

**Social cognitive, parental, and family functioning profiles
of children with conduct problems and different levels of
callous-unemotional traits**

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Declaration

I, Ruth Roberts, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis was conducted with the broad aim of advancing the understanding of social cognition, parenting, and family functioning in children with conduct problems (CP) and high levels of callous-unemotional traits (CP/HCU), children with CP and low levels of callous-unemotional traits (CP/LCU) and typically developing children (TD) children and their parents/caregivers. In **Chapter 2**, development of new task that assesses ability to understand how antisocial acts are perceived by others is described. In **Chapter 3**, children with CP/HCU showed an intact ability to represent mental states of others, but a reduced tendency to update mental state inferences as a function of different minds, when compared to children with CP/LCU and TD children. In **Chapter 4**, we found a similar pattern of mentalising in parents/caregivers of CP/HCU children, as compared with parents/caregivers of CP/LCU and TD children. In **Chapter 5**, parents/caregivers of CP children reported elevated rates of inconsistent discipline compared with parents/caregivers of TD children. CP/HCU children reported difficulty with monitoring their child, as compared to the other two groups. Children with CP/HCU reported reduced involvement with their fathers. Qualitative reports by parents and children provided possible explanations of how and why it is difficult and disheartening to parent children with CP. In **Chapter 6**, parents/caregivers of CP/HCU children reported significantly poorer quality of family's affective involvement than parents/caregivers of CP/LCU and TD children, as well as differences in roles and general functioning. Parent/caregiver qualitative descriptions offered a more nuanced insight into potential factors contributing to differences in family functioning.

Impact statement

Although no single experimental, questionnaire or interview study will have immediate clinical or practical implications, the findings from this thesis can be considered in a clinical and practical context. While children with CP/HCU are able to represent the minds of others, they may not always do so, particularly when they are required to process complex information in ‘real-time’ or when mentalising provides no benefit to themselves. A similar pattern of mentalising was observed in parents/caregivers of CP/HCU children. Clinicians, educators and others who work with children with CP/HCU and their parents/caregivers may want to consider that while they may appear to be able to mentalise (even be manipulative), they may not always consider the minds of other people, which may impact behaviour and relationships in multiple domains. There is a need to develop treatment adjuncts that make it easier and more probable for children with CP/HCU and their parents/caregivers to engage in thinking about others.

Parent/caregivers of children with CP/HCU and CP/LCU were able to accurately represent their child’s mind and provided valuable insight into what it is like to parent and live with their child. Qualitative reports of parenting demonstrated distinct reasons why parents/caregivers of CP/HCU and CP/LCU children have challenges with inconsistent discipline and parents/caregivers of CP/HCU children also gave explanations for difficulties in monitoring and supervising their child. It will be important for those who work with parents/caregivers of CP children to consider their lived-experiences which are not always captured in traditional measures as they have the potential to elucidate the unique challenges that parents/caregivers face when trying to raise CP/HCU and CP/LCU children.

Parents, particularly mothers, are often blamed for their child’s behaviour and feel stigma from being labelled as a bad parent, however in the context of findings from this thesis (and the

broader field) it is clear that children with CP present with challenges which make them more difficult to parent and may require different parenting strategies that may not always come naturally to parents. Information processing biases may impact how children with CP process social and affiliative cues from others and create considerable variability in how they respond to interventions. Parents/caregivers of children with CP may also have similar vulnerabilities as their child, that can cause difficulties for the successful implementation of interventions. In light of these challenges, it is important that parents/caregivers and those who work with children with CP receive adequate support with their relationship with the child to ensure that they are able to provide optimal care.

Future research should consider further exploration of mentalising with tasks that are designed to assess propensity to mentalise and the degree to which engagement with other minds may be modulated by motivational factors. Genetically informed, longitudinal research will be important for understanding mechanisms underlying social cognition, parenting and family functioning in families with CP. Future research will also want to consider whether the findings in this thesis extend to girls with CP and those families that are the most vulnerable and receiving specialist clinical services.

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Key abbreviations

ADHD	Attention deficit hyperactivity disorder
APQ	Alabama Parenting Questionnaire
APSD-SR	Antisocial Process Screening Device - Self-Report Version
AQC	Alexithymia Questionnaire for Children
AUDIT	Alcohol Use Disorder Identification Test
BES	Basic Empathy Scale
CASI-4R	Child and Adolescent Symptom Inventory
CD	Conduct Disorder
CP	Conduct Problems
CP/HCU	CP with high levels of CU traits
CP/HCU _p	Parents/caregivers of children with CP with high levels of CU traits
CP/LCU	CP with low levels of CU traits
CP/LCU _p	Parents/caregivers of children with CP with low levels of CU traits
CU	Callous-unemotional
DUDIT	Drug Use Disorder Identification Test
FAD	McMaster Family Assessment Device
GAD	generalised anxiety disorder
HCU	High levels of CU traits
ICU	Inventory of Callous Unemotional Traits
IRI-PT	Interpersonal Reactivity Index – Perspective taking items
LCU	Low levels of CU traits
MASC	Movie Assessment of Social Cognition
MDE	Major depressive episode
SDQ	Strengths and Difficulties Questionnaire
ODD	Oppositional Defiant Disorder
SES	Socio-economic status

SJT	Social Judgement Task
SRP-SF	Self-report Psychopathy Short-Form
TD	Typically developing
TDp	Parents/caregivers of typically developing children
WASI	Wechsler Abbreviated Scale of Intelligence

CHAPTER ONE: General Introduction

1.1 Conduct problems

Conduct problems (CP) refer to a range of challenging behaviours which are included in diagnostic criteria for Conduct Disorder (CD) in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013). These behaviours include aggression towards people and animals (such as physical cruelty, use of weapons, physical fights, sexual aggression), destruction of property, lying, theft, and serious disregard for rules and norms (American Psychiatric Association, 2013). In the United Kingdom, prevalence of CD has been estimated to be 0.8% for girls and 2.1% for boys (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004).

Oppositional Defiant Disorder (ODD) shares similar features of CD has been thought to represent a less severe form of CD (Rowe, Costello, Angold, Copeland, & Maughn, 2010). The DSM-5 classifies ODD and CD separately (American Psychiatric Association, 2013). While CD is characterised by serious acts of aggression and violations of rules and norms, the DSM-5 defines ODD as being characterised by hostile, defiant, and vindictive behaviour (American Psychiatric Association, 2013). Studies have shown that ODD is more common in early childhood, whereas CD diagnoses are more common in early adolescence, which suggests that ODD might be a precursor to CD (Rowe et al., 2010). Additionally, while rates of ODD appear mostly similar in boys and girls, CD is more commonly diagnosed in boys (Rowe et al., 2010). For the purposes of this thesis the ODD will not be included in the definition of CP.

Caring for children with CP represents a significant cost to society. Children with CP require more support from specialist education provisions and have increased use of health and social care services (D’Amico et al., 2014; Frick, 2016; Scott, Knapp, Henderson, & Maughan, 2001). Children with CP have a greater risk of physical and mental health problems, difficulties with personal relationships, as well as reduced employment and increased criminality in adulthood (Frick, 2012, 2016; Rivenbark et al., 2018; Wertz et al., 2018). The combination of challenging daily behaviour, and poor adult outcomes combine to create a significant societal burden and emotional toll on those around them. Perhaps unsurprisingly, CP is the most common reason for referral to Child and Mental Health Services (CAMHS) in the UK (NICE, 2017). However, despite being so common, despite 30% of child GP consultations being with regard to behavioural problems and despite the CAMHS referral rates, children with conduct disorder are under-represented in those in receipt of care from CAMHS (Vostanis, Meltzer, Goodman, & Ford, 2003; NICE, 2017) For this reason, the current thesis focuses on children with problematic levels of CP (as defined by research diagnostic cut offs), but recruited from community settings instead of CAMHS services.

1.2 Callous-unemotional traits

Considerable research has demonstrated that children with CP are a heterogeneous group. One way of understanding the heterogeneity of CP behaviours is to consider the role of callous-unemotional (CU) traits (Frick, Ray, Thornton, & Kahn, 2014; Frick & Viding, 2009; Viding & McCrory, 2015). The DSM-5 includes a ‘Limited Prosocial Emotions’ specifier to identify children with Conduct Disorder who display CU traits: a persistent lack of guilt or remorse, a lack of empathy and general disregard for the feelings of others, a lack of concern about the negative impact of their actions, a lack of concern about their performance, and expression of

emotions that seem insincere or are used for manipulation or intimidation (American Psychiatric Association, 2013). CU traits commonly start to emerge between early and middle childhood (Frick, Kimonis, Dandreaux, & Farell, 2003). Prevalence estimates suggest that 0.75-1.5% of children have Conduct Disorder and Limited Prosocial Emotions (Viding & McCrory, 2015).

There is currently no officially defined 'cut off' score for assigning children into groups of those with CP with high levels of CU traits (CP/HCU) or CP with low levels of CU traits (CP/LCU) in research settings; however a common approach to grouping CP children is to use a median split of CU scores (Hodsoll, Lavie, & Viding, 2014; Jones, Happé, Gilbert, Burnett, & Viding, 2010; Martin-Key, Brown, & Fairchild, 2017; O'Nions et al., 2017; Roberts, McCrory, Joffe, De Lima, & Viding, 2018; Schwenck et al., 2012; Sebastian et al., 2016; Sethi, O'Nions, McCrory, Bird, & Viding, 2018). The most widely used measure for subgrouping school aged children based on CU traits is the Inventory of Callous Unemotional Traits (ICU; Frick, 2004). The ICU has been found to have good reliability and validity in adolescent samples (Essau, Sasagawa, & Frick, 2006; Roose, Bijttebier, Decoene, Claes, & Frick, 2010). High levels of CU traits, as indexed by this instrument, define a group of children who have different behavioural and cognitive profiles than those with CP/LCU (Frick, 2012; Jones et al., 2010; O'Nions et al., 2017; Sebastian et al., 2016). A recent study has suggested that a score of 41 may represent a clinically meaningful cut-off for HCU using the ICU (Docherty, Boxer, Huesmann, O'Brien, & Bushman, 2017). The median split scores presented in Chapters 3-6 are in line with or higher than the majority of other studies and isolates children who are at an extreme range for their CU traits.

A median split approach was used to group children with CP into CP/HCU and CP/LCU groups (as opposed to conducting continuous analyses) for studies in Chapters 3-6 for the following

reasons: 1) Effects of CU traits do not often emerge as interactions and can instead lead to suppressor effects in correlational analyses (Frick, 2012); 2) The median split approach has, in the past, successfully delineated groups of children with CP who have different cognitive-affective processing patterns (Viding et al., 2012; Sebastian et al., 2016). The pattern of results in these two groups has often been such that if they had been combined, we might have missed deficits in either group; 3) The child/group centric analyses also make it easier to interpret the translational relevance of findings, which is more challenging when examining suppressor effects, for example. We are still able to conduct post-hoc continuous analyses to explore the data (Viding et al., 2012), which is not possible if the middle of the distribution is not included (were we to select two extreme ends of the distribution, as opposed to employing a median split approach).

A potential disadvantage of using a categorical approach is reduction of power. It is important to note that concerns regarding loss of power from dichotomizing relate to the case of bivariate normality (Cohen, 1983), but using a continuous measure of CP and CU can generate problems if modelled together, given the absence of bivariate normality. High CU traits almost invariably denote high levels of CP, but not the other way around (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011).

Children who display CP/HCU tend to have a more severe pattern of antisocial behaviour which persists into adulthood (Fontaine et al., 2011; Frick, 2016; Frick et al., 2003; Viding & Kimonis, 2018). CP/HCU children prioritize their own needs above the needs of others and view aggression to be acceptable if it helps them get what they want, regardless of the potential consequences or distress it causes others (O'Brien & Frick, 1996; Pardini & Byrd, 2012). Children with CP/LCU, on the other hand, do not display deficits in empathy and guilt but are impulsive and display more reactive aggression to perceived threats which can leave them

feeling anxious about the outcomes of their behaviour (Blair, Leibenluft, & Pine, 2014). Children with CP/LCU are prone to interpreting benign behaviour as hostile and are vigilant to threat cues, often as a result of living in unpredictable and chaotic environments (Frick & Viding, 2009).

1.3 Risk factors for CP

A number of risk factors have been associated with the likelihood of developing CP. These include: child neuropsychological factors, peer problems, community violence, socioeconomic status, prematurity, maternal depression and parenting (Fairchild et al., 2019; Frick, 2012, 2016; Jones et al., 2010; Viding & McCrory, 2015; Waller, Gardner, & Hyde, 2013; Viding & Kimonis, 2018). *This thesis focuses on garnering further understanding of child level social cognitive risk factors associated with CP and whether these differ for those with CP/HCU and CP/LCU. Furthermore, parent/caregiver social cognition, parenting and family functioning in both CP/HCU and CP/LCU groups will also be explored.* The comparison will always be provided by typically developing (TD) children matched for age, sex and ability and their parents/caregivers.

Social cognitive profile of children with CP

A substantial amount of work has focussed on how children with CP/HCU process emotional signals from others. Children with CP/HCU have been found to have difficulties in processing emotional information, such as, having reduced neural responses when viewing other people in pain (Lockwood et al., 2013), reduced neural and behavioural responses to laughter (O’Nions et al., 2017), and difficulties in responding to and resonating with other people’s fear and sadness (Blair et al., 2014; Frick et al., 2014; Lozier, Cardinale, Van Meter, & Marsh, 2014; Viding et al., 2012). These difficulties, particularly difficulties with resonating with other people’s emotions, might in part explain why children with CP/HCU are able to engage in acts

of aggression and violence and why they do not form typical affiliative relationships (Blair et al., 2014; Viding & McCrory, 2019). CP/LCU children on the other hand, may have an exaggerated response to emotional signals from others if they perceive them to be threatening (Blair et al., 2014; Frick & Viding, 2009; Viding & McCrory, 2018; Viding et al., 2012).

Besides focusing on affect processing in children with CP, their ability to mentalise has also received attention. Mentalising refers to the ability to understand others' thoughts, feelings and intentions (Fonagy & Allison, 2012; Frith & Frith, 2006). Children with CP/HCU have been found to be able to make accurate mental state inferences when the mentalising task does not require the participants to consider the feelings or emotional state of others (Anastassiou-Hadjicharalambous & Warden, 2008; Jones et al., 2010; O'Nions et al., 2014; Schwenck et al., 2012). This pattern of mentalising is in line with CP/HCU behaviours. Children with CP/HCU are able to successfully manipulate others for personal gain, which would not be possible without the ability to mentalise, however, they display clear deficits resonating with others' feelings.

Although the basic ability to mentalise has been found to be intact, children with CP/HCU often behave in ways which suggests that they may have a reduced propensity to mentalise (Viding & McCrory, 2019). They tend to be more self-focused and can aggress even when someone is showing distress, in order to achieve their goals (Jones et al., 2010; Pardini, Lochman, & Frick, 2003). Recent research has found that adult psychopaths can deliberately take the perspective of others, which may help them to manipulate others, but do not always spontaneously do so (Drayton, Santos, & Baskin-Sommers, 2018). Drayton, Santos & Baskin-Sommers (2018) proposed that this pattern of functioning may enable individuals with psychopathy to avoid processing the emotional consequences of their antisocial behaviour towards other people or even orienting to other people's needs in the first place. The findings

suggest that individuals with psychopathy can take on the perspective of others when it helps them achieve a goal but also ignore the perspective of others when it is not useful to them.

Although research suggests children with CP (both those with HCU and those with LCU, see e.g. Jones et al., 2010) have an intact ability to represent the minds of others, there are some subtle aspects of mentalising that are not fully understood. Less is known about whether children with CP consider people's mind types when making mental state assessments. Understanding that a person has a jealous mind type, for example, may help to increase accuracy in making mental state inferences about that person's feelings and motivations (Conway, Catmur, & Bird, 2019). Additionally, it is not known whether children with CP display a tendency to think about the minds of their friends. Previous research has suggested that young adults are more likely to make mind-related comments about others with whom they have a close relationship, as familiarity with the person increases the ease of accessing the person's mental states (Meins, Fernyhough, & Harris-Waller, 2014). Furthermore, it is not known if some of the antisocial behaviour seen in CP children may be partly due to difficulty in accurately predicting how other people think about antisocial actions. Finally, less research has focussed on how children with CP/HCU may differ from CP/LCU children in these more nuanced aspects of mentalising.

Social cognition of parents of children with CP

While extant research has advanced our broad understanding of mentalising in children with CP, relatively little research has focussed on mentalising in parent/caregivers. When children feel that their thoughts and feelings are being considered, they feel trust and security in their relationship with their parent/caregiver (McMahon & Bernier, 2017). Parents' sensitivity in recognising and responding to their child's mental state and engagement in conversation with

children about emotions are thought to help children understand their own and other's mental states (Pavarini, de Hollanda Souza, & Hawk, 2013).

One area of research exploring mentalising in parents/caregivers of children with CP has investigated mind-mindedness, which refers to parents' tendency to think of their children beyond their basic needs, as individuals with their own thoughts, feelings and intentions (Meins, 1999, 2013). Maternal mind-mindedness in infancy has been associated with secure attachment, language and cognitive development, and child theory of mind (McMahon & Bernier, 2017; Meins, Fernyhough, Arnott, Leekam, & De Rosnay, 2013; Zeegers et al., 2018). Studies have found low and non-attuned parental mind-mindedness to be associated with child externalising behaviour (Colonnesi, Zeegers, Majdandžić, van Steensel, & Bögels, 2019; Hughes, Aldercotte, & Foley, 2017). A recent study by Centifanti, Meins & Fernyhough (2016) found that even after controlling for externalising behaviour, appropriate mind-mindedness in infancy was shown to predict lower CU traits at age ten by way of increased emotional understanding in the child at age four. Mothers' appropriate/attuned mind-mindedness was thought to promote children's considerations of other's emotions (Centifanti et al., 2016). Parental accuracy in representing children's mental states is thought to help children develop effective social-cognitive strategies (Sharp, Fonagy, & Goodyer, 2006). Low maternal accuracy in representing their child's mental state has been linked to increased ratings of child emotional and behaviour problems by the mother and higher self-reports of depression by the child, independent of gender and cognitive ability (Sharp et al., 2006).

While less accurate and reduced levels of parent/caregiver mentalising have been associated with externalising behaviour in children, most studies have focussed on parent/caregiver mentalising in parents/caregivers of infants and young children and less is known about mentalising in parents/caregivers of older children with CP. Ha, Sharp & Goodyer (2011)

suggest that parent/caregiver mentalising may be a function of the relationship with the child and is therefore subject to change over time. The studies have also typically focussed on only one aspect of mentalising and have not examined more nuanced aspects of mentalising such as whether parents/caregivers of children with CP incorporate the mind types of others when making mental state assessments. Additionally, very few studies have examined whether parent/caregiver mentalising differs in parents/caregivers of CP/HCU children as compared parent/caregivers of CP/LCU children.

Parenting and CP

Parenting is one of the most widely researched risk factors in relation to CP and CU, as it is thought to play an important role in socialisation and the development of guilt and empathy in childhood (Dadds & Salmon, 2003; Frick et al., 2014; Kochanska, 1991; Kochanska, Aksan, & Carlson, 2005). Both positive and negative aspects of parenting have been found to play a role in the either increasing or decreasing the risk of developing both CP and CU traits (Waller et al., 2013).

Negative parenting, including harsh and inconsistent parenting practices, has been associated with CP and have also been found to be associated with higher levels of CU traits in adolescence (Frick et al., 2003; Pardini, Lochman, & Powell, 2007). Studies examining whether negative parenting is differentially associated with CP/HCU and CP/LCU have found that children with CP/HCU were more likely to have experienced harsh parenting than children with CP/LCU (Barker, Oliver, Viding, Salekin, & Maughan, 2011) and parents of CP/HCU children reported more difficulty with monitoring their child than parents of CP/LCU children (Muñoz, Pakalniskiene, & Frick, 2011). Wootton, Frick, Shelton & Silverthorn (1997) found elevated levels of negative parenting in both CP/HCU and CP/LCU children, but only the CP/LCU group showed a dose response relationship between the degree of negative parenting

and CP. CP/HCU children have been found to be less responsive to punishment cues and parental discipline (Dadds & Salmon, 2003; Hawes, Price, & Dadds, 2014), which along with their high rates of difficult and insensitive behaviour, may help to explain the lack of dose response relationship between degree of negative parenting and degree of CP in the CP/HCU group.

Positive parenting, including warm, sensitive and consistent parenting, has been proposed to help promote development of empathy and internalising of social norms, as well as help children with behaviour regulation (Frick et al., 2014; Pasalich, Dadds, Hawes, & Brennan, 2011; Waller et al., 2013). Low levels of parental warmth have been found to predict increases in CU traits in children (Pardini et al., 2007) and high levels of positive parenting and parental warmth have been associated with lower levels of CP in boys high on CU traits (Muratori et al., 2016; Pasalich et al., 2011).

There has been considerable interest not only in how parenting influences children's development but how children's behaviour may elicit different parenting responses from their caregivers. Bell (1968) posited that parents modified their behaviour when children did not behave in ways that were in line with parental standards. When children behaved in ways that exceeded parent limits on intensity or frequency (e.g. behaviours associated with conduct problems or hyperactivity) this caused parents to respond with high levels of parental control in attempts to regulate the family environment. Belsky (1984) also suggested parenting is multi-determined, where characteristics in the child shape the quality and quantity of parenting they receive. Parenting behaviour was found to be less affected by negative child behaviour in parents who had high levels of resources and support (Belsky, 1984; Taraban & Shaw, 2018). Family systems theory proposed that families function via a series of transactional patterns which regulate behaviours via rules, expectations and boundaries (Minuchin, 1988). Boundaries are important for family functioning. When boundaries are

reduced, family members may become enmeshed and find a loss of autonomy (Minuchin, 1988). Conversely, families who are disengaged have rigid boundaries which cause difficulty with communication hamper capacity for change (Minuchin, 1988). Transactional patterns within families are circular rather than linear, so that behaviour from one family member can trigger concern in another member which then causes the initial family member to react in response, in a continuous cycle (Minuchin, 1988). Several studies have explored the bidirectional aspects of parent and child interactions in families who have a child with CP. Aggressive and oppositional behaviour in children has been found to elicit physical discipline from parents (Jaffee et al., 2004). The association between parental negativity and negative parenting and CP has been found to be driven by parent and child effects (Larsson, Viding, Rijdsdijk, & Plomin, 2008; Oliver, 2015). While parenting influences child behaviour, it is also important to consider that CP behaviours in children may make it very difficult to provide optimal parenting.

Despite the accumulating evidence base about parenting practices related to CP and CU, there are still areas that need further investigation. There is a dearth of studies directly comparing children with clinically significant levels of CP, who vary in their degree of CU traits – both to each other, as well as with well-matched TD peers. There are limited studies examining parenting in CP/HCU and CP/LCU children from the child’s perspective, which has potential to elucidate how children with different levels of CU traits perceive parenting efforts from their parent/caregiver. Measuring parenting using more than one method is optimal for minimising potential biases and capturing parenting experiences that are not measured by questionnaires alone. There is a dearth of qualitative research on parenting children with CP which means that we are missing the important voices of parents/caregivers who are bearing the brunt of managing challenging child behaviour on a daily basis.

Family functioning and CP

CP creates an impact on various members of the family, with both parents/caregivers and siblings receiving abuse and victimisation from the child (Fairchild et al., 2019). Children with CP often come from homes characterised by chaos and discord (Fontaine et al., 2011) and CP in children has been associated with high levels of family conflict and poor general functioning (Byles, Byrne, Boyle, & Offord, 1988). There is reason to believe that children with CP/HCU and CP/LCU may have different profiles of family functioning. Children with CP/HCU are generally insensitive to punishment and sanctions which may cause considerable frustration for parents (Pardini et al., 2003). CP/CHU children also show less responsivity to affiliative behaviours (O’Nions et al., 2017) and a reduced desire to please others (Frick et al., 2014) which may reduce opportunities for family members to share positive experiences together. CP/LCU children on the other hand display reactive aggression in response to perceived threats (Blair et al., 2014; Viding & McCrory, 2012) and may not always accurately predict the consequences of their behaviour, which may make it more difficult for parents/caregivers to control their behaviour. Qualitative research on family functioning is sparse but has found families of children with CP experience difficulty with relationships within the family and the wider community and difficulty managing the child’s behaviour which has an impact on parent/caregivers own emotions (Lewis, Petch, Wilson, Fox, & Craig, 2015; Webster-Stratton & Spitzer, 1996). To date, there is a dearth of research on the social ecology of families of children with CP and no extant research has considered the impact of CP and varying levels of CU traits on various domains of family functioning. Qualitative research also has the potential to elucidate lesser known subtleties of CP/HCU and CP/LCU characteristics and how they may impact family functioning, but is relatively rare.

1.4 Research in this thesis

The research reported in this thesis focused on advancing our understanding of potential risk factors implicated in the development of CP and how these may vary as a function of child CU traits. The studies examined social cognition, specifically mentalising, in children with CP and their parents/caregivers and also provided an in-depth look at parenting in families with CP/HCU, CP/LCU and TD children, using both quantitative and qualitative methods, from both the perspective of the parent/caregiver and the child. The impact of CP/HCU and CP/LCU behaviour on relationships beyond the parent/child dyad was also explored, by examining family functioning.

Participants for the task development study described in Chapter 2 were recruited from a mainstream secondary school in Essex. Parental opt-out consent was obtained prior to participation by children. The research was conducted in the school setting and no incentive was provided for participation.

Participants for the studies described in Chapters 3-6 were recruited via a study funded by the Medical Research Council (MRC), examining the neurodevelopmental correlates of CP. Research took place in the Psychology and Language Sciences Department at University College London. Families were recruited to take part from the community in the greater London area. All participants gave informed consent (assent for child participants). Families received a £50 honorarium to cover travel and lunch expenses. Given the preponderance of CP in boys and desire to maximise statistical power, the study focused only included boys, aged 11-16 and their parent/caregiver. Children completed fMRI, cognitive, questionnaire, and behavioural assessments. Parents/caregivers completed questionnaire and behavioural assessments. Studies detailed in Chapters 3-6 focussed on questionnaire and behavioural data from children and their parents/caregivers (the fMRI data collection was not the focus of this

thesis). The MRC study took place over two research phases. Data for Chapter 6 was collected over the first phase of research. Data for Chapters 3 and 4 were collected over the second phase of research. Data for Chapter 5 was collected over the first and second phases of research, which resulted in a larger sample than Chapters 3, 4, and 6.

Research protocol for all studies in Chapters 2-6 were approved by the University College London Research Ethics Committee (Project ID number: 0622/001).

The Social Judgement Task (SJT), presented in Chapters 2 and 3, was conceptualised and developed in collaboration with the primary supervisor, Professor Essi Viding. The PhD candidate was responsible for recruitment of participants, screening for study eligibility, task administration and data management for the studies presented in Chapters 2-6. The PhD candidate completed analysis of both quantitative and qualitative data in Chapters 2-6 (second rating/coding of mind-mindedness coding and qualitative data in Chapters 3-6 was completed by three other Research Assistants on the MRC study).

1.5 Thesis outline

In this thesis, five empirical chapters which address gaps in the current understanding of social cognition, parental and family functioning profiles of children with conduct problems and high vs. low levels of callous-unemotional traits (CP/HCU vs. CP/LCU), compared with matched, TD children are presented.

Chapter 2 describes the development and pilot study of a new measure, the Social Judgement Task (SJT), an illustrated mentalising task assessing understanding of how others' think about antisocial actions. The negative interaction scenarios in the SJT were developed to assess whether acting antisocially may be, in part, explained by difficulty in accurately

predicting how the antisocial acts are viewed by others. Findings are presented from a task validation sample of 186 TD children.

Chapter 3 details a study of mentalising in CP/HCU, CP/LCU and TD children. Children (n = 81) completed three mentalising tasks: 1) a video-based task which assessed the ability/propensity to incorporate judgements about others' minds into inferences about their mental states; 2) a standardised mind-mindedness task which assessed the tendency to think about the mind of a good friend; and 3) the SJT (described in Chapter 2) which assessed understanding of how others' think about antisocial actions.

Chapter 4 details a study of mentalising in parents/caregivers of CP/HCU, CP/LCU and TD children. Parents/caregivers (n = 86) completed three mentalising tasks: 1) a video-based task which assessed the ability/propensity to incorporate judgements about others' minds into inferences about their mental states; 2) a standardised mind-mindedness task which assessed the tendency of parents/caregivers to think about the mind of their child; and 3) a task which assessed parental accuracy in inferring their child's responses to fictional distressing scenarios.

Chapter 5 examines parenting in families of CP/HCU, CP/LCU and TD children, from the perspective of both the parent/caregiver and the child (n = 146), using both quantitative and qualitative methods. Parents/caregivers and children completed standardised questionnaires which assessed parenting behaviours commonly associated with CP. Parents/caregivers of CP/HCU and CP/LCU children qualitatively described the challenges of parenting their child. CP/HCU and CP/LCU children qualitatively described their experience of being parented.

Chapter 6 examines family functioning in families of CP/HCU, CP/LCU and TD children, using both quantitative and qualitative methods. Parents/caregivers (n = 101) completed

questionnaires assessing multiple domains of family functioning. Parents/caregivers also provided a spontaneous description of their child which was qualitatively analysed in relation to quantitative reports of family functioning and the child's group assignment.

Finally, in Chapter 7, the findings from the five empirical chapters are summarised and potential implications of this research, potential future avenues of enquiry and clinical implications are discussed.

1.6 Dissemination

The findings from Chapter 2 were presented as poster and a Blitz talk at Society for the Scientific Study of Psychopathy (SSSP) conference in Antwerp in 2017. The findings from Chapter 3 are 'accepted/in press' in the Journal of Abnormal Child Psychology and were also presented as posters at the 2019 London MQ conference (winning the poster Prize) and the SSSP conference in Las Vegas in 2019. The findings from Chapter 6 have been published in the European Journal of Child and Adolescent Psychology (Roberts et al., 2018) and were presented at the 2017 London MQ conference.

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CHAPTER TWO: The development and validation of the Social Judgement Task

An abbreviated version of this chapter appears in Appendix 1 (Development and validation of the SJT) as it is included as supplementary electronic material in the journal article that has been accepted for publication and is reported in Chapter 3.

2.1 Introduction

There are substantial individual differences in both judgements of social/moral appropriateness and level of disruptive behaviours in childhood and adolescence. Most children and adolescents have internalised societal norms, are concerned about how their behaviour is perceived by others, and do not typically engage in antisocial acts, however, a minority display problematic behaviour. However, a small minority – those with CP – repeatedly violate the rights of others and break societal norms. To gain further understanding of the possible underlying reasons for CP behaviour, and to add to the social cognitive task battery used in this thesis, we developed the Social Judgement Task (SJT); a new measure to assess adolescents' self-reported likelihood of committing negative actions against a peer, and the degree to which they understand that other people see such actions as unacceptable. The aim of the task was, therefore, to enable assessment of whether the reason children with CP engage in antisocial behaviour may be, in part, due to a reduced understanding of other people's thoughts about antisocial actions.

2.1 Task Development

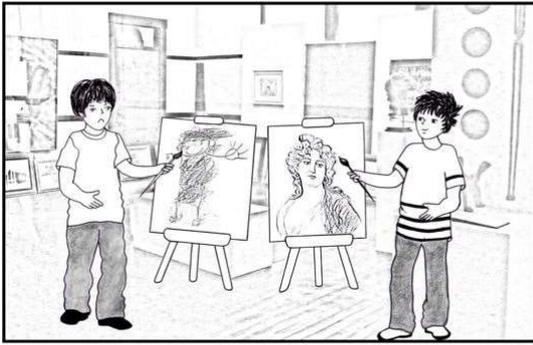
Using a similar format to Sharp et al. (2006), we presented a sample of typically developing adolescents a series of ten stories accompanied by illustrative cartoons and asked them to imagine that they were the main character in the story. Several story options were generated,

and the final stories were selected based upon their clarity and the potential for the action to happen in real life. The stories depicted five negative, three prosocial, and two neutral interactions with a peer. Because the task was designed to elucidate how children with CP think about others' perceptions of antisocial actions, the negative scenarios were the primary focus of this study. The five negative scenarios were presented alongside the positive and neutral scenarios in a pseudorandomised order. The positive and neutral scenarios were included to avoid presenting participants with solely negative content and reduce the possibility of participants making automated computations about social norms. Participants had to consider each positive, negative and neutral scenario individually.

Instructions were as follows: *'You will be given 10 stories, each with a cartoon. Please read each story carefully. Each story involves interactions with kids around your own age and we would like you to imagine yourself as the main character in each story. After you have read the story, we would like you to guess what other kids might think of you if you behaved in the way that the story described. We will give you three possible choices and we want you to circle the answer that most closely describes what they would think of you.'*

Participants were presented with three response options for the positive and negative stories reflecting mutually exclusive categories: (i) belief that peers would find the behaviour acceptable; (ii) belief that peers would find the behaviour unacceptable; (iii) an emotionally naïve/neutral response. The two neutral stories had 3 response options: (i) a positive statement; (ii) a negative statement; (iii) and a neutral statement.

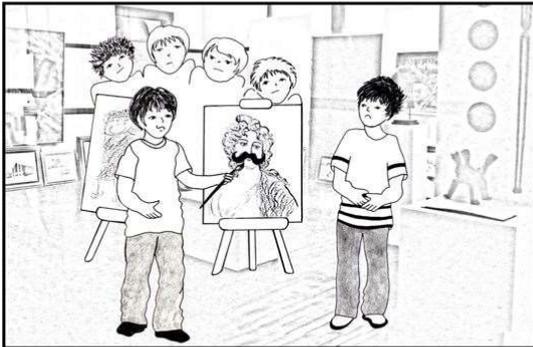
Participants were also asked how likely they were to commit the act in real life on a 1-5 point Likert scale. Stories were presented in a pseudo randomised order to ensure that no priming effects occurred. Figure 1. shows an example of a negative story.



You and Liam are painting in art class. Liam's picture is much nicer than yours. When Liam goes to clean his brushes, you paint over his picture.

What would other kids think of you in this situation? They would think:

- a) I am hilarious and play the best pranks
- b) I am a jerk for ruining the painting
- c) I am bored in art class



In real life, how likely would you be to paint over Liam's picture?

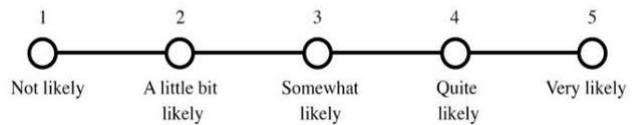


Figure 1. An example of an antisocial peer interaction scenario. Participants were presented with three answer options representing the following categories: a) belief that others would endorse or approve of an antisocial action; b) belief that others would not endorse or disapprove of an antisocial action; c) an emotionally naïve response

2.2 Method

Participants

Participants were recruited from a mainstream secondary school in Romford, Essex. The school was rated as 'Outstanding' by Ofsted school inspectors, with ninety percent of pupils achieving at or above expected level for their year. Nearly three-quarters of pupils at the school were from a minority ethnic background. Twenty percent of pupils at the school were eligible for free school meals.

One hundred and ninety-six adolescents participated in the research. Ten participants had more than 20% of the questionnaire data missing, indicating that the questionnaire had not been answered carefully. These participants were removed from all further analyses, leaving a final sample of $N = 186$. The age range of participants was 11-14 years old ($M = 12.57$, $SD = 0.83$; $N = 2$ did not disclose age). The sample was 53.8 % female ($N = 100$) and 45.2% male ($N =$

84); 1.1% of participants did not disclose their gender (N = 2). Ethnicity and socio-economic data were not collected as per request of the school.

Parental consent was obtained prior to testing. Questionnaires were administered in a classroom setting. A researcher read the instructions aloud to the class and informed all participants that their participation was voluntary. Participants completed the questionnaire independently and anonymously. No participant was identified to the researchers as having reading difficulties or special educational needs.

A random sample of 39 participants were re-assessed one week later to check reliability of the measure. Two participants were removed for having incomplete data at time one (T1) and one participant was removed due to incomplete data at time two (T2) leaving a final sample of N = 36 (20% of 186). The test-retest sample was 12-13 years old (M = 12.58, SD = 12.58) and 33.3% were male (N = 12).

Measures

In addition to the SJT, participants completed two additional questionnaires to assess the association between the SJT, callous-unemotional traits (CU) and conduct problems (CP). Brief measures were selected due to limited time for assessing participants in a school setting.

Callous-unemotional (CU) subscale of the Antisocial Process Screening Device, Self-Report Version (APSD-SR; Frick & Hare, 2001). Participants completed the six-item CU subscale of the ASPD-SR. Respondents were asked to rate their agreement with each statement on a 0-2 scale (0 = not true, 1 = sometimes true 3 = certainly true). The APSD-SR has been shown to have good psychometric properties (Munoz & Frick, 2007). We predicted that likelihood to commit the described negative interaction and the belief that others would find the negative interaction to be acceptable would be positively correlated with CU traits.

Conduct problems (CP) subscale of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Participants completed the five-item CP subscale of the SDQ-SR. Respondents were asked to rate their agreement with each statement on a 0-2 scale (0 = not true, 1 = sometimes true, 2 = certainly true). The SDQ has been shown to have good psychometric properties (Goodman, 2001). We predicted that likelihood to commit the described negative interaction and the belief that others would find the negative interaction to be acceptable would be positively correlated with CP.

Statistics

All data were analysed using SPSS (version 21) unless stated otherwise.

Defining SJT variables. To investigate the likelihood of committing negative interactions against a peer, a sum of Likert scores on negative stories was computed (min = 5, max = 25). To investigate the perception of others' view of negative actions, a percentage of negative stories that participants thought peers would rate as acceptable was computed (range = 0-100%).

Test-retest reliability. To measure the stability of responses over time, a random subset of participants (20% of original sample) completed the SJT twice, one week apart. Wilcoxon signed rank test was used to examine the differences in likelihood scores between T1 and T2.

Internal Consistency. To establish internal consistency, Cronbach's alpha was computed for negative and positive stories.

Principal Components Analysis. Principle components analysis was computed to determine if the likelihood scores for negative stories clustered together and the likelihood scores for positive stories clustered together.

Construct validity. Spearman’s correlations were computed to examine the associations between the two SJT variables (likelihood of committing negative interaction and belief that peers think negative interactions are acceptable), CU traits and CP. Spearman’s partial correlations were computed to assess the relationship between CU and the two SJT variables after adjusting for CP, and CP and the two SJT variables after adjusting for CU.

2.3 Results

SJT variables

As illustrated in Table 2.1, the majority of participants were unlikely to commit the negative interactions described in the stories. Six cases (3.2%) were missing one response so they were not included in this analysis.

Table 2.1 Likelihood of committing negative action

	Likert scores			
	5	10-15	16 or more	Missing
Number of participants	140	28	12	6
(percentage)	(75.3%)	(15%)	(6.5%)	(3.2%)

5 = not likely; 10-15 = a little bit or somewhat likely; 16 or more = quite or very likely (min = 5, max = 25)

As shown in Table 2.2, the majority of participants indicated they would be likely to act as the positive stories described. Five cases (2.7%) were missing one response so they were not included in this analysis.

Table 2.2 Likelihood of engaging in positive action

		Likert scores			
		3-5	6-9	10 or more	Missing
Number of participants		1	24	156	5
(percentage)		(0.5%)	(12.9%)	(83.9%)	(2.7%)

3-5 = not likely; 6-9 = a little bit or somewhat likely; 10 or more = quite or very likely (min = 5, max = 25)

As illustrated in Table 2.3, the majority of participants believed that peers would have low levels of acceptance of negative actions, with over half the participants saying their peers would find none of the interactions to be acceptable. Six cases (3.2%) were missing one response so they were not included in this analysis.

Table 2.3 Number of negative stories participants thought their peers would rate as acceptable

		Number of negative stories peers would find acceptable			
		0	1-2	3 or more	Missing
Number of participants		97	64	19	6
(percentage)		(52.2%)	(34.4%)	(10.2%)	(3.2%)

Out of a possible five negative stories

As shown in Table 2.4, the majority of participants believed that peers would rate positive interactions favourably. One case (0.5%) was missing one response so they were not included in this analysis.

Table 2.4 Number of positive stories participants thought their peers would rate favourably

		Number of positive stories peers would rate favourably			
		0	1	2-3	Missing

Number of participants	8	23	154	1
(percentage)	(4.3%)	(12.4%)	(82.8%)	(0.5%)

Out of a possible three positive stories

Test-retest reliability

A random sample of 39 participants completed the questionnaires twice, one week apart. As shown in Table 2.5, Wilcoxon signed rank test showed no difference between the mean likelihood scores for T1 and T2 on all items.

Table 2.5 Test-retest reliability: Wilcoxon signed rank test of likelihood scores at Time 1 and Time 2 (Interval = 7 days)

Item	Sig.	<i>r</i>
Negative story 'Art'	0.56	0.04
Negative story 'Crisps'	0.32	0.03
Negative story 'Fair'	0.11	0.12
Negative story 'Queue'	0.74	-0.10
Negative story 'Treats'	0.66	0.07
Positive story 'Fiver'	0.59	-0.06
Positive story 'Goal'	0.79	-0.19
Positive story 'Phone'	0.41	0.05

Over 80% of participants selected the same response at T2 as they had selected at T1. One prosocial interaction story had only 63% agreement. With the exception of the one prosocial story with low agreement, the majority of participants were selecting responses that would

reflect a belief that peers would think negative actions are unacceptable and prosocial actions are acceptable.

Internal Consistency

The five stories depicting a negative interaction had a high level of internal consistency, as determined by a Cronbach's alpha of 0.81.

Principle components analysis

Principle components analysis (PCA) was computed on the likelihood scores for the five negative and three positive stories. The suitability of PCA was assessed prior to analysis. As shown in Table 2.6, the negative stories loaded on to one component and the positive stories loaded together on a second component. Reliability statistics for the two components are displayed in Table 2.7.

Table 2.6 Principle components analysis: Likelihood scores for negative and positive stories

	Component	
	1	2
Negative story 'Crisps'	.83	
Negative story 'Art'	.80	
Negative story 'Treats'	.77	
Negative story 'Queue'	.73	
Negative story 'Fair'	.61	-.36
Positive story 'Fiver'		.75
Positive story 'Goal'		.72
Positive story 'Phone'	-.36	.50

Table 2.7 Test-retest reliability: Wilcoxon signed rank test of component one and two at Time 1 and Time 2 (Interval = 7 days)

Item	Sig.	<i>r</i>
Principle component 1	0.79	0.03
Principle component 2	0.17	-0.17

Construct validity

Spearman’s correlations were computed to examine the associations between the two SJT variables, CU traits, and CP. As shown in Table 2.8, the two SJT variables were positively correlated. The SJT variables were positively correlated with both CU traits and CP which is in line with hypotheses (see Table 2.8).

Table 2.8 Construct validity: Spearman's correlations between SJT variables, CU and CP

		<i>Belief peers think negative interactions are acceptable</i>	<i>Likelihood of committing negative interaction</i>	CU	CP
Correlation					
<i>Belief peers think negative interactions are acceptable</i>	Coefficient	1.000	.380**	.175*	.235**
	N	180	178	180	177
Correlation					
<i>Likelihood of committing negative interaction</i>	Coefficient	.380**	1.000	.337**	.333**
	N	178	180	180	177

	Correlation				
	Coefficient	.175*	.337**	1.000	.378**
CU	N	180	180	186	183
	Correlation				
	Coefficient	.235**	.333**	.378**	1.000
CP	N	177	177	183	183

* $p < 0.05$, ** $p < 0.001$

Partial correlation analyses revealed that there was no longer a significant association between CU and belief that peers would find negative interactions to be acceptable after controlling for CP ($r(174) = 0.096, p = 0.207$). The association remained significant between CP and belief that peers would find negative interactions to be acceptable when controlling for CU ($r(174) = 0.185, p = 0.014$). Both CP ($r(174) = 0.236, p = 0.002$) and CU ($r(174) = 0.241, p = 0.001$) were significantly associated with the likelihood of committing a negative interaction, independent of the variance shared with the other dimension.

2.4 Discussion

This paper describes the development of the SJT, a measure to assess young people's self-reported likelihood of committing negative actions against a peer and the degree to which they understand that other people see such actions as unacceptable. The SJT shows good test-retest reliability, internal consistency and construct validity. As expected from a typically developing sample of adolescents, the majority of participants were unlikely to engage in the described negative interactions with peers and believed that peers would find negative interactions to be unacceptable. However, there were individual differences in the self-reported likelihood of

engaging in negative interactions and the belief that peers would find negative behaviour acceptable. The two SJT variables were positively correlated which indicates that if an individual does not understand that being disruptive is wrong, or indeed, thinks that this is an accepted way of behaving, he or she will be more likely to act disruptively. The two SJT variables were not perfectly correlated, indicating that there may be some individuals who know that peers find negative behaviour unacceptable but would choose to act negatively anyway.

As participants were typically developing adolescents, it was not unexpected that the majority would believe that peers would find negative interactions to be unacceptable, however, it is possible that the results reflect a floor effect. It may be that the scenarios did not present enough complexity or represent the types of situations that young people would experience in their daily lives and this may have influenced responding. Future research may want to consider co-creation of additional scenarios with young people (including adolescents with CP) to ensure that the scenarios are representative of situations that they would encounter in real life and present adequate complexity to capture variability in responding. Additionally, it would be helpful to do further validation of the SJT to see if it has the ability to predict everyday antisocial and prosocial behaviour (as assessed with behavioural diaries or experience sampling, for example). Further examination of validity should include a large sample of children with varied disruptive behaviour disorders.

CU traits and CP were positively correlated with both the likelihood of acting negatively towards peers and belief that peers would find negative interactions to be acceptable, which indicates that the measure is able to characterise how the thinking patterns of adolescents with high levels of troubling traits and behaviours differ from their peers with lower levels of such traits and behaviours. In Chapter 3, we report on a study where the SJT was administered to children with CP/HCU, CP/LCU and a matched TD control group.

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**CHAPTER THREE: Thinking about others' minds: mental state inference in boys with
conduct problems and callous-unemotional traits**

**This section is presented as an accepted journal article and is an exact copy of the
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callous-unemotional traits. *Journal of Abnormal Child Psychology*.

Supplementary electronic material that is referenced in this chapter will appear in:

Appendix 1 (Development and validation of the SJT)

Appendix 2 (Correlation of MASC 'intentions' and child characteristics)

TITLE PAGE

Thinking about others' minds: mental state inference in boys with conduct problems and callous-unemotional traits

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Abstract

Children with conduct problems (CP) and high levels of callous-unemotional traits (CP/HCU) have been found to have an intact ability to represent other minds, however, they behave in ways that indicate a reduced propensity to consider other people's thoughts and feelings. Here we report findings from three tasks assessing different aspects of mentalising in 81 boys aged 11-16 [Typically developing (TD) $n = 27$; CP/HCU $n = 28$; CP and low levels of callous-unemotional traits (CP/LCU) $n = 26$]. Participants completed the Movie Assessment of Social Cognition (MASC), a task assessing ability/propensity to incorporate judgements concerning an individual's mind into mental state inference; provided a written description of a good friend to assess mind-mindedness; and completed the Social Judgement Task (SJT), a new measure assessing mentalising about antisocial actions. Boys with CP/HCU had more difficulty in accurately inferring others' mental states in the MASC than TD and CP/LCU boys. There were no group differences in the number of mind-related comments as assessed by the mind-mindedness protocol or in responses to the SJT task. These findings suggest that although the ability to represent mental states is intact, CP/HCU boys are less likely to update mental state inferences as a function of different minds.

Keywords

Conduct problems, Callous-unemotional traits, Mentalising, Adolescent males

Introduction

Children with conduct problems (CP) display a range of antisocial behaviours including bullying and manipulation, physical aggression, and violation of societal rules and norms (Frick, 2016). Children with CP have a greater risk of physical and mental health problems, difficulties with personal relationships, as well as reduced employment and increased criminality in adulthood (Frick, 2016; Rivenbark et al., 2018; Wertz et al., 2018). They require more support from specialist education provisions, have increased use of health and social care services, and increased contact with the criminal justice system which creates a significant financial burden for society (D'Amico et al., 2014; Frick, 2016; Scott, Knapp, Henderson, & Maughan, 2001). This has created an impetus for earlier and more targeted intervention strategies to halt the development of CP for the good of the individual and society (Rivenbark et al., 2018; Stellwagen & Kerig, 2013).

Considerable research has demonstrated that children with CP are a heterogeneous group and one way of understanding the heterogeneity of CP behaviours is to consider the role of callous-unemotional (CU) traits (Frick, Ray, Thornton, & Kahn, 2014; Frick & Viding, 2009; Viding & Mccrory, 2015). Those children with CP and high levels of CU (CP/HCU) display a callous lack of remorse and guilt and marked deficits in empathy (Frick et al., 2014; Viding & Mccrory, 2015) and are thought to be at an increased risk of developing psychopathy in adulthood (Frick et al., 2014; Frick & Viding, 2009). Children with CP/HCU not only display impulsive and reactive antisocial actions, but also commit calculated acts of aggression with little regard for other people's feelings (Frick et al., 2014; Blair, Leibenluft, & Pine, 2014; Pardini & Byrd, 2012). In contrast, children with CP and low levels of CU (CP/LCU) do not have pronounced deficits in empathy and remorse and often commit acts of aggression that have clear environmental triggers, such as perceived threat or frustration (Frick & Viding, 2009; Blair et

al., 2014). Measurement of CU traits (termed ‘Limited Prosocial Emotions’) was included in the latest edition of the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5) as a specifier for children with Conduct Disorder (American Psychiatric Association, 2013).

A substantial amount of work has focussed on how children with CP/HCU process emotional signals from others. Children with CP/HCU have been found to have difficulties in processing emotional information, such as, having reduced neural responses when viewing other people in pain (Lockwood et al., 2013), reduced neural and behavioural responses to laughter (O’Nions et al., 2017), and difficulties in responding to and resonating with other people’s fear and sadness (Blair et al., 2014; Frick et al., 2014; Lozier, Cardinale, Van Meter, & Marsh, 2014; Viding et al., 2012). These difficulties, particularly difficulties with resonating with other people’s emotions, might in part explain why children with CP/HCU are able to engage in acts of aggression and violence and why they do not form typical affiliative relationships (Blair et al., 2014; Viding & McCrory, 2019).

Another important aspect of social and emotional processing involves mentalising, which is the ability to understand the thoughts, intentions and feelings of other people (Fonagy & Allison, 2012; Frith & Frith, 2006). Mentalising is essential for all aspects of social interactions, allowing one to consider not only one’s own perspective, but also the various perspectives of others (Choudhury, Blakemore, & Charman, 2006). Several studies have reported that children with CP/HCU are able to make accurate mental state inferences when the mentalising task does not require the participants to consider affective content (Anastassiou-Hadjicharalambous & Warden, 2008; Jones, Happé, Gilbert, Burnett, & Viding, 2010; O’Nions et al., 2014; Schwenck et al., 2012). For example, Jones et al. (2010) found that

CP/HCU children have difficulties with affective resonance, but not with cognitive perspective taking (i.e. mentalising without affective content), with the opposite pattern reported for children on the autism spectrum. Children with CP/LCU did not differ from TD peers on either affective resonance or cognitive perspective taking in this study. Other studies have reported similarly spared ability in making mental state inferences when children with CP/HCU are not required to mentalise about emotions (Anastassiou-Hadjicharalambous & Warden, 2008; Schwenck et al., 2012). Additionally, O’Nions et al. (2014) reported that children with CP/HCU show recruitment of similar brain regions to TD peers when required to process scenarios that require mentalising, but which do not have affective content, whereas children on the autism spectrum show reduced activity in brain regions associated with mentalising compared with TD peers. This pattern of findings makes sense in the light of what is known about the behaviour of children with CP/HCU. They are able to successfully manipulate others for personal gain, which would not be possible without the ability to mentalise, however, they display clear deficits resonating with others’ feelings.

Although the basic ability to mentalise has been found to be intact, behaviours of children with CP/HCU suggest that they have a reduced propensity to mentalise (Viding & McCrory, 2019). They tend to be more self-focused and can aggress even when someone is showing distress, especially if they stand to gain something (Jones et al., 2010; Pardini, Lochman, & Frick, 2003). A recent study by Drayton et al. (2018) has found that adult psychopaths can deliberately take the perspective of others, which may help them to manipulate others, but do not always spontaneously do so. Drayton et al. (2018) proposed that this pattern of functioning may enable individuals with psychopathy to avoid processing the emotional consequences of their antisocial behaviour towards other people or even orienting to other people’s needs in the first place. It seems that individuals with psychopathy can take on the perspective of others when it

helps them achieve a goal but ignore it when it is not useful to them. In other words, part of the reason why individuals with psychopathy (or at risk of developing psychopathy) may so readily be able to prioritise ‘looking after number one’ could be due to their reduced tendency to consider other minds and/or make mental state inferences, while having the cognitive machinery to do so when it serves their own needs (Drayton et al., 2018).

The aim of the current study was to assess mentalising using three different tasks. We administered the Movie Assessment of Social Cognition (MASC) which asks participants to assess characters’ mental states after watching them interacting in a video (Dziobek et al., 2006). This task was selected as it presents a variety of information and cues (social, verbal, physical) and participants are asked to make assessments of thoughts, feelings, and intentions in ‘real-time’, similar to what one might encounter in real-life interactions with others (Sharp et al., 2011). It is thought to assess the ability/propensity to incorporate judgements about the protagonists’ minds into inferences about their mental states (e.g., whether one updates one’s estimate of the likelihood a character will be suspicious of another character based on whether the former character is thought to be paranoid or easy-going; Conway, Catmur, & Bird, 2019; Conway, Coll, et al., 2020). The MASC has previously been administered to a small sample of children with behaviour problems in a mainstream school (Körner, Chuleva, & Clausen, 2009). In this study, behaviour problems were associated with a reduced number of correct mentalising responses, however the rating of behaviour problems was limited to teacher reports on a single measure and no quantification of CU traits was provided (Körner et al., 2009). We also asked children to complete a standardised mind-mindedness task, which assesses the tendency to think about the minds of peers that are relevant to the participant. This task requires the participants to spontaneously describe a good friend, with no restrictions or limitations on their description. Previous research has found that young adults are more likely to make mind-

related comments about someone they know personally, rather than a stranger, with intimacy providing greater knowledge of and ease of access to the person's mental states (Meins, Fernyhough, & Harris-Waller, 2014). Children with CP/HCU may not be motivated to mentalise about strangers unless they can personally gain something out of it, however it may be less effortful and more instrumentally useful for them to consider the minds of peers that they regularly interact with. Finally, we administered the Social Judgement Task (SJT), an illustrated mentalising task that asked the participants to report what other children would think about them, if they engaged in a negative interaction with a fictional peer. The negative interaction scenarios in the SJT were developed to assess whether acting antisocially may be, in part, explained by difficulty in accurately predicting how the antisocial acts are viewed by others. This task provides insight into whether children with CP/HCU can infer what other people, specifically peers, think when they engage in social transgressions against others. The participants are also asked to report on the likelihood of committing acts described in the scenarios, providing a possible index of acting antisocially, despite knowing how it is viewed by others. Some previous cross-sectional research has found higher mean levels of CU traits in older adolescents (Essau, Sasagawa, & Frick, 2006), although this is not evident in longitudinal data (Pardini & Loeber, 2008). However, to ensure that age differences were not accounting for the findings, the groups were matched on age, with comparable representation across the age bands of the sample.

We chose to focus on groups of boys with CP/HCU and CP/LCU instead of conducting continuous analyses for the following reasons: 1) Effects of having distinct subgroups of children with CP as divided on CU traits do not often emerge as interactions and can instead lead to suppressor effects in correlational analyses (Frick, 2012); 2) We know that bivariate normality does not apply to CP and CU distributions where high CU traits almost invariably

denote high levels of CP, but not the other way around (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011). Dichotomizing leads to reduction of power in the case of bivariate normality (Cohen, 1983), but we know that bivariate normality does not apply to CU traits and CP; 3) The median split approach has, in the past, successfully delineated groups of children with CP who have different cognitive-affective processing patterns – often in a manner that would lead to the two groups cancelling each other out if pooled into a single CP group for comparison with typically developing children, or which do not necessarily emerge in dimensional analysis in community samples that represent the whole spectrum of scores. The child/group centric analyses also make it easier to interpret the translational relevance of findings, which is more challenging when examining potential suppressor effects.

Although experimental findings indicate that individuals with or at risk of developing psychopathy have an intact ability to represent other minds (Anastassiou-Hadjicharalambous & Warden, 2008; Jones et al., 2010; O’Nions et al., 2014; Schwenck et al., 2012), their behaviour suggests a reduced propensity to consider others. At the cognitive level this may manifest as: i) a reduced ability/propensity to incorporate mind type into mental state inference (as assessed by the MASC); ii) a reduced propensity to represent the minds of others (as indexed by the Mind Mindedness task); or iii) reduced ability to infer what other people think about them when they engage in social transgressions (as assessed by the SJT). The purpose of this study was to investigate each of these possibilities.

Method

Participants

Families were recruited from the community in the greater London area, via newspaper advertisements and from mainstream schools and schools who provide alternative education

for children with behavioural difficulties. One hundred and fifty-eight families were screened for participation. Sixty-nine families did not participate (57 did not meet study criteria; 6 CP and 3 TD families had scheduling problems; 1 CP and 2 TD children refused to participate). Eighty-nine families were included in the main study, however, 8 children refused to take part in the mentalising tasks which left a total of 81 boys (aged 11-16 years) in the study. There was no significant difference in child age between participants and non-participants (age obtained at screening), $t(156) = 1.172, p = 0.243$. Participant characteristics are displayed in Table 1. The research was approved by the University College London Research Ethics Committee (Project ID number: 0622/001). Parents/caregivers and the boys were provided with information sheets outlining the details of the study and were given an opportunity to ask questions and seek clarification regarding their participation. Parents/caregivers provided written informed consent and written assent to participate was obtained from all boys. An experienced clinician provided training to researchers beforehand on how to sensitively work with boys with CP and their families. Exclusion criteria for child participants included a formal diagnosis of autism spectrum disorder, any reported neurological disorder, use of prescription medication for behavioural difficulties, and cognitive ability of <70 on a standardised cognitive assessment. Parent/caregivers were not subjected to any exclusion criteria. All families were provided with a £50 honorarium to cover travel expenses and lunch.

Table 1. Demographic data

Characteristics and questionnaires	TD controls (n=27)			CP/LCU (n=26)			CP/HCU (n=28)			p value ^a	Post hoc*
	Mean	S.D.	(Min-Max)	Mean	S.D.	(Min-Max)	Mean	S.D.	(Min-Max)		
Child age (years) ^b	14.37	1.43	(11-16)	14.57	1.65	(11-16)	14.71	1.23	(12-16)	0.678	
Child IQ (full score, two-subtest WASI) ^c	91.48	11.45	(72-122)	93.46	12.63	(70-118)	88.70	11.11	(76-113)	0.338	
Child ethnicity ^{b,f}	16:4:7			8:4:14			20:3:5			0.033	
SES ^b	2.84	1.22	(1-5.5)	3.12	1.18	(1.25-5)	3.38	1.17	(1.5-5.5)	0.079	
ICU ^d	25.74	6.04	(13-38)	33.46	6.76	(15-42)	49.32	5.68	(43-63)	0.000	1<2<3
CASI Conduct disorder ^d	0.78	0.75	(0-2)	6.12	2.88	(3-15)	13.36	6.52	(4-31)	0.000	1<2<3
CASI Attention deficit hyperactivity disorder ^e	12.4	9.36	(1-38)	24.17	12.27	(2-47)	28.56	12.55	(6-52)	0.000	1<2<3
CASI Generalised anxiety disorder ^e	4.77	4.49	(0-18)	6.81	3.86	(0-15)	10.19	4.56	(1-19)	0.000	1/2<3
CASI Major depressive episode ^e	3.48	2.41	(2-13)	5.69	4.27	(2-17)	8.46	4.61	(2-19)	0.000	1/2<3
(BES) Cognitive empathy ^e	35.55	3.08	(29-39)	35.12	4.70	(23-45)	32.85	5.22	(16-41)	0.061	
(BES) Affective empathy ^e	34.98	4.78	(27-46)	34.16	7.68	(20-49)	29.40	5.31	(22-41)	0.001	1/2<3
(IRI – PT) Perspective taking ^e	14.96	4.14	(5-22)	13.85	5.64	(4-25)	10.89	4.90	(3-22)	0.009	1>3
(AQC) Alexithymia ^e	15.37	6.53	(4-27)	15.49	6.63	(3-28)	14.95	6.81	(2-28)	0.952	

TD = typically developing; CP/LCU = conduct problems and low levels of callous-unemotional traits; CP/HCU = conduct problems and high levels of callous-unemotional traits; S.D. = standard deviation; WASI = Weschler Abbreviated Scale of Intelligence; SES = socio-economic status; ICU = Inventory of Callous-Unemotional Traits; CASI = Child and Adolescent Symptom Inventory; BES = Basic Empathy Scale; IRI-PT = Perspective taking subscale of the Interpersonal Reactivity Index; AQC = Alexithymia Questionnaire for Children *p<0.05, Games-Howell post hoc comparison.

a All p values obtained using Welch ANOVA, except child ethnicity (Chi-square); b Measures obtained at screening phase, parent report; c Measures obtained at testing session, child report; d Measures obtained at screening phase, parent and teacher report; e Measures obtained at testing session, parent report; f White:Black:Mixed/Other

Measures

Screening. Screening questionnaires assessing CP, CU traits, and psychopathology were completed by parents/caregivers and teachers to determine CP/HCU, CP/LCU, and TD groups prior to participation. Screening measures were scored by taking the highest ratings from either the parent or teacher questionnaire for each item (Piacentini, Cohen, & Cohen, 1992). There was a statistically significant, moderate, positive correlation between parent and teacher ratings of CP (CP: $r_s(68) = 0.42, p < 0.001$) and CU (CU: $r_s(68) = 0.49, p < 0.001$). Teacher ratings were unavailable for five boys with CP/HCU, seven boys with CP/LCU and two TD boys.

CP was assessed using the *Child and Adolescent Symptom Inventory* (CASI-4R; Gadow & Sprafkin, 2009) Conduct Disorder scale (CASI-CD), a widely used measure demonstrating good reliability and validity (Sprafkin, Gadow, Salisbury, Schneider, & Loney, 2002). In our sample, the CASI-CD had a good level of internal consistency as determined by a Cronbach's alpha of 0.83. Inclusion for the CP group required that the CASI-CD score met either parent or teacher severity cut-off (parent report = 4+ (ages 10–12) and 3+ (ages 13–16) or teacher report = 3+ (ages 10–12), 4+ (ages 13–14), and 6+ (ages 15–16)). These scores are associated with a clinical diagnosis of conduct disorder (Gadow & Sprafkin, 1998). Fifty-four boys meeting the screening criteria for CP were recruited for this study.

CU traits were assessed using the *Inventory of Callous-Unemotional Traits*, which has been found to have good reliability and validity (ICU; Essau et al., 2006). In our sample, the ICU had a high level of internal consistency as determined by a Cronbach's alpha of 0.92. Boys meeting CP criteria were assigned to CP/HCU and CP/LCU groups based on a median split of the ICU scores. Twenty-six boys met CP/LCU criteria with ICU scores less than or equal to 42

and twenty-eight boys met criteria for CP/HCU with ICU scores greater than 42. Other studies employing the median split approach to assign boys with conduct problems into CP/HCU and CP/LCU groups have reported median scores of the ICU ranging from 30 to 42 (Hodsoll, Lavie, & Viding, 2014; Jones et al., 2010; Martin-Key, Brown, & Fairchild, 2017; O’Nions et al., 2017; Roberts, McCrory, Joffe, De Lima, & Viding, 2018; Schwenck et al., 2012; Sebastian et al., 2016; Sethi, O’Nions, McCrory, Bird, & Viding, 2018) and a recent study has suggested that a score of 41 may represent a clinically meaningful cut-off for HCU (Docherty, Boxer, Huesmann, O’Brien & Bushman, 2017). The median split of 42 in the current study is thus higher than or comparable to median split scores in previous research and designates a group of children with extreme CU scores within clinically significant range (estimated to be within the top 5% of the population).

The *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997) was used to screen for emotional and behavioural difficulties in the control participants. Twenty-seven boys met screening criteria for inclusion in the TD group, scoring ≤ 2 on the CASI-CD, ≤ 38 on CU traits, and less than 17 on the SDQ Total Difficulties subscale (outside the abnormal range as per SDQ scoring norms; Youth in Mind, 2016), not meeting exclusion criteria.

Movie Assessment of Social Cognition (MASC; Dziobek et al., 2006). The MASC is a video-based assessment of mentalising. Participants viewed four characters (young adults, two males and two females, from White ethnic backgrounds) making arrangements to meet up for dinner. The video is divided into short segments and at the end of each segment participants were presented with a multiple-choice question asking them to infer the mental state of one of the characters. The task required participants to attend to verbal, social, and physical cues from the characters as one might typically do in real-life interactions (Sharp et al., 2011). The video

was presented on a Dell laptop using Psychopy software (Peirce, 2007). Participants selected one of four response options on the computer keypad and were given as much time as needed to consider their response. In line with previous studies (Feyerabend et al., 2018; Newbury-Helps, Feigenbaum, & Fonagy, 2017), items were grouped into questions that assessed characters 'intentions' or cognitive mentalising (e.g. Why is Sandra saying this?; nine items) and questions that assessed the 'feelings' of characters or affective mentalising (e.g. What is Betty feeling?; eight items). Three control questions asking participants about details of the scene (e.g. How many adults were in the scene?) were also included to ensure that participants paid attention to the task.

As it is difficult to keep children with CP engaged in lengthy assessments, the original task was shortened from forty-five questions (plus 5 non-social control questions) to 17 questions (plus 3 non-social control questions). This decision was made based on analysis of a large corpus of published and unpublished data indicating that the total score after 17 questions was correlated approximately 0.8 with the total score based on 45 questions (Shah, Catmur, & Bird, 2017). In this sample, Cronbach's alpha for the shortened version of the task was 0.62.

Mind-Mindedness (Meins & Fernyhough, 2015). Mind-mindedness was assessed via participants' hand-written descriptions of a person they considered to be a good friend (Meins, Fernyhough, Johnson, & Lidstone, 2006). Using methods developed for older children, participants were asked to describe their close friend with open-ended, written responses to the following question: *Please describe your good friend - no specific type of description is required, you should just write whatever comes into your head* (Meins et al., 2006; Meins, Harris-Waller, & Lloyd, 2008). Participants were not restricted in the length of their description or the time it took to complete their response. The text was divided into

segments and coded using the following exhaustive and exclusive categories: *Mind-minded* (referencing feelings, emotions, intellect, or mental states of the person being described); *Behavioural* (referencing activities, behaviours, or interactions that were behavioural in nature); *Physical* (referencing physical attributes, including age); and *General* (comments not belonging to any of the previous categories, such as length of friendship; or ambiguous statements, such as: 'he's great') as detailed in the Mind-Mindedness Coding Manual (Meins & Fernyhough, 2015). Higher numbers of mind-related comments indicated greater mind-mindedness. Although mind-minded descriptions are not typically analysed for affective content, for the purposes of this paper, mind-minded comments were further categorised as being affective if they were referencing their friend's feelings or emotions.

Social Judgement Task (SJT). The SJT is a cartoon measure assessing child perception of their peers' point of view about antisocial interactions. Participants were presented with a series of five illustrated stories and asked to imagine that they have engaged in an instrumental antisocial interaction with a fictional peer (all fictional peers were depicted as adolescent males from Black and White ethnic backgrounds). They were given three multiple choice options: (1) other children would find the interaction acceptable, (2) other children would find the interaction unacceptable, or (3) a socially naive response not focussed on the interaction. Participants were specifically directed to mentalise in this task, by imagining themselves as the main character in the story and then thinking about what their peers would think about them following the interaction. The task was not designed to assess any affective aspects of mentalising (participants were asked what peers would think about them, rather than how peers would feel about them). The five antisocial scenarios were presented alongside 'filler scenarios' (three positive and two neutral scenarios) in a pseudorandomised order. The 'filler scenarios' were included to avoid the possibility of participants making automated

computations about social norms, so that the participants had to consider each scenario individually. However, the antisocial scenarios were the focus of this task. This task was validated on a sample of 186 children from a mainstream secondary school in the Greater London area. The antisocial interactions were found to have good internal consistency ($\alpha = 0.81$) and good construct validity as demonstrated by correlations between ‘belief that peers would say negative interactions are acceptable’ and CP ($r_s(178) = 0.18, p < 0.05$) and CU ($r_s(175) = 0.24, p < 0.001$). Full details of the development and validation of the SJT and an example of an antisocial scenario can be found in Online resource 1.

Additional measures. Boys completed the *Wechsler Abbreviated Scale of Intelligence* (WASI; Wechsler, 1999) two-subtest version to assess cognitive ability. Parents/caregivers provided information about parental education (scored using the six output categories for educational attainment from the Office of National Statistics, 2004) and employment (scored using the Office of National Statistics occupational coding tool: https://onsdigital.github.io/dp-classification-tools/standard-occupational-classification/ONS_SOC_occupation_coding_tool.html) to determine family socio-economic status (SES). Parents/caregivers completed the CASI-4R scales for attention deficit hyperactivity disorder (ADHD), generalised anxiety disorder (GAD), and major depressive episode (MDE) to assess for commonly occurring comorbidities with CP. The CASI-4R subscales were found to have good internal consistency in this sample (CASI-ADHD $\alpha = 0.96$; CASI-GAD $\alpha = 0.86$; CASI-MDE $\alpha = 0.84$). To assess features that might explain mentalising differences between groups, we obtained participants’ self-reported affective and cognitive empathy using the Basic Empathy Scale (BES; Jolliffe & Farrington, 2006), perspective taking using items from the Interpersonal Reactivity Index (IRI-PT; Davis, 1980), and alexithymic traits using the Alexithymia Questionnaire for Children (AQC; Rieffe, Oosterveld, & Terwogt,

2006). Good internal consistency was found for the BES, IRI-PT and AQC in this sample (BES affective $\alpha = 0.82$; BES cognitive $\alpha = 0.79$; IRI-PT $\alpha = 0.76$; AQC $\alpha = 0.77$). See Table 1 for details of the measures reported here.

Procedure

Participants completed all assessments in a quiet testing room at University College London. Participants completed assessments independently from their parents/caregivers to ensure their responses were confidential. As child participants could not be left unattended, a researcher was on hand to answer questions. The researcher monitored compliance on all tasks. Participants watched the video using noise cancelling headphones to help minimise distraction.

Statistics

Demographics. To examine the demographic characteristics of the groups, a one-way Welch ANOVA was computed to compare differences between the means for age, IQ, traits, CASI CD, ADHD, GAD, and MDE subscales, BES, IRI-PT, AQC, and family SES. Games-Howell post hoc analyses were conducted to examine differences between groups on the demographic variables. Chi-square was computed to compare groups on ethnicity. To further examine age matching within the three groups of participants, age was grouped into three bands: 11-12 years (TD $n = 4$; CP/LCU $n = 5$, CP/HCU $n = 2$), 13-14 years (TD $n = 12$; CP/LCU $n = 10$, CP/HCU $n = 12$), and 15-16 years (TD $n = 11$; CP/LCU $n = 11$, CP/HCU $n = 14$). Chi-square was computed to compare groups on the three age bands. A one-way Welch ANOVA was computed to compare differences in mean CU scores for the three age bands.

MASC. A one-way ANOVA was computed to determine if the groups differed on the ‘feelings’ (affective mentalising) and ‘intentions’ (cognitive mentalising) questions and control questions. Where overall significant group differences were found, Tukey’s post hoc analyses were computed to examine the differences between groups. Cohen’s *d* was computed to quantify the difference between the groups. Analysis of covariance (ANCOVA) was computed to control for all variables that were correlated with MASC performance or group status, which included ADHD, GAD, MDE, BES cognitive, BES affective, and IRI-PT.

Mind-Mindedness. Prior to conducting analysis, data entry was checked for accuracy and completeness. Any identifiable information was removed. Data was segmented into statements prior to coding. The entire data set was double coded by two raters who were masked to the participant group status. Cohen’s Kappa revealed a ‘substantial’ agreement between raters, $\kappa = 0.824$ (Landis & Koch, 1977). To control for group differences in verbosity, scores were computed as a percentage of the total number of statements (Meins & Fernyhough, 2015). A one-way ANOVA was computed to determine if the groups differed on any of the coding categories, as well as the number of affective mind-minded comments. Pearson chi-square was computed to determine if the groups differed on the percentage of mind-minded descriptions.

SJT. The number of acceptable, not acceptable and neutral responses to the five antisocial scenarios was computed for each participant. The scores for each scenario were binomially distributed (e.g. acceptable or not; not acceptable or not; neutral or not) so a generalized linear model was computed to ascertain the effect of group on the odds of thinking that other children would find the behaviour acceptable, unacceptable, or neutral. The generalised linear model assumes the odds of a subject saying something is acceptable (or not acceptable, or neutral) is the same across all five scenarios. To check this assumption, Fisher’s exact tests were

computed to see if the groups differed on responding to any of the individual scenarios. ANOVA was computed to determine if the groups differed in terms of their likelihood of committing the described antisocial interactions.

Data was examined for suitability for ANOVA prior to each analysis. Boxplots were used to assess for outliers, normal distribution of data for each group was assessed by Shapiro-Wilk test, and Levene's test was used to assess homogeneity of variance.

Results

Demographics

Demographic information is presented in Table 1. No differences were found between groups on age, IQ, or SES. The groups differed on ethnicity, with the CP/LCU having fewer boys from white backgrounds and more boys from mixed ethnic backgrounds than the TD and CP/HCU groups. The CP/HCU and CP/LCU had significantly higher ADHD scores than the TD group, but the two CP groups did not differ significantly from each other. The CP/HCU group had significantly higher levels of anxiety and depression than the TD and CP/LCU groups who did not differ on anxiety and depression. The CP/HCU group had significantly lower levels of affective empathy (as measured by the BES) and perspective taking (as measured by the IRI-PT) than the TD and CP/LCU groups, who did not differ on these measures. There were no statistically significant group differences on cognitive empathy (as measured by the BES) or alexithymia (as measured by the AQC). However, the group difference in the cognitive empathy score (as measured by the BES) did approach significance ($p < .06$) and CP/HCU had the lowest level of cognitive empathy across the groups. No differences were found between groups on the three age bands (i.e. 11-12 years, 13-14 years, 15-16 years) $X^2(4) = 1.92, p =$

0.75. There were no significant differences in CU scores across the three age bands $F(2, 78) = 1.48, p = 0.233$.

MASC

“Intentions” vs “Feelings”. There was an overall group difference on the mean proportion of correctly identified ‘intentions’ questions, $F(2, 78) = 5.448, p = 0.006$, (TD $M = 0.70$; CP/LCU $M = 0.67$; CP/HCU $M = 0.52$). Post hoc analysis revealed statistically significant differences between CP/HCU and TD groups, with a large effect size ($p = 0.009; d = 0.853$) and between CP/HCU and CP/LCU groups, with medium effect size ($p = 0.029; d = 0.671$). The groups did not differ significantly on the ‘feelings’ questions, $F(2, 78) = 0.737, p = 0.482$, (TD $M = 0.57$; CP/LCU $M = 0.56$; CP/HCU $M = 0.52$), but it appeared that all groups struggled with the ‘feelings’ items, ranging from 52-57% correct on these items.

Control questions. The three groups did not differ significantly on the three control questions, $F(2, 78) = 0.75, p = 0.475$. All groups performed well on the control questions (TD $M = 2.70$; CP/LCU $M = 2.54$; CP/HCU $M = 2.50$) indicating good attention to the task.

Covariate analysis. We examined how group membership, child characteristics and task performance related to each other using Spearman’s Rho correlation analysis (See electronic supplementary material Table 1). We then ran an ANCOVA entering all of the child variables that correlated with the MASC performance or group status (ADHD, GAD, MDE, BES cognitive, BES affective and IRI-PT). This analysis showed that the effect of group on MASC ‘intentions’ was no longer statistically significant after adjusting for BES cognitive $F(2, 76) = 2.879, p = 0.062$.

Mind-Mindedness

There was an overall group difference on total number of statements, $F(2, 78) = 3.358, p = 0.040$, (TD $M = 4.52$; CP/LCU $M = 3.43$; CP/HCU $M = 3.54$), however post hoc analyses revealed no significant difference between any of the three groups. To control for verbosity, scores for each category were computed as a percentage of the total number of statements. No differences were found between groups on mind-minded descriptions of close friends, $F(2, 78) = 1.063, p = 0.351$; on affective mind-minded descriptions, $F(2, 57) = 0.447, p = 0.642$; on behavioural descriptions, $F(2, 78) = 0.838, p = 0.436$; on physical descriptions, $F(2, 78) = 2.557, p = 0.084$; and on general descriptions, $F(2, 78) = 0.899, p = 0.411$. No differences were found between groups on the number of participants who generated no mind-minded descriptions of their friend, $\chi^2(2) = 2.906, p = 0.234$.

SJT

Results did not reveal any group differences for any of the individual antisocial interaction scenarios (Table 2), which meant that we were able to group these items for analysis. As detailed in Table 3, there was no effect of group on responses to the antisocial interaction scenarios (i.e. group was not affecting the likelihood of indicating that peers would find the antisocial scenario acceptable, unacceptable, or neutral). Groups did not differ on likelihood of committing the described negative actions, $F(2, 75) = 1.845, p = 0.165$, (TD $M = 8.148$; CP/LCU $M = 9.76$; CP/HCU $M = 10.15$).

Table 2. Fisher's exact (and item counts) for acceptable, not acceptable, and neutral responses on the five 'negative' SJT scenarios by group

	Scenario one (Queue)			Scenario two (Crisps)			Scenario three (Art)			Scenario four (Fun fair)			Scenario five (Treats)		
	Acceptable	Not Acceptable	Neutral	Acceptable	Not Acceptable	Neutral	Acceptable	Not Acceptable	Neutral	Acceptable	Not Acceptable	Neutral	Acceptable	Not Acceptable	Neutral
TD	2	17	7	12	14	0	4	21	2	12	11	4	2	21	4
CP/LCU	2	19	3	7	15	3	4	19	2	16	9	0	3	21	1
CP/HCU	2	22	3	11	13	3	5	20	2	17	9	1	1	24	2
	Total = 77 $p = 0.163$			Total = 78 $p = 0.307$			Total = 79 $p = 1.00$			Total = 79 $p = 0.235$			Total = 79 $p = 0.575$		

Table 3. Generalised linear model predicting likelihood of beliefs about SJT negative interaction scenarios

	Wald	df	p
Peers would say acceptable ^a	0.150	2	0.928
Peers would say unacceptable ^b	0.076	2	0.963
Peers would say neutral ^c	2.979	2	0.232

1. Goodness of fit (Pearson's X^2 (a: 1.109; b: 1.176; c: 1.141)) did not indicate over dispersion
2. As the distribution of responses was different for scenarios two and four as compared to scenarios one, three, and five (see Table 2), the analysis was repeated excluding scenarios two and four. This did not change the findings; no effect of group on responding (acceptable, unacceptable, or neutral) was found.

Discussion

Boys with CP/HCU had difficulty mentalising (as compared with TD and CP/LCU boys) when they performed a complex, ecologically valid task which indexed the ability/propensity to incorporate judgements about another's mind type into inferences about their mental state (the MASC task). However, they did not differ from TD boys in their propensity to represent the minds of their friends when asked to describe them, or in their ability to understand that other children would think negatively about someone committing antisocial acts. Boys with CP/LCU did not differ from TD boys on performance in any of the three tasks. These findings provide a more nuanced picture of mentalising in boys with CP. Overall, they are in line with prior

studies suggesting an intact ability to mentalise in children with CP, including those with CP/HCU, especially if there is no requirement to consider other people's feelings. These findings also suggest that despite having the ability, boys with CP/HCU may have a reduced propensity to mentalise than their peers. They may only deploy this ability spontaneously if it does not require them to process complex information or if it is of instrumental benefit to themselves.

In line with our hypotheses, boys with CP/HCU had difficulty with the MASC task, in particular with the 'intentions' questions (assessing cognitive mentalising). MASC, unlike most assessments of mentalising, depicts people interacting in real life situations. Task performance depends on the ability/propensity to incorporate information about each character's mind in order to make accurate mental state inferences during an observed 'live' interaction (Conway, Coll, et al., 2020; Dziobek et al., 2006). The effect of group on the 'intentions' questions was no longer significant after adjusting for cognitive empathy (as measured by the BES cognitive scale). Although the groups only showed a trend level difference on BES cognitive empathy, the CP/HCU boys had the lowest scores on this measure and the BES cognitive empathy scale taps into ability/propensity to incorporate information about other people's minds to make accurate mental state inferences. It therefore follows that cognitive empathy would be having effect on correct responding to 'intentions' or cognitive items in the MASC as both are focussed on understanding the perspective of others. CP/HCU children may not be interested in others' minds unless other people are instrumentally valuable, or they have a mind that is vulnerable or easy to manipulate. It could also be that the characteristics of children with CP/HCU mean that they will experience a restricted range of social interactions with other people, which may in turn reduce the number of types of mind to which CP/HCU children are exposed. While CP/HCU boys had clear difficulties with the

‘intentions’ questions in the MASC, they did not significantly differ from TD or CP/LCU participants in spontaneously mentalising about ‘feelings’ (affective mentalising). Although this may seem surprising, it is important to note that all groups had difficulties with the ‘feelings’ questions and it is likely that no group differences emerged because of a floor effect. It would, therefore, be inappropriate to conclude that boys with CP/HCU do well in spontaneously mentalising about feelings (in fact their rate of mentalising about feelings was very similar to their rate of mentalising about intentions). Instead, it appears that adolescent boys from similar SES backgrounds and of similar cognitive ability all show low levels of spontaneous mentalising about emotions.

Boys with CP/HCU showed reduced spontaneous mentalising about the interactions of strangers in the MASC task, but there were no group differences when boys were asked to spontaneously mentalise about a friend. CP/HCU boys appear similar to CP/LCU and TD peers in their propensity to represent friends’ minds. This may be explained by the greater knowledge one has about friends rather than someone with whom there is no personal relationship (Meins et al., 2014). Familiarity makes it easier to represent the mental states of friends. CP/HCU boys may also be more motivated to represent the minds of friends, as understanding friends’ point of view could be instrumentally valuable, if for no other reason than for successful manipulation. It may also be that CP/HCU have a similar mind type to their friends which makes it easier to infer mental states (Conway, Coll, et al., 2020). There were no group differences on affective mind-minded comments, but as was found with the MASC where all groups had difficulty with the ‘feelings’ questions, all groups had low levels of mentalising about their friends’ feelings and emotions. It would, therefore, be inaccurate to conclude that CP/HCU boys are inclined to consider their friends feelings when describing them.

Although the CP/HCU group had difficulty with the MASC task, they had an intact ability to infer the thoughts of others regarding engagement in antisocial actions. Boys with CP/HCU knew just as well as typically developing boys that peers would find antisocial acts unacceptable. This indicates that they can understand what is wrong and more critically how that is perceived by their peers. The SJT task does not require any inference of others' feelings and it may be helpful for future research studies to include an affective component to explore whether group differences occur when children are asked how they might feel if they acted as the antisocial story described or how peers would feel about them if they acted antisocially. Interestingly, CP/HCU boys were not more likely to say they would act antisocially, as described in the story, than their TD or CP/LCU peers. It is instrumentally valuable to consider the thoughts of others with regard to antisocial actions and only execute such actions when the outcome is judged to be sufficiently valuable to discard the displeasure of others. In this case, it may not have been worth discarding the potential displeasure of the researcher given that there was nothing tangible to be gained by reporting that they would be likely to act as the story described. It is not adaptive to act in an antisocial way at all times, as this is likely to preclude taking maximal advantage of someone.

Limitations

A number of limitations should be noted. There is a need to extend the study of spontaneous mentalising in CP/HCU in several ways. We currently have a poor understanding of factors that may impact the degree of mentalising. We need to assess the ability to incorporate inferences as to others' mind into mental state inferences with tasks explicitly designed to do so (Conway, Coll, et al., 2020). Studies are needed that administer measures of social motivation, or which manipulate the instrumental benefits of mentalising, to see how these variables influence performance in tasks of spontaneous mentalising like the MASC. The

findings of the MASC should be interpreted with the understanding that this task is not explicitly designed to isolate mentalising propensity vs ability. There is a need to develop more tasks that sensitively measure individual differences in mentalising and isolate the processes that are involved. These tasks should be administered simultaneously to children with CP/HCU and comparison groups. Although we matched the groups on age, future studies may want to explore how mentalising changes as a function of age in children with CU. An important task for future research will be to consider the role of trauma and anxiety when assessing affective responses in children with CU as recent research has found differential responses to affective stimuli in children with high levels of trauma/anxiety and high levels of CU (Meffert et al., 2018). Finally, we only assessed boys and it will be important to see whether these difficulties extend to girls with CP/HCU.

Conclusions

This study has the advantage of examining mentalising in three different ways which allows for refinement of understanding of mentalising in boys with CP/HCU. Overall, our findings suggest that boys with CP/HCU can successfully represent mental states when doing so does not require processing of complex information or when there is some potential instrumental advantage. They may find it easier or be more motivated to mentalise about peers or people their own age, as mentalising about peers typically has instrumental value. Although the capacity to mentalise is intact, which is necessary to be able to manipulate others, the reduced propensity to incorporate the mind of the other into mental state inference may allow CP/HCU boys to ignore the negative emotional consequences of their antisocial behaviour. This warrants further investigation with experimental tasks that vary the mind type and motivational context.

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CHAPTER FOUR: Thinking about the child's mind: mental state inference in parents/caregivers of children with conduct problems and callous-unemotional traits

4.1 Introduction

The ability to understand the thoughts, intentions and feelings of others is essential for all aspects of social interactions, allowing one to consider not only one's own perspective, but also the various perspectives of others (Choudhury, Blakemore, & Charman, 2006). Although children with CP/HCU have been found to have an intact ability to represent the minds of others, their actions suggest that they have a reduced propensity to consider the thoughts and feelings of others. In Chapter 3 we demonstrated that when compared with TD and CP/LCU groups, children with CP/HCU had more difficulty in accurately inferring the mental states of others as assessed by the MASC task. This could be due to difficulty in processing a complex range of social, verbal and physical cues as presented in 'live' interactions in this task or there being no tangible advantage in understanding the mind types of fictional characters. There were no group differences in children's propensity to represent friends' mind as assessed in the mind-mindedness task, and there were no group differences in the ability to infer the thoughts of others as assessed by the SJT. These findings suggest that it may be instrumentally valuable to be able to understand the minds of friends and how others view antisocial interactions, if for no other reason than to allow for successful manipulation of people and situations. The same motivational factors might not be at play when performing a task where complex social information about others needs to be monitored and inferred and when doing so does not confer benefits to self. The findings reported in Chapter 3 suggest that children can represent others' mental states when doing so does not require processing of complex information or when it provides an instrumental advantage. Although the ability to

mentalise, which is required for successful manipulation, is intact, the reduced propensity to consider the minds of others may allow CP/HCU children to ignore the negative fallout of their actions.

Mental state inference in parents/caregivers of CP children

While substantial research has focussed on the ability, and more recently propensity, of mentalising in children with CP/HCU, relatively little is known about mentalising ability in parents/caregivers of children with CP. A handful of studies have explored mind-mindedness in parents/caregivers of children with CP. Mind-mindedness indexes parents' tendency to consider their child beyond their basic needs, as an individual with a unique mind of their own (Meins, 1999, 2013). When children feel that their thoughts and feelings are being considered, they feel trust and security in their parental relationship (McMahon & Bernier, 2017). Maternal mind-mindedness in infancy has been shown to be a predictor of secure attachment, language and cognitive development, and child theory of mind (McMahon & Bernier, 2017; Meins, Fernyhough, Arnott, Leekam, & De Rosnay, 2013; Zeegers et al., 2018). Studies have shown negative associations between attuned maternal mind-mindedness in infancy and child behaviour problems in early childhood (Camisasca, Miragoli, Ionio, Milani, & Di Blasio, 2018; Meins, Centifanti, Fernyhough, & Fishburn, 2013). Low and non-attuned parental mind-mindedness was found to predict externalising behaviour in childhood (Colonnesi, Zeegers, Majdandžić, van Steensel, & Bögels, 2019; Hughes, Aldercotte, & Foley, 2017). A recent study by Centifanti, Meins & Fernyhough (2016) found that even after controlling for externalising behaviour, appropriate mind-mindedness in infancy was shown to predict lower CU traits at age 10 by way of increased emotional understanding in the child at age 4. Mothers' appropriate/attuned mind-mindedness is thought to promote children's considerations of other's emotions (Centifanti et al., 2016).

In addition to being able to represent the mind of their child, parental accuracy in representing the child's mental state is thought to provide the child with the necessary scaffolding to develop effective social-cognitive strategies (Sharp, Fonagy, & Goodyer, 2006). Sharp et al. (2006) developed a paradigm to assess maternal accuracy in predicting children's responses to uncomfortable peer-related scenarios. Low maternal accuracy was linked to increased ratings of child emotional and behaviour problems by the mother and higher self-reports of depression by the child, independent of gender and IQ (Sharp et al., 2006). Using the same paradigm, Ha, Sharp & Goodyer (2011) found that reduced maternal accuracy was related to current child conduct problems, but it did not predict the development of conduct problems one year later. The authors suggest that parental mentalising about children's minds may be a function of the relationship with the child and will therefore change over time as the child matures (Ha et al., 2011).

The current study

While less attuned and lower levels of parental mentalising have been associated with child behaviour problems, these studies have not, as a rule, considered the possibility that parent mentalising might not only reflect an environmental risk factor for behavioural problems, but may also index family level socio-cognitive vulnerability that can be seen in both children and their parents. The past studies have focused on parental mentalising in infants and young children and have not assessed possible differences in parental mentalising between different groups of children with CP, as compared with TD peers. The aim of the current study was to expand the current evidence base by assessing mentalising in parents/caregivers of CP/HCU, CP/LCU, and TD children and adolescents using three different tasks. We administered the MASC task as it presents a range of social, verbal, and physical cues; participants are required to process this information from watching characters interacting as one might typically do in everyday interactions, in order to assess the characters' mental states (Sharp et

al., 2011). We administered a standardised mind-mindedness task which assesses the tendency of parents/caregivers to think about the mind of their child. This task requires parents/caregivers to spontaneously describe their child, with no restrictions or expectations from researchers about the content of their description. Finally, we administered the maternal accuracy task (Sharp et al., 2011) to assess whether there were differences in accuracy of inferring their child's responses to fictional distressing scenarios.

On the basis of previous literature (Camisasca et al., 2018; Centifanti et al., 2016; Colonnese et al., 2019; Ha et al., 2011; Hughes et al., 2017; Meins, Centifanti, et al., 2013; Sharp et al., 2006) we hypothesized that parents/caregivers of CP children would have lower levels of mind-mindedness and accuracy in mentalising and also predicted that parents/caregivers would have more difficulty assessing characters' mental states as measured by the MASC.

4.2 Method

Participants

Families were recruited from the community in the greater London area via newspaper advertisements and from mainstream and alternative provision schools who cater for children with behavioural difficulties. Participants in the current study were parents/caregivers of CP/HCU, CP/LCU and TD children (who were recruited to participate in a study investigating behavioural and neural correlates of conduct problems in children). Eighty-six parents/caregivers took part (Parents/caregivers of CP/HCU children $n = 27$, parents/caregivers of CP/LCU children $n = 29$, parents/caregivers of TD children $n = 30$). Four parents/caregivers declined to participate but consented for their child to take part (two CP/HCU and two CP/LCU parents) and one parent of a TD child was removed from analysis as their child did not meet study criteria. Parents/caregivers were all mothers or female

caregivers with the exception of two fathers of TD children and one father and one stepfather of CP/HCU children (no male parents/caregivers of CP/LCU children took part).

Parent/caregiver and child characteristics are displayed in mind 4.1. Parents/caregivers were given detailed information sheets describing the study aims and the details of their participation and were given the opportunity to ask questions on any aspect of participation. Written informed consent was obtained prior to participation. The research protocol was approved by the University College London Research Ethics Committee (Project ID number: 0622/001).

Measures

Screening. Parents/caregivers and teachers completed screening questionnaires to assess child CP, CU traits, and child psychopathology for inclusion into the behavioural and neuroimaging study. Screening ratings were used to assign children into CP/HCU, CP/LCU, and TD groups and parents were grouped based on their child's group assignment. Full details of the child screening procedure are presented in Chapter 3. Parents/caregivers were not subject to any screening or exclusion criteria.

Demographic measures. Parents/caregivers provided information about parental education and employment to ascertain socio-economic status (SES) and completed the *Self-Report Psychopathy Short Form* (SRF-SF; Gordts, Uzieblo, Neumann, Van den Bussche, & Rossi, 2017) to assess parent/caregiver psychopathic traits. In the current sample, Cronbach's alpha for the SRP-SF was $\alpha = 0.80$.

Table 4.1 Demographic data

Characteristics and questionnaires	TD controls (n=27)			CP/LCU (n=29)			CP/HCU (n=30)			p value ^a	Post hoc*
	Mean	S.D.	Min-Max	Mean	S.D.	Min-Max	Mean	S.D.	Min-Max		
Child age (years) ^b	14.37	1.43	11.4-16.7	14.52	1.70	11.0-16.9	14.79	1.23	12.5-16.7	0.544	
Child IQ (full score, two-subtest WASI) ^c	91.48	11.45	72-122	92.21	12.98	70-118	89.78	10.41	76-113	0.732	
Child ethnicity ^{b,f}	16:4:7			10:4:15			21:3:6			0.063	
Child ICU ^d	25.74	6.04	13-38	33.24	6.71	15-42	49.10	5.55	43-63	0.000	1<2<3
Child CASI Conduct disorder ^d	0.78	0.75	0-2	6.07	2.74	3-15	13.23	6.34	4-31	0.000	1<2<3
Parent SRP ^e	36.75	6.98	29-54	42.70	9.35	30-59	42.86	9.69	29-68	0.018	1<2/3
SES ^b	2.82	1.23	1.00-5.50	3.24	1.20	1.25-5.00	3.42	1.19	1.50-5.50	0.161	

TD = typically developing; CP/LCU = conduct problems and low levels of callous-unemotional traits; CP/HCU = conduct problems and high levels of callous-unemotional traits; S.D. = standard deviation; WASI = Weschler Abbreviated Scale of Intelligence; SES = socio-economic status; ICU = Inventory of Callous-Unemotional Traits; CASI = Child and Adolescent Symptom Inventory; SRP = Self-report psychopathy scale; *p<0.05, Tukey post hoc comparison.

a All p values obtained using ANOVA, except child ethnicity (Chi-square)

b Measures obtained at screening phase, parent report

c Measures obtained at testing session, child report

d Measures obtained at screening phase, parent and teacher report

e Measures obtained at testing session, parent report

f White:Black:Mixed/Other

Movie Assessment of Social Cognition (MASC; Dziobek et al., 2006). The MASC is a video-based assessment of mentalising in which participants viewed four characters making plans to meet up for dinner. The video is divided into short segments and at the end of each segment participants are asked to infer the mental state of one of the characters by selecting one of four response options to a multiple-choice question. Participants attended to the characters' verbal, social, and physical cues as one might do in everyday interactions (Sharp et al., 2011). The task was presented on a Dell laptop using Psychopy software (Peirce, 2007). In line with previous studies (Feyerabend et al., 2018; Newbury-Helps, Feigenbaum, & Fonagy, 2017), nine items were grouped to assess characters 'intentions' or cognitive mentalising (e.g. Why is Sandra saying this?) and eight items were grouped to assess 'feelings' or affective mentalising (e.g. What is Betty feeling?). Participants also completed three non-mentalising control questions, administered at the start, middle, and end of the task, to ensure that they were paying attention throughout the task.

As discussed in Chapter 3, the MASC task was administered to child participants (as part of the behavioural and neuroimaging study). Because children with CP often find it difficult to stay focussed in lengthy tasks, the task was shortened from forty-five questions (plus 5 non-social control questions) to 17 questions (plus 3 non-social control questions). The decision to shorten the task was based on analysis of a large corpus of published and unpublished data indicating that the total score after 17 questions was correlated approximately 0.8 with the total score based on 45 questions (Shah, Catmur, & Bird, 2017). To ensure consistency, parents/caregivers completed the same, shortened version of the MASC in the current study. In the current parent/caregiver sample, Cronbach's alpha for the shortened version of the task was $\alpha = 0.62$.

Mind-Mindedness (Meins & Fernyhough, 2015). Mind-mindedness was assessed via participants' hand-written descriptions of their child (Meins, Harris-Waller, & Lloyd, 2008). Parents/caregivers were asked to describe their child with open-ended, written responses to the following question: Please describe your child (*'no specific type of description is required, you should just write whatever comes into your head'*) (Meins, Fernyhough, Russell, & Clark-Carter, 2001; Meins et al., 2008).¹ Parents/caregivers were not restricted in the length of their description and were given as much time as they needed to complete their response. Completing written rather than verbal responses was beneficial for our participants as (1) this method allows for answers to be written privately to provide increased anonymity in responding and, (2) this method allowed for participants to take their time and not feel rushed with their responses (Edwards & Holland, 2013). In two cases, the parent was unable to write their response to the question (owing to difficulty with literacy and disability) so their verbal response was written by a trained researcher. The statements were divided into segments and coded into the following exhaustive and exclusive categories: Mind-minded (indexing feelings, emotions, intellect, or mental states of the child); Behavioural (indexing activities, behaviours, or behavioural interactions); Physical (indexing physical attributes of the child, including age); and General (comments not belonging to any of the other categories), as described in the Mind-Mindedness Coding Manual (Meins & Fernyhough, 2015). Higher numbers of mind-related comments indicated greater parental mind-mindedness. The entire data set was double coded by two raters who were masked to parental group status. Cohen's Kappa was revealed a 'substantial' agreement between raters, $\kappa = 0.769$ (Landis & Koch, 1977).

¹ Parent's/caregiver's spontaneous descriptions of their child were coded for mind-related statements in the current chapter to assess parental mind-mindedness. The descriptions of the child were also qualitatively analysed in Chapter 6.

Maternal Accuracy (Sharp et al., 2006). Maternal accuracy was assessed via an illustrated cartoon task (Sharp et al., 2006). The task is comprised of a series of fifteen cartoon scenarios depicting a child character in an uncomfortable social situation with a peer (or peers). Each scenario portrays a different theme (some examples of themes include: ridicule, social exclusion, embarrassment, and peer rejection). During the behavioural and neuroimaging study, children were asked to imagine themselves as the main character who is experiencing an uncomfortable social encounter and select from three multiple-choice options indicating a positive, negative, or neutral response style to the situation. Parents/caregivers were given the same set of fifteen scenarios and were asked to guess how their child responded to each scenario. Parents/caregivers were reminded to think about *how their child would respond*, rather than how they wished their child would respond or how they might respond themselves. A score was computed out of fifteen, indicating how many times the parent and child's responses matched. Higher scores indicated a greater maternal accuracy. In the current parent/caregiver sample, Cronbach's alpha for maternal accuracy task was $\alpha = 0.96$.

Procedure

Parents/caregivers completed all assessments in a quiet testing room at University College London. Parents/caregivers completed assessments independently from their child to ensure their responses were confidential and wore noise cancelling headphones while completing the MASC task to minimise distractions.

Statistics

Demographic characteristics. Analysis of variance (ANOVA) was computed to explore the demographic characteristics of the three parent/caregiver groups on family SES

and parental self-reported psychopathy. Where overall significant group differences were found, Tukey's post hoc analyses were computed to examine the differences between groups.

MASC. A one-way ANOVA was computed to determine if the parents/caregiver groups differed on the 'feelings' (affective mentalising) and 'intentions' (cognitive mentalising) questions. Where overall significant group differences were found, Tukey's post hoc analyses were computed to examine the differences between groups. Cohen's *d* was computed to quantify the difference between the groups. Analysis of covariance (ANCOVA) was computed to control for parental self-reported psychopathy.

Mind-Mindedness. Data entry was checked for accuracy and completeness, and any identifiable information was removed prior to conducting analysis. Data was segmented into statements prior to coding. To control for verbosity, scores were computed as a percentage of the total number of statements (Meins & Fernyhough, 2015). A one-way ANOVA was computed to determine if parents/caregivers of children in the three groups differed on any of the coding categories. Pearson chi-square was computed to determine if there were group differences on the number of parents/caregivers who made no mind-minded statements about their child.

Maternal accuracy. A one-way ANOVA was computed to determine if parents/caregivers of children in the three groups differed on number of matched scenarios. Where overall significant group differences were found, Tukey's post hoc analyses were computed to examine the differences between groups. Cohen's *d* was computed to quantify the difference between the groups.

Data was examined for suitability for ANOVA prior to each analysis. Boxplots were used to assess for outliers, normal distribution of data for each group was assessed by Shapiro-Wilk test, and Levene's test was used to assess homogeneity of variance.

4.3 Results

Demographics

Demographic information is presented in Table 4.1. There were no differences on SES. Parents/caregivers differed significantly on self-reported psychopathy, with parents of TD children having lower levels of self-reported psychopathy than parents/caregivers of CP/HCU and CP/LCU children. Parents/caregivers of CP/HCU children did not differ from parents/caregivers of CP/LCU children on self-reported psychopathy.

MASC

‘Intentions’ vs ‘Feelings’. There was an overall group difference on the mean proportion of correctly identified ‘intentions’ of the characters as completed by parents/caregivers, $F(2, 78) = 4.026, p = 0.022$, (TDp $M = 0.81$; CP/LCU_p $M = 0.82$; CP/HCU_p $M = 0.70$). Post hoc analysis revealed significant differences between parents/caregivers of CP/HCU children and parents/caregivers of TD children, with medium effect size ($p = 0.047; d = 0.62$) and between parents/caregivers of CP/HCU children and parents/caregivers of CP/LCU children, with medium effect size ($p = 0.037; d = 0.67$). Parents/caregivers of TD children did not significantly differ from parents/caregivers of CP/LCU children on the ‘intentions’ items ($p = 0.995; d = 0.03$). (Parents/caregivers did not differ significantly on the ‘feelings’ questions $F(2, 78) = 1.144, p = 0.324$, but all parents/caregivers showed lower mean accuracy on the ‘feelings’ questions than the ‘intentions’ questions (TDp $M = 0.67$; CP/LCU_p $M = 0.64$; CP/HCU_p $M = 0.60$).

Control questions. Parents/caregivers did not differ significantly on the three control questions, $F(2, 75) = 0.77, p = 0.468$. Parents/caregivers showed high levels of accuracy with

the control questions (TDp $M = 0.91$; CP/LCUp $M = 0.87$; CP/HCUp $M = 0.93$) indicating good attention to the task.

Covariate analysis. The effect of group on MASC ‘intentions’ remained significant after adjusting for parental SRP, $F(2, 72) = 6.12, p = 0.004$.

Mind-mindedness

Parents/caregivers did not differ significantly on the number of mind-related comments made about their child, $F(2, 77) = 0.48, p = 0.62$; on behavioural descriptions of their child, $F(2, 77) = 0.75, p = 0.44$; nor on physical descriptions of their child, $F(2, 77) = 0.99, p = 0.38$. Parents/caregivers differed significantly on general descriptions of their child $F(2, 77) = 3.38, p = 0.039$; post hoc analyses revealed parents/caregivers of CP/LCU children made significantly more general descriptions of their child than parents/caregivers of TD children, with a medium effect size ($p = 0.033; d = 0.71$). No differences were found between parents/caregivers of CP/HCU children and parents/caregivers of TD children ($p = 0.614; d = 0.27$), nor between parents/caregivers of CP/HCU and parents/caregivers of CP/LCU children ($p = 0.213; d = 0.44$) on general descriptions of their child. Parents/caregivers did not differ on the number of parents/caregivers who generated no mind-minded descriptions of their friend, $X^2(2) = 0.94, p = 0.62$.

Maternal accuracy

Parents/caregivers did not differ on the number of matched responses with their child on the cartoon scenarios, $F(2, 80) = 0.26, p = 0.771$.

4.4 Discussion

There is a dearth of research examining mentalising in parents/caregivers of children with CP using multiple methods. Less attuned and lowered levels of parental mentalising have been associated with child behaviour problems, however most research to date has only explored parental mentalising in infants and young children and has not considered the role of the child's callous-unemotional traits. The current study addressed these gaps in the literature by assessing mentalising in parents/caregivers of CP/HCU, CP/LCU, and TD children and adolescents using three different tasks. Parents/caregivers of CP/HCU children had difficulty mentalising (as compared to parents/caregivers of TD and CP/LCU children) as indexed by the MASC task, a complex and ecologically valid task which assessed the ability/propensity to incorporate other's mind types into inferences about their mental state. They did not, however, differ from parents/caregivers of TD and CP/LCU children in their propensity to represent the mind of their child as evidenced by similar numbers of mind-related comments about their child. Parents/caregivers of CP/HCU children were also similar to parents/caregivers of TD and CP/LCU children in their degree of accuracy in identifying how their child would respond to uncomfortable social scenarios. These findings suggest that parents/caregivers of CP/HCU have an intact ability to mentalise about their child but may have a reduced propensity to mentalise. They may only deploy this ability spontaneously if there is no requirement to process complex information or when the task is of direct relevance to them (e.g. thinking about their child's mind).

Parents/caregivers of CP/HCU children had difficulty with the 'intentions' questions (assessing cognitive mentalising) in the MASC task. Unlike most assessments of mentalising, the MASC shows characters with well-developed characteristics and motivations.

Performance on the MASC depends on the ability/propensity to incorporate information about the characters' minds in order to make accurate mental state inferences during a 'live'

interaction (Conway et al., 2020; Dziobek et al., 2006). The effect of group on the ‘intentions’ questions remained significant after adjusting for parental self-reported psychopathic traits. Parents/caregivers of CP/LCU children had similar levels of parental self-reported psychopathic traits to parents/caregivers of CP/HCU but did not have similar levels of difficulty with the MASC. Based on these data we are unable to elucidate the cause of the group differences. We can speculate that parents/caregivers of CP/HCU children often experience a great deal of complex negative information regarding their child which may result in a tendency to disengage with complex information in ‘live’ interactions as a protective mechanism. It is also possible that owing to challenges presented by their children, parents/caregivers of CP/HCU children may have a restricted range of social interactions with others which may reduce the number of mind types to which they are exposed. Future studies deploying multiple paradigms that vary in the complexity of social interactions and familiarity of the task protagonists might help shed further light to this issue. Difficulty with the ‘intentions’ items (cognitive mentalising) in the MASC task, observed in parents/caregivers of CP/HCU children, is similar to the difficulty with ‘intentions’ items (cognitive mentalising) observed in CP/HCU children (Chapter 3). Unfortunately, the sample size was too small to allow for a direct comparison of the MASC scores between parents/caregivers and CP/HCU children on this experimental measure, so further investigation of mentalising in CP/HCU children and their parent/caregivers in a larger sample is warranted. Parent/caregiver groups did not differ significantly on the ‘feelings’ questions. It is likely that no group differences emerged due to a floor effect so further investigation of affective mentalising in parents/caregivers of CP children is needed. It is worth noting that although all parents/caregivers showed worse performance with the ‘feelings’ questions than performance on the ‘intentions’ questions, they did better than their children, who were found to be performing close to chance on the ‘feelings’ questions (see

Chapter 3, page 18). This suggests that while the ‘feelings’ questions are more difficult to discern than the ‘intentions’ questions, adolescent boys tend to show low levels of spontaneous mentalising about others’ emotions.

While parents of CP/HCU children showed reduced spontaneous mentalising in the MASC, they were similar to parents of TD and CP/LCU children in the number of mind-related comments they generated when asked to spontaneously mentalise about their child. Although previous research has found that attuned mind-mindedness in infancy predicted reduced CU in childhood (Centifanti et al., 2016) there are several possibilities why parents/caregivers of children with CP/HCU may be mind-minded about their older child/adolescent, as found in this study. As the possibility to control the child decreases during the adolescence, it may be increasingly beneficial to understand their child’s mind and this may be even more important for parents/caregivers of CP/HCU children who may need to evaluate when their child is being superficially charming, to understand possible triggers for violent outbursts, and to attempt to monitor the child’s whereabouts (Hughes, Devine, & Wang, 2018; Muñoz, Pakalniskiene, & Frick, 2011; Roberts, McCrory, Joffe, De Lima, & Viding, 2018). Parents of CP/HCU children may find it easier to spontaneously mentalise about their child in later childhood and adolescence as they have greater knowledge about their child’s mind type and intimacy in the relationship makes it easier to represent their child’s mental state (Ha et al., 2011; Meins, Fernyhough, & Harris-Waller, 2014). It may also be that owing to a shared relationship/environment or unmeasured heritable traits, that parents/caregivers and children have similar mind types, which may make it easier for parents/caregivers to represent their child’s mind type (Conway et al., 2020). Unexpectedly, parents of children with CP/LCU differed from TD parents in the number of general comments they made about their child (more). As this finding did not relate to mind-mindedness and this variable was not the focus of the study, it is not interpreted further.

There were no group differences in the accuracy of parents/caregivers in inferring how their child would respond to uncomfortable social scenarios. Parents of CP/HCU children were just as able as parents of TD and CP/LCU children to accurately predict how their child would react to difficult situations. Parents/caregivers may have greater understanding of how their child has reacted to uncomfortable experiences throughout their childhood and this previous experience may have helped with accuracy in predicting their child's response. There is also an instrumental benefit to parents in being able to accurately predict how their child would respond to difficult situations, if for no other reason than to be able to mitigate their child's negative reaction or distress, which may be particularly important for parents/caregivers of CP/HCU children who are known to be explosive and unpredictable (Hughes et al., 2017; Roberts et al., 2018).

Limitations

There are several limitations worth noting. Parents/caregivers were not subject to any screening criteria and there may be unmeasured factors, such as autistic spectrum disorder or differing levels of empathy or perspective taking, which may have influenced their mentalising ability. This was also a group of highly motivated parents who agreed to take part in a larger behavioural and neuroimaging study with their child so therefore, may not be representative of all parents/caregivers of CP children; future studies may seek to identify patterns of mentalising in parents/caregivers in a larger, fully representative sample, including parents/caregivers with more significant clinical impairments. There was no baseline measure of parental mentalising in infancy or early childhood so future longitudinal research of children with CP/HCU will want to consider how mentalising changes over time. While parents'/caregivers' ability to mentalise was captured across a variety of tasks, it is important that the findings of the MASC be considered with the understanding that this task is not designed to explicitly isolate mentalising ability vs propensity. Further research with

tasks that are designed to isolate propensity to mentalise from the ability to mentalise is needed. The majority of parents/caregivers in this study were mothers or female caregivers and were asked to represent the minds of their sons (given the higher prevalence of CP in males). Future research may want to examine parental mentalising with mothers and fathers (including male and female caregivers) of boys and girls with CP to elucidate how mentalising patterns may differ by sex.

Conclusions

This study presents findings of mentalising in parent/caregivers of TD, CP/LCU and CP/HCU children and adolescents, using three different tasks. Parents/caregivers of CP/HCU children showed reduced mentalising when they were processing complex social information, as assessed by the MASC task. However, parents/caregivers of CP/HCU children were similar in their ability and accuracy in representing the mind of their child as compared to parents/caregivers of CP/LCU and TD children. While accurately representing the mind of their child may help parents/caregivers of CP/HCU predict potential triggers for their child's outbursts, reduced mentalising in certain contexts may allow CP/HCU parents/caregivers to block out negative feedback regarding their child's antisocial actions – but this proposition needs to be investigated empirically. Further research with experimental tasks that index the ability to incorporate others' mind types and vary motivational context in both male and female parents/caregivers is warranted.

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CHAPTER FIVE: Parenting children with conduct problems and callous-unemotional traits: parents' experiences of parenting and children's experiences of being parented

5.1 Introduction

Parenting is thought to play a crucial role in socialisation and the development of guilt and empathy and has received considerable attention as a possible determinant of CP and CU traits (Dadds & Salmon, 2003; Frick, Ray, Thornton, & Kahn, 2014; Kochanska, 1991; Kochanska, Aksan, & Carlson, 2005). Coercive parenting has been associated with the development of CP (Patterson, DeBaryshe, & Ramsey, 1989) while high levels of positive engagement between parent and child have been associated with lower levels of CP (Gardner, Ward, Burton, & Wilson, 2003). A recent systematic review focusing on not just parenting and CP, but also parenting and CU traits, found that both negative and positive aspects of parenting play a role in either increasing or decreasing the risk of developing both CP and CU traits (Waller, Gardner, & Hyde, 2013). In this context, negative parenting refers to harsh, coercive and inconsistent parenting style, whereas positive parenting often refers to warm, sensitive and consistent parenting style.

Negative parenting as a risk factor for CP and CU traits

Although there is a large literature focusing on negative parenting and risk for CP, there is a smaller, but rapidly growing research base investigating the impact of negative parenting on CU traits or whether negative parenting is differentially associated with CP that are accompanied with HCU vs. LCU (Frick, 2016; Frick et al., 2014; Pardini, Hawes, Waller, & Pardini, 2015; Pardini, Lochman, & Powell, 2007; Pasalich, Dadds, Hawes, & Brennan, 2011; Waller et al., 2013; Wootton, Frick, Shelton, & Silverthorn, 1997). Negative parenting, including harsh, coercive and inconsistent discipline, has often been associated with

increased risk of developing CP. Studies examining negative parenting and CU have found that early harsh parenting has been associated with higher levels of CU in adolescence (Frick, Cornell, Barry, Bodin, & Dane, 2003; Pardini et al., 2007). Poor parent-child communication and corporal punishment have also been found to predict higher levels of CU traits (Pardini et al., 2007; Pardini & Loeber, 2008). Findings regarding whether negative parenting is differentially associated with CP/HCU and CP/LCU are sparse. Barker, Oliver, Viding, Salekin & Maughan (2011) reported that children with CP/HCU were more likely to have experienced harsh parenting (as reported by mothers) in early childhood than those with CP/LCU. Muñoz, Pakalniskiene & Frick (2011) found that the parents of children with CP/HCU were less able to monitor their child's whereabouts (as reported by parents) than parents of CP/LCU children's parents. Wootton et al. (1997) focused on the degree to which negative parenting (as reported by parents) was associated with the level of CP among children with HCU vs. those with LCU. Although both groups reported elevated levels of negative parenting, only the CP/LCU group showed a dose response relationship between the degree of negative parenting and CP. It has been proposed that owing to a reduced responsivity to punishment cues, CP/HCU children are less responsive to parental discipline and teaching of social norms (Dadds & Salmon, 2003; Hawes, Price, & Dadds, 2014). This might explain the lack of dose response relationship between negative parenting and degree of CP in the CP/HCU group, despite the fact that this group does receive negative parenting, likely in response to their high rates of difficult behaviour and resistance to sanctions.

Positive parenting as a risk factor for CP and CU traits

The protective role of positive parenting in reducing the likelihood of CP has also received considerable attention (Frick, 2016; Pardini et al., 2015). There is also a growing body of evidence examining the impact of positive parenting on CU traits or whether positive parenting is differentially associated with CP that are accompanied with HCU vs. LCU. It has

been proposed that warm parent child relationship may help promote development of empathy and internalising of social norms and help children to regulate their behaviour (Frick et al., 2014; Pasalich et al., 2011; Waller et al., 2015). Higher levels of positive parenting have been associated with reduced CU traits in children (Pasalich et al., 2012; Waller et al., 2013; Waller, Hyde, Klump, & Burt, 2018), whilst lower levels of positive parenting, such as low parental warmth (as reported by the child), have been found to predict increases in CU traits in children (Pardini et al., 2007). High levels of parental involvement were found to predict reduced levels of CU traits in boys (Hawes, Dadds, Frost, & Hasking, 2011). High levels of positive parenting and parental warmth (as reported by the parent) have also been associated with lower levels of CP in boys high on CU traits (Muratori et al., 2016; Pasalich et al., 2011).

Recent genetically informative work has shown that warm and consistent parenting can buffer the heritable risk for CU traits. A large adoption study found that antisocial behaviour in biological mothers predicted CU traits in their children, however, positive parenting by adoptive mothers protected against the inherited risk of CU traits (Hyde et al., 2016). Another study by the same group found that fearlessness and low affiliative behaviour in biological mothers predicted child CU traits, however, positive parenting provided by adoptive mothers protected against the development of CU traits resulting from biological mothers' fearlessness (Waller et al., 2016). In line with this adoption research, a recent twin study reported that the heritability of CU traits was moderated by the degree of warm parenting (as reported by the mother), finding lower heritability estimates for CU traits for those children receiving more warm parenting (Henry et al., 2018).

Bidirectional associations between child characteristics and parenting

It is important to consider that CP and CU traits in the child may also evoke poor parenting practices as a reaction to the child behaviour (evocative gene-environment correlation) (Moffitt, 2005; Viding & McCrory, 2018). In line with this notion, longitudinal research has found that CU traits in children are associated with later inconsistent discipline, decreased parental involvement and increased corporal punishment (as reported by the parent) (Hawes et al., 2011). Longitudinal research has also shown that parents of children with high levels CU traits report low levels of parental involvement and high levels of parental distress (as reported by the parent) as compared to children with moderate to low levels of CU traits (Fanti & Munoz Centifanti, 2014). Longitudinal data indicate that high levels of child CU traits are associated with reduced parental monitoring behaviour and reduced parental knowledge (as reported by the parent) about their child one year later (Muñoz et al., 2011). In contrast, parents of children with low levels of CU traits report higher levels of knowledge about their child and higher levels of monitoring (as reported by the parent) (Muñoz et al., 2011).

Qualitative research into parenting and CP

While measures of parenting are able to quantify the extent of negative and positive parenting practices, they are less able to capture some of the context surrounding parenting experiences. Qualitative studies on parenting children with CP are relatively scarce but have the potential to elucidate the nature of the parenting experience not captured by traditional questionnaire methods. In a qualitative study by Lewis, Petch, Wilson, Fox & Craig (2015) parents of children with CP described not only the difficulty in managing their child's behaviour, but also the impact of the child's behaviour on their own emotions. In another qualitative study, parents described the pervasive impact of their child's behaviour on various relationships in the family and in relationships with the wider the community (Webster-Stratton & Spitzer,

1996). Qualitative research by Stevens (2017) explored parents' descriptions of both helpful and unhelpful aspects of various interventions and support for managing a child with CP. These extant qualitative studies focussed only on CP and did not consider the role of CU traits or the perspective of the child.

The current study

Both negative and positive aspect of parenting play a role in increasing and decreasing the risk of CP and CU traits (Waller et al., 2013). Children with CP and CU may also illicit negative parenting responses in reaction to their difficult behaviour (Jaffee et al., 2004; Larsson, Viding, Rijdsdijk, & Plomin, 2008; Munoz et al., 2011; Fanti & Munoz Centifanti, 2014; Oliver, 2015). Most research examining parenting and CP to date has either focused on CP without differentiating on CU traits (Frick, Christian, & Wootton, 1999; Shaw & Taraban, 2017) or has focused on CU traits as a dimensional measure (Dustin A. Pardini, Lochman, & Frick, 2003). Only a handful of studies have directly compared children with CP/HCU and CP/LCU, and very few of those have obtained child reports of parenting (Waller et al., 2013). The currently study aims to expand our understanding of parenting experiences in parents/caregivers of children with CP/HCU and CP/LCU as well as the children themselves, through quantitative and qualitative methods. There are no qualitative studies focusing on parenting of CP/HCU vs. CP/LCU children. Qualitative methods may increase our understanding of the experience of parenting a child with CP, as well as the child's experience of being parented, by exploring phenomenon that has not previously been captured by with traditional measures and allowing parents/caregivers and children the opportunity to share their experiences in their own words.

To examine possible differences in experiences of parenting in families of CP/HCU, CP/LCU and TD children (matched on child age, child IQ, child ethnicity, family factors and parental

psychopathy), this study assessed both parent/caregiver and child reports on five domains of parenting as measured by the Alabama Parenting Questionnaire (APQ; Shelton, Frick & Wootton, 1996). The APQ is a widely used measure which assesses positive and negative parenting (parental involvement, positive parenting, monitoring and supervision, inconsistent discipline, and corporal punishment). The APQ has the advantage of having both parent and child reports which is useful in examining parenting from both the perspective of the parent and the child. The child rated APQ assesses mother and father involvement separately. We predicted that both CP/HCU and CP/LCU groups would report more negative parenting (parent and child rated) and less positive parenting (parent and child rated) than their TD peers. Prior research also suggests that CP/HCU group might receive reduced parental involvement, parental monitoring and supervision and reduced positive parenting, compared with TD peers.

To explore parenting experiences not readily captured by questionnaire measures, this study also employed a structured qualitative approach, with written descriptions provided by parents/caregivers describing the challenges of parenting their child. In addition, children with CP/HCU and CP/LCU were asked to provide written descriptions of their experience of being parented.

5.2 Methods

Participants

One hundred and forty-six boys aged 11-16 years and their parent/caregiver were recruited to take part in the current study via newspaper advertisements and through engagement with mainstream and alternative provision schools who serve children with behavioural difficulties, in the greater London area. University College London Research Ethics

Committee (Project ID number: 0622/001) gave approval for the research protocol. Detailed information sheets describing the aims and participation in the study were provided to parents/caregivers and children (written in age-appropriate language for the child participants). Written informed consent was obtained from the parent/caregiver and assent to participate was obtained from the children. Researchers were trained on how to sensitively work with children with CP and their families and a clinician was on hand to provide support if needed. Study exclusion criteria for children included a diagnosis of autism spectrum disorder, any reported neurological abnormality, and/or a score of <70 on a standardised cognitive assessment. No exclusion criteria were applied for parents. Details of participant characteristics are displayed in Table 5.1.

Table 5.1 Demographic data

Characteristics and questionnaires	TD controls (n=45)			CP/LCU (n=57)			CP/HCU (n=44)			p value ^a	Post hoc*
	Mean	S.D.	Min-Max	Mean	S.D.	Min-Max	Mean	S.D.	Min-Max		
Child age (years) ^b	14.48	1.63	11.42-16.91	14.68	1.59	11.10-16.99	14.90	1.40	11.23-16.77	0.454	
Child IQ (full score, two-subtest WASI) ^c	97.02	12.94	72-122	97.09	15.14	70-129	93.10	11.63	77-117	0.304	
Child ethnicity ^{b,f}	6:27:12			7:31:19			7:28:9			0.711	
SES ^b	2.80	1.17	1-5.50	3.03	1.27	1-5.00	3.51	1.18	1.5-5.50	0.015	1>3
ICU ^d	24.27	6.98	7.00-40.00	33.57	7.78	10.00-43.00	50.09	5.49	45.00-69.00	0.000	1<2<3
CASI Conduct disorder ^d	0.69	0.73	0.00-2.00	6.47	3.53	3.00-22.00	11.54	5.36	4.00-25.00	0.000	1<2<3
CASI Attention deficit hyperactivity disorder ^e	11.35	7.26	1.00-38.00	22.01	11.77	2.00-46.59	26.89	12.81	4.00-53.00	0.000	1<2/3
CASI Generalised anxiety disorder ^e	4.88	3.77	1.00-19.00	8.10	4.52	1.00-21.00	9.68	4.48	1.00-19.00	0.000	1<2/3
CASI Major depressive episode ^e	3.31	2.12	2.00-13.00	6.20	4.55	2.00-19.00	7.39	3.95	2.00-17.00	0.000	1<2/3
Child alcohol use ^e	0.70	1.76	0.00-7.00	2.68	4.56	0.00-19.00	2.38	3.87	0.00-18.00	0.021	1<2
Child drug use ^e	0.18	0.83	0.00-4.00	1.91	3.43	0.00-11.00	2.72	5.08	0.00-22.00	0.003	1<2/3
Parent self-report psychopathy ^e	6.26	9.47	0.00-39.74	6.29	8.50	0.00-34.00	9.00	10.59	0.00-0.42	0.298	
Parent/caregiver informant ^{e,g}	44:1:0			54:1:2			40:2:2			0.828	
Number of parents/caregivers ^{b,h}	25:20			30:27			16:28			0.144	
Child birth order ^{e,i}	20:13:5:6			23:19:6:8			16:16:8:4			0.567	
Number of people living in household ^{e,j}	7:11:15:7:4			3:14:26:10:4			10:10:11:8:5			0.434	

TD = typically developing; CP/LCU = conduct problems and low levels of callous-unemotional traits; CP/HCU = conduct problems and high levels of callous-unemotional traits; S.D. = standard deviation; WASI = Weschler Abbreviated Scale of Intelligence; SES = socio-economic status; ICU = Inventory of Callous-Unemotional Traits; CASI = Child and Adolescent Symptom Inventory. * $p < 0.05$, Tukey post hoc comparison.

a All p values obtained using ANOVA, except child ethnicity and number of parents/caregivers (Chi-square) and parent/caregiver informant, birth order, and number of people living in the household (Fisher's exact).

b Measures obtained at screening phase, parent report

c Measures obtained at testing session, child report

d Measures obtained at screening phase, parent and teacher report

e Measures obtained at testing session, parent report

f Counts for each ethnicity (Black:White:Mixed/Other)

g Counts for each rater category [Mother:Father:Other (Foster/Adoptive/Grandparent)]

h Counts for two-parent/carer household:single-parent/carer household

i Counts for 1st:2nd:3rd:4th+ born

j Counts for family size of 2:3:4:5:6+ family members

The *Child and Adolescent Symptom Inventory* (CASI-4R; Gadow & Sprafkin, 2009) Conduct Disorder scale (CASI-CD) was used to assess CP. Cut-off scores for inclusion in the CP group were as follows: parent report ≥ 4 (ages 10–12) and ≥ 3 (ages 13–16) or teacher report ≥ 3 (ages 10–12), ≥ 4 (ages 13–14), and ≥ 6 (ages 15–16). These scores are associated with a clinical diagnosis of CD (Gadow & Sprafkin, 1998).

The *Inventory of Callous-Unemotional Traits* (ICU; Essau, Sasagawa, & Frick, 2006) was used to assess CU traits. A median split of the ICU scores for the children meeting CP criteria was used to determine assignment to CP/HCU (ICU score greater than 43) or CP/LCU groups (ICU score less than or equal to 43).

Children in the TD control group scored less than or equal to 2 on the CASI-CD, less than 43 on the ICU and less than seventeen for total difficulties on the *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 1997).

Parents/caregivers were all mothers or female caregivers with the exception of one father in the TD group, one father and one grandfather in the CP/LCU group, and two fathers in the CP/HCU group.

Additional child and parent measures. The *Wechsler Abbreviated Scale of Intelligence* (WASI; Wechsler, 1999) was used to assess child cognitive ability. Substance use in children was assessed via the self-report *Alcohol Use Disorder Identification Test* (AUDIT; (Santis, Garmendia, Acuña, Alvarado, & Arteaga, 2009) and the self-report *Drug Use Disorder Identification Test* (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2005). The CASI-4R scales for conduct disorder (CD), attention deficit hyperactivity disorder (ADHD), generalised anxiety disorder (GAD) and major depressive episode (MDE) were completed by parents/caregivers to assess for conditions that are commonly

comorbid with CP. Parents/caregivers provided information about parental education and employment to ascertain socio-economic status (SES) and completed the *Self-Report Psychopathy Short Form* (SRF-SF; Gordts, Uzieblo, Neumann, Van den Bussche, & Rossi, 2017) to assess parent/caregiver psychopathy. In this sample, Cronbach's alpha for the shortened version of the task was 0.83. Parents also provided details about child birth order, number of parents/caregivers in the household (biological, stepparent, foster and adoptive parents, grandparents), and the total number of people living in the household.

Alabama Parenting Questionnaire (APQ; Shelton, Frick & Wooton, 1996). The APQ is widely used assessment of five dimensions of parenting commonly associated with CP: *involvement* (10 items; e.g. *You play games or do other fun things with your child*), *positive parenting* (6 items; e.g. *You compliment your child when he/she does well at something*), *poor monitoring/supervision* (10 items; e.g. *Your child is out with friends you don't know*), *inconsistent discipline* (6 items; e.g. *You feel that getting your child to obey you is more trouble than it's worth*), and *corporal punishment* (3 items, e.g. *You slap your child when he/she has done something wrong*). Parent/caregivers and children completed the 42-item parent and child forms respectively, rating frequency of parenting behaviour on a five-point scale (1 = never to 5 = always). The APQ is has been shown to be a reliable and valid measure of parenting (Dadds, Maujean, & Fraser, 2003; Essau et al., 2006). Cronbach's alpha for parent APQ subscales in this sample were as follows: involvement 0.75, positive parenting 0.77, poor monitoring/supervision 0.76, inconsistent discipline 0.77, and corporal punishment 0.68. Cronbach's alpha for child APQ subscales in this sample were as follows: involvement with mother 0.79, involvement with father 0.93, positive parenting 0.85, poor monitoring/supervision 0.75, inconsistent discipline 0.66, and corporal punishment 0.55.

Qualitative descriptions of parenting: parental description of challenges of parenting; child description of being parented. Parents/caregivers were asked to describe their parenting experiences with written responses to the following question: *What are the biggest challenges in parenting your child?*

Children were asked to provide a written response to the following open-ended question: *Please think of the person who is most involved in taking care of you. Can you tell us a little about how (or the way) they take care of you?* It was also ascertained who the children described and only descriptions pertaining to parents/caregivers were included in the analyses. The majority of the children described their mother or female caregiver (78%) and the groups did not differ significantly from each other in terms of which parent/caregiver they described ($p = 0.761$).

Parents/caregivers and children were given as much time as they needed to complete the questions and were not restricted in the length of their response. Parents/caregivers and children were advised to write what first came to their head when thinking about the question; they were made aware that there was no right or wrong way to answer the questions and there were no expectations from researchers regarding their responses.

Procedure

Parents/caregivers and children completed all assessments in a quiet testing room at University College London. Parents/caregivers and children completed the assessments separately from each other to ensure anonymity. A researcher was on hand to answer questions and offer assistance. In two cases, the parent was unable to write their response to the qualitative questions (owing to literacy problems and physical disability) so their verbal responses were written by a trained researcher. For 10 cases, the child refused to write their response to the qualitative questions (owing to literacy problems and low motivation) but

agreed for the researcher to write their verbal responses for them. Written qualitative data collection was a preferred method of data collection for our participants as: (1) this method allows for answers to be written privately to provide increased anonymity in responding and, (2) this method allowed for participants to take their time and not feel rushed with their responses (Edwards & Holland, 2013).

Analysis

Demographic characteristics. Analysis of variance (ANOVA) was computed to explore the demographic characteristics of the groups on child age, child IQ, child substance use, child CU traits, child CP, ADHD, GAD and MDE, as well as, family SES and parental self-reported psychopathy. Where overall significant group differences were found, Tukey's post hoc analyses were computed to examine the differences between groups. Chi-square was computed to compare groups on child ethnicity and number of parent/caregivers. Fisher's exact test was computed to assess group differences on parent/caregiver informant, child birth order, and total number of people living at home.

APQ. A one-way ANOVA was computed to assess group differences on the APQ subscales. For those subscales showing overall significant group differences, Tukey's post hoc analyses were conducted to examine the differences between groups. Effect sizes were computed to quantify the differences between groups. For those subscales showing overall significant group differences, analysis of covariance (ANCOVA) was computed to control for variables which showed group level differences, which included SES, ADHD, GAD, MDE, AUDIT and DUDIT.

Data was examined for suitability for ANOVA prior to each analysis. Boxplots were used to assess for outliers, normal distribution of data for each group was assessed by Shapiro-Wilk test, and Levene's test was used to assess homogeneity of variance.

Qualitative analysis of parenting descriptions. All identifiable information was removed from descriptions. Data entry was checked for accuracy and completeness of statements prior to conducting analysis. Qualitative data analysis followed the six-step procedure as developed by Braun and Clarke (Braun & Clark). The data was read several times to allow for familiarisation, during which time initial thoughts and points of interest were noted. Initial codes were generated for the CP/HCU and CP/LCU groups and were used to create a coding frame (online resource for coding frame). Codes were clustered into overall themes by exploring the relationships between the codes and the code's relevance to the quantitative parenting data and the child's group assignment. The themes were examined using the data linked to each theme to ensure that the themes were supported. Themes and data were compared for both groups and examined for overlap and contradictory evidence. The themes were then named using the key ideas from each theme. Finally, a written report of the analysis was generated using selected quotations to illustrate the themes. To assess reliability of the coding frame, 15% of the transcripts were coded by a second rater. Cohen's Kappa was computed to check agreement between raters. Any discrepancies were discussed and resolved between raters.

It is important to consider how one's own experience influences qualitative analysis (Barker, Pistrang, & Elliott, 2016). As a parent of three children, I understand that parenting brings both expected and unexpected challenges and opportunities to learn about not only your child but also yourself. I do not have the experience of parenting a child with conduct problems and I wanted to understand the unique challenges presented to parents/caregivers of children with conduct problems both with and without callous-unemotional traits. I was conscious of my own experience as a parent while examining the data and was reflective of this potential bias throughout the analysis. Through researching conduct problems for this PhD and by working in the DRRU, I brought previous knowledge and experience to this study. I was

fortunate to have had the opportunity to spend a great deal of time with young people with conduct problems and with some of their parents/caregivers. I have learned that no two families are the same, therefore, it is important not to bring any preconceived ideas to the data analysis and I remained conscious of this while examining the data.

5.3 Results

Demographic characteristics

There were no significant group differences on child age, child IQ, child ethnicity, number of parent/caregivers, parent/caregiver informant, total number of people living at home, and parental psychopathy. The TD group was lower on ADHD, generalised anxiety, major depression, and child drug use than the two CP groups. CP/HCU and CP/LCU children did not differ significantly on ADHD, generalised anxiety, major depression, and child drug use. The groups differed on child alcohol use, with the TD group having significantly lower alcohol use than the CP/LCU group; however, TD and CP/HCU, and CP/LCU and CP/HCU groups did not differ significantly on alcohol use. The groups differed on SES, with the TD group having significantly higher SES than the CP/HCU group; however, TD and CP/LCU, and CP/LCU and CP/HCU groups did not differ significantly on SES. Full participant characteristics are displayed in Table 5.1.

APQ parent report

There was an overall group difference on the parent reported poor monitoring and supervision subscale, $F(2,143) = 5.044, p = 0.008$. Post hoc analyses revealed significant differences between TD and CP/HCU with a medium effect size ($p = 0.005; d = 0.72$). No other significant group differences were found.

There was an overall group difference on the parent reported inconsistent discipline subscale, $F(2,143) = 6.783, p = 0.002$. Post hoc analyses revealed significant differences between TD and CP/HCU with a medium effect size ($p = 0.007; d = 0.67$) and TD and CP/LCU with a medium effect size ($p = 0.003; d = 0.68$). The two CP groups did not differ significantly on inconsistent discipline.

No group differences emerged on the parent reported involvement, $F(2,143) = 0.623, p = 0.538$; positive parenting, $F(2,143) = 0.915, p = 0.403$; and corporal punishment, $F(2,143) = 2.252, p = 0.109$ subscales of the APQ.

Covariate analysis. The effect of group on parent reported poor monitoring and supervision was no longer significant after adjusting for AUDIT, $F(2, 125) = 1.405, p = 0.249$.

The effect of group on parent reported inconsistent discipline was marginally reduced after adjusting for SES, but remained significant after adjusting for child ADHD, GAD, MDE, AUDIT and DUDIT, $F(2,125) = 4.806, p = 0.010$.

APQ child report

There was an overall group difference on the child reported involvement with father subscale, $F(2,143) = 3.473, p = 0.034$. Post hoc analyses revealed significant differences between TD and CP/HCU with a medium effect size ($p = 0.026; d = 0.56$). There was no significant difference between TD and CP/LCU groups or the two CP groups on the involvement with father subscale.

There was a trend level difference in child reported inconsistent discipline by group, $F(2,143) = 2.904, p = 0.058$ (2-tailed). Because our predictions were one-tailed, we ran post hoc analyses that demonstrated that the difference between TD and CP/HCU groups had a

large effect size ($p = 0.066$; $d = 1.18$). There was no significant difference between TD and CP/LCU groups or the two CP groups on the inconsistent discipline subscale

The groups did not differ on the child reported involvement with mother, $F(2,141) = 2.092$, $p = 0.127$; positive parenting, $F(2,141) = 0.055$, $p = 0.947$; poor monitoring and supervision $F(2,143) = 1.168$, $p = 0.314$; and corporal punishment $F(2,142) = 1.632$, $p = 0.199$ subscales of the APQ.

Covariate analysis. The effect of group on child reported father involvement was no longer significant after adjusting for SES and MDE, $F(2,125) = 0.625$, $p = 0.537$.

Post-hoc analyses on parent/caregiver-child agreement on APQ ratings

Because partially different patterns of findings emerged in parent and child APQ analyses, we ran post-hoc intra-class correlation analyses for all the APQ scales that were comparable between parents/caregivers and children (all except parental involvement, which was assessed separately with regard to mothers and fathers in the child APQ), in the CP groups. These analyses showed modest to moderate agreement between parents/caregivers and children (ICC range = 0.437 - 0.682), which is typical for agreement across raters. These analyses suggest that although parent/caregiver and child assessments of parenting variables relate to each other meaningfully, they are not identical and likely explain why some differences emerge in the group analyses of parenting.

Qualitative analysis

Cohen's Kappa revealed a 'substantial' agreement between raters for ratings of both parent/caregiver data, $\kappa = 0.717$, and child data $\kappa = 0.788$ (Landis & Koch, 1977). The primary focus of this study was to understand the challenges of parenting CP/HCU and CP/LCU children, as well as CP/HCU and CP/LCU children's experience of being parented,

therefore TD qualitative data is not presented. Qualitative themes for parents/caregivers and children are described in Table 5.2.

Table 5.2 Qualitative themes from parent/caregiver reports of challenges in parenting and child reports of being parented

Parent / Child	Group	Theme	Codes	Example
Parent		<i>Concerns for safety</i>		
	CP/HCU _p		Monitoring	<i>'keeping him safe and off the streets'</i>
	CP/HCU _p		Peer Influence	<i>'worry over his safety and peer pressure to engage in unsociable behaviour or illegal activity'</i>
		<i>Behaviour</i>		
	CP/HCU _p		Violence and aggression	<i>'the unpredictable outbursts which can escalate in seconds'</i>
	CP/HCU _p		Wear and tear from constant battles	<i>'Everyday is hard work and a constant worry'</i>
		<i>Parental influence</i>		
	CP/LCU _p		Motivation	<i>'trying to persuade him to do something he doesn't want to do'</i>
	CP/LCU _p		Rules and boundaries	<i>'will not confirm or follow a routine... cannot follow one instruction'</i>
Child		<i>Support</i>		
	CP/HCU		Parent willingness to support in the face of adversity	<i>'If I get arrested, she'll come get me'</i>
	CP/LCU		Parental understanding	<i>'she understands me and now I realise how well she has raised me'</i>
	CP/LCU		Parental guidance	<i>'If I do something wrong, I am usually spoken to; If I do something right I am praised'</i>
		<i>Parent as a provider of basic needs</i>		
	CP/HCU and CP/LCU		Basic caregiving with no mention of love or emotional connection	<i>'gives me shelter, a room to sleep in'</i>

Challenges of parenting CP/HCU and CP/LCU children. Themes within the parent/caregiver descriptions of the challenges of parenting are presented on the basis of their relevance to the child's group assignment and connectedness to the APQ. Qualitative themes for parenting CP/HCU children included concerns over child safety and child behaviour.

Qualitative themes for parenting CP/LCU children included challenges with exerting parental influence on their child.

Concerns for safety.

Theme 1: monitoring. Keeping their children safe was a significant cause of concern for parents/caregivers of CP/HCU children. Many CP/HCU parents/caregivers reported 'worry' or 'concerns' over the safety of their child, with one parent describing it as 'my biggest fear'. CP/HCU parents described a 'lack of fear' in their child and difficulty with 'finding out where he is'. Another CP/HCU parent described the difficulty in 'keeping him safe and off the streets'. One CP/HCU parent described the efforts made in monitoring her child: 'I spend a lot of time checking up on him and driving round to make sure he is ok'. In contrast, concern for child safety was only mentioned twice by CP/LCU parents/caregivers and was not described as a worry or concern.

Theme 2: peer influence. Many CP/HCU parent/caregiver concerns over safety were connected with the child's peer affiliations. One CP/HCU parent reported, 'It's hard to keep influential people away from him as he can be used and led very easily', and another parent described, 'worry over his safety and peer pressure to engage in unsociable behaviour or illegal activity'. Peer influence over CP/HCU children's behaviour seemed to result in CP/HCU parents having difficulty trusting their child, for example, 'trusting him when he is out with friends'. Parents/caregivers of CP/LCU children did not describe challenges with the influence of peers on their child.

Behaviour.

Theme 1: Violence and aggression. Parents/caregivers of CP/HCU children frequently described difficulty with extreme child behaviour. Parents/caregivers described challenges with 'aggression', 'violence', and 'hostility'. One CP/HCU parent described the

challenge of, *'the unpredictable outbursts which can escalate in seconds'*. The concern over CP/HCU behaviour on others was evidenced in descriptions such as, *'...younger sibling does not trust him when playing'*, and *'concerns for the future as he gets bigger, for the household, and others he may form close/intimate relationships with'*. Parents/caregivers of CP/LCU children also described challenges with their child's behaviour but it was less extreme and more about the child exhibiting oppositional behaviours such as being *'angry'* and *'argumentative'*.

Theme 2: Wear and tear from constant battles. Parents/caregivers of both CP/HCU and CP/LCU children described constant battles and arguments with their children, however, CP/HCU parents described the wear and tear of parenting their child more frequently than CP/LCU parents. One CP/HCU parent reported, *'Everyday is hard work and a constant worry'*, and another CP/HCU parent described, *'His poor behaviour is very stressful to deal with. This can cause the whole family to be strained and unhappy'*. Another CP/HCU parent described, *'daily battles with minor things, parenting (child) can be exhausting sometimes. He gets his money's worth'*. CP/HCU parents also described the chronic nature of the stress on the family. One CP/HCU parent described the last six years as being an *'emotional and stressful time... this was very hard for the whole family, especially me'*, and another parent reported, *'We often have arguments. It's sometimes tiring when we keep doing this'*.

Parental Influence.

Theme 1: Motivation. Both CP/HCU and CP/LCU parents described the need to keep their child *'focussed'* and *'on the right path'*, but while for CP/HCU parents this was driven by a need to keep their child safe, for CP/LCU parents this seemed to be driven by a difficulty in motivating their child. One CP/LCU parent described a challenge in, *'helping strike the right balance between what needs to be done (duties!) and what he wants to do'*,

and another CP/LCU parent described difficulty in, *'trying to persuade him to do something he doesn't want to do'*. CP/LCU parents described challenges in getting their child to, *'start and finish a task'*, *'making him achieve one task every year'*, and with their child's *'unwillingness to try new things'*.

Theme 2: Rules and boundaries. Parents/caregivers of CP/LCU children more frequently described considerable difficulty in both *'recognising'* and *'maintaining boundaries'* with their child as compared to CP/HCU parents/caregivers. One CP/LCU parent described a challenge in, *'instilling a stronger sense of discipline'*, and another reported that the child can be, *'...incredibly rude and answers adults back as equals... although only 12, he will not be told what to do'*. Another CP/LCU parent described challenges when their child, *'will not confirm or follow a routine... cannot follow one instruction'*.

CP/HCU and CP/LCU children's description of being parented. Two main themes within the child's descriptions of being parented are presented, which illustrate differences and similarities in how children with CP/HCU and CP/LCU describe their experience of being parented. The first qualitative theme stemming from the children's descriptions of being parented was parental support, with CP/HCU and CP/LCU children describing qualitatively different experiences of support. CP/HCU children described parental willingness to support in the face of adversity, and CP/LCU described parental understanding and guidance. The second qualitative theme that emerged was the finding that both CP/HCU and CP/CLU groups described parents as a provider of basic needs.

Parental support.

Theme 1: Parental willingness to support in the face of adversity.

CP/HCU children seemed to acknowledge parental support was there for them even when things were very difficult, or their behaviour did not warrant such support. One CP/HCU

child reported, *'If I get arrested, she'll come get me'*, and another commented, *'it didn't matter how I treated her, she was always nice to me'*. Another CP/HCU child noted his parent's optimism in the face of challenges, *'always being happy and trying not to ever be unpositive (sic), always looking on the bright side'*.

Theme 2: Parental understanding.

CP/LCU children described their parents as having them in mind. One CP/LCU child described how his parent, *'texts me to see where and how I am'*, and another reported that his parent *'thinks about me'*. CP/LCU children also reported feeling understood by their parent/caregiver. One CP/LCU child reports that his parent, *'understands my perspective'*, and another remarked, *'she understands me and now I realise how well she has raised me'*.

Theme 3: Parental guidance.

CP/LCU children seemed keenly aware of their parent's attempts to keep them on the right path. Several CP/LCU children remarked about parental guidance with statements such as, *'If I do something wrong, I am usually spoken to; If I do something right I am praised'*, and, *'She takes care of me by making sure that before I do or say something I understand it. She also takes care of by ensuring I know what is right and wrong and also what is and isn't acceptable'*, as well as, *'...points out correct (sic) or errors with my potential views'*. One CP/LCU child commented that his parent would, *'tell me what to do or show me'*, and another child remarked that his parent would *'help me come to my own decisions about issues/problems'*.

Parent as a provider of basic needs.

A considerable number of CP/HCU (31%) and CP/LCU (22%) children described their caregiver as a provider of basic needs with no mention of any emotional support or affection. These descriptions were focussed exclusively on the very basic structures of caregiving, such

as, *'she pays the electric bills'*, *'cooks and cleans'*, *'gives me shelter, a room to sleep in'*, and *'she gives me food, she dresses me, she pays for my house bills'*. The absence of emotional descriptions occurred very infrequently in TD children's descriptions of caregiving (8%).

5.4 Discussion

Considerable research has examined parenting as a possible risk factor for the development of CP but only recently, have studies begun to consider the role of CU traits. Additionally, very few studies have considered parenting from the perspective of CP/HCU and CP/LCU children or asked families to qualitatively describe their parenting experiences. The study addressed these gaps in the literature by exploring parenting in families of children with CP/HCU, CP/LCU and TD children, using both quantitative and qualitative methods, from the perspective of the parent/caregiver and the child. Parents/caregivers of CP/HCU children reported more challenges with monitoring and supervision of their child (as measured by the APQ), than CP/LCU and TD parents/caregivers. This finding was supported by qualitative analysis, with CP/HCU parents/caregivers reporting serious concerns for their child's safety owing to difficulties with monitoring and unhealthy peer affiliations. Both CP/HCU and CP/LCU parents/caregivers reported challenges with inconsistent discipline (as measured by the APQ) as compared to TD parents/caregivers. Qualitative reports of managing extreme behaviour in CP/HCU children and difficulty with exerting parental influence on CP/LCU children helped to shed light on why disciplining children with CP is challenging. Children with CP/HCU reported less involvement with their fathers (as measured by the APQ), than CP/LCU and TD children. Children with CP/HCU also reported more inconsistent discipline than TD children. This finding was at trend level in two-tailed analysis (although our predictions were one-tailed) and of large effect size. No difference in child reports of

inconsistent discipline emerged between CP/LCU and TD children. Qualitative analysis of children's experience of being parented revealed that both CP/HCU and CP/LCU described support from parents/caregivers, however their descriptions of support were different, with CP/HCU children describing support from parents/caregivers even in times when it was not necessarily warranted, and CP/LCU children describing parental understanding and guidance. Both groups of CP children tended to qualitatively describe their parent as a provider of basic needs.

The finding that CP/HCU parents/caregivers differed significantly from TD parents/caregivers on the monitoring and supervision subscale of the APQ is broadly in line with previous research which found that parents/caregivers of CP/HCU children reported reduced knowledge (as assessed by the monitoring/supervision subscale of the APQ) and reduced monitoring (as assessed by a questionnaire measuring parental control and solicitation) of their child over time (Muñoz et al., 2011). However, the current study did not find that parents/caregivers of CP/LCU children monitored their children more, as was reported by Muñoz et al. (2011). It is important to note that the study by Muñoz et al. (2011) used different measures, examined change over time, and did not have a TD control group. In other words, the findings relating to CP/HCU and CP/LCU children were relative to each other, not TD children. This means that comparisons between the Muñoz et al. (2011) study and the current findings should be interpreted with caution. The effect of group on parent reported poor monitoring and supervision was no longer significant after adjusting for child alcohol use. It is not surprising that these variables would be associated with each other, presumably less effective parental monitoring will yield more opportunities for child alcohol use. Qualitative descriptions of the challenges of parenting shed more nuanced light on the difficulties in monitoring and supervising a child with CP/HCU. Parents/caregivers of CP/HCU children reported challenges in knowing their child's whereabouts and keeping their

child off the streets, which caused them to have great concern for their child's safety. CP/HCU parents/caregivers also qualitatively described the need to monitor who their child was associating with, as peers were thought to be exerting a negative influence on the child. CP/LCU parents/caregivers were not significantly different from CP/LCU and TD parents/caregivers in monitoring and supervising their child as measured by the APQ, nor did they qualitatively report any concerns about their child's whereabouts or safety or with monitoring their child's peer group.

Both CP/HCU and CP/LCU parents/caregivers differed significantly from TD parents on the inconsistent discipline subscale of the APQ. Previous research has found that inconsistent discipline was associated with increases in CP (Pardini et al., 2007) and the current findings suggest the inconsistent discipline is a challenge for parents/caregivers of both CP/HCU and CP/LCU children. Qualitative reports from parents/caregivers of CP/HCU and CP/LCU children helped to elucidate possible reasons why it may be difficult to consistently enforce rules and discipline both groups of children. Parents/caregivers of CP/HCU reported challenges with extreme behaviour which caused considerable stress and exhaustion in both the parents/caregivers and the family. It is not hard to imagine how parents/caregivers of CP/HCU children may be wary of provoking a violent outburst when attempting to discipline their child or may choose to ignore less serious offences in an effort to not disturb the peace. This is consistent with another set of qualitative analyses relating to parents' spontaneous description of their child with CP (Roberts, McCrory, Joffe, De Lima, & Viding, 2018), reported in Chapter 6, which found that CP/HCU parents described their child as being unpredictable when provoked. Parents/caregivers of CP/LCU children on the other hand, reported challenges in maintaining boundaries and motivating their child. Although CP/LCU parents/caregivers did not report the same 'wear and tear' from the continuous battles with their child, one can imagine it being dispiriting to have a child who refuses to follow rules or

get things done and this might contribute to lapses in discipline. The effect of group remained significant after controlling for various CP comorbidities and was only slightly reduced by SES. The robustness of this finding, along with the qualitative descriptions, indicates that it is very difficult to consistently discipline a child with CP.

Interestingly, CP/LCU children demonstrated a recognition that their parents/caregivers understood them and were trying to provide guidance in their qualitative descriptions of being parenting, with children reporting that parents/caregivers corrected poor behaviour and rewarded positive behaviour, so parents/caregivers of CP/LCU children may have been having more of an impact on their child than they perceived. Children with CP/LCU tend to display reactive and impulsive aggression which may make it seem to parents that their message is not getting through, however, they also do not show a reduced propensity to mentalise when processing potentially complex information (in this case regarding consequences of behaviour) as seen in CP/HCU children (in Chapter 3). This suggests that parental messages were penetrating despite their reactive behaviour.

CP/HCU children reported lower involvement with fathers as compared to CP/LCU and TD children. This is consistent with previous research which found that children with high levels CU traits have an increased likelihood of displaying CP and reduced levels of parental involvement (Fanti & Munoz Centifanti, 2014). CP/HCU children did not qualitatively mention lowered involvement with fathers but this may be due to the fact that the majority of children came to the research visit with their mother or female caregiver and were possibly primed to discuss them when describing being parented. The effect of group was no longer significant after controlling for SES and MDE. This was an interesting finding as despite group differences in SES, there were no significant differences in the number of parent/carers in the family. It may be that even if a caregiver is present, they may only be minimally involved. Qualitatively, both CP/HCU and CP/LCU parents/caregivers described children's

difficulties with fathers equally, so it may be that children with CP/HCU are more aware of or sensitive to lowered involvement with fathers. Future research will want to examine the impact of reduced involvement on CP/HCU children in greater depth. Although child reported involvement with fathers was lower in CP/HCU children, they did qualitatively report that they felt their parent/caregiver (predominantly mothers) was supportive even when they behaved poorly or got into trouble. This description of support from CP/HCU children is consistent with the research reported in Chapter 6, which found CP/HCU children to be superficially charming and could turn on the charm to their own advantage, in this case, to get support from their parent who qualitatively describes being exhausted from the ‘wear and tear’ of their behaviour (Roberts et al., 2018).

Interestingly, both CP/HCU and CP/LCU children showed an increased tendency to qualitatively describe their parents as providers of the basic necessities of life with no mention of love or emotional support than TD children. This suggests that for some children with CP, they see the relationship with their parent/caregiver as transactional in nature. There was no clear absence of love or emotional support in either CP/HCU or CP/LCU parents/caregivers descriptions of parenting their child, and contrary to previous research which suggests that children with CP/HCU receive reduced levels of positive parenting, there were no group differences on reports of positive parenting (as measured by the APQ) in either parent or child reports of parenting, although it is worth noting that the positive parenting subscale does not expressly measure love or emotional support. This suggests that for some children with CP, love and emotional support is not registering in the way they spontaneously think about their experience of being parented. This is consistent with findings from Dadds et al. (2012) who reported that children with CP/LCU report less reciprocal affection with their mothers than TD children and this is even further reduced in CP/HCU children (despite their mothers being similar to control mothers on expressions of affection).

There may be unmeasured individual differences in the parent-child dyad that are contributing to the reasons why some CP children are not mentioning emotional support and/or affection when describing their experience of being parented and this warrants further investigation. This novel finding highlights the importance of examining the experience of being parented from the child's perspective, and in their own words

Limitations

This study has limitations which should be noted when interpreting the findings. Although families who took part in this study were recruited from the community, these families travelled to a university in central London to take part in a substantial research study and will likely not include parents and children with the most significant clinical impairment. Future research on more severely affected families would enable researchers to assess parenting in families presenting with greater difficulties. Prior research indicates that many of the parenting risk factors not only reflect pure, environmental causal effects but also reflect genetic endowments in the families (Moffitt, 2005; Jaffee & Price, 2007; Viding, Fontaine, Oliver, & Plomin, 2009). This was not a genetically informative study and we do not know to what extent our measures of parenting reflected genetic risk. Only genetically informed, longitudinal studies will be able to elucidate the mechanisms underlying patterns of parenting in families with CP/HCU and CP/LCU children. The majority of parents/caregivers in this study were mothers or female caregivers and this study focussed on parenting in boys given the higher prevalence of CP in males. Future research may want to examine both quantitative and qualitative experiences of parenting, with mothers and fathers (including male and female caregivers) and both boys and girls with CP to elucidate how parenting experiences may differ by sex.

The use of qualitative methods in this study had some limitations that should be considered. Although parents/caregivers and children were given a half page to write their answer and were told that they could use the backside of the paper if needed, the majority of responses were completed within the provided box. This presents the possibility that parents/caregivers and children may have felt some constraint in the length of their response. Parents/caregivers and children may have provided more detailed responses in a semi-structured interview, where there is the possibility to ask participants to elaborate on responses. Given the rich responses to the qualitative questions, future research on parenting experiences in families of children with CP may want to consider conducting full semi-structured interviews. It may be useful to have parents/caregivers of children with CP, and the children themselves, help co-construct an interview that families are likely to engage with and covers areas of the parenting experience that most relevant to families. While the qualitative findings seem consistent with the quantitative findings it is important to note that group differences were not tested, and these are impressions. Future studies may consider use of additional measures, such as observational methods, to help determine how well the qualitative findings in this study represent the experiences of CP/HCU and CP/LCU families more generally.

Strengths

Despite the limitations, this study contributes to the understanding of parenting in families with CP in several ways. The current study benefitted from the inclusion of both quantitative and qualitative reports of parenting which helps to overcome potential bias that may occur from using only one method to measure a phenomenon, and also allowed for generation of possible explanations for different parenting practices (Barker, Pistrang, & Elliott, 2016). Parents/caregivers regularly experience blame and stigma relating to their perceived inability to control their child's CP behaviour (Peters, 2012), but too often, a consideration of the nature of the parenting experience, and how this relates to parenting behaviour, is not

included. In the current study, the qualitative descriptions of the challenges of parenting a child with CP shed new light on the possible reasons why parents/caregivers of CP/HCU children struggle with monitoring their child and generated some ideas about why parents/caregivers of CP children struggle with inconsistent discipline and the potential ways that this may differ if the child is CP/HCU or CP/LCU. The reasons for certain parenting behaviours are not always captured by questionnaire measures alone and may contribute to parents being seen as providing inadequate care when, in fact, the child's behaviour makes it very challenging to effectively parent them. This highlights the importance of providing parents/caregivers with adequate support with their relationship with the child to ensure that they are able to provide optimal parenting. Additionally, the inclusion of both parent and child perspectives on parenting helps to show where parenting is having an impact, even if it is not outwardly apparent. For example, CP/LCU parents/caregivers find motivating and setting boundaries challenging which may be contributing to inconsistency in disciplining their child, but CP/LCU children's qualitative descriptions of being parented suggested that they are registering their parents/caregivers' efforts in supporting them and guiding them, despite their challenging behaviour. Qualitative reports of parenting also highlight possible areas for intervention. For example, the qualitative reports from children with CP suggested that they do not consider an emotional connection with parents/caregivers when describing their experience of being parented. Clinicians may want to consider the context around parenting behaviour to be able to provide appropriate support.

Conclusions

The findings from this study are consistent with prior work that has highlighted the challenges of monitoring children with CP/HCU. Parents of CP/HCU children found monitoring their child to be more challenging than parents/caregivers of TD children and qualitative descriptions of parenting shed new light on possible reasons why it is difficult to

supervise these children. Moreover, we found that parents/caregivers of CP/HCU and CP/LCU children experienced difficulty with consistently disciplining their child, with qualitative descriptions providing some potential explanation of how and why inconsistent discipline may differ between groups. Consistent with previous research of lower parental involvement for children with high levels of CU traits, we found that CP/HCU children reported reduced involvement with their father. Children with CP/HCU and CP/LCU both describe support from their parent but in different ways. We also find some support for a reduced reciprocal relationship between parents and children with CP, with both CP/HCU and CP/LCU children showing an increased tendency to describe their parent solely as a provider of basic needs with no mention of love or emotional support, despite there being no obvious absence of love or affection at a group level in the parent/caregivers qualitative descriptions of parenting their child. This research highlights that parents/caregivers of children with CP would not only benefit interventions that offer parenting techniques, but also from extensive practical support in managing the challenges of parenting a child with difficult behaviour.

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CHAPTER SIX: Living with conduct problem youth: family functioning and parental perceptions of their child

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Supplementary electronic material that is referenced in this chapter will appear in:

Appendix 3 (Description of FAD subscales)

Appendix 4 (Qualitative themes for parental descriptions of their child)

Appendix 5 (Covariate analysis for conditions comorbid with conduct problems)



Living with conduct problem youth: family functioning and parental perceptions of their child

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Abstract

Parenting children with conduct problems (CP) is challenging, yet very little is known about the impact of the child's behaviour on family functioning or how parents of children with CP perceive their child. The aim of this research was to examine whether families with children with CP and high vs. low levels of callous–unemotional traits (HCU vs. LCU) experience differences in family functioning and parental perceptions. One hundred and one parents/caregivers of boys aged 11–16 [Typically developing (TD) $n = 31$; CP/HCU $n = 35$; CP/LCU $n = 35$] completed the McMaster Family Assessment Device, measuring multiple domains of family functioning. Parents/caregivers also completed a written statement describing their child, used for qualitative analysis. Families with CP/HCU children had poorer affective involvement than TD ($p = 0.00$; $d = -1.17$) and CP/LCU ($p = 0.03$; $d = -0.62$) families. Families with CP/HCU children showed significantly poorer general family functioning ($p = 0.04$; $d = -0.63$) and more poorly defined family roles ($p = 0.005$; $d = -0.82$) than families with TD children. Qualitative analyses indicated that parents/caregivers of CP/HCU children characterised them as having a dichotomous personality and being superficially charming. CP/LCU children were characterised as cheeky and endearing, with parents reporting good rapport. Families with CP/HCU children presented with specific difficulties in affective involvement and parents described challenges which were in line with the child's specific presentation of lack of empathy and shallow affect. These findings may be used to help clinicians identify targets for family interventions.

Keywords Conduct problems · Callous–unemotional traits · Family functioning · Qualitative methods · Adolescent males

Introduction

Conduct problems (CP) refer to a range of challenging behaviours including bullying, physical cruelty towards people and animals, and serious disregard for rules and norms [36]. Children with CP have an increased likelihood of adverse adult outcomes and represent a substantial cost to society in terms of health service provision, specialist schooling, and social services [26]. The combination of

increased service use, poor adult outcomes, and challenging daily behaviour combine to create a significant societal burden and emotional toll on those around them.

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders DSM-5; [2] has added a 'Limited Prosocial Emotions' specifier to identify a subgroup of CP children who display low levels of empathy and remorse and persistent aggressive behaviour, consistent with the presence of high levels of callous–unemotional (CU) traits (CP/HCU) [38]. CP/HCU children show deficits in processing negative emotional stimuli and low reactivity to fear and distress signals in others [4]. Children with CP and low levels of CU traits (CP/LCU), on the other hand, do not display deficits in empathy and guilt but are impulsive and display more reactive aggression to perceived threats which can leave them feeling anxious about the outcomes of their behaviour [4].

A growing body of research indicates that children with CP evoke very different parenting reactions than their non-CP peers and adoption studies have unequivocally demonstrated that those children at higher biological risk for

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antisocial behaviour are more likely to evoke suboptimal parenting responses than their adoptive peers without biological risk for antisocial behaviour [10, 25, 30]. This strongly suggests that children with or at risk of developing CP present their families with unique challenges. Much of the research into CP and CU, including that which has examined the bidirectional nature of parent–child relationships, has focussed on parenting variables [19, 21, 28]. Harsh parenting, as well as negative and inconsistent discipline have been associated with higher CU traits in children, while warm and positive parenting has been shown to help decrease CU traits in children [39]. While a large body of parenting research exists, less work has concentrated on exploring family functioning, which examines various aspects of family life rather than just the parent–child relationship. Children with CP (including those with HCU) are more likely to come from homes characterised by chaos, discord, and less than optimal parenting strategies [11, 32]. Children with CP engage in aggressive and violent behaviour, which causes emotional stress and discord in the family [12, 16, 25]. They often resist being told what to do and have difficulty following rules [32], which can cause frustration for parents and may contribute to family systems breaking down [16, 32]. Given that both parenting and home environment contribute to the development of CP and CU, exploring family functioning has potential to provide additional insight into how the family functions as a whole.

George et al. [16] conducted one of the first studies examining the family environment of children with CP using an instrument called the Family Environment Scale that measures family structure and interactions, and community involvement. They found CP in children was associated with low family cohesion and high levels of family conflict [16]. ‘Unhealthy’ family functioning, as measured by the ‘general functioning’ subscale score of the McMaster Family Assessment Device (FAD; [6]) has also been found to be associated with CP in large community samples [1, 34]. Despite the emerging evidence base regarding problematic family functioning in families with children with CP, no extant studies have systematically examined family functioning in families who have children with CP/HCU and CP/LCU as compared with typically developing (TD) controls. Previous studies have only focused on specific domains of family functioning, rather than assessing a more comprehensive set of indicators. Additionally, children with CP often present with comorbidities that have not previously been considered in studies of CP and family functioning.

There are reasons to suspect that HCU and LCU groups, despite both displaying CP, may not have identical profiles of family functioning. Decades of research indicate that children with CP/HCU are generally insensitive to punishment and overestimate the positive outcomes of their antisocial actions [27, 29]. They may also value the instrumental

benefits of their action above any possible consequence [29], making them relatively unlikely to consider possible sanctions and particularly challenging to parents. CP/HCU children also show a reduced desire to please others [13] so parents and family members may feel less connection with the child if they are not able to share positive outcomes together. CP/LCU children, on the other hand, are able to feel empathy and guilt [4, 37]. Their aggression is often impulsive and triggered by perceived threats or frustration [4, 37]. CP/LCU children do not always accurately predict the consequences of their choices and behaviour [4, 37], which may make it more difficult for parents to control their behaviour.

We collected data on multiple domains of family functioning using the FAD (e.g. assessing family functioning beyond ‘unhealthy’ general functioning) while controlling for various comorbidities of CP. This facilitated a more nuanced picture of family functioning that may be related to having a CP child in general vs. a child with CP/HCU traits more specifically. We also collected short, written parental descriptions of the child to conduct exploratory qualitative analyses on parents/caregivers’ perceptions of their child. Qualitative research on parenting children with CP is surprisingly rare, thus lending little insight into the nature of the struggles that parents of children with CP face on a daily basis. In a recent study by Lewis et al. [22] examining how parents ‘made sense’ of their child with CP, parents describe difficulties in dealing with their child’s emotional behaviour, as well as the impact that the child’s behaviour had on their own emotions. Webster-Stratton et al. [40] qualitatively explored the effects that the CP child had on the family unit and found challenges with siblings and family and marital discord, as well as challenges faced by the family in the community. While the experiences of a small group of parents may not be generalisable to all parents of children with CP, they offer insight into how parents of children with CP may think about and cope with their child. No published studies have focused on how qualitative descriptions of a child with CP may differ as a function of the child displaying high vs. low levels of CU traits. We asked parents to *spontaneously* describe their child which enabled us to further characterise family functioning in families of children with CP/HCU and CP/LCU.

We hypothesised that the CP/HCU group would have poorer functioning than both TD and CP/LCU groups on the affective involvement and affective responsiveness scales of the FAD in light of the child’s pervasive lack of empathy and diminished tendency to seek affiliation and approval. We hypothesised that families with children with CP would have poorer general functioning as compared to their TD peers due to the disruptive behaviour that CP children exhibit on a daily basis and the impact that managing this behaviour would have on family ecology. Due to their tendency to react with impulsive aggression to perceived threats, we predicted

that CP/LCU would have poorer functioning on the behaviour control scale than TD groups but possibly look similar to CP/HCU as both groups share the ability to be aggressive and violent when frustrated. The qualitative analysis of parent's perception of their CP/HCU and CP/LCU children was exploratory in nature.

Methods

Participants

One hundred and one boys aged 11–16 years of age and their parent/caregiver were recruited from the community in the greater London area, via newspaper advertisements and both mainstream schools and schools who catered for pupils with behavioural difficulties. Participant characteristics are displayed in Table 1. The full research protocol was approved by the University College London Research Ethics Committee (Project ID number: 0622/001). Parents/caregivers and the children were provided detailed information sheets outlining the aims of the study and what participation entailed, and given an opportunity to ask questions and seek clarification on any aspect of the study about which they were unsure. Children were also provided with detailed information sheets about the research, written in age-appropriate language. Parents/caregivers provided written informed consent and assent to participate was obtained from all children. Researchers were trained by an experienced clinician on how to sensitively interact with participants with conduct problems and their families. The clinician was available to advise on any concerns over the duration of the project. Exclusion criteria for child participants included a diagnosis of autism or Asperger's syndrome, any reported neurological abnormality, and cognitive ability of < 70 on a standardised cognitive assessment. No exclusion criteria were applied for parents.

Measures

Screening

Screening questionnaires assessing CP, CU traits, and psychopathology were completed by parents/caregivers and teachers to ascertain CP/HCU, CP/LCU, and TD comparison groups. Screening measures were scored by taking the highest ratings from either the parent or teacher questionnaire for each item [33]. For eleven children with CP, only parent ratings were available at screening. All parents/caregivers provided further information pertaining to psychiatric

diagnoses and demographics after screening, once they had been successfully recruited for the study.

CP was assessed using the *Child and Adolescent Symptom Inventory* (CASI-4R; [15]) Conduct Disorder scale (CASI-CD). CASI-CD cut-off scores for inclusion in the CP group were as follows: parent report = 4 + (ages 10–12) and 3 + (ages 13–16) or teacher report = 3 + (ages 10–12), 4 + (ages 13–14), and 6 + (ages 15–16). These scores are associated with a clinical diagnosis of CD [14]. Seventy children meeting the screening criteria for CP were recruited for this study. CU traits were assessed using the *Inventory of Callous-Unemotional Traits* (ICU), a widely used instrument for quantifying CU traits [9]. A median split of the ICU scores for the children meeting CP criteria was used to determine assignment to CP/HCU and CP/LCU groups. Thirty-five children met CP/LCU criteria with ICU scores less than or equal to 42 and thirty-five children met criteria for CP/HCU with ICU scores greater than 42. The *Strengths and Difficulties Questionnaire* (SDQ; [17]) was used to screen for psychopathology in the control participants. Thirty-one children met screening criteria for typically developing controls, scoring less than 42 on the ICU, less than or equal to 2 on the CASI-CD, and within the normal range on the SDQ subscales. For all groups, exclusion criteria included diagnosis of autism or Asperger's syndrome, diagnosis of a neurological or psychotic disorder, and use of prescription medication for behavioural difficulties.

Parents/caregivers were not subject to any selection criteria but provided information about child birth order, number of parents/caregivers in the household (biological, stepparents, foster and adoptive parents, grandparents), total number of people living in the household, and completed the Self-Report Psychopathy-Short Form (SRP-SF, [18]) to assess parent/carer psychopathy (Table 1). Parents/caregivers also provided information about parental education and employment to ascertain family socio-economic status (SES).

The McMaster Family Assessment Device (FAD; [8])

The FAD is a 60-item self-report measure of family characteristics and functioning. The FAD has been found to be a valid and reliable measure of healthy and unhealthy family functioning [23]. The FAD is comprised of seven subscales, which assess problem-solving, communication, roles, affective responsiveness, affective involvement, behaviour control, and general functioning ([8, 24]; see Online Resource 1 for details of the measure). Participants (parents/caregivers in this case) rate how well each statement describes their own family. Higher scores indicate worse levels of functioning.

Table 1 Demographic data

Characteristics and questionnaires	TD controls (<i>n</i> = 31)			CP/LCU (<i>n</i> = 35)			CP/HCU (<i>n</i> = 35)			<i>p</i> value ^a	Post hoc [*]
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range		
Child age (years) ^b	13.96	1.85	5.85–33.00	14.56	1.54	5.60–32.00	14.66	1.41	5.54–26.00	0.17	
Child IQ (full score, two-subtest WASI) ^c	100.68	12.72	51–4:17:10	101.06	14.16	54–5:21:9	95.35	12.34	58–6:20:9	0.14	
Child ethnicity ^{b,f}										0.96	
ICU ^d	25.39	7.36	33.00	33.61	7.39	32.00	51.00	6.57	26.00	0.00	1 < 2 < 3
CASI conduct disorder ^d	0.58	0.76	2.00	6.00	3.58	19.00	11.02	4.97	21.00	0.00	1 < 2 < 3
CASI attention deficit hyperactivity disorder ^e	11.31	6.73	31.00	23.07	11.86	41.00	25.54	11.84	49.00	0.00	1 < 2/3
CASI generalised anxiety disorder ^e	3.63	2.02	7.00	8.60	5.00	18.00	9.05	4.08	18.00	0.00	1 < 2/3
CASI major depressive episode ^e	2.99	1.50	5.78	6.20	3.95	13.00	6.84	4.31	15.00	0.00	1 < 2/3
Alcohol use and disorders ^e	0.60	1.53	6.75	2.81	5.50	22.00	2.30	3.78	18.00	0.08	
Drug use and disorders ^e	0.13	0.72	4.00	2.44	3.56	11.00	2.00	4.32	20.00	0.02	1 < 2
SES ^b	2.87	1.12	4.00	2.67	1.14	4.00	3.15	0.83	3.00	0.15	
Parent/caregiver informant ^{e,g}	23:3:0			29:5:1			32:0:3			1.00	
Family structure ^{b,h}	15:16			19:16			15:20			0.63	
Child birth order ^{e,i}	15:9:4:3			14:11:4:4			14:14:5:1			0.83	
Number of people living in household ^{e,j}	4:10:9:6:2			0:9:16:6:3			7:8:8:6:6			0.11	
Parent self-report psychopathy ^b	11.36	9.66	39.74	11.57	9.76	43.00	14.15	9.87	39.00	0.43	

TD typically developing, CP/LCU conduct problems and low levels of callous-unemotional traits, CP/HCU conduct problems and high levels of callous-unemotional traits, SD standard deviation, WASI Wechsler Abbreviated Scale of Intelligence, ICU inventory of callous-unemotional traits, CASI Child and Adolescent Symptom Inventory, SES socio-economic status

* $p < 0.05$, Bonferroni corrected

^aAll *p* values obtained using analysis of variance, except child ethnicity and family structure (Chi-square) and parent/caregiver informant, child birth order, number of people living in the household (Fisher's exact test)

^bMeasures obtained at screening phase, parent report

^cMeasures obtained at testing session, child report

^dMeasures obtained at screening phase, parent and teacher report

^eMeasures obtained at testing session, parent report

^fCounts for each ethnicity (Black: White: Mixed/Asian)

^gCounts for each rater category [Mother: Father: Other (Foster/Adoptive/Grandparent)]

^hCounts for two-parent/carer household: single-parent/carer household

ⁱCounts for 1st:2nd:3rd:4th born

^jCounts for family size of 2:3:4:5:6 + family members

Qualitative component: parental description of their child

Parents/caregivers were asked to describe the child with open-ended, written responses to the following question: *Please describe your child (no specific type of description is required, you should just write whatever comes into your head)*. They were given as much time as they needed to complete the question and were not restricted in the length of their response.

Additional measures

Child participants completed the *Wechsler Abbreviated Scale of Intelligence* (WASI; [41]) two-subtest version, to assess cognitive ability. The *Alcohol Use Disorder Identification Test* (AUDIT; [35]) and the *Drug Use Disorder Identification Test* (DUDIT; [3]) (Table 1) were completed by the child participants to assess substance use. Parents/caregivers completed the CASI-4R scales for conduct disorder (CD), attention deficit hyperactivity disorder (ADHD), generalised anxiety disorder (GAD), and major depressive episode (MDE) to assess for commonly occurring comorbidities with CP (Table 1).

Procedure

Parents completed the FAD to assess family functioning and provided a written qualitative description of their child. For the qualitative description of the child, researchers explained to the parent/caregivers that they should simply write what first came to mind when thinking about their child; there were no expectations by the researchers regarding what the parents should say. In two cases, the parent was unable to write (owing to literacy problems and disability) and their verbal responses were recorded by a trained researcher. Written qualitative data collection has distinct advantages which were of benefit to our participants: (1) this method provided parents an extra layer of anonymity so they could be free to give honest answers about their child and, (2) this method gave parents time to reflect upon their answers and not feel rushed in their responses [7].

Statistics

Demographics

To explore demographic characteristics of the groups, analysis of variance (ANOVA) was computed to compare differences between the means for child age, child IQ, child alcohol and drug use, child CU traits, CASI conduct disorder, ADHD, GAD and MDE subscales, family SES, and parental self-reported psychopathy. Chi-square was computed to

compare child ethnicity and family structure. Fisher's exact test was computed to examine whether groups differed on parent/caregiver informant, childbirth order, and total number of people living in the household. Bonferroni corrections were computed for multiple comparisons. As CP often co-occur with substance use and other psychopathologies, analysis of covariance (ANCOVA) was computed to control for common comorbid disorders (ADHD, GAD, MDE, alcohol and drug use).

McMaster Family Assessment Device (FAD)

A one-way ANOVA was conducted to determine if the groups differed on the FAD subscales. For those subscales showing overall significant group differences, Tukey's post hoc analyses were conducted to examine the differences between groups. Effect sizes were computed to quantify the difference between the groups.

Qualitative analysis of parental description of the child

Prior to conducting the content analysis, data entry was checked for accuracy and completeness of participant statements. Any identifiable data (names) were removed. Content analysis [5] was used to explore the raw data and help to identify the most prevalent parental perceptions about their child. The prevalent perceptions in the content analysis were used to inform further thematic analysis [5] of the statements. Researchers read through the statements multiple times, and notes were made about the patterns and points of interest in the parental description of their child. These patterns were assembled to form a coding frame (see Online Resource 2 for qualitative theme overview). Codes were clustered into overall themes by exploring the relationship between the codes and the code's relevance to the child's group assignment. To assess the reliability of the coding frame a second rater double coded all of the interview transcripts and Cohen's Kappa was computed to check agreement between raters. Discrepancies were discussed and resolved between raters.

Results

No differences were found between groups on child age, child IQ, child alcohol use, SES, child birth order, total number of people living in the household, and parental psychopathy. There was no difference between groups on child ethnicity, family structure and parent informant. The TD group was lower on clinical indicators than both CP groups. The CP/HCU group had higher scores on conduct problems and callous-unemotional traits than the CP/LCU group as

per group assignment. CP/HCU and CP/LCU groups did not differ significantly on the CASI ADHD, GAD, MDE, scales or AUDIT scores but did differ on DUDIT scores (Table 1).

McMaster Family Assessment Device

Affective involvement

There was an overall group difference on the affective involvement subscale, $F(2, 91) = 11.70, p = 0.000$. Post hoc analyses revealed significant differences between TD and CP/HCU with a large effect size ($p = 0.00; d = -1.17$) and CP/LCU and CP/HCU with a medium effect size ($p = 0.03; d = -0.62$). TD and CP/LCU did not differ significantly but had a medium effect size ($p = 0.057; d = -0.69$). The effect of group on affective involvement remained statistically significant after adjusting for child ADHD, GAD, MDE, and substance use (see Online Resource 3 for covariate analysis).

General functioning

There was an overall group difference on the general functioning subscale, $F(2, 93) = 3.32, p = 0.04$. Post hoc analyses revealed significant differences between TD and CP/HCU with a medium effect size ($p = 0.04; d = -0.63$). No other group differences were statistically significant. After adjusting for child ADHD, GAD, MDE and drug use, the effect of group on general functioning was no longer significant (Online Resource 3).

Roles

There was an overall group difference on the roles subscale, $F(2, 92) = 5.40, p = 0.006$. Post hoc analyses revealed significant differences between TD and CP/HCU with a large effect size ($p = 0.005; d = -0.82$). TD and CP/LCU did not differ significantly but had a medium effect size ($p = 0.055; d = -0.63$). There were no significant differences between the two CP groups. After adjusting for child ADHD and GAD, the effect of group on roles was no longer significant (Online Resource 3).

As two items in the roles subscale potentially overlap with CP behaviours (“When you ask someone to do something, you have to check that they did it” and “If people are asked to do something, they need reminding”) analyses were also conducted without those two items. The overall group difference remained significant, $F(2, 93) = 4.31, p = 0.016$, with post hoc analysis revealing significant differences between TD and CP/HCU ($p = 0.018, d = 0.70$). As before, there was no difference between the two CP groups, and the effect of group on roles was no longer significant after adjusting for ADHD and GAD.

There were no statistically significant differences between the groups on the problem solving, communication, affective responsiveness, and behavioural control scales on the FAD (p values = 0.12–0.99; Online Resource 3).

Qualitative analysis of parent descriptions of CP/HCU and CP/LCU children

Cohen’s Kappa revealed a ‘substantial’ agreement between raters, $\kappa = 0.65, p = 0.000$ [20]. As the focus of the qualitative analysis was to understand parental perceptions of CP/HCU and CP/LCU children, TD qualitative data is not presented in this paper. Themes within the parent/caregiver descriptions of the child are presented on the basis of their relevance to the child’s group assignment and connectedness to the FAD. Qualitative themes included the dichotomous nature of the CP/HCU child, the perception of the CP/LCU child as a cheeky and loveable character, and a greater sense of rapport between parents and CP/LCU children (Online Resource 2).

Dichotomous child

Theme 1: changeable moods

Parents/caregivers of CP/HCU children frequently described their child as being unpredictable and changeable. The dichotomous nature of their child’s personality was of concern to many parents/caregivers of CP/HCU children, who described their child as ‘loving’ and ‘bubbly’ but could turn ‘opposite’ or ‘dark’ when stressed or provoked. One parent described being in a state of vigilance over their child’s moods: “...sometimes it’s like living with a volcano waiting for it to explode...”. Parents/caregivers of CP/LCU children also described their child as capable of variable moods but did not seem to have the same challenges with extreme and unpredictable moods as CP/HCU parents.

Theme 2: instrumental charm

In keeping with the child’s changeable nature, CP/HCU parents/caregivers also reported that their child could switch on the charm to gain something from them: “...can be very charming when he needs something from you”. A charming persona was employed when it suited the child and could be turned on and off at will. Parents/caregivers of CP/LCU children on the other hand did not describe any premeditation in their child’s expressions of kindness. For example, one CP/LCU parent describes her child as “...capable of spontaneous kindness and sympathy”.

Cheeky child

Theme 1: normalising of behaviour

While CP/HCU parents/caregivers saw their children's behaviour as fundamentally problematic, many CP/LCU parents/caregivers offered explanations that appeared to minimise the seriousness of their child's behaviour. For example, many described their child in a playful tone, such as using the word 'cheeky' or the term "cheeky chappie". This gave the sense that CP/LCU parents/caregivers normalised their child's behaviour seeing it as endearing, and typical behaviour for a teenage boy. CP/LCU parents/caregivers were also more likely to identify 'reasonable' triggers for the child's behaviour or attribute it to characteristics that might be unusual but not problematic; for example, one CP/LCU parent described their child as having "an interesting and quirky personality".

Theme 2: warmth and affection

CP/LCU parents/caregivers commonly described their child as a loveable and loving character. The words "loving", "caring", and "lovely" were frequently used by CP/LCU parents to describe their child. CP/LCU parents/caregivers often described their child as being "funny" or having a "good sense of humour". This is not to say that CP/LCU parents/caregivers did not discuss some serious challenges in their child's behaviour or that CP/HCU parents/caregivers were completely devoid of affection towards their children, but there was an overall sense of a closer, more affectionate relationship between parent/caregiver and child in the CP/LCU group as compared to CP/HCU group.

Rapport with child

Both CP/LCU and CP/HCU parents/caregivers gave rich descriptions of their children, however, CP/LCU parents/caregivers tended to characterise their child's personality and mental state, thinking about what their child might be going through (e.g. "He is very resilient given the changes in his life that he has experienced"), whereas CP/HCU parents/caregivers were more inclined to focus on their child's behaviours. CP/LCU parents/caregivers described their child as "intelligent" or "clever" more frequently than CP/HCU parents/caregivers despite there being no significant difference in the average IQ scores of the two groups of children.

Discussion

Families of children with CP/HCU functioned less well than both TD and CP/LCU families with qualitative results providing some insight into what may be contributing to the

differences in family functioning. Families of children with CP/HCU had poorer functioning on the affective involvement scale than both TD and CP/LCU families and presented with poorer functioning on both the general functioning and roles scales than families with TD children. The exploratory qualitative analyses were in line with the findings obtained from the quantitative assessment of the FAD and provided insight into how parents of children with CP perceive their child.

CP/HCU families differed significantly from the TD as well as CP/LCU families on the affective involvement subscale of FAD, although the groups did not differ on affective responsiveness as predicted. The affective involvement subscale best quantifies aspects of family functioning that correspond with the CP/HCU profile, including using others for personal gain and looking out for number one with items such as: "We only show interest in each other when we can gain something out of it personally", and "We are too self-centered". This finding is supported by qualitative reports from parents/caregivers of CP/HCU children who described their child as being able to switch on a charming persona if they wanted to gain something from them. The difference between CP/LCU and TD families approached significance and was of medium effect size suggesting that difficulties with affective involvement may also be a problem for families with CP/LCU children. However, qualitative analysis found that CP/LCU parents/caregivers had a warm relationship and good rapport with their child (which was not as clearly demonstrated by CP/HCU parents), which may ameliorate challenges in this domain. Interestingly, the effect of group remained significant for affective involvement even after controlling for various CP comorbidities. The robustness of this finding, alongside the qualitative descriptions, indicates that a child with CP/HCU (primarily preoccupied with his own needs) can have a substantial negative impact on the way in which families are able to function collaboratively.

Families with CP/HCU children also had poorer general functioning than TD families. Parents/caregivers of CP/HCU children qualitatively described their child as being unpredictable and changeable which left families feeling uneasy. While affect is known to be shallow in children presenting with CP/HCU, their parents/caregivers nonetheless describe strong emotional reactions that occur when the child is stressed about not getting his way. Although CP/LCU children also present with challenging and difficult behaviour, CP/LCU parents/caregivers seemed more able than CP/HCU parents/caregivers to normalise some of this behaviour and see their child as a loveable and endearing character. They also seemed to have a greater understanding of their child's challenges. This rapport and understanding of their child could be why CP/LCU parents/caregivers did not differ significantly from TD parents on general functioning

or the behaviour control subscale of the FAD as predicted. Research has also shown that as parents increase discussion about child behaviour problems with their CP/LCU child, the behaviour problems get worse (reactive aggression) so they may speak less about the child's naughty behaviour to illicit less negative reactions in the child [31]. The effect of group on general functioning did not remain significant, however, after controlling for ADHD, GAD, MDE, and drug use. Previous studies have found worse general functioning in CP families than TD families but did not systematically control for comorbidities of CP [1, 34]. Further research into the effect of CP on family functioning is warranted.

CP/HCU families functioned significantly less well than TD families in terms of their 'roles' which examines how families fulfil functions and responsibilities with items such as: "When you ask someone to do something, you have to check that they did it". The difference between CP/LCU and TD families approached significance and was of medium effect size. It, therefore, appears that the CP/HCU group is the most impaired on this dimension of family functioning, but that the CP/LCU group may not be entirely typical either. The observed difference could be due to children with CP not caring about pleasing others and requiring more cajoling regarding completing household tasks. CP children only want to do things on their own terms so they may not be compliant with requests if it does not suit them. The overall group difference remained significant even after removing two items from the roles scale that potentially overlapped with CP behaviours. This suggests that difficulties with roles go beyond those social interactions that directly reflect CP presentation. Future longitudinal research could formally investigate this finding further, for example examining whether time spent managing CP behaviours infringes on more normative activities and social interactions. As the groups did not differ significantly on number of parents/caregivers and SES, the worse functioning in the roles domain was thus not likely due to lack of parental or family resources but more likely owing to child driven factors. The effect of group on roles was no longer significant after controlling for ADHD and GAD but this is not surprising given that parents/caregivers may not feel confident in assigning tasks to children who are unfocussed or anxious.

There are a number of limitations that should be noted. First, the sample selection was based around child rather than parent/caregiver characteristics, with parents/caregivers reporting similar levels of resources and self-reported psychopathy. While this aspect of the study limits the generalisability of the findings it offers an opportunity to look at the impact of child behaviour on family functioning in families with similar resources and parent/caregiver characteristics. Future research should seek to examine the

family environment and parenting domains in parents who have higher levels of antisocial behaviour and higher material needs to gain a more complete picture of family functioning in families with children who have CP. Second, the study focused on males only, given the preponderance of CP in boys and the desire to maximise the statistical power. It would be of interest to investigate family functioning in families of girls with CP in the future. Finally, this research is not able to determine the direction of the relationship of family functioning and CP/CU over development. Future research would benefit from having a child report of family functioning to elucidate specific parent and child influences on family functioning, particularly within a longitudinal framework.

The strength of the current study is the inclusion of both qualitative and quantitative forms of assessment. Given the rich data provided by parents in response to the request to describe their child, future research might consider a full qualitative interview with multiple family members living with children who have CP. The current data can be helpful for clinicians in their work with children presenting with CP and their families. For those cases where a child presents with CP/HCU, the clinician can be mindful that parents may see their child's behaviour as instrumental and unpredictable. In addition, they may wish to attend to improving affective involvement of the whole family, promoting an interest in each other's interests and priorities. For those cases where a child presents with CP/LCU, the clinician can be mindful that parents may tend to normalise their child's behaviours and reframe possible difficulties as endearing rather than problematic. In this way, these findings can help clinicians build a priori formulations of family functioning in children presenting with CP. This may help shape how an intervention is framed and introduced for this group, particularly in light of the frequent difficulties in engaging parents and children in treatment.

This research provides additional context to the existing research on parenting children with CP and demonstrates that families with CP/HCU children experience challenges with affective involvement even when controlling for CP comorbidities and when family resources and parent characteristics are similar to those of families of TD children. Families with CP/LCU children experience fewer challenges with family functioning, which could be due to parents/caregivers having a good rapport with their child.

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Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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CHAPTER SEVEN: General discussion

This thesis was conducted with the broad aim of advancing our understanding of potential risk factors implicated in the development of CP and how this may vary as a function of child CU traits. Work within this thesis examined social cognition, specifically mentalising, in children with CP and their parents/caregivers. The work within this thesis also provided an in-depth look at parenting in families with CP/HCU, CP/LCU and TD children, using both quantitative and qualitative methods, from both the perspective of the parent/caregiver and the child. Finally, the impact of CP/HCU and CP/LCU behaviour on relationships beyond the parent/child dyad was explored by examining family functioning. This concluding chapter provides a summary of the findings in Chapters 2-6, followed by a discussion of several important limitations. An interpretation of the findings and how they link with previous research in the field is then presented, and several avenues for future research are proposed. This chapter concludes with clinical and practical considerations stemming from this work.

7.1 Summary of findings

Chapter 2 detailed the development and validation of the SJT, a new mentalising task assessing the ability to infer others' perceptions about antisocial actions. The task performed as expected, with majority of TD participants indicating that they were unlikely to engage in antisocial interactions and reporting that they believed that peers would think antisocial interactions are unacceptable. Results revealed good test-retest reliability and a high level of internal consistency. The task showed good construct validity as the two SJT variables, 'belief that peers would think antisocial interactions are acceptable' and 'likelihood of committing antisocial interactions', were positively correlated with CP and CU. This

indicated that the task was able to detect differences in the thinking patterns of adolescents with higher levels of troubling traits and behaviours from peers with lower levels of such traits and behaviours. The two SJT variables were also positively correlated which suggests that if an individual believes that others think it is acceptable to act antisocially, he or she reports that he or she is more likely to act antisocially. However, the two SJT variables were not perfectly correlated, which suggests that there are some individuals who would believe that peers would say antisocial behaviour is unacceptable but would choose to act antisocially regardless.

Chapter 3 presented a study of mentalising in children with CP/HCU, CP/LCU and TD peers using three different experimental tasks. Children with CP/HCU had significantly more difficulty than CP/LCU and TD children in understanding characters' 'intentions' (cognitive mentalising) in the MASC task. There were no group differences in understanding characters' 'feelings' (affective mentalising) in the MASC task, however, all groups were performing just above chance on the 'feelings' items. There were no group differences in the ability to represent the mind of a close friend, as measured by a mind-mindedness task, or in the ability to accurately infer how other youths would view antisocial actions, as measured by the SJT. These findings suggest that although the ability to represent mental states is intact, CP/HCU children are less likely than CP/LCU and TD children to update mental state inferences as a function of different minds.

Chapter 4 detailed a study of mentalising in parents/caregivers of CP/HCU, CP/LCU, and TD children using three different experimental tasks. Parents/caregivers of children with CP/HCU showed reduced mentalising as compared to parents/caregivers of CP/LCU and TD children in understanding characters' 'intentions' (cognitive mentalising) in the MASC task. There were no group differences in parents/caregivers understanding of characters' 'feelings' (affective mentalising) in the MASC task, however, all parent groups had difficulty on the

‘feelings’ items. There were no group differences in the ability of parents/caregivers to represent the mind of their child, as measured by a mind-mindedness task, or in their ability to accurately predicting how their child would respond to uncomfortable social scenarios, as measured by the maternal accuracy task. These findings suggest that although the ability to represent mental states is intact, parents/caregivers of CP/HCU children are less likely to update mental state inferences when they are required to process complex information.

Chapter 5 examined parenting in families of CP/HCU, CP/LCU and TD children using quantitative and qualitative methods. Both parent/caregiver and child reports of parenting were obtained. Quantitative analysis of the parent-report APQ revealed that parents/caregivers of CP/HCU children were reporting significantly more difficulties with monitoring and supervision than TD parents/caregivers, although the effect of group did not remain significant after adjusting for child alcohol use. Both CP/HCU and CP/LCU parents/caregivers reported significantly more difficulties with inconsistent discipline than TD parents/caregivers, as measured by the APQ. The effect of group on parent-reported inconsistent discipline was marginally reduced after adjusting for SES, but remained significant after adjusting for child ADHD, GAD, MDE, AUDIT and DUDIT.

Parents/caregivers of CP/HCU children qualitatively reported serious concerns for their child’s safety stemming from challenges in monitoring their child and concerns about peer affiliations and also described challenges with their child’s extreme behaviour which caused wear and tear on the whole family. Parents/caregivers of CP/LCU children qualitatively reported challenges with parental influence in terms of motivating their child and maintaining rules and boundaries. Quantitative analysis of the child-report APQ revealed that CP/HCU children were reporting significantly less involvement with their fathers than TD children. The effect of group on father involvement was not significant after adjusting for SES and MDE. Children with CP/HCU also reported more inconsistent discipline than TD children. It

is important to note that this finding was at trend level in a two-tailed analysis (although our predictions were one-tailed) and of large effect size. Both CP/HCU and CP/LCU children qualitatively reported that their parents were supportive, but the descriptions of support were qualitatively different with CP/HCU children describing their parents/caregivers as being supportive and optimistic even when their behaviour did not warrant such a response and CP/LCU children describing how they felt understood by their parent/caregiver and acknowledged attempts by their parent/caregiver to guide and correct their behaviour. Both groups of CP children had a greater tendency to qualitatively describe their parent/caregiver as a provider of basic needs, with no mention of affection or emotions, than TD children.

Chapter 6 examined family functioning in families of CP/HCU, CP/LCU and TD children using both quantitative and qualitative methods. Quantitative analysis of the FAD revealed that families of children with CP/HCU had more difficulty with affective involvement, which measures the degree of interest and value shown to other family members activities and interests, than families of CP/LCU and TD children. The effect of group on affective involvement remained significant after adjusting for child comorbidities. Families of CP/HCU children also reported poorer general family functioning and difficulties with family roles than families of TD children, as measured by the FAD, however the effect of group did not remain significant after controlling for child comorbidities. Qualitative analyses indicated that parents/caregivers of CP/HCU children characterised their child as having a dichotomous personality and being superficially charming. Parents/caregivers of CP/LCU children were able to normalise some of their 'cheeky' child's behaviour and reported good rapport with their child.

7.2 Limitations

The findings in this thesis should be interpreted in light of a number of limitations. First, while families who took part in the studies presented in Chapters 3-6 of this thesis had children with disrupting and clinically significant levels of CP, they may not have been fully representative of families of children with CP on the whole. Although they were recruited from the community, these were families that were willing to travel to a university in central London to take part in a substantial research study and will likely not include families with most significant clinical impairment. Regardless of this shortcoming, this research provided several findings that were in accordance and extended prior research base. Future research on more severely affected families would enable researchers to assess whether the patterns of findings that are reported here are found in a more severe form in families presenting with greater difficulties. Second, parents/caregivers were not subject to any screening criteria and were mostly mothers. This sample did represent parents who most commonly took the parenting responsibility in their families, but future research might benefit from direct attempts to recruit a representative sample of CP parents (related to the first limitation) and study of fathers as well. Third, owing to the greater preponderance of CP in boys than girls, this thesis focussed on boys with CP to maximise statistical power and increase feasibility of recruitment. However, this precluded study of sex differences and it cannot be assumed that the findings reported in Chapters 3-6 would apply to girls. Although the current evidence base is limited, some differences in cognitive risk factor profiles between boys and girls with CP have been found, although commonalities also exist (Freitag et al., 2018). It will be important for future work to examine patterns of social cognition, parenting and family functioning in girls with CP/HCU and CP/LCU. Fourth, although the current studies advanced our knowledge of social cognition in children with CP and their parents/caregivers, only a limited array of tasks were included and we did not perform replication of the findings.

Furthermore, the tasks used to assess mentalising were not designed to explicitly isolate mentalising propensity from mentalising ability. It is important to continue investigation of social cognition in CP/HCU and CP/LCU groups using a wide array of tasks, including those that explore what motivates social cognition and are able to isolate the processes that are involved in mentalising, and seek replication of the findings in independent samples. Finally, in relation to findings about parenting and family functioning, prior research indicates that many of the parenting and family risk factors not only reflect pure, environmental causal effects but also reflect genetic endowments in the families (Moffitt, 2005; Jaffee & Price, 2007; Viding, Fontaine, Oliver, & Plomin, 2009). This was not a genetically informative study and we do not know to what extent our measures of parenting and family dynamics reflected genetic risk. It is likely that both processes are contributing to the findings in this thesis. Genetically informative longitudinal studies will be essential for understanding the mechanisms underlying patterns of parent/caregiver and child mentalising, parenting and family functioning in families with CP/HCU and CP/LCU children. Despite these limitations, the novel findings from this thesis have both extended and replicated findings in the field and pave the way for new research in CP.

7.3 Synthesis and future directions

Social cognitive functioning in children with CP

Despite over 20 years of research into CU traits in children, there is still a surprising dearth of studies directly comparing children with CP/HCU and CP/LCU with matched TD controls on experimentally assessed social cognitive functioning and parenting/family functioning.

Experimental studies of social cognition in children with CP are still relatively scarce and the majority have focused on studying psychological underpinnings of emotion processing,

affective empathy, emotion regulation, and decision making (Blair, Leibenluft, & Pine, 2014). Most studies of mentalising in children with CP have not employed an array of mentalising tasks capable of interrogated mentalising processes across contexts, nor in a more nuanced way. Furthermore, very little research has focused on the social cognition of parents with CP, particularly dividing the parents into groups depending on whether their child has CP/HCU or CP/LCU. Research into parenting and family functioning comparing these two groups is also scarce and there is almost no qualitative research into experiences of parents who have children with CP, especially focusing on the potential difference in experience of those with CP/HCU as compared with CP/LCU children.

In order to add to address gaps in the research base pertaining to social cognition, we first developed the SJT to assess whether children were able to accurately predict how antisocial actions are viewed by others as well as the likelihood of engaging in antisocial actions to elucidate whether acting antisocially may be partly owing to difficulty in predicting how antisocial actions are viewed by others. This task showed promise in the development phase as poor ability to perceive how others viewed actions was linked to higher CP and CU traits, and there was a positive association between likelihood of reporting propensity to act antisocially and both CP and CU traits. Furthermore, because ability to perceive how others viewed antisocial acts was not perfectly correlated with the reported likelihood to commit certain acts, the task showed potential promise in being able to characterise patterns of behaviour where antisocial acts might be committed, even if the child was able to accurately perceive how the act was viewed by others. Surprisingly, this task did not, however, show group differences between children with CP/HCU, CP/LCU and TD controls on either ability to perceive how antisocial actions are viewed or the likelihood of committing antisocial actions. This was unexpected given the data from the task development phase where clear associations between these task variables and both CP and CU traits emerged, in the expected

direction. It may be that the associations in the task development phase were driven by a third variable, such as cognitive ability or SES, which were unfortunately not measured. In the group comparison study all groups were matched on cognitive ability and SES and when these were equalised, the ability to discern how actions are viewed or self-reported likelihood of engaging in such acts (reported at low base rates) did not differ between the groups. Additionally, at the task development phase, participants completed the SJT on their own, whereas in the group study, they completed the task with an experimenter. This may have led to a social desirability bias. Future studies using the SJT task should directly compare anonymous and experimenter administration of the task and its potential impact on how the children report on the task. Finally, it would also be interesting to see if patterns of responding changed if the gains of acting antisocially were more tangibly rewarding or if the impact of antisocial actions on the victims' feelings was explicitly spelled out. It might be hypothesised that children with CP/HCU would report increased likelihood of engaging in antisocial actions if they result in tangible rewards (Jones, Happé, Gilbert, Burnett, & Viding, 2010; Pardini, Lochman, & Frick, 2003) and they may be less accurate than CP/HCU and TD children in understanding how others would feel (rather than think) about engagement in antisocial actions (Jones et al., 2010).

Although group differences between CP/HCU, CP/LCU and TD children did not emerge on the SJT task, the collective findings from Chapter 3 provided a more nuanced understanding of mentalising in children with CP and extended prior literature. Several studies have reported that children with CP/HCU are able to make accurate mental state inferences when the mentalising task does not require the participants to consider affective content (Anastassiou-Hadjicharalambous & Warden, 2008; Jones et al., 2010; O'Nions et al., 2014; Schwenck et al., 2012). In line with previous research, CP/HCU and CP/LCU children in this study were found to have intact mentalising in tasks assessing mind-mindedness and

interpreting how others think about antisocial actions. Children with CP/HCU, however, did have difficulty in representing the minds of others in a complex mentalising task, the MASC. These findings are in line with recent research which found that adults with psychopathy can deliberately take the perspective of others, but do not always spontaneously do so (Drayton, Santos, & Baskin-Sommers, 2018). Although this is an interesting first step in understanding the subtleties of possible mentalising differences in children with CP/HCU, there is a need to develop this line of enquiry further. Future studies should investigate factors that may impact the degree of mentalising. This may be achieved through tasks which measure social motivation or which manipulate the instrumental benefits of mentalising. It is also important to develop tasks that assess propensity to mentalise. It would be important to explore whether group differences in the number mind-related comments emerged if children with CP were asked to describe a person where there is not a close relationship (e.g. a student in another year group) which requires more consideration of person's mind type. Finally, although we were able to observe group level differences in task performance, these experimental tasks have not been optimised for reliably charting individual differences. In order to relate measures of psychological functioning, such as those measured by the MASC task and behaviour longitudinally, future research efforts need to be directed at psychometric development of experimental tasks.

Social cognitive functioning in parents of children with CP

Although we know that antisocial behaviour runs in families and parents/caregivers of children with CP often behave in ways that might indicate compromised ability to consider their child, there is surprisingly little experimental research into social cognitions of parents/caregivers of children with CP. To address this gap in the literature, parents/caregivers of CP/HCU, CP/LCU and TD children completed two of the same set of tasks that we deployed with their children, the MASC task which assessed the

ability/propensity to incorporate judgements concerning an individual's mind into mental state inference and an assessment of mind-mindedness from written descriptions of their child. They also completed a third maternal accuracy task to assess accuracy in representing their child's mind. Previous studies have found that low and non-attuned parental mind-mindedness predicted externalising behaviour and lower maternal accuracy in mentalising was linked to increased ratings of child emotional and behavioural problems (Colonnesi, Zeegers, Majdandžić, van Steensel, & Bögels, 2019; Sharp, Fonagy, & Goodyer, 2006). We did not find lowered levels of mind-related comments or reduced accuracy in parents of CP children, but it is worth noting that the children in this study were older than the children in most previous research. Research by Ha, Sharp & Goodyer (2011) found that reduced maternal accuracy was related to current child CP but did not predict the development of CP at a one-year follow-up, and suggested that parent mentalising about children's minds may change over time as the child matures. It may be that familiarity with their child as they get older and the need to be accurate in predicting triggers for their child's outbursts makes it easier for parents/caregivers to access their child's mind-type and be accurate in predicting their response to uncomfortable situations. As with children, future research should explore whether group differences are evident in mind-mindedness and accuracy if parents/caregivers are asked to describe or predict the responses of a person where there is not a close relationship (e.g. a work colleague), where the other person's mind-type might be less familiar. Although the ability to mentalise about their child was intact, parents/caregivers of CP/HCU children showed more difficulty in representing the minds of others in the MASC task than CP/LCU and TD parents/caregivers which suggests that when they need to consider the mind of someone other than their child, or when they are required to process complex information, they show a reduced propensity to mentalise. Children with CP/HCU and their parent/caregiver showed a similar spared ability but reduced tendency to mentalise, however

the small sample size precluded the ability to directly compare children and parents/caregivers. Future studies should examine the relationship between mentalising patterns in children with CP/HCU and their parents/caregivers and aim to include both male and female parents/caregivers and use tasks which can examine propensity and vary motivational context for mentalising.

Parenting

Considerable research has examined parenting as a potential determinant for CP, but only recently have studies included CP/HCU and CP/LCU groups. Additionally, very few studies have included child reports of parenting or qualitative descriptions of parenting. To address these gaps, we explored parenting in families with CP/HCU, CP/LCU and TD families, from both the perspective of the parent/caregiver and the child, using both quantitative and qualitative reports of parenting. We found support for previous research which found parents/caregivers of CP/HCU children reporting reduced monitoring and supervision, but we did not replicate findings of increased monitoring by parents/caregivers of CP/LCU children (Muñoz, Pakalniskiene, & Frick, 2011), however previous research was examining change over time and did not have a TD control group so caution should be used when comparing findings. Interestingly, parents/caregivers of CP/HCU children qualitatively described concerns for their child's safety stemming from difficulty with monitoring and the child's negative peer associations. The effect of group on poor monitoring and supervision was no longer significant after controlling for child alcohol use, however the quantitative and qualitative findings together provide important insight into the challenges of monitoring CP/HCU children. We found that parents/caregivers of both CP/HCU and CP/LCU were reporting more difficulty with inconsistent discipline, which is contrary to previous research has found that inconsistent discipline was associated with increases in CP but not CU (Pardini, Lochman, & Powell, 2007). Qualitative reports from parent/caregivers of challenges

associated with parenting children with CP were able to provide some potential possibilities of why parents/caregivers may experience lapses in discipline their child, with CP/HCU parents/caregivers describing exhaustion from managing extreme behaviour in their child, and CP/LCU parents/caregivers describing difficulty in motivating their child and maintaining rules and boundaries. These findings seem to suggest that challenging behaviours in children may be evoking suboptimal parenting practices. We found support for previous research that found reduced parental involvement in children with CP/HCU (Fanti & Munoz Centifanti, 2014), with CP/HCU reporting lowered levels of involvement from fathers. Qualitative reports of being parented found children in both CP groups reporting support from parents/caregivers, but in different ways, with CP/HCU children reporting support when it was not necessarily warranted and CP/LCU children reporting understanding and guidance. The qualitative findings illustrated that although CP/LCU parents/caregivers were reporting challenges with parental influence, CP/HCU were registering their parents support and guidance. This finding taken together with evidence from the family functioning study in Chapter 6 which found CP/LCU qualitatively describing good rapport with their child, we find support for previous research that suggests warm and positive parenting helps child to internalise messages from parents (Frick, Ray, Thornton, & Kahn, 2014). Finally, the parenting chapter found that children with CP tended to describe their parent as a provider of basic needs which is consistent with findings from Dadds et al. (2012) which found lowered levels of reciprocal affection from children with CP towards their mothers. Observational research would be the optimal method to look at to assess bidirectional aspects of the challenges that parents/caregivers qualitatively described, however, the interactions that they described with their child seem to suggest that some of the challenges are driven by child driven factors rather than disinterested parents/caregivers.

Family functioning

While there is a wealth of research examining parenting in families of children with CP, very little research has investigated family functioning in families with a child with CP. We found support for previous research which found that families with CP children have worse family functioning (Abu-Rayya & Yang, 2012; Byles, Byrne, Boyle, & Offord, 1988; Renzaho & Karantzas, 2010) with CP/HCU families reporting poorer family functioning than TD families, although the finding of group did not remain after controlling for child comorbidities so future research is warranted. The current study of family functioning also shed light on new domains of family functioning that are compromised in families with CP, specifically roles (although, similarly to general functioning, group did not remain specific after controlling for child comorbidities) and affective involvement. CP/HCU families functioned less well than both CP/LCU and TD families in affective involvement, which assesses family members self-interest and use of others for gain, and the effect of group remained significant after controlling for child comorbidities which suggests that children with CP/HCU are having a significant impact on this domain of family functioning. Parent/caregivers qualitative descriptions of their CP child also shed new light on what it is like to live with their child, with CP/HCU children being described as having changeable moods and being superficially charming (in line with CP/HCU presentation) and CP/LCU children described as cheeky and loveable and parents/caregivers reporting good rapport. Both studies of parenting and family functioning in children with CP/HCU and CP/LCU benefited greatly from the inclusion of quantitative and qualitative measures, with qualitative measures providing context into some of the reasons why it is difficult to parent and live with children with CP. Future studies may want to consider using multiple measures parenting and family functioning domains, including lived experiences, and include child (and other family

members) reports of parenting and family functioning to help understand the experiences that are not always captured on traditional measures.

7.4 Clinical and practical considerations

Although no single experimental, questionnaire or interview study will have immediate clinical or practical implications, the findings from this thesis can be considered in a clinical and practical context. While children with CP/HCU are able to represent the minds of others, they may not always do so, particularly when they are required to process complex information in ‘real-time’ or when mentalising provides no benefit to themselves. A similar pattern of mentalising was observed in parents/caregivers of CP/HCU children who showed a reduced tendency to mentalise if required to process complex information or if there is no direct relevance to themselves. Clinicians, educators and others who work with children with CP/HCU and their parents/caregivers may want to consider that while they may appear to be able to mentalise (even be manipulative), they may not always consider the mind of other people which may impact behaviour and relationships in multiple domains. Pending future studies that can investigate the degree to which engagement with other minds may be modulated by motivational factors, it may be possible, in the future, to develop treatment adjuncts that make it easier and more probable for children with CP/HCU and their parents/caregivers to engage in thinking about others. There are a number of child and adult based mentalising programmes that may inform such clinical innovation (Asen & Midgley, 2019), but to date these have not focussed on children with CP/HCU or their parents.

Parents/caregivers of children with CP/HCU and CP/LCU were able to accurately represent their child’s mind and provided valuable insight into what it is like to parent and live with their child. Qualitative reports of parenting generated possible explanations of why

parents/caregivers of CP/HCU and CP/LCU children have challenges with inconsistent discipline and parents/caregivers of CP/HCU children also gave explanations for difficulties in monitoring and supervising their child. Parent/caregivers of CP/HCU and CP/LCU provided unique qualitative characterisations of their child which gave insight into what it is like to live with them. It will be important for those who work with parents/caregivers of CP children to consider their lived-experiences which are not always captured in traditional measures as they have the potential to elucidate the unique challenges that parents/caregivers face when trying to raise CP/HCU and CP/LCU children.

Parents, particularly mothers, are often blamed for their child's behaviour and feel stigma from being labelled as a bad parent (Peters, 2012), however in the context of findings from this thesis (and the broader field) it is clear that children with CP present with challenges which make them more difficult to parent and may require different intervention strategies (Viding & McCrory, 2019, 2018). It is not sufficient for interventions to focus behaviour management techniques that can be employed by parents/caregiver and teachers without considering how it may be more challenging to deliver traditional interventions to children with CP. Many interventions for children with CP focus on the relationship between the child and those with whom the child interacts with (parents/caregivers, peers, teachers) and yet, a considerable part of establishing reciprocal relationships with others is contingent upon social cognitive processes that function differently in children with CP, in particular those with CP/HCU. Reduced propensity to mentalise could contribute to a distinct pattern of socialisation difficulties. Information processing biases may impact how children with CP process social and affiliative cues from others and create considerable variability in how they respond to interventions. Interventions often emphasise the impact that adult behaviour has on the child, but children also impact the responses from adults they interact with, particularly children with CP who often evoke negative reactions. The effects of child CP on parenting seem to be

buffered in parents who are well supported (Belsky, 1984), therefore it is important that parents/caregivers, and those who work with children with CP, receive adequate support with their relationship with the child to ensure that they are able to provide optimal care (Viding, 2020). Parents/caregivers of children with CP may also have similar vulnerabilities as their child which can cause difficulties for the successful implementation of interventions. It may be useful to combine parent and child interventions to meet the needs of all family members (Larsson, Viding, Rijdsdijk, & Plomin, 2008).

7.5 Programme of future research

Leading on from the findings in Chapters 3-6, there is considerable scope for further research examining mentalising, parenting, and family functioning in families who have a child with CP.

Findings from Chapters 3 and 4 provided some interesting insight into potential mentalising difficulties in children with CP/HCU and parents/caregivers of CP/HCU children. While use of three different tasks allowed for a more nuanced picture of mentalising, there is still a need to design tasks that can isolate propensity to mentalise from ability to mentalise.

Additionally, future studies may seek to develop tasks which manipulate the benefits of mentalising to see if mentalising increases or becomes more accurate when there is a tangible reward in doing so. Additionally, limited information collected about the parents/caregivers so there may be unmeasured factors, such as autistic spectrum disorder or differing levels of empathy or perspective taking, which may have influenced their mentalising ability. Future studies of mentalising in parents/caregivers of children with CP will want to include assessment of characteristics that are associated with mentalising.

Findings from Chapter 5 demonstrated that parents/caregivers of children with CP/HCU found monitoring and supervising their children to be very difficult, stemming from not

knowing their child's whereabouts or their child's peer affiliations. The challenges with monitoring and supervision of CP/HCU children caused parents to have significant concerns about their child's safety. Additionally, both CP/HCU and CP/LCU parents were found to use inconsistent discipline methods, with qualitative findings suggesting that there may be different reasons for the inconsistencies in discipline practices. Given the rich responses to the written qualitative questions about parenting, it would seem that parents/caregivers are eager to share their experiences, therefore conducting a full semi-structured interview to explore these challenges in greater depth is warranted. Other additional points of interest that could be explored in a semi-structured interview include learning more about what types of support or intervention parents/caregivers find helpful in parenting their child and asking parents/caregivers about their perception of the aetiology of their child's CP.

The finding that children with CP showed an increased tendency to describe their experience of being parented without any mention of emotional support or emotional connection to their parent/caregiver was interesting and worth further investigation. It may be that children with CP can describe the emotional content of their experience of being parented when more specifically asked or directed to do so. The exploration of children's perceptions of being parented was exploratory and it was not known how children with CP would respond to qualitative questions. Given that 10 CP children did not want to provide a written answer but were happy to provide a verbal response to the qualitative question suggests that a semi-structured interview may allow children to feel more comfortable and allow for deeper exploration of their experience of being parented. It may be beneficial to conduct a focus group with young people with CP to co-create an interview schedule that includes questions that young people feel are important and are comfortable to answer in regard to their experience of being parented.

Participants in the studies in Chapters 3-6 were exclusively male children with CP and their parents/caregivers were predominantly mothers/female caregivers. A future programme of research will want to consider the inclusion of females with CP and fathers/male caregivers. Additionally, the families in these studies were interested and motivated to take part in a long research session (involving MRI) and therefore, may not be representative of all families of children with CP. Future research will want to consider recruitment of families with higher material needs and more significant clinical impairments to ensure the findings are accurately capturing parenting and family functioning across the whole spectrum of CP and CU. Focus groups with diverse groups of parents may help to identify ways of increasing participation in harder to reach families.

7.6 Conclusions

This thesis was conducted with the broad aim of advancing the understanding of social cognition, parenting, and family functioning in CP/HCU, CP/LCU and TD children and their parents/caregivers. First, we found that while children with CP/HCU show an intact ability to represent mental states of others, they show a reduced tendency to update mental state inferences as a function of different minds when compared to children with CP/LCU and TD children. Second, a similar pattern of mentalising was observed in parents/caregivers of CP/HCU children who showed a reduced tendency to update mental state inferences when required to process complex information as compared with parents/caregivers of CP/LCU and TD children, but appeared similar to CP/LCU and TD parents in their ability and accuracy in representing the mind of their child. Third, parents/caregivers of CP/HCU children showed difficulty with monitoring and supervising their child, as compared to parents/caregivers of CP/LCU and TD children, and both groups of parents/caregivers of CP children had difficulty with inconsistent discipline as compared to parents/caregivers of TD

children. Qualitative reports of challenges of parenting as reported by parents/caregivers of CP children provided possible explanations of why it is difficult to monitor and supervise their children. Fourth, in line with previous research, CP/HCU children reported reduced involvement with their fathers. CP/HCU and CP/LCU children reported receiving support from parents but there were qualitative differences between the groups on the type of support they received. Both groups of CP children displayed an increased tendency to describe their experience of being cared for in terms of provision of basic needs, with no mention of love or affection. Finally, parents/caregivers of CP/HCU children reported significantly more difficulty than parents/caregivers of CP/LCU and TD children in their family's affective involvement, as well as differences in roles and general functioning. CP/HCU parents qualitatively described their child as dichotomous and superficially charming and CP/LCU parents reported good rapport and normalising some of their child's behaviour as cheeky and endearing.

These findings are relevant to clinicians and those who work with families of children with CP in the following ways: First, although children with CP/HCU and their parents/caregivers may appear to be able to mentalise, they may not always do so. Efforts to ensure mentalising is relevant and does not require overly complicated processing of information may help CP/HCU children and their parents/caregivers to mentalise; Second, CP children and their parents/caregivers are able to provide valuable qualitative insight into some of the possible reasons why parenting and living with a child with CP is difficult and their lived experiences should be considered as part of an understanding of parenting and family functioning; Third, parents/caregivers should be fully supported alongside any intervention efforts.

Future research should consider further exploration of mentalising with tasks that are designed to assess propensity to mentalise and allow for direct comparison of mentalising between parents/caregivers and children. Genetically informed, longitudinal research will be

important for understanding mechanisms underlying social cognition, parenting and family functioning in families with CP. Future research will also want to consider whether the findings in this thesis extend to girls with CP and those families that are the most vulnerable and receiving specialist clinical services.

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Appendix 1 Development and validation of the SJT

The development of the Social Judgement Task (SJT): Assessing adolescents' understanding of peer perception of negative interactions

There are substantial individual differences in both judgements of social/moral appropriateness and level of disruptive behaviours in childhood and adolescence. Most children and adolescents have internalised societal norms, are concerned about how their behaviour is perceived by others, and do not typically engage in antisocial acts, however, a minority display problematic behaviour. We developed the Social Judgement Task (SJT); a new measure to assess adolescents' self-reported likelihood of committing negative actions against a peer, and the degree to which they understand that other people see such actions as unacceptable.

Task Development

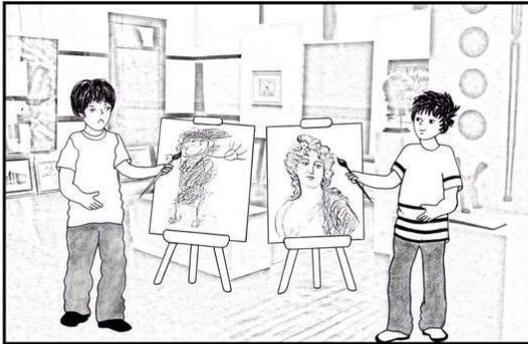
Using a similar format to Sharp et al. (2006), we presented a sample of typically-developing adolescents a series of ten stories accompanied by illustrative cartoons and asked them to imagine that they were the main character in the story. Several story options were generated, and the final stories were selected based upon their clarity and the potential for the action to happen in real life. The stories depicted negative, prosocial or neutral interactions with a peer. Half of the stories depicted negative interactions and these negative stories were the focus of the study. The prosocial and neutral stories were included to avoid presenting participants with solely negative content.

Instructions were as follows: *'You will be given 10 stories, each with a cartoon. Please read each story carefully. Each story involves interactions with kids around your own age and we would like you to imagine yourself as the main character in each story. After you have read the story, we would like you to guess*

what other kids might think of you if you behaved in the way that the story described. We will give you three possible choices and we want you to circle the answer that most closely describes what they would think of you.'

Participants were presented with three response options for the positive and negative stories reflecting mutually exclusive categories: (i) belief that peers would find the behaviour acceptable; (ii) belief that peers would find the behaviour unacceptable; (iii) an emotionally naïve/neutral response. The two neutral stories had 3 response options: (i) a positive statement; (ii) a negative statement; (iii) and a neutral statement.

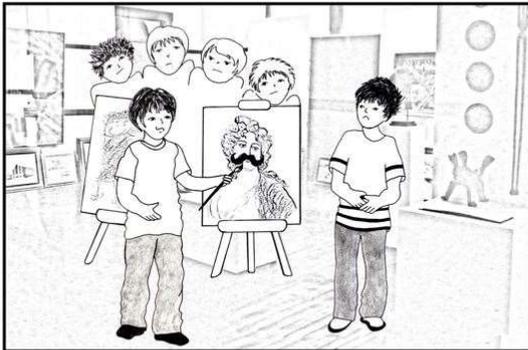
Participants were also asked how likely they were to commit the act in real life on a 1-5 point Likert scale. Stories were presented in a pseudo randomised order to ensure that no priming effects occurred. Figure 1. shows an example of a negative story.



You and Liam are painting in art class. Liam's picture is much nicer than yours. When Liam goes to clean his brushes, you paint over his picture.

What would other kids think of you in this situation? They would think:

- a) I am hilarious and play the best pranks
- b) I am a jerk for ruining the painting
- c) I am bored in art class



In real life, how likely would you be to paint over Liam's picture?

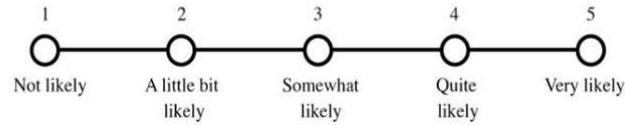


Figure 1. An example of an antisocial peer interaction scenario. Participants were presented with three answer options representing the following categories: a) belief that others would endorse or approve of an antisocial action; b) belief that others would not endorse or disapprove of an antisocial action; c) an emotionally naive response

Method

Participants

Participants were recruited from a mainstream secondary school in Romford, Essex. The school was rated as 'Outstanding' by Ofsted school inspectors, with ninety percent of pupils achieving at or above expected level for their year. Nearly three-quarters of pupils at the school were from a minority ethnic background. Twenty percent of pupils at the school were eligible for free school meals.

One hundred and ninety-six adolescents participated in the research. Ten participants had more than 20% of the questionnaire data missing, indicating that the questionnaire had not been answered carefully. These participants were removed from all further analyses, leaving a final sample of $N = 186$. The age range of participants was 11-14 years old ($M = 12.57$, $SD = 0.83$; $N = 2$ did not disclose age). The sample was 53.8 % female ($N = 100$) and 45.2% male ($N = 84$); 1.1% of participants did not disclose their gender ($N = 2$). Ethnicity and socio-economic data were not collected as per request of the school.

Parental consent was obtained prior to testing. Questionnaires were administered in a classroom setting. A researcher read the instructions aloud to the class and informed all participants that their participation was voluntary. Participants completed the questionnaire independently and anonymously. No participant was identified to the researchers as having reading difficulties or special educational needs.

A random sample of 39 participants were re-assessed one week later to check reliability of the measure. Two participants were removed for having incomplete data at time one (T1) and one participant was removed due to incomplete data at time two (T2) leaving a final sample of $N = 36$ (20% of 186). The test-retest sample was 12-13 years old ($M = 12.58$, $SD = 12.58$) and 33.3% were male ($N = 12$).

Measures

In addition to the SJT, participants completed two additional questionnaires to assess the association between the SJT, callous-unemotional traits (CU) and conduct problems (CP). Brief measures were selected due to limited time for assessing participants in a school setting.

Callous-unemotional (CU) subscale of the Antisocial Process Screening Device, Self-Report Version (APSD-SR; Frick & Hare, 2001). Participants completed the six-item CU subscale of the ASPD-SR. Respondents were asked to rate their agreement with each statement on a 0-2 scale (0 = not true, 1 = sometimes true 3 = certainly true). The APSD-SR has been shown to have good psychometric properties (Munoz & Frick, 2007). We predicted that likelihood to commit the described negative interaction and the belief that others would find the negative interaction to be acceptable would be positively correlated with CU traits.

Conduct problems (CP) subscale of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Participants completed the five-item CP subscale of the SDQ-SR. Respondents were asked to rate their agreement with each statement on a 0-2 scale (0 = not true, 1 = sometimes true, 2 = certainly true). The SDQ has been shown to have good psychometric properties (Goodman, 2001). We predicted that likelihood to commit the described negative interaction and the belief that others would find the negative interaction to be acceptable would be positively correlated with CP.

Data analysis procedure

All data were analysed using SPSS (version 21) unless stated otherwise.

Defining SJT variables

To investigate the likelihood of committing negative interactions against a peer, a sum of Likert scores on negative stories was computed (min = 5, max = 25).

To investigate the perception of others' view of negative actions, a percentage of negative stories that participants thought peers would rate as acceptable was computed (range = 0-100%).

Test-retest reliability

To measure the stability of responses over time, a random subset of participants (20% of original sample) completed the SJT twice, one week apart. Wilcoxon signed rank test was used to examine the differences in likelihood scores between T1 and T2.

Internal Consistency

To establish internal consistency, Cronbach's alpha was computed for negative and positive stories.

Principal Components Analysis

Principle components analysis was computed to determine if the likelihood scores for negative stories clustered together and the likelihood scores for positive stories clustered together.

Construct validity

Spearman's correlations were computed to examine the associations between the two SJT variables (likelihood of committing negative interaction and belief that peers think negative interactions are acceptable), CU traits and CP. Spearman's partial correlations were computed to assess the relationship between CU and the two SJT variables after adjusting for CP, and CP and the two SJT variables after adjusting for CU.

Results

SJT variables

As illustrated in Table 1, the majority of participants were unlikely to commit the negative interactions described in the stories. Six cases (3.2%) were missing one response so they were not included in this analysis.

Table 2. Likelihood of committing negative action

		Likert scores			
		5	10-15	16 or more	Missing
Number of participants		140	28	12	6
(percentage)		(75.3%)	(15%)	(6.5%)	(3.2%)

5 = not likely; 10-15 = a little bit or somewhat likely; 16 or more = quite or very likely (min = 5, max = 25)

As illustrated in Table 2, the majority of participants believed that peers would have low levels of acceptance of negative actions, with over half the participants saying their peers would find none of the interactions to be acceptable. Six cases (3.2%) were missing one response so they were not included in this analysis.

Table 2. Number of negative stories participants thought their peers would rate as acceptable

		Number of negative stories peers would find acceptable			
		0	1-2	3 or more	Missing
Number of participants		97	64	19	6
(percentage)		(52.2%)	(34.4%)	(10.2%)	(3.2%)

Out of a possible five negative stories

Test-retest reliability

A random sample of 39 participants completed the questionnaires twice, one week apart. As shown in Table 3, Wilcoxon signed rank test showed no difference between the mean likelihood scores for T1 and T2 on all items.

Table 3. Test-retest reliability: Wilcoxon signed rank test of likelihood scores at Time 1 and Time 2 (Interval = 7 days)

Item	Sig.
Negative story 'Art'	0.56
Negative story 'Crisps'	0.32
Negative story 'Fair'	0.11
Negative story 'Queue'	0.74
Negative story 'Treats'	0.66
Positive story 'Fiver'	0.59
Positive story 'Goal'	0.79
Positive story 'Phone'	0.41

Over 80% of participants selected the same response at T2 as they had selected at T1. One prosocial interaction story had only 63% agreement. With the exception of the one prosocial story with low agreement, the majority of participants were selecting responses that would reflect a belief that peers would think negative actions are unacceptable and prosocial actions are acceptable.

Internal Consistency

The five stories depicting a negative interaction had a high level of internal consistency, as determined by a Cronbach's alpha of 0.81.

Principle components analysis

Principle components analysis (PCA) was computed on the likelihood scores for the five negative and three positive stories. The suitability of PCA was assessed prior to analysis. As shown in Table 4, the negative stories loaded on to one component and the positive stories loaded together on a second component.

Table 4. Principle components analysis: Likelihood scores for negative and positive stories

	Component	
	1	2
Negative story 'Crisps'	.83	
Negative story 'Art'	.80	
Negative story 'Treats'	.77	
Negative story 'Queue'	.73	
Negative story 'Fair'	.61	-.36
Positive story 'Fiver'		.75
Positive story 'Goal'		.72

Positive story 'Phone'	-.36	.50
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Construct validity

Spearman's correlations were computed to examine the associations between the two SJT variables, CU traits, and CP. As shown in Table 5, the two SJT variables were positively correlated. The SJT variables were positively correlated with both CU traits and CP which is in line with hypotheses (see Table 5).

Table 5. Construct validity: Spearman's correlations between SJT variables, CU and CP

		<i>Belief peers think negative interactions are acceptable</i>	<i>Likelihood of committing negative interaction</i>	CU	CP
	Correlation				
Belief peers think negative interactions are acceptable	Coefficient	1.000	.380**	.175*	.235**
	N	180	178	180	177

	Correlation				
Likelihood of committing negative interaction	Coefficient	.380**	1.000	.337**	.333**
	N	178	180	180	177
	Correlation				
	Coefficient	.175*	.337**	1.000	.378**
CU	N	180	180	186	183
	Correlation				
	Coefficient	.235**	.333**	.378**	1.000
CP	N	177	177	183	183

* $p < 0.05$, ** $p < 0.001$

Partial correlation analyses revealed that there was no longer a significant association between CU and belief that peers would find negative interactions to be acceptable after controlling for CP ($r(174) = 0.096, p = 0.207$). The association remained significant between CP and belief that peers would find negative interactions to be acceptable when controlling for CU ($r(174) = 0.185, p = 0.014$). Both CP ($r(174) = 0.236, p = 0.002$) and CU ($r(174) = 0.241, p = 0.001$) were significantly associated with the likelihood of committing a negative interaction, independent of the variance shared with the other dimension.

Discussion

This paper describes the development of the SJT, a measure to assess young people's self-reported likelihood of committing negative actions against a peer and the degree to which they understand that other people see such actions as unacceptable. The SJT shows good test-retest reliability, internal consistency and

construct validity. As expected from a typically developing sample of adolescents, the majority of participants were unlikely to engage in the described negative interactions with peers and believed that peers would find negative interactions to be unacceptable. However, there were individual differences in the self-reported likelihood of engaging in negative interactions and the belief that peers would find negative behaviour acceptable. The two SJT variables were positively correlated which indicates that if an individual does not understand that being disruptive is wrong, or indeed, thinks that this is an accepted way of behaving, he or she will be more likely to act disruptively. The two SJT variables were not perfectly correlated, indicating that there may be some individuals who know that peers find negative behaviour unacceptable but would choose to act negatively anyway. CU traits and CP were positively correlated with both the likelihood of acting negatively towards peers and belief that peers would find negative interactions to be acceptable, which indicates that the measure is able to characterise how the thinking patterns of adolescents with high levels of troubling traits and behaviours differ from their peers with lower levels of such traits and behaviours.

The SJT does not have clinical utility as a diagnostic tool but may be helpful in characterising some of the vulnerability in cognitive processing in adolescents with behaviour problems. Future research with the SJT will seek to assess clinical populations to see if different patterns of cognitive processing occur adolescents with more severe behavioural problems.

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Appendix 2 Correlation of MASC ‘intentions’ and child characteristics

Journal of Abnormal Child Psychology

Thinking about others’ minds: mental state inference in boys with conduct problems and callous-unemotional traits

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Supplementary Material Table 1. Spearman's Rho Correlations between MASC 'intentions' and child characteristics

		<i>MASC 'intentions'</i>	<i>Child group</i>	<i>CASI ADHD</i>	<i>CASI GAD</i>	<i>CASI MDE</i>	<i>BES cognitive</i>	<i>BES affective</i>	<i>IRI-PT</i>	<i>AQC</i>
<i>MASC 'intentions'</i>	<i>Correlation Coefficient</i>	1.00	-.32**	-.28*	-.29**	-.15	.40**	.29**	.19	-.13
	<i>Sig. (2- tailed)</i>	.	.003	.011	.009	.181	.000	.009	.082	.239
	<i>N</i>	81	81	81	79	80	80	80	81	80
<i>Child group</i>	<i>Correlation Coefficient</i>	-.32**	1.00	.52**	.48**	.49**	-.23*	-.39**	-.34**	-.04
	<i>Sig. (2- tailed)</i>	.003	.	.000	.000	.000	.040	.000	.002	.752
	<i>N</i>	81	81	81	79	80	80	80	81	80

MASC = Movie Assessment of Social Cognition ('intentions' items); CASI = Child and Adolescent Symptom Inventory; ADHD = Attention Deficit Hyperactivity Disorder; GAD = Generalised Anxiety Disorder; MDE = Major Depressive Episode; BES = Basic Empathy Scale (cognitive items / affective items); IRI-PT = Perspective taking subscale of the Interpersonal Reactivity Index; AQC = Alexithymia Questionnaire for Children

Appendix 3 Descriptions of FAD subscales

Living with conduct problem youth: Family functioning and parental perceptions of their child

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Online resource 1. *Description of the McMaster Family Assessment Device scales*

Subscale	Domain
Problem solving	The family's ability to resolve problems
Communication	The way in which the family exchanges information
Roles	How individuals fulfil family functions and responsibilities
Affective responsiveness	The family's ability to respond to others and events with a range of appropriate actions and emotions
Affective involvement	The degree of interest in and value shown toward other family member's activities and interests
Behaviour control	The pattern that the family employs for behaviour management
General functioning	A composite measure of overall family functioning

Epstein NB, Baldwin LM, Bishop DS (1983) The McMaster Family Assessment Device. *J Marital Fam Ther* 9:171-180

Miller I, Ryan C, Keitner G, Bishop D, Epstein N (2000) The McMaster approach to families: theory, assessment, treatment and research. *J Fam Ther* 22:168-189

Appendix 4 Qualitative themes for parental descriptions of their child

Living with conduct problem youth: Family functioning and parental perceptions of their child

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Online resource 2. *Qualitative themes for parental descriptions of their child*

Group	Theme	Codes	Example
HCU	Dichotomous Child	Changeable moods	"Overall we describe him as a complete contradiction, enchanting one minute and unbearable the next."
		Instrumental charm	"He can switch back to being extremely nice and charming when it suits him and most of the time this is due to him wanting something."
LCU	Cheeky Child	Normalising behaviour	"He can be aggressive towards me only at times and has had some counselling for this."
		Warmth & affection	"___ is very kind, caring and not afraid to show it."
	Rapport with Child	Characterisation of child	"_____ is interested and reflective of the world around him"

Appendix 5 Covariate analysis for conditions comorbid with conduct problems

Living with conduct problem youth: Family functioning and parental perceptions of their child

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There is a statistically significant effect of group on affective involvement even after controlling for the following covariates: ADHD, GAD, MDE, AUDIT, DUDIT. Post hoc analysis indicates a significant difference between the TD and HCU groups and the HCU and LCU groups except when controlling for ADHD where there is no significant difference between HCU and LCU groups.

There is no statistically significant effect of group on general functioning when controlling for ADHD, GAD, MDE or DUDIT. There is no statistically significant effect of group on roles when controlling for ADHD or GAD.

There is no statistically significant effect of group on problem solving, communication, affective responsiveness, and behaviour control after controlling for any of the following covariates: ADHD, GAD, MDE, AUDIT, DUDIT.

