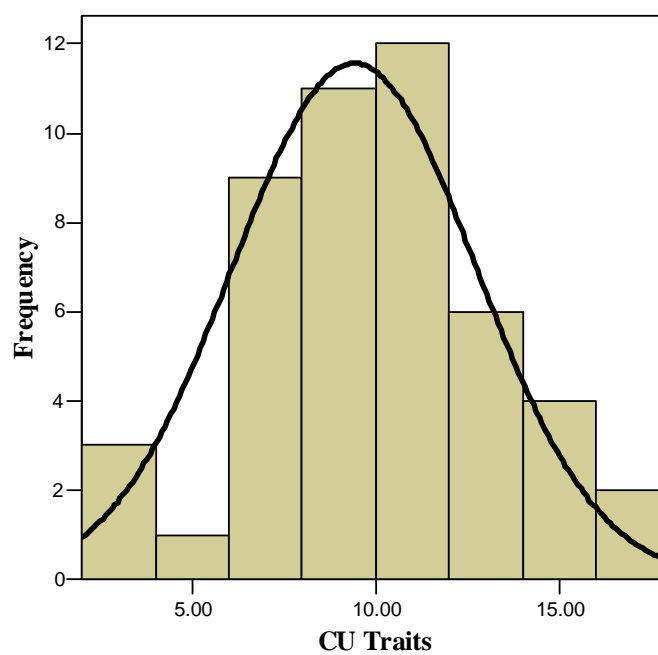Distribution of Pre-treatment Antisocial Factor Scores

Figure 3

Distribution of Pre-treatment CU Traits Factor Scores

CU traits and conduct problems at pre-treatment

Table 4 shows means and standard deviations for the joint APSD and SDQ factors across time and compared to the age and gender matched norms taken from Dadds et al. (in press). Also shown are the percentages of the treatment sample scoring above the 90th and 95th community sample percentiles for each of the measures, as well as for ODD symptom severity across time.

The hypothesis that CU traits would be positively associated with severity of presenting conduct problems was tested with bivariate correlations between CU, Antisocial, and ODD severity ratings. A positive relationship between pre-treatment CU and presenting conduct problems was seen for both measures, with CU correlating significantly with both Antisocial scores ($r = .43$, $p < .01$), and ODD severity ($r = .31$, $p < .05$).

Overall treatment outcomes

Prior to examining the relationship of CU traits to treatment outcomes, the changes in conduct problems from pre-treatment to follow-up for the entire sample were examined. The means and standard deviations for the Antisocial factor at each time point are presented in Table 4, as is the mean severity of ODD symptoms at each time point. The drop in ODD diagnoses observed over time reflects a pattern of treatment response typical of parent training effectiveness studies. The rate of ODD diagnosis fell to 19% upon completion of treatment, with subsequent relapse among the sample seeing 35% diagnosed at 6-month follow-up. This post-treatment rate of diagnosis is typical of research reports of immediate treatment effectiveness, as is the subsequent response rate of 65% at follow-up (e.g., Webster-Stratton & Hammond, 1997).

Table 4

Means and Standard Deviations for Joint Factor Scales in the Treatment and Community Samples and Severity of ODD Symptoms Across Time

| New factor scale | Treatment sample (n=49) | | | [a]Community sample (n=702) | | | |
	Pre- Mean SD	Post- Mean SD	Follow-up Mean SD	Mean SD		90th Percentile	95th Percentile
Antisocial	10.60 4.53	8.71 4.89	7.77 4.58	4.34	3.67	60	42
Anxiety	2.54 2.10	1.89 1.63	1.57 1.96	2.01	2.02	53	35
CU traits	9.42 3.31	7.78 3.36	7.39 3.79	4.61	3.16	39	26
Hyperactivity	11.83 3.40	10.71 3.18	10.11 4.14	6.91	4.03	7	6
Peer problems	2.67 2.07	2.67 1.81	2.16 1.92	1.68	1.67	20	7
ODD severity	3.92 .84	0.81 1.63	1.41 1.88	-	-	-	-

[a]Sample from Dadds et al. (2004)

Table 5 shows means and standard deviations for the child and parent behaviours recorded in the observational assessments of parent-child interaction, at each observational assessment point (pre-treatment, post-reward, post-discipline, post-treatment). These data are presented firstly for the dinner setting, then for the play setting. From pre-treatment to post-treatment, observed child deviant behaviour dropped an average of 38.02% percent for the dinner setting, and 54.95% for the play setting. Aversive parent behaviour dropped an average of 59.44% percent from the pre- to post-treatment dinner observations, and 16.93% from pre- to post-treatment play observations. Correct implementation of discipline strategies increased by 64.67% from the pre- to post-treatment dinner observations, and 35.98% on the play observations, and use of descriptive praise increased by 68.56% and 41.48% on the dinner and play observations respectively. Also shown are the means and standard deviations for conduct problems as measured on the behaviour monitoring scales completed by parents throughout treatment and at follow-up. Parent reports of conduct problems continued to decline in severity from pre- to post-treatment, before returning at follow-up to the mean severity seen mid-treatment (i.e., post-reward), that is one standard deviation below that of pre-treatment.

Pre-treatment CU traits and presenting conduct problems

To examine the effects of CU traits on treatment outcomes, logistic regression analysis was conducted. Prediction of diagnostic status at follow-up was tested for a set of background predictor variables (mother's education, child age, pre-treatment severity of ODD, number of sessions attended), along with pre-treatment scores on the CU factor. The results of the logistic regression are shown in Table 6. For each

Table 5

Mean Rates of Parent and Child Behaviours Observed Across Treatment, and Mean Severity of Conduct Problems Monitoring Reports

	Pre-treatment Mean SD	Post-rewards Mean SD	Post-discipline Mean SD	Post-treatment Mean SD	Follow-up Mean SD
Dinner observations					
Child deviant behaviour	23.26 19.27	20.78 17.31	12.20 12.26	14.41 17.28	-
Parent aversive behaviour	11.54 16.33	8.72 10.25	8.72 10.25	4.68 10.92	-
Correct implementation	20.55 38.27	30.82 39.32	52.90 44.04	58.14 42.81	-
Descriptive praise	2.16 3.42	5.26 6.54	6.07 9.73	6.85 7.79	-
Play observations					
Child deviant behaviour	16.23 16.27	14.34 14.56	9.94 13.37	7.31 8.83	-
Parent aversive behaviour	3.78 7.71	2.46 3.85	3.02 4.17	3.14 5.16	-
Correct implementation	38.85 47.14	34.40 43.80	46.92 47.22	60.69 44.28	-
Descriptive praise	4.65 6.71	7.61 10.23	6.72 9.09	7.94 8.99	-
Behaviour monitoring (parent report)					
Conduct problems	13.20 2.11	10.93 2.09	9.72 2.38	8.93 1.93	10.93 3.42

Table 6

Logistic regression predicting diagnostic status at follow-up from pre-treatment variables

Block 1					Block 2				
Variable	B	SE	Wald	Exp B	Variable	B	SE	Wald	Exp B
Mother education	-.72	.40	3.14	.48	Mother education	-.68	.51	1.79	.50
Pre- ODD severity	.30	.61	.24	1.35	Pre- ODD severity	.28	.81	.12	1.08
N^o of sessions	1.05	.37	7.72	2.86**	N^o of sessions	1.30	.48	7.23	3.69**
Child age	.07	.03	6.45	1.08*	Child age	.07	.04	3.50	1.08
CU Factor	.46	2.05	5.10	1.59*	CU Factor	.51	.24	4.31	1.67*
					Correct praise	-.27	.16	2.77	.75
					Correct time-out	-.02	.03	.88	.97
					Harsh / aversive parenting	.02	.09	.07	1.02

* $p < .05$, ** $p < .01$.

Note. Pre- ODD severity = ODD symptom severity at pre-treatment; N^o of sessions = number of treatment sessions attended

predictor variable, the logit coefficient (B) and its standard error, the Wald statistic, and the odds ratio (Exp B) are reported. The odds ratio represents the change in the odds of being classified as having an ODD diagnosis at follow-up for a unit change in the independent variable (or a standard deviation change when the independent variables are standardised). The distance of the odds ratio from 1 shows the proportion of increase or decrease in the odds for a unit change (or a standard deviation change) in the predictor, and thus constitutes an indicator of effect size (Pampel, 2000). The results show that higher CU scores at pre-treatment increased the likelihood of receiving an ODD diagnosis at follow-up (B= .46, $p < .05$), as did being older (B = .07, $p < .01$), and receiving more treatment sessions (B = 1.05, $p < .05$). This effect for treatment dose is consistent with the assigning of additional sessions (limited to three) on the basis of poor parent functioning.

The results from this regression however do not preclude the possibility that the poor outcomes seen for high CU participants may be due to a confounding relationship between CU traits and parents' implementation of the child management strategies. To address this, a further step was added to the same regression model, consisting of implementation variables based on parent behaviour observed in the family home. These three variables were observations of: the total amount of correctly-implemented descriptive praise, the total amount of correctly-implemented time-out, and the total amount of harsh/aversive parenting. None of these variables added significantly to the prediction of follow-up outcomes beyond those predicted by the original set. With the addition of this block of variables, CU traits and number of sessions remained significant, while child age became non-significant (see Table 6). Thus, clear support was found for the hypothesis that CU traits would predict

treatment outcomes independently of previously established predictor variables or parents' implementation of the treatment components.

Pre-treatment CU traits and treatment process

The relative effectiveness of the reward versus time-out treatment components in relation to participant CU traits was examined next. Partial correlations were calculated between CU traits and parents' ratings of the overall effectiveness of the reward strategies and time-out, controlling for ODD severity at pre- and post-treatment, as well as implementation variables based on observations of parents' correct use of the descriptive praise and time-out strategies. Consisted with the directional hypotheses, CU traits correlated with parent ratings of ineffectiveness for time-out ($r = .31$, $p < .05$), but not reward-strategies. This indicates support for the hypothesised relationship between CU traits and poor responsiveness to the disciplinary component of parent training, showing that parents found time-out to be less effective for boys with high CU traits, regardless of the correctness with which these strategies were implemented, or the severity of the child's conduct problems.

The relationship between CU traits and children's affective reactions to being placed in time-out was examined using correlations between CU traits and parents' ratings of child affect. The child affect variable was created by collapsing the three negative affect categories (anger, sadness, fear) into a dichotomous negative/neutral affect variable. An overall rating of time-out affect was then calculated for each child based on the percentage of overall affect ratings that were negative. As ratings of affect were available only for cases reporting use of time-out, those with missing data received mean substitution to increase analytic power. A negative correlation was seen between CU traits and overall child affect when controlling for Antisocial scores

($r = -.24$, $p < .05$), the size of which did not vary after controlling for frequency ($r = -.22$) or observed correctness ($r = -.25$) of time-out implementation. When repeated with only those cases implementing time-out regularly, the relationship between CU traits and lack of negative affect was stronger ($r = -.46$), and increased in strength after controlling for frequency and correctness of implementation ($r = -.59$).

Change in CU scores across treatment

A subset of the sample exhibited an obvious drop in CU factor scores from pre- to post-treatment. Further analyses were therefore conducted to examine the effects of CU trait stability on treatment outcomes and processes. A categorical 'CU-stability' variable was created based on CU scores at pre- and post-treatment. A median split was performed on CU scores at pre-treatment, with cases categorised as 'Low-CU' if scoring below this median cut-point at both pre- and post-treatment. Cases were denoted as 'Unstable-CU' if scoring above this cut-off point at pre-treatment and then dropping below it at post-treatment. Finally, 'Stable-CU' cases were those scoring above this cut-point both at pre- and post-treatment. Applying these criteria, CU-stability groups comprising the follow-up proportions of the overall sample were formed: Low-CU (n=22; 49%), Unstable-CU (n=10; 29%), Stable-CU (n=13; 22%). None of the cases initially identified as 'low-CU' were identified as 'high-CU' following treatment.

A MANCOVA was then conducted to analyse whether ODD severity and Antisocial factor scores at follow-up were dependent on CU (stable-CU, unstable-CU, low-CU), after controlling for ODD severity and Antisocial scores at pre- and post-treatment. An overall main effect was found for CU stability [$F(4,72) = 4.59$, $p < .01$]. Univariate main effects were seen for both ODD severity [$F(2,36) = 4.86$, $p < .05$,

[eta]2 = 0.21], and Antisocial scores [F(2,36) = 10.30, *p* < .01, [eta]2 = 0.36]. Post-

hoc group comparisons conducted with Bonferroni adjustments indicated significant

differences in follow-up ODD severity between the Stable and Unstable CU groups (*p*

< .05). Significant differences in Antisocial scores were found between the Stable and

Unstable CU groups (p < .01), and between the Unstable and Low CU groups (*p* <

.01). Means and confidence intervals for ODD severity and Antisocial factor scores

by CU groups are presented in Figure 4.

To test for differences in implementation between these groups, data from

both parent self-reports and observations of parent-child interactions were examined.

Firstly, a MANOVA was conducted with CU group as the independent variable, and

dependent variables including the frequencies of self-reported reward strategy and

time-out implementation, each averaged across the assessment points following the

introduction of each in treatment. No main effects were seen for frequency of

implementation. Mean ratings of implementation frequency for the CU groups are

reported in Table 7. For observational data, a MANOVA was conducted with CU

group as the independent variable, and dependent variables being rates of correct

implementation of descriptive praise, correct implementation of time-out, and

aversive parent behaviour, each averaged across the four observations conducted

across treatment. No main effects were seen for correctness of implementation. Mean

rates of observed parent behaviours in each of the CU groups are reported in Table 7.

In sum, these analyses of parent-report and observational data indicate that parents in

the CU groups did not differ in the frequency with which they implemented either the

reward-based or time-out strategies, or in the quality of this implementation.

Child responsiveness to the reward-based and time-out strategies was then

compared between the CU groups using ANOVA. Firstly, an ANOVA was conducted

with CU group as the independent variable, and the dependent variable being the

overall effectiveness of reward strategies as reported by parents at post-treatment.

Table 7 shows mean parent effectiveness ratings for reward strategies and time-out,

for each of the CU groups. No main effect was found for CU. A second ANOVA was

then conducted with CU group as the independent variable, and the dependent

variable being the overall effectiveness of time-out as reported by parents at post-

treatment. A main effect was found for CU, $F(2,42) = 3.63$, $p < .05$, [eta]2 = 0.14.

Post-hoc group comparisons using the Bonferroni test with a 95% confidence interval

showed a significant difference between the stable-CU and low-CU groups ($p < .05$),

with time-out reported to be less effective in the stable CU group.

        Child affect in response to time-out was examined next. To compare the

stable-unstable CU groups on child affect, a series of chi-square analyses were

conducted, comparing frequencies of negative versus neutral affect when being placed

in time-out at each of three time-points (following the introduction of time-out mid-

treatment, post-treatment, and follow-up). Rates of negative affect for each group are

reported for each time point in Figure 5. Chi-square analyses showed that the stable-

CU group was significantly less likely to express negative affect at follow-up only,

$X^2(2, N = 38) = 6.16$, $p < .05$. As parents only reported child affect if time-out had

been recently implemented at the time of the monitoring telephone contact, the

number of reports differs at each time point. It is therefore possible that the chi-square

conducted on the follow-up data was the only one with sufficient power to detect

differences between the groups. SPSS output for all analyses can be seen in Appendix

6.

Figure 4

Unadjusted means for ODD severity and Antisocial factor scores by CU groups, for pre-treatment, post-treatment, and follow-up
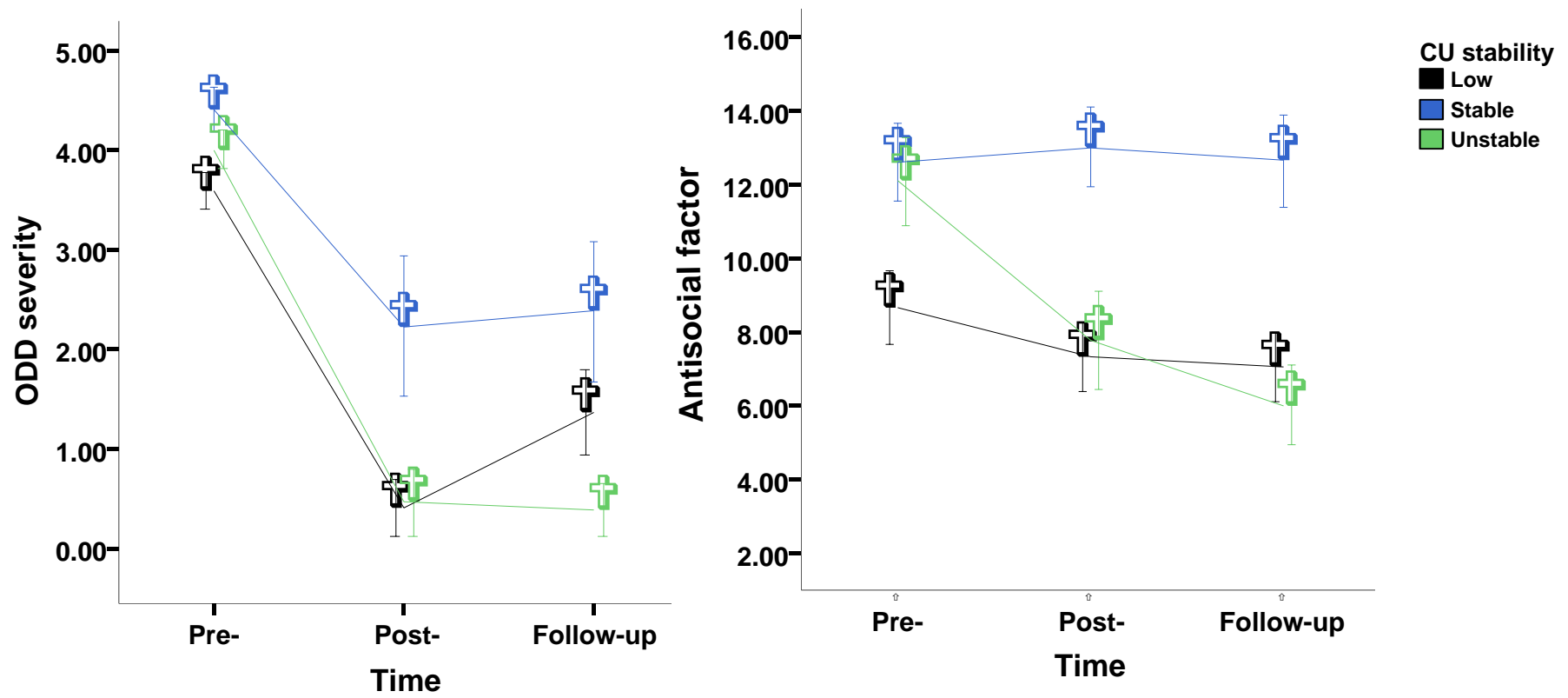
Table 7

Parent-reported frequency and effectiveness of reward strategies and time-out, and observed parent implementation, according to CU groups

	Stable-CU		Unstable-CU		Low-CU	
	Mean	SD	Mean	SD	Mean	SD
Frequency of implementation						
Reward strategies	2.16	.59	2.04	.48	1.96	.42
Time-out	3.41	.61	3.66	.71	3.65	.50
Perceived effectiveness						
Reward strategies	1.90	0.94	1.62	0.58	1.48	0.45
Time-out	2.63[a]	1.21	2.12	0.85	1.81[a]	0.49
Observed parent implementation						
Correct descriptive praise	6%	4.80	8%	4.59	5%	5.40
Correct discipline strategies	44%	16.78	35%	14.18	48%	18.94
Aversive parent behaviour	5%	4.59	8%	6.46	7%	6.50

Note: Lower values indicate greater frequency and greater effectiveness.

[a]This mean is different from the corresponding mean.

Figure 5

Percentage of CU groups rated as displaying negative affect when being placed in time-out at each time-point
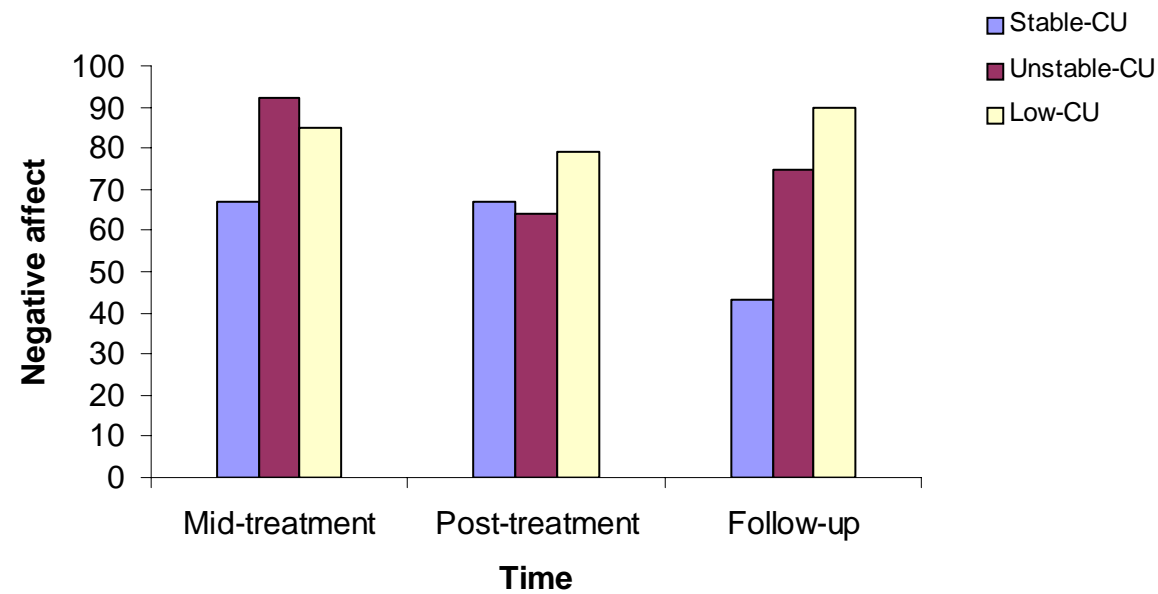
Note. Affect reports available at each time-point: Mid-treatment (n=35), Post-treatment (n=31), Follow-up (n=38).

Discussion

The aim of this study was to determine the impact of CU traits on treatment outcomes and processes in a behavioural parent training intervention with young boys referred for conduct problems. This study represents the first investigation of this risk factor in the context of a clinical trial, and extends the body of research examining the predictive utility of the CU traits construct in relation to the development and course of antisocial behaviour.

A positive relationship between CU traits and severity of presenting conduct problems was predicted for the treatment sample. This prediction was supported, with pre-treatment CU scores correlating positively with both concurrent Antisocial scores, and clinician-rated severity of ODD symptoms. Evidence consistent with this finding was also seen in the relationship between the sample's pre-treatment scores on the Antisocial and CU traits factors and the Australian norms reported by Dadds et al. (in press). Not only were Antisocial means for the clinic-referred sample relatively higher than those in the age and gender-matched community, but so were CU factor means.

The relationship observed between CU traits and pre-treatment severity of conduct problems is consistent with previous research with child samples. In the community samples studied by Frick, Cornell, Barry, Bodin, and Dane (2003) (n=98, mean age 12 years) and Dadds et al. (in press) (n=1359), CU traits were found to be associated with severity of concurrent conduct problems, as well as predicting follow-up conduct problems beyond the prediction afforded by initial conduct problem severity alone. Wootton et al. (1997) found CU traits to be associated with severity in concurrent conduct problems in a clinic-referred sample of conduct problem boys (n=166, aged 6-13 years). While consistent with these findings, those of the current study are unique in relation to the age and therefore developmental stage of the clinic

sample. Compared to the older clinic sample studied by Wootton et al. (1997), the majority of whom met diagnostic criteria for CD, the majority of boys in the current sample were diagnosed with ODD, a syndrome of conduct problems considered developmentally distinct from that of CD (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004). The current finding therefore represents unique evidence that CU traits is a marker for conduct problem severity within clinically-referred children aged four to eight years.

The primary prediction pertaining to treatment response was that participants high in CU traits would demonstrate fewer improvements at follow-up than those low in CU traits, and that the effects of CU traits would remain after controlling for differences in initial levels of conduct problems, socioeconomic status, age, and treatment dose. Support for this hypothesis was found firstly in regression analysis, with diagnostic status at follow-up predicted from CU scores at pre-treatment. When evaluated in the context of established predictors of antisocial functioning (e.g., parent education, child age), and observations of parenting behaviour and implementation, CU scores added unique contribution to this prediction (odds ratio [Exp(B)] = 1.59, $p < .05$). Thus, clear support was found for the hypothesis that CU traits predict treatment outcomes independently of previously established predictor variables, and the effects of CU could not be explained by differences in parent's implementation of the treatment components.

The finding that CU traits were associated with poor response to treatment demonstrates some consistency with the few existing studies examining child factors as predictors of conduct problem treatment outcomes. First, based on the low levels of fearful inhibitions characteristic of conduct problem children with high CU traits, this finding is consistent with previous evidence that children with comorbid

anxiety/depression respond better to parent training interventions than those lacking

such emotional dysregulation (Beauchaine, et al., in press; Beauchaine, et al., 2000).

The only study of which we are aware to have directly evaluated either child

or adolescent CU traits in a treatment context is that of Spain et al. (2004). Before

comparing these findings however, it is important first to recognise the marked

differences regarding the participants and treatment modalities examined in these two

studies. Compared to the young oppositional children (mean age 6 years) treated with

a brief and primarily self-referred parenting program in the current study, Spain et al.

(2004) studied indices of treatment progress in adolescent offenders (mean age 15.77

years) participating in a mandated long-term cognitive therapy program while

incarcerated. While the obvious differences between this study and the current one

complicate any comparison of findings, such comparisons should nonetheless be

considered due to the rarity of this research. Spain et al. (2004) reported that high

levels of CU traits to be associated with increased delays in treatment progress, and

greater instances of disciplinary infractions among the adolescents during treatment.

The findings of the current study could therefore be considered somewhat analogous

to those of Spain et al. (2004). Unfortunately the authors did not report follow-up

behavioural or diagnostic measures of treatment outcomes, which in the current study

were found to demonstrate a negative relationship to CU traits.

The correlates of CU traits reported for samples of conduct problem children

and adolescents describe a child with a reward-dominant/punishment-insensitive style

and reduced emotional reactivity to cues of punishment or threat (Frick & Morris,

2004). Based on these correlates, specific aspects of treatment process were predicted

in relation to participants' CU traits. Specifically, it was hypothesized that the

disciplinary component of treatment (i.e., the time-out procedure) would be less

effective in correcting the oppositional behaviour of boys with high CU traits than that of boys without these traits. Parent reports demonstrated support for this hypothesis, indicating that while boys with disparate levels of CU traits responded comparably to the reward strategies (e.g., descriptive praise, token rewards), time-out was less effective with high CU boys. Furthermore, this relationship remained after controlling for both parents' implementation of time-out and conduct problem severity. It appears then that the risk for poor treatment outcomes associated with CU traits can be explained at least partly by this relationship between CU traits and reduced responsiveness to time-out.

These findings of the relative effectiveness of reward versus discipline strategies in correcting the behaviour of children with CU traits can be seen as consistent with evidence associating CU traits with a reward dominant response style in previous studies of children and adolescents (e.g., O'Brien & Frick, 1996; Frick et al 2000). These studies have typically measured response to stimuli presented in computer-based games involving activities such as fishing and card playing. In contrast to this laboratory evidence, that of the current study is based on children's responsiveness to daily interpersonal experiences of reward versus discipline in the context of the parent-child relationship. Furthermore, the mean age of the treatment sample is considerably younger than that of the samples participating in existing laboratory studies of reward-dominance. The current findings therefore provide initial evidence of an association between CU traits and reward-dominance/punishment-insensitivity in conduct problem children as young as four years old.

A further prediction of CU-related differences in response to time-out was made in relation to displays of child affect during time-out. Based on evidence that conduct problem children with CU traits are less reactive to threatening or

emotionally distressing stimuli (Blair, 1999; Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003), boys with CU traits were predicted to exhibit less affect when being placed in time-out than those without these traits. Parent reports supported this prediction, with high levels of CU traits associated with low levels of negative affect exhibited during the initiation of the time-out procedure.

On the surface it may appear paradoxical that the boys who benefited the least from therapy (i.e., those with high CU traits) were rated as the most cooperative when placed in time-out for misbehaviour, while those for whom treatment was the most effective were more likely to react to this discipline with emotional outbursts. This finding however is consistent with previous research into the affective correlates of CU traits in children with conduct problems. This research has found children with conduct problems and high CU traits to be less reactive to emotionally distressing and threatening stimuli (Blair, 1999; Frick et al., 2003a; Loney, Frick, Clements, Ellis, & Kerlin, 2003), as well as less distressed by their own behavioural problems (Barry et al. 2000). Such evidence has been used to inform the subtyping of conduct problem children in developmental models of antisocial behaviour, with researchers (e.g., Frick, et al., 2003a) suggesting that among children exhibiting early-onset antisocial trajectories, the presence or absence of CU traits may represent a marker for distinct patterns of emotional dysregulation.

The finding of this specific relationship between CU traits and responsiveness to time-out discipline is open to a number of interpretations. In the punishment insensitivity literature the concept of punishment encompasses a broad range of events, spanning legal consequences such as imprisonment, to internal aversive states associated with cues of negative affect in others. While parent training teaches parents to implement time-out without harsh or aversive behaviour such as yelling or negative

physical contact, it is expected that a parent placing a child in time-out will nonetheless communicate negative consequences through cues such as negative facial expressions (Dadds & Salmon, 2003). Preliminary studies of affective processing in conduct problem children and adolescents with high levels CU traits indicate that these traits may be associated with deficits in the processing of fearful and sad faces (Blair, Colledge, Murray, & Mitchell, 2001). It is possible then, that processes specific to these affective cues may have contributed to participants' behavioural and affective responsiveness to time-out. More research is needed to clarify these deficits and the developmental factors associated with their manifestation.

For the overall treatment sample parent reports of the affect displayed by their children when being placed in time-out were generally consistent with anecdotal reports made by parents in treatments of this kind. That is, children typically respond to time-out with emotional tantrums in the period during which it is first introduced, with these emotional displays decreasing over time as children become more familiar with the procedure, and parents become more skilled at initiating it prior to escalations in oppositional child behaviour. Interestingly, the pattern of change observed for affective reactions to time-out across treatment showed that the relationship between CU traits and low levels of affect grew stronger over time. This finding that boys with high levels of CU traits became less reactive to time-out over time appears to be theoretically consistent with the CU temperament. That is, conduct problem children with CU traits appear to be particularly responsive to novelty. For the high CU boys, the effectiveness of time-out may have diminished along with the novelty associated with the process.

It may also be relevant to consider the role of attachment in the findings of differential affective and behavioural responses to time-out associated with CU traits.

As parent-child separation is the central component of the disciplinary process of time-out, it could be speculated that a child's response to this separation may be associated with attachment security. It is possible, for example, that attachment security may moderate a child's responsiveness to rewards and punishments from parents, especially those involving the provision or withdrawal of time with parents (e.g., child-centred time, time-out). This interpretation is consistent with the integration of attachment theory into social learning models of antisocial behaviour seen in recent years, and suggests the need for future research into the attachment correlates of CU traits in early childhood.

The hypothesis that CU traits would remain stable across treatment was not supported, with a drop in CU scores observed for a subset of the sample. To assess the possibility that these traits simply responded to treatment with the same malleability that conduct problems did, each of the analyses examining the relationship of pre-treatment CU scores to treatment outcomes and processes were repeated by operationalising CU traits according to stability. For these analyses participants were grouped according to those who exhibited 1) consistently low CU scores, 2) consistently high CU scores, or 3) CU scores that dropped from high to low across treatment. When interpreting these results, the limited size of these CU stability groups should however be kept in mind (Low-CU: n=22; Unstable-CU: n=10; Stable-CU: n=13). The results of these group analyses were consistent with those of the continuous pre-treatment CU scores, indicating that while CU scores dropped for some participants, those with the most stable high CU traits exhibited the poorest outcomes at follow-up, were the least responsive to time-out, and reacted to time-out discipline with the most affect. By controlling for conduct problem severity and testing for differences in parents' implementation, the results indicated that CU traits

were not simply another measure of conduct problems, or associated with differences in parenting practices that may have been influenced by, or contributed to, the manifestation of these traits.

In cases scoring high in the distribution of CU scores at pre-treatment, some remained high, while others dropped significantly. Two interpretations are suggested for this drop in CU scores. Firstly, it may be possible that for some parents, the stress associated with the conduct problems precipitating treatment referral contributed to exaggerations in parent reports of all negative aspects of their child. This phenomenon is well documented in the parent training literature. That is, parents' own distress colours their perception of their child, and inflated estimates of the child's problems occur across multiple domains (Schaughency & Lahey, 1985; cf. Richters, 1992). If this were the case, the boys who displayed initially high CU traits that later dropped, may not have been characterised by true CU traits. While we were restricted to parent report given the preschool age of the children sampled, future research may benefit from using a multi-informant approach to measuring CU (see Frick et al., 2003a).

In light of evidence of the high stability and unique predictive validity of CU traits across 12 months in a comparably aged sample (Dadds et al., in press), it is unlikely that measurement error alone can account for the change in CU traits observed. Alternatively, it is possible that those children who recorded high CU scores at pre-treatment were in fact characterised by high levels of these traits, and that this drop represents an attenuation of CU traits for this subset of the sample. If this were the case, such a drop in CU scores might represent indirect evidence that CU traits in some children may respond indirectly to treatments targeting conduct problems. Little is known about the plasticity of CU traits and the conditions or factors associated with change in these traits. While Spain et al. (2004) did not report

changes in CU factor scores from pre- to post-treatment in their study of adolescent treatment progress, the current study suggests that changes in CU trait measures concurrent with treatment should be given careful attention when interpreting the relationship of CU traits to treatment response.

The developmental stage of the treatment sample should be carefully considered when interpreting the changes in CU scores observed. The impact of parent training on childhood conduct problems is known to be greatest in early childhood, with evidence that conduct problems become less malleable as children age. The same may be true for CU traits, which may not yet be fully developed in early childhood, and therefore amenable to early intervention in some children. Further research is needed to tease our measurement error versus real change in the stability of CU traits seen in treatment samples.

While the observed change in CU traits raises the issue of their causality, caution should be taken when interpreting such processes. While a number of children in the treatment sample exhibited a drop in CU factor scores following changes to their parenting, it would be erroneous to interpret this pattern as evidence of a causal relationship between parenting and these traits. While it has been argued that parenting practices may contribute to the development of correlates of CU traits such as punishment-insensitivity through a transactional interaction with child predispositions (see Dadds & Salmon, 2003), evidence of such processes can not be inferred from the design of the current study.

The findings of this study support the clinical utility of assessing CU traits in children presenting for conduct problems. Among clinic-referred conduct problem children, those scoring high on measures of CU traits at presentation appear to be at increased risk for poor outcomes. If identified pre-treatment, children exhibiting high

levels of CU traits may be targeted with more intensive and individualised interventions. Clinicians however should be aware that among those children exhibiting high levels of CU traits at pre-treatment, some will exhibit a drop in CU scores during treatment. The monitoring of CU scores during treatment may therefore be clinically informative also, as the greatest risk for poor treatment outcomes were seen for children whose CU scores were not only high, but also stable.

As the current findings suggest that boys with high CU traits respond poorly to time-out regardless of conduct problem severity or parents' implementation of the procedure, the provision of additional attention to discipline strategies in treatment may add little benefit. Alternatively, reward strategies were found to be equally effective with boys exhibiting either high or low levels of CU traits. Based on the reward-dominant temperament associated with CU traits in conduct problem children, approaches that focus on rewarding experiences in the context of a positive parent-child relationship may hold the most promise for maximising treatment gains in children with CU traits.

One paradigm with the potential to make promising contributions for such treatments is that of parent-child attachment. Recent research has promoted the notion that positive attachment experiences may be important to the development of conscience and prosocial behaviour in children characterised by a fearless temperament (e.g., Fowles & Kochanska, 2000). Important evidence in this area has come from Kochanska's research into the moderating influence of child temperament on the relationship between parenting practices and the development of conscience in children. Fowles and Kochanska (2000), for example, found that young children with a fearful temperament (operationalised using measures of electrodermal reactivity) responded well to gentle discipline practices which capitalized on the child's internal

discomfort, whereas for those with a fearless temperament (consistent with CU traits) attachment security was a stronger predictor of conscience and prosocial behaviour. Dadds and Salmon (2003) have argued that for children who are highly reward driven and relatively unresponsive to punishment contingencies, activities that promote positive attachment may be vital to nurturing prosocial behaviour while circumventing the coercive punishment cycles which such families appear to be particularly vulnerable to.

It was somewhat surprising that the child CU variable predicted clinical outcomes in the logistic regression when the parent-training variables did not. While this may be due to the limited sample size, it should be noted that failure to find effects for parent training process variables (e.g., session attendance) is not unheard of (e.g., Webster-Stratton et al. in press). These risk factors should be examined further in future research with larger samples, as should other risk factors omitted from the current study due to limited sample size (e.g., parent depression, marital stress).

Being the first evaluation of CU traits in a treatment trial for young conduct problem children, the current study presents some implications for theoretical models involving CU traits. Based on correlational evidence that CU traits moderate the relationship of parenting practices to conduct problem severity, Wootton et al. (1997) suggested that for children with high levels of CU traits, conduct problems may develop through etiological processes distinct from those without these traits. This finding, replicated by Oxford et. al. (2003) is also consistent with findings from recent twin research. Viding et al. (2004) found evidence of substantial genetic risk for psychopathy in seven year-old twins, with the antisocial behaviour of those with high CU traits associated less with shared environment than the antisocial behaviour of those without these traits. In the current study, the conduct problems in children with

high levels of CU traits were found to be less responsive to changes in parenting practices than the conduct problems in low CU children. This evidence can be seen as further supporting the idea that pathways to antisocial outcomes in children with CU traits are distinct from those of children without these traits.

It is important however to recognize the limits of what can be inferred from the current study regarding the role of parenting in the developmental of antisocial behaviour. Previous evidence that parenting may be associated less with antisocial behaviour in children with high CU traits than in children without these traits has come from samples assessed at single time points (Wootton et al. 1997; Viding et al. 2004). Just as these findings do not constitute direct evidence that pathways to antisocial behaviour bypass parenting in children with CU traits, neither do those of the current study.

The design of the current study allows for observations of the effects of modifications to parenting behaviours on the behaviour of children with existing conduct problems. It should be noted however that the specific parenting modifications examined in the current study are based on effectiveness findings from research that has typically neglected the heterogeneity of conduct problem populations. A strict interpretation of the results would therefore be that the conduct problems of the boys with high CU traits were not responsive to the same modifications to parenting generally found to improve conduct problems in the majority of cases. The modification of alternative parenting practices may well be associated with different outcomes.

As research has not yet tested the potential for reciprocal effects between CU traits and parenting practices, the extent to which parenting contributes to conduct problems in children with CU traits remains largely speculative. In order to

demonstrate the respective etiological contributions of parenting and CU traits in the development of antisocial behaviour, prospective prevention designs are needed. The prospective nature of the current study and the manipulation of the parenting variable are however design features that represent steps towards such research.

The issue of parent antisociality and CU traits is also relevant to this discussion. Twin research has demonstrated moderate genetic links for antisocial behaviour (Raine, 2002), and the findings reported by Viding et al. (2004) indicate that such a link may be particularly strong for children with CU traits. In addition to etiological issues, these findings suggest implications for the treatment and prevention of psychopathy. While little is known about the processes through which parental CU traits contribute to the development of antisocial child behaviour, the treatment context of the current study raises a related issue. As parents play a central role in the treatment of young children with conduct problems, how might parental CU traits impact on their participation in treatment and their implementation of the behavioural strategies involved? While the data from the observational assessments of parent-child interaction revealed no relationship between child CU traits and treatment implementation, there may be aspects of parenting associated with parental CU traits. It is also possible that parental CU traits may be related to nuances in the communication of affect not detected by the conventional observational protocol used. Such nuances may impact on child response to the respective strategies implemented during treatment, presenting a further speculative interpretation of the findings. This issue and a possible methodology for investigating it are discussed further below in relation to future research directions.

While parent training interventions have traditionally served as the paradigm of choice for studying the social learning processes implicated in the development of

conduct problems, little research has studied the impact of child traits in this clinical

context. The current study supports the utility of a parent training paradigm to study

the interaction of parent and child factors associated with antisocial outcomes. The

study also incorporated a number of methodological features that support the integrity

of the reported findings. The most important of these pertain to the manner in which

CU traits were measured and operationalised. First, the measure of CU traits

employed, the APSD, is the most well established screening device for CU traits in

pre-adolescent children. While the original factor structure of the APSD has been

validated in community and clinical samples (Frick et al., 2000), measurement of CU

traits in the current study utilised a modified factor structure found to be advantageous

in recent large-scale studies of representative child samples in Australia (Dadds et al.,

in press) and the UK (Viding et al., 2004). This method involved the use of items

from the joint factor structure of the APSD and SDQ, with the resulting CU factor

comprising items more coherently reflective of CU traits than those in the original

APSD factor (Dadds et al., in press). In addition to using this factor structure, the

issue of construct overlap was addressed by using independent diagnostic assessments

of conduct problems, and including conduct problem severity as a covariate in the

analysis of the effects of CU traits on treatment outcomes.

Second, for analyses of the relationship of CU traits to treatment outcomes,

CU traits were operationalised in two different ways. Studies of CU traits and their

correlates typically operationalise these traits using measures taken at a single time

point. This approach is consistent with the theoretical conceptualisation of trait-like

stability inherent in definitions of these traits, and evidence from follow-up

assessments with the community sample studied by Dadds et al. (in press) supports

this presumption of stability. This conceptualisation of CU traits was maintained in

the regression analysis in which time one CU scores were included as a predictor

variable, and the subsequent correlational analyses. The measurement of these traits in

the context of a clinical trail however presented issues regarding stability and

plasticity not encountered in previous research. As noted earlier, is has been reported

that in samples commencing treatment, parent distress may influence reports of child

problems across multiple domains (Schaughency & Lahey, 1985; cf. Richters, 1992).

Furthermore, as no previous research has examined these traits in early intervention

samples, the extent to which these traits themselves may respond to early intervention

was unknown. For both of these reasons, it was considered important not to

operationalise CU traits based on pre-treatment assessments exclusively. The CU

construct was therefore also operationalised based on stability of CU factor scores

across treatment. The grouping of participants based on CU stability is considered a

strength of this study, and may prove to be an important methodological innovation

for future clinical research into these traits.

The use of direct observation of parent-child interaction in the family home is

also considered a strength of this study. This method of assessment is considered a

gold standard in parent training research, and as such was chosen to provide the

optimal measure of parents' implementation of the behavioural techniques presented

in treatment. The observational data collected was found to be valid and reliable in

relation to the other forms of assessment employed.

A number of limitations should also be recognised when interpreting the

findings of this study. First, the measurement of CU traits as well as child

responsiveness to the various treatment components relied exclusively on parent

report. Future research may benefit from additional measures (e.g., direct observation)

of child affect and behaviour in response various parenting strategies, in addition to

specific measures of the correlates of CU traits (e.g., punishment insensitivity) theorized to underlie the differential responses to discipline strategies found in our sample. As the current study did not evaluate the impact of the various system-focused modules on family risk factors, the inclusion of such an evaluation would be relevant to future research also.

It should be noted that the diagnostic interviews varied in assessment format from face-to-face at pre-treatment, to telephone-administered at post-treatment and follow-up. It is possible that nuances associated with these methodologies may have limited the comparability of interview results across these formats.

Participant factors that may limit the generalisation of the current findings to broader clinical samples include the exclusion of cases with untreated ADHD comorbidity, and the use of an exclusively male sample. While the latter is a common bias in antisocial research, primarily due to sampling difficulties associated with low rates of antisocial behaviour in females, the decision to focus on only one gender was also considered theoretically justified due to evidence of gender-specific relationships between CU traits and antisocial behaviour (Silverthorn, Frick, & Reynolds, 2001). The inclusion of female samples in future clinical investigations, however, is necessary for building a complete picture of the clinical correlates of CU traits.

While no relationship was found between CU traits and the frequency or quality of treatment implementation by parents, it is possible that poor outcomes associated with CU traits may be associated with correlates of CU traits not measured in the study. This issue however is more reflective of the infancy of current knowledge of CU traits rather than a limitation specific to this study. This issue pertains to the interaction of child temperament and parenting practices in the development of antisocial behaviour, which itself remains a relatively new focus of

research. In order to advance such knowledge, future clinical research into CU traits may benefit from the inclusion of a broader range of measures pertaining to parent factors and aspects of the parent-child relationship such as attachment or dyadic interaction under a broader range of conditions.

An example of such an approach that may reveal additional family correlates of CU traits can be seen in a recent study by Granic and Lamey (2002). This study utilised a problem-solving paradigm to observe the interactions between parents and children in a clinic sample of conduct problem boys (mean age 10 years) with and without concurrent anxiety/depression problems. The study included a number of unique design and methodological features intended to reflect important principles in child development theory. The authors point out that the traditional use of global ratings in observational studies of parent-child interactions may fail to pick up temporal processes important to relationship dynamics. In order to better examine such processes, the authors utilised a methodological strategy based on dynamic systems (DS) theory, a mathematical language that can describe the internal feedback processes of a system in adapting to new conditions. The application of DS principles to parent-child observations allowed for multiple dyadic-interaction patterns to be analysed concurrently, and their relation to one another explored. A combination of case-based and multivariate analyses were employed in this process. In order to examine the role of context changes on these dyadic interactions, a 'perturbation' was used, in which a knock on the laboratory door signalled that the allotted time for the problem-solving discussion was almost over, and a resolution was needed. The rationale for this perturbation included the developmental premises that individual differences are most apparent under stressful situations, and the DS premise that only by perturbing a system can the full range of behavioural possibilities by identified.

Consistent with their predictions, Granic and Lamey (2002) found that parent-child interactions in the two groups (conduct problem children with and without comorbid internalising problems) differed only after the perturbation. The findings from this study are of particular interest, as they provide evidence of how subtypes of conduct problem children differ in terms of the transactional processes occurring with their parents, and demonstrate that contextual conditions are important in determining the processes occurring at any given time.

Evidence of the controversy surrounding the application of the psychopathy construct to children is pervasive in the literature, and deserves some attention here. In the adolescent psychopathy literature, concern has been expressed that the labelling of adolescents as psychopaths may lead to their exclusion from treatment opportunities due to the presumption that they are therefore untreatable (Johnstone & Cooke, 2004). Such concerns demonstrate the importance of caution in interpreting the current findings, and the sensitivity with which their implications should be discussed. For the sake of clarification, it should be emphasized that the current findings are not considered evidence that the conduct problems of children with high CU traits cannot be effectively treated. As a group, the high CU boys in the sample displayed a drop in ODD symptom severity ratings from above the clinically significant cut-off for the DISCAP, to below this point. As a group, this could be considered evidence of clinically significant improvement. Conversely however, the Antisocial factor scores for the high-stable CU group remained stable at each time-point, compared to the drop in these scores seen for the remaining sample. In summary these data demonstrate some evidence of clinical improvement in boys with high levels of CU traits, despite these traits also increasing risk for poor outcomes. As evident from the discussion of future clinical research however, it is expected that

improvements to these outcomes may be achieved through the incorporation of temperament-specific adaptations to existing social learning based treatments such as parent training.

The need to be sensitive in applying the psychopathy construct to children is also clear from the concerns of parents regarding the 'pathologising' of their children. According to reports from therapists in the current study, participating parents expressed a number of concerns about the social stigma attached to diagnostic labels such as ODD and ADHD. Parents worried that such labels may lead to peer rejection, result in discrimination by school teachers, and create negative self-concepts in their children. While the terms 'psychopathy' or 'callous-unemotional traits' were at no time used with parents or children during treatment, it can be confidently assumed that these terms would have sparked much greater anxieties. The renaming of the Psychopathy Screening Device to the Antisocial Process Screening Device (APSD) by Frick and Hare (2002) is a good example of sensitivity to this issue in the research literature. While the current study did not target CU traits as part of treatment, it is suggested that particular care should be taken if these traits are to be directly addressed with parents. Clinical wisdom suggests that the most appropriate approach would involve referring the relevant features of these traits as specifically as possible, avoiding global labels that are open to misinterpretation. Using this approach, a therapist might discuss aspects of a child's behaviour such as 'a lack of concern about punishment', and 'difficulties in perspective-taking that affect awareness of his/her actions on others'.

General summary and conclusions

Parent training is considered highly effective in the treatment of conduct problems, especially when intervention is early and families are not overwhelmed by social adversity. Despite the growing emphasis on developmental child factors in models of antisocial behaviour, however, little research has examined the factors characterising children who respond poorly to these treatments. Recent child research guided by the psychopathy construct has supported the predictive validity of CU traits in relation to future antisocial behaviour, and has suggested that such traits may present adverse implications for the treatment of childhood conduct problems. The aim of the current study was to examine the relationship of CU traits to treatment outcomes and processes in a parent training intervention with young boys referred for conduct problems. This study represents the first investigation of these traits in the context of a standard clinical trial, and extends the body of research examining the predictive utility of the CU traits construct in relation to the development and course of antisocial behaviour.

The findings of the current study indicated support for the predictive validity of CU traits both in relation to clinical outcomes and processes. CU traits were associated with a particularly severe pattern of presenting conduct problems, and were related to poor treatment outcomes at follow-up even when controlling for socioeconomic status, age, treatment dose, and conduct problem severity. Boys with high CU traits also demonstrated a pattern of response to the components of treatment consistent with a reward-dominant / punishment-insensitive temperament. Parents reported time-out (but not reward strategies) to be less effective with high CU boys, who also exhibited less affect in reacted to time-out discipline. The relationship of CU traits to these aspects of treatment could not be accounted for by differences in

parental implementation of treatment, and may explain the poor outcomes associated with CU traits. These findings appear consistent with various theoretical predictions seen in the literature concerning CU traits. Those of most relevance include the notion that conduct problems in children with CU traits are related less to typical parenting practices than they are for children without these traits (e.g., Wootton, et al. 1997), and Frick's (1998) proposal that CU traits delineate a subgroup of early onset conduct problem children relatively unaffected by the emotional dysregulation characterising the majority of these children. Finally, these findings also appear consistent with research involving antisocial adult offenders, which has found psychopathy to be a risk factor for poor response to treatment.

The current study involved a number of methodological and design strengths that support the integrity of the findings. These included multiple measures of parent and child behaviour (i.e., direct observation, diagnostic interview, parent report), and the measurement of CU traits using a joint factor structure validated with young children, and found to produce a CU factor with greater reliability than that of the original APSD scale alone. For analytic purposes CU traits were operationalised as both a continuous construct, as well as categorical groups based on patterns of stability across treatment. Furthermore, severity of conduct problems was controlled for in analyses of the relationship of CU traits to treatment outcomes and processes, as was parents' implementation of the treatment components. Various methodological limitations should also be recognised, including the reliance on parent report of CU traits and child responsiveness to the individual components of treatment, and the use of an exclusively male sample.

The current findings point to a number of issues warranting future investigation. The most salient of these is the evaluation of alternative treatment

protocols targeting conduct problems in children with high CU traits. CU theory suggests that reward strategies and attention to parent-child attachment processes may be important to achieving additional treatment gains for these children. However, in addition to remedial interventions, it is apparent that preventive research designs are necessary in order to better understand the interaction of parent and child factors in the developmental of antisocial behaviour as well as CU traits. The application of the psychopathy construct to childhood remains a controversial issue, and particular sensitivity should be applied when addressing CU traits clinically with parents of young children.

While these findings resulted from theoretically driven predictions, they should be considered tentative until replicated with other samples. While care was taken to evaluate the effects of CU traits while controlling for established predictors of treatment outcomes and measures of antisocial behaviour, it remains possible that CU traits functioned as a proxy for some unmeasured variable. Caution should be applied when interpreting the clinical implications of these findings, which should not be considered evidence that children with conduct problems and CU traits are untreatable, or that parenting practices are irrelevant to antisocial pathways involving CU traits. Rather, these findings suggest that the conduct problems of children with high CU traits, compared to those without these traits, are less responsive to the specific parenting modifications common to standard parent training interventions. These findings add to growing evidence of the predictive validity of CU traits in relation to childhood conduct problems, and support a model of treatment in which child temperament is integrated with social learning processes.

References

Achenbach. T. M. (1991). *Manual for the Child Behaviour Checklist/4-18 and 1991 Profile*. Burlington: University, of Vermont. Department of Psychiatry.

Barrett, P. M., Rapee, R. M. Dadds, M. M., & Ryan, S. M. (1996). Family enhancement of cognitive style in anxious and aggressive children. *Journal of Abnormal Child Psychology*, 24, 187-203.

Barry, C. T., Frick, P. J., Grooms, T., McCoy, M. G., Ellis, M. L., & Loney, B. R. (2000). The importance of callous-unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology*, 109, 335-340.

Bates, J. E. (1989). Concepts and measures of temperament. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 3-26). New York: Wiley.

Bates, J. E., Pettit, G. S., Dodge, K. A., & Ridge, B. (1998). Interaction of temperamental resistance to control and restrictive parenting in the development of externalising behaviour. *Developmental Psychology*, 34(5), 982-995.

Beauchaine, T. P., Gartner, J., & Hagen, B. (2000). Comorbid depression and heart rate variability as predictors of aggressive and hyperactive symptom responsiveness during inpatient treatment of conduct-disordered, ADHD boys. *Aggressive Behaviour*, 26, 425-441.

Beauchaine, T. P., Webster-Stratton, C., & Reid, M. J. (in press). Mediators, moderators, and predictors of one-year outcomes among children treated for early-onset conduct problems: A latent growth curve analysis. *Journal of Consulting and Clinical Psychology*.

Blair, R. J. R. (1999). Responsiveness to distress cues in the child with psychopathic tendencies. *Personality and Individual Differences*, 27, 135–145.

Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29, 491–498.

Blair, R. J., Jones, L., Clark, F., & Smith, M. (1997). The psychopathic individual: a lack of responsiveness to distress cues? *Psychophysiology*, 34, 192–8.

Brestan, E. V., & Eyberg, S. M. (1998). Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. *Journal of Clinical Child Psychology*, 27, 180-189.

Burns, G.L., (2000). Problem of item overlap between the Psychopathy Screening Device and attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder rating scales. *Psychological Assessment*, 12, 447-450.

Caspi, A., Henry, B., McGee, R. O., & Moffitt, T. E. (1995). Temperamental origins of child and adolescent behaviour problems: From age three to fifteen. *Child Development*, 66, 55-68.

Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., Taylor, A., Poulton, R. (2002). Role of genotype in the cycle of violence in maltreated children. *Science*, 297, 851-854.

Clark, L. A., Kochanska, G., & Ready, R. (2000). Mothers' personality and its interaction with child temperament as predictors of parenting behaviour. *Journal of Personality and Social Psychology*, 79(2), 274-285.

Cleckley, H. (1976). The Mask of Sanity, 5th edition. St. Louis, MO: Mosby.

Dadds, M. R. (1995). *Families, children, and the development of dysfunction*. Thousand Oaks, CA: Sage Publications.

Dadds, M. R. (2002). Learning and intimacy in the families of anxious children. In R. J. McMahon & R. D. Peters (Eds.), *The Effects of Parental Dysfunction on Children* (pp. 87-106). New York, NY: Kluwer Academic.

Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. (in press). Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: A community study. *Journal of Consulting and Clinical Psychology*.

Dadds, M. R., & Hawes, D. J. (in press). Integrated Family Intervention. Brisbane, Qld: Australian Academic Press.

Dadds, M. R., & McHugh, T. A. (1992). Social support and treatment outcome in behavioural family therapy for child conduct problems. *Journal of Consulting and Clinical Psychology*, 60, 252-259.

Dadds, M.R., & Salmon, K. (2003). Learning and temperament as alternate pathways to punishment insensitivity in antisocial children. *Clinical Child and Family Psychology Review*, 6, 69-86.

Dadds, M.R., Schwartz, S. & Sanders, M.R. (1987). Marital discord and treatment outcome in the treatment of childhood conduct disorders. *Journal of Consulting and Clinical Psychology*, 55, 396-403.

DeKlyen, M., Spelz, M. L., & Greenberg, M. T. (1998). Fathering and early onset conduct problems: Positive and negative parenting, father-son attachment, and the marital context. *Clinical Child and Family Psychology Review*. 1(1), 3-21.

Dishion, T.J., & Patterson, G.R. (1992). Age effects in parent training outcome. *Behaviour Therapy*, 23, 719-729.

Dodge, K. E. (1991). The structure and function of reactive and proactive aggression.

In D. J. Pepler & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 201-218). Hillsdale, NJ: Lawrence Erlbaum Associates.

Dodge, K. A., Lochman, J. E., Harnish, J. D., Bates, J. E., & Pettit, G. S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology*, 106, 37-51.

Dodge, K. A., & Pettit, G. S. (2003). A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology*, 39(2), 349-371.

Edelbrock, C., Rende, R., Plomin, R., & Thompson, L. A. (1995). A twin study of competence and problem behaviour in childhood and early adolescence. *Journal of Child Psychology and Psychiatry*, 36, 775-785.

Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between the quality of attachment and behaviour problems in preschool in a high-risk sample. In I. Bretherton & E. Waters (Eds.), Growing points of attachment theory and research. *Monographs of the Society for Research in Child Development*. 50(1-2, Serial No. 209), 147-167.

Falkenbach, D. M., Poythress, N. G., & Heide, K. M. (2003). Psychopathic features in a juvenile diversion population: reliability and predictive validity of two self-report measures. *Behavioural Sciences and the Law*, 21(6), 787-805.

Farmer, E. Z. M., Compton, S. N., Burns, B. J., & Robertson, E. (2002). Review of the evidence base for treatment of childhood psychopathology: Externalizing disorders. *Journal of Counselling and Community Psychology*, 70(6), 1267-1302.

Forth, A.E., Kosson, D.S., & Hare, R.D. (2003). *The Psychopathy Checklist: Youth Version*. Toronto, Ontario: Multi-Health Systems.

Fowles, D. C., & Kochanska, G. (2000). Temperament as a Moderator of Pathways to Conscience in Children: The Contribution of Electrodermal Activity. *Psychophysiology*, 37, 788-795.

Frick, P.J. (2000). The problems of internal validation without a theoretical context: The different conceptual underpinnings of psychopathy and the disruptive behaviour disorders criteria. *Psychological Assessment*, 12, 451-456.

Frick, P. J. (2002). Understanding the association between parent and child antisocial behaviour. In R. J. McMahon & R. D. Peters (Eds.), *The Effects of Parental Dysfunction on Children* (pp. 105-126). New York, NY: Kluwer Academic.

Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment*, 12, 382-393.

Frick, P. J., Cornell, A. H., Barry, C. T., Bodin, S. D., & Dane, H. E. (2003). Callous-unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency. *Journal of Abnormal Child Psychology*, 31, 457–470.

Frick, P.J., Cornell, A.H., Bodin, S.D., Dane, H.E., Barry, C.T., & Loney, B.R. (2003a). Callous-unemotional traits and developmental pathways to severe conduct disorder. *Developmental Psychology*, 39, 246-260.

Frick, P.J., & Hare, R.D. (2002). *The Psychopathy Screening Device*. Toronto: Multi-Health Systems.

Frick, P. J., Lilienfeld, S. O., Ellis, M. L., Loney, B. R., & Silverthorn, P. (1999). The

association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*, 27, 381–390.

Frick, P. J., & Morris, A. S. (2004). Temperament and developmental pathways to severe conduct problems. *Journal of Clinical Child and Adolescent Psychology*, 33, 54-68.

Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology*, 103(4), 700-707.

Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38, 581-586.

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire (SDQ). *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1337-1345.

Granic, I., & Lamey, A. V. (2002). Combining dynamic systems and multivariate analyses to compare the mother-child interactions of externalising subtypes. *Journal of Abnormal Child Psychology*, 30(3), 265-283.

Greene, R. W., & Doyle, A. E. (1999). Toward a transactional conceptualisation of oppositional defiant disorder: Implications for assessment and treatment. *Clinical Child and Family Psychology Review*, 2(3), 129-148.

Gretton, H., Hare, R. D., & Catchpole, R. (2004). Psychopathy and offending from adolescence to adulthood: A Ten-Year Follow-Up. *Journal of Consulting and Clinical Psychology*, 72, 636-645.

Gross, D., Fogg, L., Webster-Stratton, C., Garvey, C., Julion, W., & Grady, J. (2003). Parent training of toddlers in day care in low-income urban communities. *Journal of Consulting & Clinical Psychology*, 71(2), 261–278.

Hare, R. D. (1991). *The Hare Psychopathy Checklist—Revised*. Toronto, Ontario, Canada: Multi-health Systems.

Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. *Criminal Justice and Behaviour*, 23, 25-54.

Harlow, H. F., & Harlow, M. (1962). Social deprivation in monkeys. *Scientific American*, 207, 136-146.

Hart, S. D., & Hare, R. D. (1997). Psychopathy: Assessment and association with criminal conduct. In D. M. Stoff, J. Brieling, & J. Maser (Eds.), *Handbook of Antisocial Behaviour* (pp. 22–35). New York: Wiley.

Hawes, D. J., & Dadds, M. R. (2004). Australian data and psychometric properties of the strengths and difficulties questionnaire. *Australian and New Zealand Journal of Psychiatry*, 38, 644-651.

Hemphill, J. F., Hare, R. D., & Wong, S. (1998). Psychopathy and recidivism: A review. *Legal and Criminological Psychology*, 3, 139-170.

Henggeler, S. W., Melton, G. B., & Smith, L. A. (1992). Family preservation using multisystemic therapy: An effective alternative to incarcerating serious juvenile offenders. *Journal of Consulting and Clinical Psychology*, 60, 953-961.

Holland, D., & Dadds. M.R. (1997). *The Diagnostic Interview Schedule for Children, Adolescents, and Parents*. Brisbane, Griffith University.

Johnson S, Barrett P, Dadds M, Fox T, & Shortt A. (1999). The diagnostic interview schedule for children, adolescents and parents: Initial reliability and validity data. *Behaviour Change*, 16, 155-164.

Johnstone, L., & Cooke, D. J. (2004). Psychopathic-like traits in childhood:

Conceptual and measurement concerns. *Behavioural Sciences and the Law*, 22,103-125.

Lochman, J. E., & Frick, P. J. (2003). Callous/unemotional traits and social cognitive processes in adjudicated youth. *Journal of the American Academic of Child and Adolescent Psychiatry*, 42, 364–371.

Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology*, 48, 371-410.

Loeber, R., & Stouthamer-Loeber, M. (1998). Development of juvenile aggression and violence: Some common misconceptions and controversies. *American Psychologist*, 53, 242-259.

Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., Kerlin, K. Pardini, D. A., Lynam, D. R. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology*, 106, 425-438.

Lyons-Ruth, K. (1996). Attachment relationships among children with aggressive behaviour problems: The role of disorganized early attachment patterns. *Journal of Consulting and Clinical Psychology*, 64, 64-73.

Lyons-Ruth, K., Alpern, L., & Repacholi, B. (1993). Disorganised infant attachment classification and maternal psychosocial problems as predictors of hostile-aggressive behaviour in the preschool classroom. *Child Development*, 64, 572-585.

Mason, D. A., & Frick, P. J. (1994). The heritability of antisocial behaviour: A meta-analysis of twin and adoption studies. *Journal of Psychopathology and Behavioural Assessment*, 16(4), 301-323.

Maughan, B., Rowe, R., Messer, J., Goodman, R., & Meltzer, H. (2004). Conduct disorder and oppositional defiant disorder in a national sample: age and gender variations and comorbidity. *Journal of Child Psychology and Psychiatry*, 45(3), 609-621.

McMahon, R. J., & Forehand, R. L. (2003). *Helping the Noncompliant Child: Family-Based Treatment for Oppositional Behaviour*. New York, NY: Guilford Press.

McNeil, C.B., Eyberg, S.M., Eisenstadt, T.H., Newcomb, K., & Funderburk, B.W. (1991). Parent-child interaction therapy with behaviour problem children: Generalisation of treatment effects to the school setting. *Journal of Clinical Child Psychology, 20, 140-151*.

Miller, G. E., & Prinz, R. J. (1990). Enhancement of social learning family interventions for child conduct disorder. *Psychological Bulletin*, 108, 291-307.

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behaviour: A developmental taxonomy. *Psychological Review*, 100, 674-701.

Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways in males and females. *Development and Psychopathology*, 13, 355–376.

Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex Differences in Antisocial Behaviour: Conduct Disorder, Delinquency, and Violence in the Dunedin Longitudinal Study*. Cambridge, UK: Cambridge

Nixon, R.D., Sweeney, L., Erickson, D.B. & Touyz, S. W. (2004). Parent-child interaction therapy: One and two-year follow-up of standard and abbreviated treatments for oppositional preschoolers. *Journal of Abnormal Child Psychology*, 32(3), 263-71.

O'Brien, B. S., & Frick, P. J. (1996). Reward dominance: Associations with anxiety,

conduct problems, and psychopathy in children. *Journal of Abnormal Child Psychology*, 24(2), 223-240.

Ogloff, J.R., Wong, S., & Greenwood, A. (1990). Treating criminal psychopaths in a therapeutic community program. *Behavioural Sciences and the Law*, 8, 81-90.

Owens, E. B., & Shaw, D. S. (2003). Predicting growth curves of externalising behaviour across the preschool years. *Journal of Abnormal Child Psychology*, 31(6), 575-590.

Oxford, M., Cavell, T.A., & Hughes, J.N. (2003). Callous-unemotional traits moderate the relation between ineffective parenting and child externalizing problems: A partial replication and extension. *Journal of Clinical Child and Adolescent Psychology*, 32, 577-585.

Pampel, F.C. (2000). Logistic Regression. Sage: Thousand Oaks, CA.

Pardini, D.A., Lochman, J.E., & Frick, P.J. (2003). Callous/unemotional traits and social cognitive processes in adjudicated youth. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 364-371.

Patterson, G. R. (1982). *A Social Learning Approach: 3. Coercive Family Process*. Eugene, OR: Castalia.

Patterson, G.R., Gullion, M.E. (1968). *Living with children: New methods for parents and teachers*. Champaign, IL: Research Press.

Petrila, J., & Skeem, J.L. (2003). An introduction to the special issues on juvenile psychopathy and some reflections on the current debate. *Behavioural Sciences and the Law*, 21, 689-694.

Pettit, G. S., Bates, J. E., Dodge, K. A., & Meece, D. W. (1999). The impact of after-

school peer contact on early adolescent externalising problems is moderated by parental monitoring, neighbourhood safety, and prior adjustment. *Child Development*, 70, 768-778.

Raine, A. (2002). Biosocial studies of antisocial and violent behaviour in children and adults: A review. *Journal of Abnormal Child Psychology*, 30(4), 311-326.

Reid, J. B., Patterson, G. R., & Snyder, J. J. (2002). *Antisocial behaviour in children and adolescents: A developmental analysis and model for intervention.* Washington, DC: American Psychological Association.

Reid, M. J., Webster-Stratton, C., & Hammond, M. (2003). Follow-up of children who received the incredible years intervention for oppositional-defiant disorder: maintenance and prediction of 2-year outcomes. *Behaviour Therapy*, 34, 471-491.

Rice, M.E., Harris, G.T., & Cormier, C.A. (1992). Evaluation of a maximum security therapeutic community for psychopaths and other mentally disordered offenders. *Law and Human Behaviour*, 16, 399-412.

Richters, J. E. (1992). Depressed mothers as informants about their children: A critical review of the evidence for distortion. *Psychological Bulletin*, 112, 485-499.

Rothbart, M. K. (1989). Temperament and development. In G. Kohnstamm, J. Bates, & M. K. Rothbart (Eds.), *Temperament in Childhood* (pp. 187-248). Chichester, ENG: Wiley.

Ruma, P.R., Burke, R.V., & Thompson, R.W. (1996). Group parent training: Is it effective for children of all ages? *Behavioural Therapy*, 27, 159-169.

Rutter, M. L. (1997). Nature-nurture integration: The example of antisocial behaviour. *American Psychologist*, 52, 390-398.

Rutter, M., Giller, H., & Hagell, A. (1998). *Antisocial Behaviour by Young People*. New York: Cambridge University Press.

Salekin, R. T. (2002). Psychopathology and therapeutic pessimism: Clinical lore or clinical reality? *Clinical Psychology Review*, 22, 79-112.

Sanders, M.R., & Christensen, A.P. (1985). A comparison of the effects of child management and planned activities training in five parenting environments. *Journal of Abnormal Child Psychology*, 13, 101 117.

Sanders, M.R., & Dadds, M.R. (1982). The effects of planned activities and child management training: An analysis of setting generality. *Behaviour Therapy*, 13, 452 461.

Sanders, M. R., & Dadds, M. R. (1993). *Behavioural Family Intervention*. Needham Heights, MA: Allyn and Bacon.

Sanders, M.R., & Glynn, T. (1981). Training parents in behavioural self-management: An analysis of generalisation and maintenance. *Journal of Applied Behaviour Analysis*, 14, 223-237.

Sanders, M. R., Markie-Dadds, C., Tully, L. A., & Bor, W. (2000). The triple-P-positive parenting program: A comparison of enhanced, standard, and self-directed behavioural family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology*, 68(4), 624-640.

Sanders, M. R., Markie-Dadds, C., & Turner, K.M.T. (2003). Theoretical, scientific and clinical foundations of the triple p – positive parenting program: A population approach to the promotion of parenting competence. *Parenting Research and Practice Monograph*, 1, 1-21.

Schaughency, E. A., & Lahey, B. B. (1985). Mothers' and fathers' perceptions of child

deviance: Roles of child behaviour, parental depression, and marital satisfaction. *Journal of Consulting and Clinical Psychology*, 53, 718-723.;

Serketich, W. J., & Dumas, J. E. (1996). The effectiveness of behavioural parent training to modify antisocial behaviour in children. A meta-analysis. *Behaviour Therapy*, 27(2), 171-186.

Shaw, D. S., Bell, R. Q., & Gilliom, M. (2000). A truly early starter model of antisocial behaviour revisited. *Clinical Child and Family Psychology Review*, 3(3), 155-172.

Silverthorn, P., Frick, P.J., & Reynolds, R. (2001). Timing of onset and correlates of severe conduct problems in adjudicated girls and boys. *Journal of Psychopathology and Behavioural Assessment*, 23, 171-181.

Snyder, J. & Stoolmiller, M. (2002). Reinforcement and coercive mechanisms in the development of antisocial behaviour. The family. In J. Reid, G. Patterson, & J. Snyder (Eds.), *Antisocial Behaviour in Children and Adolescents: A Developmental Analysis and Model for Intervention* (pp. 65-100). Washington, D.C.: American Psychological Association.

Spain, S. E., Douglas, K. S., Poythress, N. P., & Epstein, M. (2004). The relationship between psychopathic features, violence and treatment outcome: Comparison of three youth measures of psychopathic features. *Behavioural Sciences and the Law*, 22, 85-102.

Stevens, D., Charman, T., & Blair, R. J. R. (2001). Recognition of emotion in facial expressions and vocal tones in children with psychopathic tendencies. *Journal of Genetic Psychology*, 16, 201–211.

Thomas, A., & Chess, S. (1977). *Temperament and development*. New York: Brunner/Mazel.

Viding, E., Blair, J. R., Moffitt, T. E., & Plomin, R. (2004). Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology and Psychiatry*, 45, 1-6.

Vitacco, M. J., Rogers, R. & Neumann, C. S. (2003). The Antisocial Process Screening Device: An examination of its construct and criterion-related validity. *Assessment*, 10(2), 143-150.

Wootton, J. M., Frick, P. J., Shelton, K. K., & Silverthorn, P. (1997). Ineffective parenting and childhood conduct problems: The moderating role of callous-unemotional traits. *Journal of Consulting and Clinical Psychology*, 65, 301–308.

Webster-Stratton, C. (1994). Advancing videotape parent training: A comparison study. *Journal of Consulting and Clinical Psychology*, 62(3), 583-593.

Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology*, 65(1), 93-109.

Webster-Stratton, C., & Hancock, L. (1998). Parent training for young children with conduct problems: Content, methods, and therapeutic processes. In *Handbook of Parent Training*, edited by C.E. Schaefer. New York, NY: John Wiley & Sons.

Webster-Stratton, C., Kolpacoff, M., & Hollinsworth, T. (1989). The long-term effectiveness and clinical significance of three cost-effective training programs for families with conduct problem children. *Journal of Consulting and Clinical Psychology*, 57(4), 550-553.

Youngblade, L. M., & Belsky, J. (1992). Parent-child antecedents of five-year-olds'

close friendships: A longitudinal analysis. *Developmental Psychology*, 1, 107-

121.

- Family Observation Schedule (FOS 5th edition) protocol

- Home observation record form

Parent self-report measures:

- The Antisocial Process Screening Device

- The Strengths and Difficulties Questionnaire

- Table showing items comprising the joint APSD-SDQ factor structure

Appendix Three

Behaviour monitoring and treatment process scales

Appendix Four

Treatment protocol

Appendix Five

Treatment integrity scales

Appendix Six

SPSS analytic output