INDIVIDUAL DIFFERENCES IN PSYCHOPATHIC TRAITS AND IDENTIFYING MENTAL STATES AND EMOTIONS IN OTHERS

by

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Abstract

Psychopathy has gained interest as a research topic in recent years due to the devastating effects it has on society and the failure of traditional rehabilitation techniques to work. Of particular interest is the identification of early indicators of psychopathy in children who may be more susceptible to treatment. There are three distinct factors to psychopathy in childhood—antisocial behaviour, callous-unemotional traits, and narcissism—and it is unclear if these traits exist in various degrees in non-clinical samples and if each factor relates to unique deficits. This study examined how individual differences in these psychopathic traits in typically developing children relate to their competence in identifying both emotional and non-emotional mental states in others. Forty-three children from the Greater Vancouver Area aged 6 to 11 (M = 8yrs 3mos, SD = 1yr 5mos) participated (23 boys, 20 girls). The participants completed an emotion recognition task, a mental state identification task, and an intelligence measure. The parents of the participants completed two well-validated measures of psychopathy in children.

The results revealed no relationship between individual differences in these traits and the identification of non-emotional mental states or the overall ability to correctly detect emotions in others. There was, however, a diminished ability to detect negative emotions in those with higher levels of callous-unemotional traits as well as a tendency to incorrectly attribute threat emotions for those with lower levels of psychopathy. These effects were found while controlling for the effects of age, gender, and intelligence. These findings are discussed in relation to current theories of psychopathy and potential avenues for future research.
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1. Introduction

Murder, rape, theft, corporate fraud, and other crimes have a horrific effect on society. If the precursors to these behaviours could be identified and curbed early on, society would benefit prodigiously. This is particularly true for those individuals identified as ‘psychopaths’. Psychopaths commit more crimes and a wider variety of crimes than other criminals, thereby placing a burden on society that is disproportionately large. For example, while only 20% of criminals are given a diagnosis of psychopathy, they commit approximately 50% of all serious crimes (Hare, 1993). Previous evidence suggests that some children show personality traits and behaviours similar to adults identified as psychopaths (e.g., Barry et al., 2000; Harpur & Hare, 1994). These personality traits include a lack of guilt and empathy, self-centredness, and unresponsiveness in personal relationships (Cleckley, 1976)—referred to here as ‘callous-unemotional’ traits. In contrast, behaviours that violate other people’s rights or societal norms are referred to as ‘impulsive/antisocial behaviour’. Psychopathy is thought to be comprised of both callous-unemotional traits and impulsive/antisocial behaviour.

There are reasons to believe that the factors associated with psychopathy are relatively stable. Evidence of Conduct Disorder (CD) during childhood is necessary for the diagnosis of Antisocial Personality Disorder (ASPD) later in life (American Psychiatric Association, 2000), providing support for the notion of some stability in impulsive/antisocial behaviour from childhood to adulthood. The more personality-based traits (‘callous-unemotional’ ones) are potentially noticeable as early as age three (Bower, 2006), have been found to be stable across development (Block, 1993; Frick, Cornell, Barry, Bodin, & Dane, 2003; Frick, Kimonis, Dandreaux, & Farrell, 2003; Loney,
Taylor, Butler, & Iacono, 2007; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Roberts & DelVecchio, 2000), and potentially have a genetic basis (Viding, Blair, Moffitt, & Plomin, 2005). However, this research still only suggests moderate stability across development (e.g., Loney, Taylor, Butler & Ianoco, 2007); thus, caution must be used when discussing the long-term effects of these traits. The current study takes an important step towards understanding these larger issues by exploring developmentally the relationship between the presence of traits and behaviours associated with psychopathy and specific socio-cognitive skills fundamental to normal social interaction.

The aforementioned callous-unemotional personality traits have long been considered the hallmark of psychopathy and the focus of much research on the condition (e.g., Blonigen, Hicks, Krueger, Patrick & Iacono, 2005; Cleckley, 1976; DeMatteo, Heilbrun, & Marczyk, 2006; Frick & Ellis, 1999; Harpur, Hakstian, & Hare, 1988; Harpur, Hare, & Hakstian, 1989; Patrick, Bradley, & Lang, 1993; Soderstrom, 2003; Viding, 2004). These traits distinguish psychopathy from ASPD (which is best characterized by continued antisocial/impulsive behaviour) and are found to be distinct from the impulsive/antisocial behaviour that is also assessed in psychopathy. These traits play a crucial role in identifying the construct of psychopathy in children (Barry et al., 2000; Frick & Hare, 2001; Lynam, 1997)—a necessary step in understanding its development. Understanding the processes associated with these factors, particularly in childhood, should shed light on effective ways to prevent or treat the condition. This is important as adult psychopathic offenders are thought to be less receptive to treatment.

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1 Psychopathy is not considered a mental disorder in the clinical sense, but it certainly can pose problems for society if not the person who has these particular traits. Whether or not psychopathy is defined as a personality disorder, condition, or combination of other disorders is still up for debate; therefore, the use of "condition" here is my personal choice.
and are considered at high risk for recidivism compared to non-psychopathic offenders (e.g., Grann, Langstrom, Tengstrom, & Kullgren, 1999; Gretton, McBride, Hare, O'Shaughnessy, & Kumka, 2001; Harris, Rice, & Cormier, 1991; Hawes & Dadds, 2005; Serin, Mailloux, & Malcolm, 2001; Seto & Barbaree, 1999).

The majority of research with children has focused on the processes associated with either the presence of two factors of psychopathy (i.e., impulsive/antisocial behaviour and callous-unemotional traits) or the impulsive/antisocial factor without assessing, and controlling for, callous-unemotional traits (Barry et al., 2000; Cohen & Strayer, 1996; Frick et al., 2005; Hughes, Dunn, & White, 1998; Loney et al., 2003; van Goozen et al., 2004). Furthermore, much of the extant research in this area has focused on the presence of these traits in purely clinical samples. Thus, the findings may not be applicable to the majority of the population. I believe these behaviours and traits can exist to varying degrees and therefore should be identifiable in non-clinical samples of children. The current study aims to fill these gaps in the literature by: 1) assessing the effects of impulsive/antisocial behaviour and callous-unemotional traits independently, and 2) examining individual differences in the degree to which these behaviours and traits are present in a non-clinical sample of children. Of particular interest, given the problems in psychopaths’ interpersonal relations, is the relationship between individual differences in the levels of these behaviours and traits in children and their ability to identify other people’s mental and emotional states.

1.1. Defining the Concepts

The callous-unemotional traits associated with psychopathy include, amongst others, a lack of empathy and guilt, pathological lying, and problems in interpersonal
relationships (Hare, 1991). Behaviours associated with these traits include not responding to pain in others (physical and emotional), showing little regard for the emotions of others, displaying no remorse for actions that have negatively affected others, and a lack of spontaneous kindness towards others (Cleckley, 1976). These traits are usually identified in adult criminal populations, but extending the concept of callous-unemotional traits to childhood is important for research into the development of psychopathy. Measures have been developed to assess callous-unemotional traits in childhood (e.g., The Antisocial Process Screening Device, Frick & Hare, 2001; Child Psychopathy Scale, Lynam, 1997) and although these traits are generally assessed in clinical samples (e.g., Barry et al., 2000; Blair, 1997; Cohen & Strayer, 1996; Fisher & Blair, 1998; Loney et al., 2003; van Goozen et al., 2004), they have been assessed and identified in typically developing children (Frick, Barry, & Bodin, 2000; Skilling, Quinsey, & Craig, 2001; Trevethan & Walker, 1989).

Another factor of psychopathy, impulsive/antisocial behaviour, includes actions that demonstrate both a lack of planning or behavioural inhibition, engaging in risky behaviours, and acting without thinking of the consequences (Hare, 1991; Hart & Cox, 1995). In the most severe cases, these behaviours can include theft, aggressive or violent behaviour, and other illegal activities. In clinical samples, children who demonstrate these behaviours may be diagnosed with either Conduct Disorder (CD) or Oppositional Defiant Disorder (ODD) as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000). However, in non-clinical and very young samples, there is little reason to believe that children will display severe types of antisocial behaviours, but should present with impulsive behaviours and milder
forms of antisocial behaviour. Although both the impulsive and antisocial behaviours are being assessed in the current study, I expect to find more impulsive behaviour than antisocial behaviour.

A third component being considered in the current study is narcissism. Narcissism focuses on the grandiose personality that is usually found in people labelled as psychopaths. Believing one’s self to be better than others and looking down upon others are traits associated with the narcissistic personality style identified in psychopathy (e.g., Frick & Hare, 2001). This component is not identified as being separate in adult samples (i.e., it is subsumed under the callous-unemotional personality traits); however, research into the development of scales to assess psychopathy in children suggests narcissism should be considered as separate from callous-unemotional traits (Frick et al., 2000).

The identification of others’ mental states and emotions is essential for normal social development and interpersonal relationships—the very areas in which psychopaths experience difficulties. Identifying others’ mental and emotional states can be considered the result of a unitary ability or separate and distinct abilities; that is, one ability to identify others’ cognitive states and another for identifying others’ affective states. In Autistic Disorder, for instance, both of these abilities are affected, and the ‘theory of mind’ deficit discussed in much of the literature refers to them both (e.g., Baron-Cohen, 1995). In contrast, I argue that it is beneficial to treat identification of emotions and identification of other mental states as distinct abilities, potentially associated with different behaviours or traits. Recent neuroimaging findings lend support for the notion of two separate abilities. Identifying other people’s mental states (e.g., thoughts, intentions, desires, or beliefs) has been shown to activate the anterior paracingulate
cortex, the superior temporal sulci, and the temporal poles bilaterally (for a review, see Gallagher & Frith, 2003). On the other hand, identification of emotions in others, which has also been labelled ‘cognitive empathy’ or ‘empathic accuracy’ and is distinct from the affective response to another person’s emotional state (e.g., Hoffman, 2001; Ickes 1997), seems to involve activation of the amygdala and other areas of the limbic system as well as orbital and lateral areas of the prefrontal cortex—areas also known for their role in affective processing (e.g., Gur et al., 2002; Sprengelmeyer, Rausch, Eysel, & Przuntek, 1998).

These abilities—identifying other people’s mental states and emotions—are important to assess because of their pivotal role in social relationships. Being able to correctly identify what other people are thinking or feeling is essential for building and maintaining social relationships. If one is unable to identify what other people are feeling, it will be a challenge to respond appropriately, hence, limiting the ability to form strong interpersonal relationships. Another possibility, that is not mutually exclusive with the former, is that someone who experiences problems interpreting what others are thinking or feeling behaves without appreciating the consequences of his actions on others’ thoughts and feelings because the ability to identify these consequences is diminished. In other words, without understanding other people’s thoughts and feelings, it is difficult, if not impossible, to be cognizant of how our actions affect others; thus, leading to actions that may hurt another person and hurt the relationship with that person. Obviously, there are various other components that are important to social relationships (e.g., empathy, feelings of similarity to others, moral reasoning)—yet the ability to

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2 The identification of emotions and the affective experience of emotions appear to be distinct processes; however, the mirror neuron system may trigger affective reactions when performing an identification task in normal individuals (Iacoboni & Dipretto, 2006).
correctly identify others’ emotions and the ability to correctly identify others’ mental states are arguably two of the most fundamental. For instance, empathic responding includes emotion identification (‘cognitive empathy’) as a necessary prerequisite.

1.2. Current Objectives and Hypotheses

There are two primary objectives of this research derived from the existing literature (that I review below). These objectives, as a whole, address the need for research on components of psychopathy in non-clinical samples. The current research treats the components as existing on a continuum, which is different from much of the previous work that has used a cut-off point and examined people who are ‘high’ versus ‘low’ on these traits. One objective of the current study is to examine how different levels of the individual components of psychopathy relate to the identification of cognitive states in others. The Hostile Attribution Bias (or ‘Nasty Minds’ theory) is defined as a failure to correctly identify others’ intentions, instead assuming a hostile intent. The literature is brimming with support for this bias in childhood and adolescent aggression (e.g., Dodge & Somberg, 1987). What still remains unknown is whether there are other misidentifications of mental states based on impulsive/antisocial behaviour. The current study looks at whether levels of impulsive/antisocial behaviour in ‘non-problematic’ children are related to a deficit in identifying a variety of mental states in others (e.g., pretence, forgetting, deception). It is theorized that higher levels of impulsive/antisocial behaviour will predict lower scores on identifying other peoples’ mental states. In contrast, I hypothesize that the personality-based components of psychopathy, callous-unemotional traits and narcissism, will be unrelated to the ability to identify others’ mental states.
A second objective of the current study is to examine how different levels of the individual components of psychopathy (i.e., callous-unemotional traits, narcissism, and impulsive/antisocial behaviour) relate to emotion identification. Based on previous literature, I hypothesize that individual differences in one’s impulsive/antisocial component will be unrelated to one’s ability to correctly identify emotional states in others. In contrast, I hypothesize that the personality components – callous-unemotional traits and narcissism – will negatively predict the ability to correctly identify emotions in a non-clinical sample of children. In particular, I expect to see specific deficits in recognizing negative emotions in others, in line with previous research with behaviourally problematic children (Blair, Budhani, Colledge, & Scott, 2005; Blair, Colledge, Murray, & Mitchell, 2001; Stevens, Charman, & Blair, 2001). In addition, I expect that levels of the personality components of psychopathy will be predict fewer threatening, or hostile, emotional attributions (e.g., labelling others as mad or angry); this is based upon work with adult psychopaths who demonstrate reduced activation of appropriate physiological systems (e.g., startle reflex response) when presented with threatening stimuli, supporting the idea of an inability to properly process the stimuli (although whether the deficit is in the identification stage or later is unknown) (e.g., Levenston, Patrick, Bradley, & Lang, 2000; Patrick et al., 1993; for a review, see Patrick, 1994).

1.3. Emotion Recognition and Psychopathy in Adults

Research with adults has implicated an emotional deficit in psychopathy, although the etiology of this deficit remains unclear. While there seems to be consensus that psychopaths lack empathy (e.g., Cleckley, 1976; Hare, 1993), why they do is still
unknown. One possibility is a deficit in the identification of emotions in others. In support of this, there seem to be two main areas in which psychopaths show abnormal physiological responses—the identification of sadness or fear in others and the response to threatening stimuli. Both of these have been tested in adult criminal psychopaths through the use of the startle reflex response—a physiological reaction that is elevated in response to others’ negative emotions (e.g., sadness, fear) or the recognition of threat to oneself. These studies found deficits in the psychopath’s response to these particular stimuli (e.g., Benning, Patrick, & Iacono, 2005; Levenston et al., 2000; Patrick et al., 1993).

R. J. R. Blair (2005), in a review, also reports that there is evidence of reduced activation of the amygdala in psychopaths. The amygdala is involved in the ability to identify emotions in others, along with other areas of the limbic system and orbital and lateral areas of the prefrontal cortex in typical adults, and many of these areas overlap with the expression of emotions (Gur et al., 2002; Esslen, Pascual-Marqui, Hell, Kochi, & Lehmann, 2004; Breiter et al., 1996; Ioannides, Liu, Kwapien, Drozdz, & Streit, 2000; Nakamura et al., 1999; Paradiso et al., 1999; Reiman et al., 1997; Sprengelmeyer, Rausch, Eysel, & Przuntek, 1998). Damage to, or reduced activation in, the amygdala has been related to a deficit in affective tasks, such as recognizing emotion from facial and vocal cues, in the general population (for a review see, Blair, 2005). However, behavioural studies examining an emotion identification deficit in adult psychopaths have yielded equivocal results: some have found a deficit in emotion recognition abilities (Dolan & Fullam, 2006); others have not (Glass & Newman, 2006; Richell et al., 2003).
A second possibility is that the psychopath can identify emotions in others, but does not have the usual affective response to that identification. In his seminal work on psychopathy, Cleckley (1976) argued that psychopaths can identify and interpret emotions, but "the feeling itself does not come to pass" (p.428), implying that identifying emotions in the psychopath does not elicit the affective processes most people experience. Studies that have examined this possibility behaviourally (Blackburn, 1975) or using brain imaging (e.g., Deeley et al., 2006; Gordon, Baird, & End, 2004; Kiehl et al., 2001) provide support for this hypothesis. Gordon et al. (2004) used functional magnetic resonance imaging (fMRI) to identify the areas of activation in the brain when performing a 'cognitive' task (identifying gender from a face) or an 'emotional' task (identifying an emotion from a face) in university participants 'high' and 'low' on callous-unemotional traits (i.e., they used a median split on the callous-unemotional scores). Participants 'high' on callous-unemotional traits utilized a different neural network (although there was some overlap) to perform the emotion identification task than those 'low' on these traits, whereas, there were no activation differences for the cognitive task. One interpretation of these results is that psychopaths (or those high on callous-unemotional traits) are able to use a more 'cognitive' area of the brain to perform 'affective' tasks. That is, the identification of emotions can be achieved through cognitive processes that do not require an affective component (even though the affective component is present for most people). Arguably, psychopaths must learn to solve these typically affective tasks through a compensatory cognitive mechanism. If this interpretation is true, it follows that earlier in development, before children with

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3 Individual differences in cognitive compensatory skills (however they may arise) may then explain why some results in adults (e.g., Dolan & Fullam, 2006) have found deficits in performing an emotion identification tasks whereas others have not.
psychopathic traits have acquired the ability to compensate, they should show deficits in identifying emotions relative to their peers.

1.4. Emotion Recognition and Psychopathic Traits in Children

In comparison to the adult literature much less research has examined psychopathic traits and emotion recognition in children. The majority of work with children has been done by Blair and his colleagues who have found some evidence of deficits in processing fearful and sad expressions in 9- to 17-year-old boys labelled with behavioural problems and high levels of psychopathic tendencies as compared to boys with the behavioural problems without these psychopathic tendencies (Blair, Budhani, Colledge, & Scott, 2005; Blair, Colledge, Murray, & Mitchell, 2001; Stevens, Charman, & Blair, 2001); thus, lending support to the argument for a link between emotion identification and psychopathic traits in children. Moreover, in an 11- to 14-year old, non-clinical sample of children Blair and Coles (2000) found that the ability to recognize fearful and sad expressions was correlated negatively with both factors of psychopathy (callous-unemotional traits and impulsive/antisocial behaviour, considered separately). In a regression model in the same study, the identification of fearful and sad faces predicted a total psychopathy score above and beyond verbal ability, gender, age, and the recognition of other emotional expressions (i.e., happy, surprise, disgust, and anger). There is, therefore, early evidence of an emotion recognition deficit associated with psychopathic traits in preadolescents and adolescents; however, this has yet to be replicated and the nature of this relationship earlier in development remains an open question.
1.5. Impulsive/Antisocial Behaviour and Mental State Identification

Impulsive/antisocial behaviour is present in a number of conditions other than psychopathy and has its own set of negative effects. For example, Attention Deficit Hyperactivity Disorder (ADHD) is characterized by high levels of impulsive behaviour (DSM-IV, 2000) and has been found to result in more negative reactions and attributions by parents of these children (Johnston & Freeman, 1997). That is, parents of these children over-attribute negative outcomes to the behaviour of their child rather than as the result of the situation. Impulsive behaviour (e.g., not planning ahead) is associated with antisocial behaviour in older samples and clinical samples (e.g., Blonigen, Hicks, Krueger, Patrick & Iacono, 2005; Liu, 2004; O’Brien & Frick, 1996; Patrick, Hicks, Krueger, & Lang, 2005), and is believed to exist to a greater degree than more severe antisocial behaviour in young, non-clinical samples of children. Children labeled ‘problematic’ or ‘aggressive’ without a clinical diagnosis from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, 2000) are usually given these labels because of their impulsive/antisocial behaviours. Research with these populations suggests there may be a deficit in identifying other people’s mental states in children of varying ages who display these types of behaviour (Badenes, Estevan, & Bacete, 2000; Dodge & Coie, 1987; Dodge, Price, Bachorowski, & Newman, 1990; Dodge & Somberg, 1987; Hughes, Dunn, & White, 1998; Schultz, Izard, & Ackerman, 2000). Badenes and colleagues (2000) found that certain tasks involving mental state identification (e.g., the white lie portion of Happé’s Strange Stories) can differentiate problematic and peer-rejected children from popular and average children. Moreover, Hughes and colleagues (1998) studied preschool children (3-4 years of age) and found that hard-to-manage
preschoolers did worse on a recall/prediction false belief task (where the child has to recall his or her own false belief and predict someone else will hold the same false belief) than the control group. The hard-to-manage preschoolers also performed worse on another task that required identifying the other person’s mental state (e.g., I love pizza but he does not).

Research on misattribution biases also suggests that children who display impulsive/antisocial behaviour have problems in mental state identification. In addition to worse performance on the mental state identification task, Badenes et al. (2000) found that the peer-rejected boys in their study tended to attribute negative, hostile intentions to motivations they did not understand. Schultz et al. (2000) found that children who have a hostile attribution bias—that is, they see others’ intentions as being mean or hostile even when they are not—tend to show poorer social adjustment and, for boys, are more aggressive than their peers. Dodge and colleagues have examined attribution biases in several populations of aggressive children and although not all aggressive children show a hostile attribution bias (e.g., Dodge & Coie, 1987), many aggressive children do, particularly when feeling threatened (e.g., Dodge et al., 1990; Dodge & Somberg, 1987).

In a comparison study of current treatments used for aggressive preadolescent boys, Orobio de Castro and colleagues (2003) compared two treatments focused on either the feelings of the victim or the feelings of the aggressor. The first treatment had the boys stop and think about the other person’s intentions and feelings while the latter had each boy stop and think about his own feelings and try to calm down. There was also a control group of aggressive boys who did not receive either treatment. All children in the study reasoned that they acted aggressively in part because of another’s hostile intention.
The boys who were asked to think about their own feelings were able to calm down (although they did not change their belief about the other person’s intention) and, in turn, reacted less aggressively than either the control or the first treatment group. The boys who spent their time thinking about the other person’s intentions got angrier and reacted more aggressively than the other groups, supporting the view that these aggressive children have a tendency to identify other people’s mental states as hostile and maintain that belief over time. The evidence for the hostile attribution bias in children who show high levels of impulsive/antisocial behaviour is robust, yet this does not necessarily extend to children who display lower levels of these behaviours or to other types of misidentification of mental states.

More research is needed to discern how levels of impulsive/antisocial behaviour relate to mental state identification in others and what other factors may affect that relationship (e.g., gender and different aspects of intelligence). For example, a connection between antisocial behaviour and verbal ability has already been found (e.g., Barratt, Stanford, Kent & Alan, 1997; Frick, 2004; Raine et al., 2002) as has a relationship between verbal ability and tests of mental state identification (e.g., Happé, 1995; Hughes et al., 2005). Therefore, although many children display some impulsive or antisocial behaviour, it is not necessarily related to a deficit in identifying mental states in others, but may be due to lower verbal ability or a third factor. The current research aims to establish what relationship, if any, there is between the ability to identify mental states and impulsive/antisocial behaviour in a non-clinical sample of children while taking other factors, such as verbal ability, into account.
1.6. Emotion Identification, Mental State Identification, and Narcissism

Narcissism is not identified as a separate factor of psychopathy in either the adult Psychopathy Checklist – Revised (Hare, 1991) or the previous version of the Antisocial Process Screening Device, known as the Psychopathy Screening Device (Frick & Hare, 2001). It has, however, always had a role in the concept of psychopathy. In the adult literature, the ‘callous-unemotional’ factor is correlated with both Narcissistic Personality Disorder and self-report measures of narcissism (for a review, see Hare, Hart, & Harpur, 1991). In the child literature the third factor labelled ‘Narcissism’ was identified in a large factor analysis performed on the Psychopathy Screening Device in a non-clinical sample (Frick et al., 2000).

While there is a dearth of research examining the relationships between narcissism and identifying other people’s emotions and mental states, there is evidence of a negative relationship between narcissism and self-reported empathy (Watson, Grisham, Trotter, & Biderman, 1984) as well as a relationship between narcissism and self-reported personality traits regarding affiliating with others (e.g., agreeableness, dominance) (Bradlee & Emmons, 1992), components related to (but not identical to) the identification of mental states and emotions in others. Clearly there is a need for more research on how narcissism relates to socio-cognitive processes, and particularly how this plays into the concept of psychopathy in children.

1.7. Dissociating the Components of Psychopathy

While it is important to examine psychopathy as a construct in and of itself, it is also important to examine the relationships each of the comprising factors (callous-unemotional traits, narcissism, and impulsive/antisocial behaviour) has with social,
cognitive, and affective abilities. As previously mentioned, the callous-unemotional factor has been considered the hallmark of psychopathy and yet is rarely examined separately from impulsive/antisocial behaviour, even in research with children and non-criminal samples (Barry et al., 2000; Blair, Budhani, Colledge, & Scott, 2005; Blair, Colledge, Murray, & Mitchell, 2001; Loney et al., 2003; Stevens, Charman, & Blair, 2001; for an exception in the adult literature, see Gordon et al., 2004). For example, Barry and colleagues (2000) studied children aged 6 to 13 with CD and ADHD who either displayed callous-unemotional traits or not and found that the CD/ADHD group with callous-unemotional traits performed worse on an affective task and yet also had a higher average IQ than the CD/ADHD group without these traits. Similarly, Loney and colleagues (2003) found that behaviourally problematic adolescents with callous-unemotional traits were slower to respond to emotional stimuli (i.e., faces) than behaviourally problematic adolescents without callous-unemotional traits. This research has been very important in highlighting differences amongst behaviourally problematic children or between behaviourally problematic children and controls, but limits the interpretation of these findings because the presence of callous-unemotional traits in the absence of impulsive/antisocial behaviour may be related to different outcomes and cognitive processes. That is, it is possible that the previous results hold only when multiple factors of psychopathy are present. However, it is equally likely that higher levels of each factor are related to different processes. The current study will explore each factor independently and their relationships to the identification of mental states and emotions using a non-clinical sample of children.
In sum, it is hypothesized that: 1) A child’s level of psychopathic personality traits (i.e., callous-unemotional traits and narcissism) will predict his or her ability to correctly identify others’ emotions, and 2) A child’s level of impulsive/antisocial behaviour will predict his or her ability to correctly identify others’ cognitive mental states. The roles of intelligence, age, and gender will be considered in addition to simply looking at the relationship between the personality characteristics of psychopathy and identification of mental and emotional states. The inconclusive results from work with psychopathic adults, coupled with neuroimaging research, suggest a possible compensatory system by which emotional tasks are performed cognitively. Thus, the components of intelligence (i.e., verbal ability, processing speed, and fluid intelligence) will be included as controls while assessing the relationships of interest. Age is another factor that can affect performance on both identification tasks and therefore will also be controlled for in all analyses. Finally, the role of gender is important to explore.

Psychopathy is predominantly looked at in male populations (e.g., Forth, Brown, Hart, & Hare, 1996; Hare et al., 1990; Harpur et al., 1988) with less research focused on the construct in females (for exceptions, see Salekin, Rogers, & Sewell, 1997; Salekin, Rogers, Ustad, & Sewell, 1998; Vitale & Newman, 2001). The DSM-IV lists Narcissistic Personality Disorder (NPD) as occurring in males up to 75% more often than in females and ASPD as occurring five times more often in males than in females. Thus, I expect to find gender differences in the factors of psychopathy being assessed, with males scoring higher on callous-unemotional traits, narcissism, and impulsive/antisocial behaviour. ⁴

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⁴ Although psychopathy as it is currently construed has been identified in females, albeit to a lesser degree, it is possible that the way in which psychopathy manifests itself in females is different. One possibility is that there is a larger emphasis on the callous-unemotional traits as opposed to either the narcissistic traits or impulsive/antisocial behaviour.
test these hypotheses a 6- to 11-year old non-clinical sample of children were
administered an emotion identification task, a mental state identification task, and
measures of verbal ability, fluid intelligence, and processing speed. Parents of these
children were also given two measures assessing the factors of psychopathy in children.
2. Methods

2.1. Participants

Participants were 60 children from the Vancouver area (37 boys and 23 girls). Seventeen children (9 boys and 8 girls) completed the study at their elementary school while the remainder completed the study at a university laboratory. All but one child completed the entire child portion of the study. Six parents did not complete any portion of the questionnaire to assess behaviour and demographics. Ten participants were omitted for invalid data on the intelligence measures (see below for a further explanation). Therefore, data from 43 participants were used to calculate indices of psychopathic behaviour and traits. Of these 43 participants, 23 were boys and 20 were girls. Participants ranged in age from 6- to 11-years old (M = 8 years, 3 months, SD = 1 year, 5 months). Thirty-seven percent of the participants were Caucasian, 18.6% were Asian, 11.6% declined to specify, and the remainder were of various different ethnicities. The majority (81%) of participants were from middle to upper class backgrounds (with family income ranging from $40,000 to more than $220,000 per year) and 14% declined to specify.

2.2. Measures

2.2.1. Child Measures

Happe's Strange Stories (Happe, 1994). This task involves answering questions about the non-literal statements made by the characters in 12 short stories. Correctly answering these questions requires that the participant understands the story character's mental states. More specifically, it involves answering questions about what the character is thinking and why he/she said what he/she did. The 12 different types of stories
include: lie, white lie, joke, pretend, misunderstanding, persuade, appearance/reality, figure of speech, sarcasm, forget, double bluff, and contrary emotions. For an example, see Appendix A. The stories have been found to reliably discriminate amongst children with known mental state identification deficits, such as those associated with autism and Asperger's Syndrome (Happe, 1994). The child's answers for each story were scored on a 3-point scale with 0 being awarded for an incorrect answer, 1 point for a partially correct answer, and 2 points for a fully correct answer. The participant's total score (i.e., the sum of the score for each story, out of 24) was used for analyses. The scoring was done by a coder blind to the child's scores from the parent-report measure, and as with the Reading the Mind in the Eyes task, 25% of cases were coded by a second, blind coder for reliability purposes, with a $\kappa = .81$.

Reading the Mind in the Eyes – Children's Version (Baron-Cohen, Wheelwright, Scahill, Lawson, & Spong, 2001). This task requires participants to choose which emotion a person is displaying based on pictures of the eye-region. This version includes 28 pictures from the adult version of the task that were selected based on the performance of a sample of typically-developing children aged 6 to 10 (i.e., > 50% of the children selected the correct label from a set of four options) (Baron-Cohen et al., 2001). In the current study, participants were given two versions of the task – the original version in which the participant chooses an emotion from a list of four labels (forced-choice) and my modified version in which the participant must label the emotion without any choices (open-ended). For the open-ended version of the task, see Appendix B. For the forced-choice, or standard, version of the task, see Appendix C. The rationale for including the open-ended category was to explore what children come up with on their own (without
using a process of elimination)—a better parallel to real life scenarios. In addition, if there is a compensatory mechanism in place, or developing, it should be harder to generate an appropriate term than to simply select the appropriate answer from a limited set of answers. A third reason is that it allows us to test for systematic biases in the responses of the children. For example, a child who does not spontaneously label anyone as having a negative emotion is of interest, but that information would not emerge in a forced-choice task. In the forced-choice version, the total number correct was calculated and used for analysis. In the open-ended version, the participant’s answer was coded for valence (i.e., positive, neutral, negative, or threat/hostile) and compared to the valence of the appropriate answer. Examples of positive valence terms provided by the children in my sample include ‘happy’, ‘nice’, or ‘excited’; neutral valence includes words like ‘normal’ or ‘thinking’; negative valence examples include ‘sad’, ‘scared’, or ‘afraid’; and finally threat/hostile valence is specific to believing others to be angry and therefore includes items such as ‘angry’, ‘mad’, or ‘furious’. The total number of correct matches, the number of threat labels used, and the number of missed negative emotions were calculated. The coding for the open-ended portion of the task was performed by a coder who was blind to the child’s scores from the parent-report measures. In addition, 25% of the subjects were also coded by a second, blind coder for reliability purposes, with a $\kappa = .88$.

*Woodcock-Johnson III Brief Intellectual Assessment (WJ-III BIA) (Woodcock, McGrew, & Mather, 2001).* Participants were given this task in order to control for the various components of intelligence involved in the aforementioned tasks: verbal ability, fluid intelligence, and processing speed. The WJ-III BIA has been reported to correlate $r$
= .71 with the full-scale IQ from the WISC-III (McGrew & Woodcock, 2001). The individual scores for each component of intelligence measured (i.e., verbal ability, fluid intelligence, and processing speed) were included in the analyses to control for both individual differences in intelligence and age-related changes in intelligence. If any problems arose during testing (e.g., the child did not want to continue), it was noted and those participants were excluded from the analyses. For the verbal section, there were no participants omitted due to problems during testing. For the fluid intelligence section, there were testing problems for five participants. For the processing speed section, there were testing problems for three participants, but one overlapped with problems for the fluid intelligence section leading to a total of seven participants being omitted for testing problems during the WJ-III BIA.

2.2.2. Parent Report Measures

Two measures assessing psychopath traits in children were given to parents to complete. Both have been used in previous research and found to converge on a final score of psychopathic traits (e.g., Salekin, Leistico, Trobst, Schrum, & Lochman, 2005; Spain, Douglas, Poythress, & Epstein, 2004).

The Antisocial Process Screening Device (Frick & Hare, 2001). The Antisocial Process Screening Device (APSD) is a 20-item questionnaire scored on a 3-point scale (i.e., Never True, Sometimes True, and Always True). See Appendix D for the items. The measure was developed based on the Hare Psychopathy Checklist (Hare, 1991) to extend the notion of psychopathic traits to younger individuals. It provides scores on three subscales assumed to represent the factors of psychopathy in children – Narcissism, Callous-Unemotional Traits, and Impulsive/Antisocial Behaviour – with internal
reliability coefficients of .85, .76, and .74, respectively, in a community sample (Frick et al., 2000). The internal reliability coefficients from the current sample were .56, .44, and .65 for Narcissism, Callous-Unemotional Traits, and Impulsive/Antisocial Behaviour, respectively. The Narcissism component includes items such as “Bargs excessively” and “Gets angry when corrected”. The Callous-Unemotional component includes items pertaining to the expression of emotions, such as “Feels bad or guilty” and “Does not show emotions”. The Impulsive/Antisocial component reflects sensation seeking and impulse control and is represented by items like “Acts without thinking” and “Engages in risky activities”. The APSD has been found to have predictive validity for children aged 6 to 13 and is the most commonly used screening device for psychopathy in children and adolescence, although it is worth noting that there are still questions surrounding the validity of current measures used to assess psychopathic-like traits in pre-adolescents (for a review see, Johnstone & Cooke, 2004).

Child Psychopathy Scale – Revised Edition (Lynam, 1997). The Child Psychopathy Scale (CPS) is a 52-item yes/no questionnaire developed to identify the traits associated with psychopathy in a younger population and, like the APSD, was based upon Hare’s Psychopathy Checklist (Hare, 1991). See Appendix E for the items. The measure was developed based on empirical research that showed certain children shared similar psychological profiles with adult psychopaths (for a review, see Lynam, 1997). The measure was validated on 12- to 13-year-old boys and the overall psychopathy score provided had an alpha reliability of .91 and the individual subscales—glibness, untruthfulness, boredom susceptibility, manipulation, lack of guilt, poverty of affect, callousness, parasitic behaviour, behavioural dysinhibition, lack of planning,
impulsiveness, unreliability, and failure to take responsibility—generally had an internal reliability of .50 or above. The measure correlated highly with behavioural measures of impulsivity and executive functioning as well as non-self-report measures of internalizing and externalizing psychopathologies. Eleven of the 13 subscales were used in creating three components of psychopathy (callous-unemotional traits, narcissism, and impulsive/antisocial behaviour) based upon conceptual overlap between the items from the APSD and the items on the CPS. The ‘callous-unemotional traits’ component was comprised of callousness, poverty of affect, lack of guilt, and unreliability. Narcissism was comprised of glibness, manipulation, and boredom susceptibility. Impulsive/antisocial behaviour included failure to take responsibility, boredom susceptibility, impulsivity, and lack of planning. The internal reliability, however, was quite low with coefficients of .47 (Impulsive/Antisocial Behaviour), .44 (Narcissism), and .18 (Callous-Unemotional Traits). The items from untruthfulness and parasitic behaviour did not map onto items from the APSD and were therefore omitted. This measure was also used with caution as it was only validated on a limited age-range (12- to 13-year olds) and no girls were included in this validation. It is also worth noting that the questions surrounding the validity of assessing psychopathic-like traits in children hold for this measure as well (Johnstone & Cooke, 2004).

Demographics. Demographic information, including the child’s ethnicity, socio-economic status, parental employment status, marital status, etc., was also collected from parents. See Appendix F. The information provided was used here for descriptive purposes only. Analyzing the relationships between these demographic variables and psychopathic-like behaviours, while interesting, was not a primary aim of this research.
Moreover, the homogeneity of the current sample's demographics limits the utility of demographic information as predictors in the current analyses.

2.3. Procedure

Participants who completed the study at their school did so over two sessions. In the first session, which lasted approximately 30 minutes, the participants completed the emotion identification task (*Reading the Mind in the Eyes* – *Children’s Version*) and the mental state identification task (*Happé’s Strange Stories*), counterbalancing for order. In the second session, which lasted approximately 30 minutes and took place between 2 days and 2 weeks later, the participants completed the *Woodcock-Johnson III Brief Intellectual Assessment*.

Participants who completed the study at the university laboratory completed everything in one session that lasted approximately 60 minutes. The emotion identification and mental state identification tasks were given first and were counterbalanced. This was followed by a 5-minute break and then the administration of the *Woodcock-Johnson III Brief Intellectual Assessment*. All participants were given a gift for their participation.

The parents of the participants completed the *Antisocial Process Screening Device*, the *Childhood Psychopathy Scale*, and the demographic questions in one questionnaire. Ten parents completed the questionnaire at home and mailed it back and the remainder completed the questionnaire at the laboratory while their child participated in the study in an adjacent room.
2.4. Preliminary Analyses

Prior to the main analyses—hierarchical multiple linear regression on each of the dependent variables—preliminary analyses were performed to: 1) Determine if participants labelled English as a Second Language (ESL) were performing similarly to non-ESL participants, and therefore if they should be included in the current analyses; 2) Determine if there were any order effects stemming from whether Happé’s Strange Stories or the Reading the Mind in the Eyes task was administered first; 3) Determine if there were any effects of location for the study (i.e., in lab versus in school); 4) Compare performance on mental state identification and emotion identification to see if the two abilities can rightfully be viewed as separate abilities; and 5) Ascertain the relationship between the APSD and the CPS to determine if their subscales could be amalgamated. In addition, the means and standard deviations for all the dependent variables were calculated (see Table 1).

To test whether the ESL participants could be considered in the same distribution as the non-ESL students, independent sample T-tests were performed on each of the dependent variables as well as the three indices of intelligence. There were four children labelled as ESL in the school sample (the information about ESL status was provided by the teacher) and none labelled as ESL in the lab sample (as provided by the parents). The only significant result was for the child’s performance on the WJ-III BIA Verbal Ability section with ESL participants performing worse than non-ESL students. All other results were clearly nonsignificant. See Table 2 for the results. Given that both Happé’s Strange Stories and the open-ended version of the Reading the Mind in the Eyes task are heavily dependent on the child’s ability to convey answers verbally and the lack of
significant differences between the ESL and non-ESL children on these tasks suggests there is reason to suspect that the WJ-III BIA Verbal section is not indicative of these participants’ overall verbal abilities, but simply reflects their knowledge of specific English vocabulary terms. I believe that because Happé’s Strange Stories and the open-ended version of the Reading the Mind in the Eyes task gave children the opportunity to elaborate on their answers (something not allowed on the WJ-III BIA) they were able to respond on par with their peers, even with a more limited English vocabulary. However, the ESL participants were omitted from the regression analyses because the verbal score was included as a predictor variable in all models. In other words, I would argue that the WJ-III BIA Verbal Scale (that is predominantly vocabulary-based) is a useful indicator of a child’s verbal abilities if the child is a native English speaker but may not be a valid indicator of a non-native speaker’s verbal abilities; hence its validity as a predictive variable is also called into question.

A second concern to address prior to analyses was the potential effect of order on the five dependent variables. Of the 53 participants with full data, 29 completed Happé’s Strange Stories first followed by the Reading the Mind in the Eyes task whereas 24 completed the Reading the Mind in the Eyes task followed by Happé’s Strange Stories. Using an independent samples T-test, I found no effect of order on the performance of any of these tasks, all p’s > .05, see Table 3 for the results; therefore, the two orders were combined and analyzed as one.

Similarly, an independent samples T-test was used to compare the results on the dependent variables between subjects who participated in the laboratory versus those who participated in their school. Results indicated no significant effect of location on the
performance of any of these tasks, all $p's > .05$, see Table 4 for the results. Thus, the two locations were combined for the main analyses.

The abilities to identify emotions and mental states in others are viewed as being conceptually distinct in this study. To test whether this distinction is warranted, Pearson product moment correlations between performances on the five dependent variables were calculated. See Table 5 for the correlations. Results indicated that performance for mental state identification was related to the forced-choice portion of Reading the Mind in the Eyes, but was not related to any of the open-ended variables. In addition, the forced-choice portion was not correlated with any of the open-ended variables. Thus, although the forced choice emotion identification task may be seen as being conceptually similar to mental state identification, the open-ended version does provide a conceptually distinct measure of emotion identification.

Finally, correlations between the APSD and the CPS subscales were performed to see if the subscales of the two measures could be merged into one subscale for each component. First, each measure was assessed for missing data. In this sample, 1% of the questions in the APSD were missing data. When factor scores were calculated, there were missing data for two participants for the callous-unemotional and impulsive/antisocial behaviour factors, and one additional participant for the narcissism factor. As the data appears to be missing at random and comprises less than 5% of items, casewise deletion was used to handle the missing values. Moreover, the distribution of each question is non-normal and there is reason to believe that replacing missing values for non-normal predictor variables is not valid (Biesanz, personal communication). In this sample, 2% of the questions in the CPS were missing data and this resulted in a loss
of 4 participants for the narcissism component while there was a loss of five participants for the callous-unemotional and impulsive/antisocial behaviour components. The correlations between the subscales of the APSD and the CPS appear in Table 6.

Although the correlations were significant amongst the impulsive/antisocial behaviour and narcissism components of both measures, there was not a significant correlation between the callous-unemotional traits for both measures. The lack of significant correlations between the callous-unemotional traits for each measure was surprising given evidence of convergence from previous studies (e.g., Salekin, Leistico, Trobst, Schrum, & Lochman, 2005; Spain, Douglas, Poythress, & Epstein, 2004). However, the previous studies were different in two important ways—a) they compared the total psychopathy score as opposed to the individual measures and it may be that the individual subscales are not as similar as one would expect, and b) they compared the scales on clinical samples whereas the current study was with a non-clinical current sample. Given failure to converge on all three components of psychopathy, the two measures were considered separately for the purposes of this study.
3. Results and Discussion with the Psychopathy Subscales of the APSD

3.1. Statistical Analyses

Regression analyses were performed with the APSD subscales as the predictor variables of interest and the various scores from the mental state and emotion identification measures as dependent variables. Hierarchical multiple regression was used over non-hierarchical methods in order to determine the effects of the factors of psychopathy on the dependent variables of interest above and beyond the contributions of age, gender, and intelligence. As previously mentioned, casewise deletion was used in the calculation of the component scores. This, combined with the removal of cases for any problems on the tasks (e.g., the child refusing to finish a particular task or problems administering any of the intelligence measures, as previously described), resulted in a valid $n$ of 41 for analyses including the callous-unemotional traits and impulsive/antisocial behaviour (i.e., the same participants were missing from each of these analyses and therefore the initial models are identical) and an $n$ of 40 for analyses including narcissism. Henceforth, the models will be referred to as ‘CUIA’ and ‘Nar’. In the first level of the analyses, age and gender were entered to see the amount of variance they contributed to the dependent variables. In the second level scores for the three intelligence measures were included in order to see the overall effect of intelligence above and beyond age and gender. Finally, the factors of psychopathy were entered individually in the third level resulting in three hierarchical models for each dependent variable (callous-unemotional traits, narcissism, and impulsive/antisocial behaviour).
3.2. Results for Happé's Strange Stories

This task was scored out of a possible 24. In the current sample, scores ranged from 4 to 19 points (M = 12.39, SD = 3.67). The lowest scoring children only received points for 2 stories while the highest scoring children received points for 10 of the 12 stories. The total score on Happé's Strange Stories was used as the dependent variable for the hierarchical linear regression models. The initial models (including age and gender) accounted for 18% of the variance of the total score for the identification of mental states in others, a significant proportion in both models. The models indicate that being older—$\beta = .41, t_{38} = 2.83, p < .01$ (CUIA) and $\beta = .41, t_{37} = 2.73, p = .01$ (Nar)—uniquely predicts better performance on identifying mental states in others. The addition of the intelligence measures in the second level of the analysis did not result in a significant $R^2$ change, both $p's > .05$, indicating that intelligence does not significantly predict scores on identifying mental states above and beyond age and gender. Consistent with my hypothesis, callous-unemotional traits and narcissism did not contribute significantly to the predictive variance. In contrast to my hypotheses, however, impulsive/antisocial behaviour did not result in a significant $R^2$ change. These results appear in Table 7.

3.3. Results for Reading the Mind in the Eyes, Children's Version

Forced-Choice Version, Total Correctly Matched

Scores for the number of correct emotions ranged from 5 to 14 out of a possible 14 (M = 9.14, SD = 1.90). The initial regression models accounted for 25% (CUIA) and 26% (Nar) of the variance in the number of correct matches. As with the models for Happé's Strange Stories, being older—$\beta = .48, t_{38} = 3.37, p < .01$ (CUIA) and $\beta = .47, t_{37}$
Intelligence did not result in a significant change in the amount of variance accounted for by the model, both $p's > .05$. The addition of the factors of psychopathy provided mixed support for my hypotheses. In support of my hypothesis, the impulsive/antisocial behaviour factor did not result in a significant $R^2$ change. However, in contrast to my hypotheses, the addition of the personality factors from the APSD also did not result in a significant $R^2$ change, all $p's > .05$. See Table 8 for a summary of these results.

Open-Ended Version, Total Correctly Matched

The first component of the open-ended version analyzed was the total number of responses given by the participant that matched the valence of the stimuli. Scores for the correct number of matches ranged from 0 to 8 out of a possible 14 ($M = 5.88, SD = 2.01$). The models including age and gender did not significantly predict scores on the number of emotions correctly matched for valence, both $p's > .05$, nor was there a significant $R^2$ change from the addition of the intelligence measures, both $p's > .05$. Thus, there was no predictive power for age, gender, or intelligence for this variable. There were no significant changes to the model when including callous-unemotional traits or narcissism, both $p's > .05$. However, the inclusion of impulsive/antisocial behaviour increased the amount of variance explained by 13%, a significant amount. This was not hypothesized and, surprisingly, the standardized regression coefficient for the impulsive/antisocial behaviour indicated that a higher score on the impulsive/antisocial behaviour factor of psychopathy is related to greater accuracy in identifying what other people are feeling when controlling for age, gender, and the various intelligence measures, $\beta = .40, t_{34} = 2.50, p < .05$. These results are located in Table 9.
Open-ended version, Threat Attributions

The second component analyzed as part of the open-ended version of Reading the Mind in the Eyes was the number of threat emotion attributions made by the participant, an indication of the participant’s assessment of hostility or threat based on facial expression. There were a total of 14 stimuli and scores ranged from 0 to 8 (M = 2.56, SD = 1.88). The initial models, including age and gender, were both significant, accounting for 24% of the variance. Increased age uniquely predicting fewer threat attributions, \( \beta = -0.35, t_{38} = -2.46, p < .05 \) (CUIA) and \( \beta = -0.37, t_{37} = -2.54, p < .05 \) (Nar), as did being female, \( \beta = -0.33, t_{38} = -2.31, p < .05 \) (CUIA) and \( \beta = -0.30, t_{37} = -2.10, p < .05 \) (Nar). Intelligence did not increase \( R^2 \) significantly in either model, both \( p's > .05 \). The addition of callous-unemotional traits in the third level resulted in a significant \( R^2 \) change in line with previous research. Furthermore, callous-unemotional traits were found to negatively predict the number of threat attributions made, \( \beta = -0.32, t_{34} = -2.27, p < .05 \), supporting the possibility of threat insensitivity. The other significant predictor in the final model was gender, \( \beta = -0.35, t_{34} = -2.55, p < .05 \), indicating that being a boy predicts—above and beyond age, intelligence, and callous-unemotional traits—making a threat attribution.

While no specific hypotheses were made regarding gender, this is not surprising given the higher prevalence of psychopathy and antisocial behaviour in boys.

When narcissism was added to the model, it also resulted in a significant change to the amount of variance accounted for by the model. As a predictor in the final model, higher levels of narcissism were related to lower numbers of threat attributions, \( \beta = -0.30, t_{33} = -2.02, p = .05 \), in line with the threat insensitivity theory of psychopathy. Gender
was also a unique predictor of the number of threat attributions, $\beta = -.28$, $t_{33} = -2.04$, $p = .05$, indicating that girls are less likely to make threat attributions than boys.

Impulsive/antisocial behaviour also resulted in a significant change in the amount of variance accounted for. However, contrary to my hypothesis, impulsive/antisocial behaviour was a negative predictor, $\beta = -.38$, $t_{34} = -2.55$, $p < .05$—that is, participants who were rated high on the impulsive/antisocial behaviour component were less likely to generate threat emotions for the visual stimuli. Gender was also a unique predictor, $\beta = -.39$, $t_{34} = -2.84$, $p < .01$, with girls attributing fewer threat attributions than boys. See Table 10 for a summary of the models.

Open-Ended Version, Number of Missed Negative Emotions

The last component analyzed from the open-ended version of the Reading the Mind in the Eyes task was the number of negative emotions recognized from the eyes (e.g., sad, fearful) that the participant incorrectly labelled as something else more positive (e.g., normal, happy). The scores ranged from 0 to 4 out of a possible 5 ($M = 1.88$, $SD = 1.33$). Thus, the number of missed negative emotions was entered as the dependent variable in the hierarchical multiple regression analysis. Age and gender did not predict a significant amount of variance in the number of missed negative emotions, both $p's > .05$; however, there were significant $R^2$ changes as a result of the inclusion of the intelligence measures. The addition of intelligence also led to significant models. The addition of the callous-unemotional traits increased the amount of variance predicted by 8% and in line with my hypothesis, was a positive, significant predictor of number of missed negative emotions, $\beta = .29$, $t_{34} = 2.09$, $p < .05$. Neither narcissism nor
impulsive/antisocial behaviour resulted in a significant model change, both $p's > .05$.

See table 11.

3.4. Discussion

The mental state identification task, Happe's Strange Stories, yielded one score of interest in this particular study—the overall ability of the participant to identify a variety of mental states. I hypothesized that callous-unemotional traits and narcissism would not predict scores on this task and this was supported by the results. Contrary to my hypothesis, however, there was no relationship between the ability to identify people's mental states and impulsive/antisocial behaviour. The lack of a relationship does not seem to be due to a lack of power to detect the difference as both components had virtually no predictive ability in the regression model after accounting for age and gender. Thus, there are (at least) three way to explain the current results (none of which are mutually exclusive): 1) The differences in performance due to age are too great thereby hiding any effects of personality that may occur within each age group; 2) The general ability to identify other people's mental states is not affected in those who display these traits; or 3) Clinical or severe levels of impulsive/antisocial behaviour are necessary before any deficits in identifying mental states are noticeable and therefore are not present in a non-clinical sample of children. It is unclear from the current results which of these possibilities is the most accurate.

The results from the emotion identification task were more in line with my hypotheses (though not all were supported). In the forced-choice portion of the emotion identification task, the number of correct identifications was not related to any of the factors from the APSD. This was in line with predictions for the impulsive/antisocial
behaviour component, but not what was hypothesized for the personality components. As with Happé's Strange Stories, performance on this task was predicted by age and gender, although predominantly by age. Again, the lack of $R^2$ change (in the range of .00 - .02) suggests that the insignificant results are not due to a lack of power. Thus, it is possible that 1) age-related changes are so great that any other effect is masked, 2) that there are no effects of individual differences in callous-unemotional or narcissistic traits for emotion identification, or 3) that the participants with higher levels of the personality components of psychopathy used the process of elimination (or another cognitive method) in order to reach the correct answer, in line with the theory of cognitive compensation for emotional tasks in psychopaths.

The most general measure from the open-ended emotion identification task was simply how well participants could label emotions based on the visual stimuli provided. While it was hypothesized that the personality components of psychopathy (i.e., callous-unemotional traits and narcissism) would significantly predict this ability in a negative manner, this was not the case. In fact, neither of these factors resulted in a significant change to the model predicting the participant's score on this task. Surprisingly, the impulsive/antisocial behaviour component did significantly change the model and positively predicted the score above and beyond age, gender, and intelligence. That is, higher scores on the impulsive/antisocial behaviour component predicted greater accuracy on the open-ended task. There is no previous research to support these results therefore it is possible that this result is spurious and would not be replicated. More research is needed to see if this effect is replicable and if so, what might explain it.
Two more specific measures from the open-ended emotion identification task were also of interest based on previous literature—the detection of threat through threat emotion attributions and the number of missed negative emotions (i.e., incorrectly assessing a negative emotion as a neutral or positive one). In the current study, both initial models were significant in predicting the number of threat emotion attributions, while the inclusion of the three factors of psychopathy led to three significant changes in the models. In addition, all three factors had negative predictive value, which was in line with my hypotheses for the callous-unemotional traits and narcissism, but was surprising for the impulsive/antisocial behaviour component for which I had hypothesized no relationship. These negative predictive values indicate that higher levels of psychopathic traits are associated with fewer threat attributions, potentially supporting the reduced attention to threat hypothesis (e.g., Benning et al., 2005; Levenston et al., 2000; Patrick et al., 1993). However, given that some of the attributions must be false (only two stimuli were identified as having threat valence as an option), it is unclear if these results indicate a reduced attention to threat or a more accurate assessment of threat. I believe a more precise interpretation is that children who are very low on the various psychopathic traits (relative to other non-clinical sample of children) are hypersensitive to threat and thereby see it in non-threatening situations. Combined with the previous research on psychopathy and threat, these results help paint a picture of a continuum whereby psychopathic traits moderate the level of threat one sees in a given situation. Clinical level of psychopathy would result in a significant reduction in the amount of attention to threat while very low levels of these traits result in seeing threat more frequently (even in instances where the threat is not real). Thus, the use of a non-clinical sample in this study
is providing the middle spectrum whereby higher levels of these traits indicate more accurate threat assessment relative to lower levels.

The second, more specific measure was the number of missed negative emotions. That is, the total number of negatively valenced emotions that were *incorrectly* labelled as being neutral or positive. The initial models with age and gender were *not* significant; however, the addition of the intelligence measures was significant. This was surprising given the nature of the error being made and the fact that there was no correlation between the number of missed negative emotions and any of the intelligence indices. In line with my hypothesis, however, was the lack of a relationship between impulsive/antisocial behaviour and the number of missed negative emotions and, most importantly, that the addition of callous-unemotional traits resulted in a significant change in the amount of predicted variance in the number of missed negative emotions. Moreover, the individual contribution from callous-unemotional traits was also in the hypothesized direction—greater levels of callous-unemotional traits led to *more* missed negative emotions. These results are consistent with, and extend, the previous findings by Blair and his colleagues (Blair & Coles, 2000; Blair et al., 2005; Blair et al., 2001; Stevens et al., 2001) with behaviourally problematic children and an older, non-clinical sample of children.
4. Results and Discussion with the Psychopathy Subscales of the CPS

4.1. Statistical Analyses

Regression analyses were performed with 11 of the CPS subscales grouped into three components—callous-unemotional traits, narcissism, and impulsive/antisocial behaviour—as previously described. Again, hierarchical multiple regression was used in order to determine the effects of the factors of psychopathy on the dependent variables of interest. Casewise deletion was used in the calculation of the component scores, which resulted in a valid $n$ of 38 for analyses including callous-unemotional traits and impulsive/antisocial behaviour (although different participants were included in each group) and an $n$ of 39 for analyses including narcissism. In the first level of the regression, age and gender were entered to see the amount of variance they predicted in the dependent variables. In the second level, scores for the 3 intelligence measures were added in order to see the overall effect of intelligence above and beyond age and gender. Finally, the factors of psychopathy were entered individually in the third level resulting in 3 hierarchical models for each dependent variable. The same dependent variables are included herein as were included in the regression analyses for the APSD. Each model is referred to herein by the psychopathy component that is added as the final predictor; that is, the callous-unemotional model ("CU"), the narcissism model ("Nar"), and the impulsive/antisocial behaviour model ("I/A").

4.2. Results for Happé's Strange Stories

The initial models, including age and gender, accounted for a significant proportion of the variance in the participant’s score for Happé’s Strange Stories with age as a unique predictor, $\beta = .46$, $t_{35} = 3.09$, $p < .01$ (CU), $\beta = .46$, $t_{36} = 3.03$, $p < .01$ (Nar),
and $\beta = .49, t_{35} = 3.35, p < .01$ (I/A), indicating better performance for older children. The inclusion of intelligence did not result in a significant $R^2$ change, all $p's > .05$, nor did the inclusion of any of the psychopathy components from the CPS, all $p's > .05$. This is in line with hypotheses for the callous-unemotional traits and narcissism, but not for the impulsive/antisocial behaviour. See Table 12 for a summary of these models.

4.3. Results for Reading the Mind in the Eyes, Children’s Version

Forced Choice Version, Total Correctly Matched

Age and gender accounted for a significant proportion of variance in the total number of emotions identified in the forced choice version of the task. Age was a unique predictor above gender in both models with increased age predicting better performance, $\beta = .55, t_{35} = 3.94, p < .001$ (CU), $\beta = .52, t_{36} = 3.60, p < .01$ (Nar), and $\beta = .58, t_{35} = 4.22, p < .001$ (I/A). The addition of intelligence did not result in a significant $R^2$ change, all $p's > .05$. In contrast with my hypothesis, callous-unemotional traits and narcissism did not add predictive value to the regression model, both $p's > .05$, but impulsive/antisocial behaviour did result in a significant $R^2$ change. Impulsive/antisocial behaviour held a negative regression coefficient, $\beta = -.36, t_{31} = -2.30, p < .05$, indicating that higher levels of impulsive/antisocial behaviour subscales of the CPS predicted poorer performance on the forced choice version of Reading the Mind in the Eyes. See Table 13.

Open-Ended Version, Total Correctly Matched

All initial models with the total number of correctly matched emotions in the open-ended version as the dependent variables were non-significant as were the models once intelligence was added, all $p's > .05$. The $R^2$ change from the addition of the
callous-unemotional traits was significant with higher levels of callous-unemotional traits predicting more correct matches, $\beta = .38$, $t_{31} = 2.05$, $p < .05$, the antithesis of what I hypothesized. There were no significant changes from the addition of narcissism, in contrast to my hypothesis, nor impulsive/antisocial behaviour, in line with my hypothesis, both $p's > .05$. See Table 14 for the model summaries.

Open-Ended Version, Threat Attributions

All initial models were significant, accounting for 17-24% of the variance (depending on the model). Age held unique predictive ability in two models, $\beta = -.32$, $t_{35} = -2.14$, $p < .05$ (CU) and $\beta = -.32$, $t_{35} = -2.14$, $p < .05$ (I/A), and was close in the other, $\beta = -.30$, $t_{36} = -1.95$, $p = .06$ (Nar). Gender held unique predictive ability in all models, $\beta = -.38$, $t_{35} = -2.59$, $p < .05$ (CU), $\beta = -.34$, $t_{36} = -2.21$, $p < .05$ (Nar), and $\beta = -.34$, $t_{35} = -2.29$, $p < .05$ (I/A). Thus, being older and being a girl predicted fewer threat emotion attributions. The addition of the intelligence scores did not yield a significant $R^2$ change, all $p's > .05$. In line with my hypothesis, the impulsive/antisocial behaviour did not predict the number of threat attributions made in the Reading the Mind in the Eyes task; however, narcissism did not result in a significant $R^2$ change either, contrary to my prediction, both $p's > .05$. In partial support of my hypothesis, the addition of callous-unemotional traits resulted in a nearly significant $R^2$ change. This indicates that higher levels of callous-unemotional traits predict fewer threat emotion attributions. Results located in Table 15.

Open-Ended Version, Number of Missed Negative Emotions

In predicting the number of missed negative emotions, age and gender did not predict a significant amount of variance, all $p's > .05$. However, the addition of the
intelligence measures not only resulted in significant $R^2$ changes, but also significant models. In line with my hypothesis, impulsive/antisocial behaviour did not result in a significant $R^2$ change, but neither did the callous-unemotional traits and narcissism, which was in contrast to my hypothesis, all $p's > .05$. See Table 16.

4.4. Discussion

Results for the mental state identification task, Happé's Strange Stories, did not support my hypothesis that levels of impulsive/antisocial behaviour would predict performance on this task. It is possible that this is due to a lack of power, however, the $R^2$ change was only .03 and therefore if power were the issue, only a small effect would likely be found. The same possibilities outlined in the discussion of the results for the APSD also apply here: 1) Age being such a strong predictor that it masked any effects of impulsive/antisocial behaviour within each age group; 2) There is no overall mental state identification deficit related to impulsive/antisocial behaviour; and 3) Severe, or clinical, levels of impulsive/antisocial behaviour are necessary to find an effect. There is also one more possibility here—that the subscales used to form the impulsive/antisocial behaviour component did not truly encompass the construct. This is unlikely as the items were chosen for their face validity to the construct and similar results were found with the APSD.

The Reading the Mind in the Eyes task provided several dependent variables. The analyses for the number correct on the forced-choice portion of this task resulted in what originally seemed to be surprising—the impulsive/antisocial behaviour component resulted in a significant change to the model and was negatively predicting performance on the task. This was surprising because I had not anticipated any relationship between
these two variables; however, given the positive correlation between Happé’s Strange Stories and the forced-choice portion of Reading the Mind in the Eyes, it is possible that the latter is more of a cognitive identification task than an affective task. That is, the forced-choice task may use similar processes as a mental state identification task and therefore is more likely to be related to impulsive/antisocial behaviour than the personality components of psychopathy.

The open-ended portion of Reading the Mind in the Eyes also provided some surprising results. The model predicting the overall number correct in the open-ended task from impulsive/antisocial behaviour was not significant, in line with my hypotheses. However, narcissism, which was hypothesized to be a significant predictor, was not significant. Moreover, although levels of callous-unemotional traits did predict performance, it was in the opposite direction than hypothesized. That is, higher levels of callous-unemotional traits predicted more accurate responses. It is possible that the index of callous-unemotional traits is not a valid measure of the construct. The lack of correlation between the callous-unemotional indices from the APSD and the CPS as well as the low internal reliability of the callous-unemotional component from the CPS lends weight to this interpretation. Another more interesting, but less probable, possibility is that moderate levels of these traits are actually beneficial to social functioning and emotion recognition. Further research is needed to better understand this.

None of the components of psychopathy yielded significant results for the number of threat emotion attributions made or the number of missed negative emotions. However, levels of callous-unemotional traits were nearly significant in predicting the number of threat emotion attributions. Higher levels of these traits predicted fewer threat
emotion attributions in the open-ended portion of the task. This is in line with previous findings regarding psychopathy and reduced attention to threat. The failure to find significant results with callous-unemotional traits and narcissism predicting the number of missed negative eyes was surprising. The $R^2$ changes for each component indicate that power is not to blame, and therefore it is possible that, as mentioned before, the CPS does not provide a valid measure of these constructs. There are at least two other possible explanations: 1) There is no effect of the levels of the psychopathic personality traits (i.e., callous-unemotional and narcissism) on the ability to accurately identify negative emotions; and 2) The personality traits must be severe, or clinical, in order for a deficit to appear. Given the lack of convergence with the callous-unemotional APSD results, I believe the most likely explanation is that the CPS does not provide a very valid, or comprehensive, measure of callous-unemotional traits.

In general, the results from the components of psychopathy as assessed by the CPS provided mixed support for my hypotheses. I do not believe that the failure to support certain hypotheses stems from the choice of subscales that formed each component; but rather because this measure is usually used to yield a total psychopathy score, the breakdown into separate components may have resulted in a loss of some of the predictive variance.
5. Reconciling Differences between the APSD and CPS Results

The relative utility of the APSD and CPS were inadvertently compared due to the inability to combine scores on the two measures to form single indices of each component of psychopathy—callous-unemotional traits, narcissism, and impulsive/antisocial behaviour. While both measures are used to assess psychopathy in young children and the components were based on similar items, the results with the CPS were less clear than those with the APSD. Arguably, the different scoring system contributed to these differences. Whereas the APSD provides parents a 3-point scale to respond to the statements, including the category ‘sometimes’, the CPS only provides ‘yes’ or ‘no’ as options. The failure to offer an in-between category may have resulted in children’s scores being too high, too low, or a combination of both depending on how each parent interpreted a ‘yes’ answer. This is particularly problematic when a parent would like to answer ‘sometimes’—some of them may have put ‘yes’, some ‘no’, while others left the question blank, hurting the validity of the indices. The low internal reliability for the callous-unemotional traits is probably evidence for inconsistencies in how parents are choosing ‘yes’ versus ‘no’.

As previously mentioned the APSD has been validated with a broader sample (including females and younger children) than the CPS, thus, where results diverge, findings from the APSD are favoured.
6. General Discussion and Conclusions

Performance on the emotion and mental state identification tasks were in the normal range, and no child reached a ‘severe’ level on any of the psychopathy indices, which was not surprising as the sample was non-clinical and on the younger side.

Not all hypotheses were borne out with respect to mental state and emotion identification abilities, particularly those that were based more on extensions (in nature) of other theories. For instance, although the impulsive/antisocial component did not predict performance on Happé’s Strange Stories, this prediction was based upon previous findings on the misreading of intent in others (the Hostile Attribution Bias) (e.g., Dodge, Price, Bachorowski, & Newman, 1990) whereas this study used a variety of mental states. Although Badenes et al. (2000) found that problematic children performed worse on the White Lie portion of Happé’s Strange Stories, it is possible that this was due to the fact that to understand a white lie requires understanding of the intent of the speaker (in this case, to not hurt someone else’s feelings). Arguably, levels of impulsive/antisocial behaviour predict specific deficits in mental state identification, not a broad deficit, and therefore the overall score on Happé’s Strange Stories is not affected.

There is also evidence that the forced-choice Reading the Mind in the Eyes (the validated version of this task) is more closely related to the cognitive task of identifying non-affective mental states than to identifying affective states. Correlations between the various tasks indicate that the forced-choice portion was only related to Happé’s Strange Stories. It was not correlated with the open-ended portion, which required generating emotional terms and is plausibly more affective in nature (although still requiring cognitive abilities). Moreover, the failure to find a relationship between the personality
components of psychopathy—callous-unemotional traits and narcissism—and the forced-choice portion may be due to the more cognitive nature of the task, not a lack of a relationship between components of psychopathy and the ability to accurately identify emotions in others. The one significant $R^2$ change for this measure was due to the addition of the impulsive/antisocial behaviour component of the CPS and indicated greater levels of this behaviour predicted poorer performance on the forced-choice portion of the task. If the task is more cognitive than affective, then this is in line with my hypothesis regarding impulsive/antisocial behaviour predicting identification of mental states (a cognitive task). Hence, if psychopathy predicts a deficit in the ability to correctly identify emotions in others, this particular task does not seem to be tapping that ability. This has implications for some of the previous work that has been done. For example, Richell et al. (2003) found no deficit in emotion identification abilities in adult psychopathy, but they utilized the adult version of Reading the Mind in the Eyes, a forced-choice task, to test this. Therefore, the results may not reflect the psychopath’s ability to correctly assess what another person is feeling via the usual mechanisms, but rather their ability to solve the task through the process of elimination.

Overall, these findings support my claim that those with diminished emotion recognition abilities may perform well despite their deficits under conditions where a compensatory mechanism can be utilized (e.g., forced choice emotion recognition tasks). In addition, results for the total correct on the open-ended emotion identification task do not contradict this hypothesis as there were no significant findings with callous-unemotional traits and narcissism from the APSD, which could be indicative of the compensatory processes at work, but is not conclusive. Recall, however, that I had
hypothesized that such a compensatory mechanism would not be as developed early in life (hence using the younger sample) and therefore if a compensation mechanism is being used, it is developing earlier than I had predicted. These findings suggest that future research on emotion recognition abilities would benefit from the use of my modified (open-ended) emotion recognition task (or a similar open-ended task) that is more in line with emotion recognition that occurs in day-to-day social interactions.

Results with this non-clinical sample of children also extended previous results with clinical samples of adults. For example, Patrick et al. (1993) used the startle reflex response to assess how criminal psychopaths responded to differently valenced stimuli. They found, amongst other things, that the psychopath responded to threat stimuli (e.g., an image of a person holding a knife or looking angry) in the same manner as positive stimuli, which was not the case for the control group. In the current study, individual differences in all three components of psychopathy (from the APSD) predicted fewer threat emotion attributions, while the callous-unemotional traits of the CPS were almost significant in the same direction. Although the relationship with the impulsive/antisocial behaviour component was surprising (no relationship was expected), it is possible that as the impulsive/antisocial behaviour component of the APSD was correlated with the other APSD components, the results were due to shared variance. Not only do the current results replicate the previous physiological finding in a behavioural study, they were found in a non-clinical sample, demonstrating a more robust effect of psychopathic traits on threat assessment.

Another goal of the current study was to replicate the finding that children with psychopathic traits (both behavioural and personality components) present with a deficit
in identifying negative emotions in others (Blair et al., 2005; Blair et al., 2001; Stevens et al., 2001). These results have been replicated in a non-clinical sample of adolescents (Blair & Coles, 2000). The current findings with a non-clinical sample of children indicate that it is specifically the levels of callous-unemotional traits that predict the deficit in identifying negative emotions in others; however, Blair and Coles (2000) found relationships for both callous-unemotional traits and impulsive/antisocial behaviour in their older sample. I believe the most likely explanation is that across development, the components of psychopathy become more correlated and therefore the significant results with the impulsive/antisocial components are due to shared variance with callous-unemotional traits. Additionally, findings utilizing only one index of psychopathy could be significant because of the inclusion of callous-unemotional traits carrying the effect.

The fact that significant results arose for only one component of psychopathy (e.g., missed negative emotions from callous-unemotional traits) further supports my argument for the need to do research with the components of psychopathy as opposed to the construct as a whole. While the focus of what separates psychopathy from other antisocial disorders has been the personality component (e.g., Soderstrom, 2003; Viding, 2004), most research has approached the question of what processes are affected by psychopathy by examining it as a singular construct or by ensuring at least one factor, impulsive/antisocial behaviour, was present (e.g., Blair, 1997; Gretton et al., 2001; Patrick et al., 1993; Richell et al., 2003). Although the components are generally highly related, particularly if the personality component is present, the results from this study indicate that perhaps the affected processes are primarily related to one component and only secondarily related to the other(s). In addition, the presence of significant results in
a non-clinical sample supports conceptualizing these traits as being present on a continuum as opposed to simply being ‘absent’ versus ‘present’ or ‘high’ versus ‘low’.

To summarize, with respect to the identification of mental states and emotions in others, results from the current study reveal that: 1) individual differences in impulsive/antisocial behaviour do not predict differences in the overall ability to identify other people’s mental states, but may affect the ability to identify emotions in a forced-choice setting; 2) individual differences in callous-unemotional traits and narcissism do not predict the overall ability to correctly identify other people’s emotional states; 3) individual differences in all three factors of psychopathy (callous-unemotional traits, narcissism, and impulsive/antisocial behaviour) predict the likelihood of making a threat emotion attribution, with higher levels of all three factors related to a decreased tendency to make threat attributions; and 4) the failure to identify negative emotions is predicted by individual differences in callous-unemotional traits, with children who have elevated (but non-clinical) levels of these traits identifying fewer negative emotions than those with lower levels of these traits. I also conclude that the APSD serves as a better measure to assess the components of psychopathy because of the breakdown and scoring methods; however, the CPS may be equally valid when examining the construct of psychopathy as a whole. Finally, there is potential support for a compensatory mechanism associated with the personality components of psychopathy through the results with the forced-choice portion of Reading the Mind in the Eyes and the failure to predict the number correct on the open-ended emotion identification task from the personality components; yet there were systematic differences in this ability in terms of threat and negative emotions.
The results help to further our understanding of psychopathy, its components, and the social, cognitive, and affective processes it affects, which in turn will eventually help in the development of treatments and interventions. Although it is premature to consider the implications for treatment strategies, the results suggest that a focus on improving the accuracy of identifying negative and threat emotions in others may be fruitful avenues. In addition, my findings suggest that focusing on the presence of the components as opposed to ‘psychopathy’ may provide more specific treatments that would serve a broader population.
7. Limitations and Future Directions

The current study provides important information regarding how individual differences in the components of psychopathy relate to the socio-cognitive processes of identifying other people's mental states and emotions in childhood. However, there are several limitations to the current study that one must keep in mind when considering the results. The sample was on the smaller side and therefore some effects may not have been found due to decreased power. In addition, the sample was a rather homogenous one from a relatively high socio-economic status. This limits the generalizability of the results and caution must be used when considering these findings relative to other populations.

Second, although age was included as a predictor in the analyses, this only indicates how performance on the dependent variables changed with age; this does not demonstrate the relationships between the components of psychopathy and the socio-cognitive processes within each age group. Increasing the number of participants in each age range would allow this type of analysis and could provide important information about these relationships. It is quite possible that the effects will change over development, particularly if the compensation theory is correct because, while a compensatory mechanism may be present to some degree early in development, it likely continues to develop with age. Similarly, although gender was included in the regression, separate analyses for boys and girls would provide more information about how the relationships between psychopathic traits and mental state and emotion identification are similar or different by gender.
A final sampling limitation is that the participants in this study were not expected to display many antisocial behaviours; therefore, the impulsive/antisocial behaviour component is most likely made up from impulsive behaviours as opposed to both impulsive and antisocial behaviours, as previously mentioned. While there is evidence that impulsivity and antisociality are related (e.g., O'Brien & Frick, 1996), I believe that the failure to find expected results with the impulsive/antisocial behaviour component is likely due to the overemphasis of impulsive behaviours and the under-representation of antisocial behaviour. Thus, a sample with more antisocial behaviour would potentially provide results more in line with previous research.

Apart from sampling limitations, the current study did not look at archetypal affective processes, like mimicry or affective empathy, but focused on cognitive processes (mental state identification) and affective-cognitive processes (emotion identification). Given that psychopathy is thought to be related to a deficit in affective processing (e.g., a lack of empathy, guilt, and demonstrated affect), I would expect similar, if not greater, relationships with more ‘pure’ affective measures than were found herein. Future research could examine how individual differences in the components of psychopathy relate to more pure affective processes. Furthermore, an examination of the relationship between the open-ended portion of Reading the Mind in the Eyes and a more strictly affective task would illustrate the degree of affective processing involved in the open-ended task and whether a compensatory mechanism is at work.

Moreover, the current study focused solely on the more basic tasks of identifying mental states and emotions, not the ‘higher’ levels of theory of mind and empathy. The rationale being to establish if these more primitive processes are affected before moving
‘up’ to the more advanced socio-cognitive processes. For example, although different levels of callous-unemotional traits predict the number of missed negative emotions, this does not explain how those who miss these emotions will engage with others in situations requiring empathic responding. However, it seems likely that if one’s ability to detect negative emotions in others is diminished one’s ability to empathize with those negative emotions will likewise be impaired. Nonetheless, I cannot make conclusions about these higher processes and how they relate to the components of psychopathy.

Finally, this study has provided important results that can act as a springboard for future research into the mechanisms behind these relationships and the causal direction of these relationships. For example, the failure to identify negative emotions may be due to the presence of callous-unemotional traits or vice versa. Conceptually I treated the components of psychopathy as being the precursors to performance on the identification tasks (because the bulk of extant research is most in line with this conception); however, it is feasible that psychopathic traits result from difficulties in identifying mental states and emotions (or that other variables are at play). Additionally, how these relationships develop is still unknown. Neuroimaging work has identified ‘mirror neurons’, neurons that are active not only when an individual is performing certain actions, but also when that individual witnesses others perform the same action. Of particular interest is the evidence in humans of activity in the mirror neuron system, the insula, and the amygdala during the observation of affective facial expressions as well as the imitation of these expressions (for a review, see Iacoboni & Dapretto, 2006). Thus, this system seems to highlight the relationship in our brains between identification and experience, arguably supporting a failure to feel negative emotions (or threatened) as the reason behind the
failure to *identify* these same emotions. Clearly this is an area where more research is needed.

In summary, future research should focus on further exploring the age and gender differences in the relationships between the components of psychopathy and the identification of mental states and emotions, expanding the research to examine the effects for more affective processes (e.g., empathy and mimicry), and work towards identifying the mechanisms underlying these relationships. Once these effects are better understood, they should prove useful in the intervention and treatment of individuals identified as having psychopathic traits.
References


Happé, F. G. E. (1994). An advanced test of social perspective taking: Understanding the story characters' thoughts and feelings by able autistic, mentally handicapped,


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Table 1

*Means and Standard Deviations for the Tasks and Measures.*

<table>
<thead>
<tr>
<th>Measure or Task</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
<th>Maximum Score Possible</th>
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</thead>
<tbody>
<tr>
<td><em>Happe's Strange Stories</em>(^a)</td>
<td>12.40</td>
<td>3.67</td>
<td>4-19</td>
<td>24</td>
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<tr>
<td>Forced-Choice Eyes*(^a)</td>
<td>9.14</td>
<td>1.90</td>
<td>5-14</td>
<td>14</td>
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<tr>
<td>Open-Ended Eyes*(^a)</td>
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<td>0-8</td>
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<tr>
<td>Threat Emotion Attributions*(^a)</td>
<td>2.56</td>
<td>1.88</td>
<td>0-8</td>
<td>14</td>
</tr>
<tr>
<td>Missed Negative Emotions*(^a)</td>
<td>1.88</td>
<td>1.33</td>
<td>0-4</td>
<td>5</td>
</tr>
<tr>
<td>Callous-Unemotional Traits (APSD)(^b)</td>
<td>2.12</td>
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<td>Impulsive/Antisocial Behaviour (APSD)(^b)</td>
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</table>

\(^a\)The total \(n\) for these calculations is 43. \(^b\)The total \(n\) for these calculations is 41. \(^c\)The total \(n\) for this calculation is 40. \(^d\)The total \(n\) for these calculations is 38. \(^e\)The total \(n\) for this calculation is 39.
Table 2

*ESL performance versus non-ESL performance.*

<table>
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<tr>
<th>Measure or Task</th>
<th>ESL\textsuperscript{a}</th>
<th>Non-ESL\textsuperscript{b}</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happé's Strange Stories</td>
<td>5.75</td>
<td>6.64</td>
<td>.94</td>
<td>.35</td>
</tr>
<tr>
<td>Forced-Choice Eyes</td>
<td>8.00</td>
<td>8.95</td>
<td>.92</td>
<td>.36</td>
</tr>
<tr>
<td>Open-Ended Eyes</td>
<td>6.25</td>
<td>6.04</td>
<td>-.21</td>
<td>.83</td>
</tr>
<tr>
<td>Threat Emotion Attributions</td>
<td>1.75</td>
<td>2.49</td>
<td>.77</td>
<td>.44</td>
</tr>
<tr>
<td>Missed Negative Emotions</td>
<td>2.00</td>
<td>1.95</td>
<td>-.08</td>
<td>.94</td>
</tr>
<tr>
<td>Verbal Ability</td>
<td>17.75</td>
<td>37.47</td>
<td>4.75</td>
<td>.00</td>
</tr>
</tbody>
</table>

\textsuperscript{a}The total $n$ for these calculations is 4. \textsuperscript{b}The total $n$ for these calculations is 55.
Table 3

*Effects of Order on Performance.*

<table>
<thead>
<tr>
<th>Measure or Task</th>
<th>Order 1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Order 2&lt;sup&gt;b&lt;/sup&gt;</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happé's Strange Stories</td>
<td>11.69</td>
<td>11.96</td>
<td>-.26</td>
<td>.80</td>
</tr>
<tr>
<td>Forced-Choice Eyes</td>
<td>9.17</td>
<td>8.79</td>
<td>.74</td>
<td>.46</td>
</tr>
<tr>
<td>Open-Ended Eyes</td>
<td>5.86</td>
<td>6.29</td>
<td>-.79</td>
<td>.43</td>
</tr>
<tr>
<td>Threat Emotion Attributions</td>
<td>2.55</td>
<td>2.46</td>
<td>.18</td>
<td>.86</td>
</tr>
<tr>
<td>Missed Negative Emotions</td>
<td>1.83</td>
<td>2.13</td>
<td>-.77</td>
<td>.45</td>
</tr>
</tbody>
</table>

<sup>a</sup> Order 1: *Happé's Strange Stories* followed by *Reading the Mind in the Eyes* (*n* = 29).

<sup>b</sup> Order 2: *Reading the Mind in the Eyes* followed by *Happé's Strange Stories* (*n* = 24).
Table 4

Effects of Location on Performance.

<table>
<thead>
<tr>
<th>Measure or Task</th>
<th>In Lab$^a$</th>
<th>In School$^b$</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happe’s Strange Stories</td>
<td>12.53</td>
<td>11.89</td>
<td>.46</td>
<td>.65</td>
</tr>
<tr>
<td>Forced-Choice Eyes</td>
<td>8.91</td>
<td>10.00</td>
<td>-1.56</td>
<td>.13</td>
</tr>
<tr>
<td>Open-Ended Eyes</td>
<td>5.68</td>
<td>6.67</td>
<td>-1.32</td>
<td>.19</td>
</tr>
<tr>
<td>Threat Emotion Attributions</td>
<td>2.71</td>
<td>2.00</td>
<td>1.00</td>
<td>.32</td>
</tr>
<tr>
<td>Missed Negative Emotions</td>
<td>1.82</td>
<td>2.11</td>
<td>-.57</td>
<td>.57</td>
</tr>
</tbody>
</table>

$^a$ The total $n$ for these calculations is 34. $^b$ The total $n$ for these calculations is 9.
Table 5

*Correlations amongst the Performance on the Emotion and Mental State Identification Tasks.*

<table>
<thead>
<tr>
<th></th>
<th>Happé's Score</th>
<th>Forced-Choice Eyes</th>
<th>Total Correct</th>
<th>Threat Attributions</th>
<th>Missed Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happé's Score</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forced-Choice Eyes</td>
<td></td>
<td>1.0</td>
<td>-.01</td>
<td>-.21</td>
<td>.21</td>
</tr>
<tr>
<td>Total Correct</td>
<td></td>
<td></td>
<td>1.0</td>
<td>-.41</td>
<td>-.09</td>
</tr>
<tr>
<td>Threat Attributions</td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td>-.25</td>
</tr>
<tr>
<td>Missed Negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

Note. Significant correlates appear in boldface (all $p < .05$). The correlations are based on an $n = 43$. 
Table 6

Correlations between Factors on the Antisocial Process Screening Device and the Childhood Psychopathy Scale.

<table>
<thead>
<tr>
<th>APSD Factors</th>
<th>CPS Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Callous-Unemotional&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Callous-Unemotional</td>
<td>.29</td>
</tr>
<tr>
<td>Narcissism</td>
<td>.07</td>
</tr>
<tr>
<td>Impulsive/Antisocial</td>
<td>.28</td>
</tr>
</tbody>
</table>

Note. Significant correlations appear in boldface (all \(p > .05\)).

<sup>a</sup> The correlations with this variable have an \(n = 36\).  
<sup>b</sup> The correlations with this variable have an \(n = 37\).
Table 7

*Hierarchical Regression Results for Happé's Strange Stories and the APSD Factors of Psychopathy.*

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>F-value</td>
</tr>
<tr>
<td>Initial$^a$(40)</td>
<td>.18</td>
<td>4.29</td>
</tr>
<tr>
<td>+ BIA$^b$</td>
<td>.26</td>
<td>2.45</td>
</tr>
<tr>
<td>+ CU$^c$</td>
<td>.26</td>
<td>2.04</td>
</tr>
<tr>
<td>+ Imp/An$^d$</td>
<td>.26</td>
<td>1.99</td>
</tr>
<tr>
<td>Initial$^a$(39)</td>
<td>.18</td>
<td>4.11</td>
</tr>
<tr>
<td>+ BIA$^b$</td>
<td>.26</td>
<td>2.36</td>
</tr>
<tr>
<td>+ Nar$^e$</td>
<td>.26</td>
<td>1.93</td>
</tr>
</tbody>
</table>

*Note.* Significant models or $R^2$ change appear in boldface.

$^a$Model includes Age and Gender $^b$Model includes Age, Gender, and the 3 scales from the WJ-III BIA $^c$Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (APSD) $^d$Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (APSD) $^e$Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (APSD).
Table 8

Hierarchical Regression Results for the Forced-Choice Portion of Reading the Mind in the Eyes, Children's Version and the APSD Factors of Psychopathy.

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>F-value</td>
</tr>
<tr>
<td>Initialᵃ (40)</td>
<td>.25</td>
<td>6.47</td>
</tr>
<tr>
<td>+ BIAᵇ</td>
<td>.26</td>
<td>2.42</td>
</tr>
<tr>
<td>+ CUᶜ</td>
<td>.26</td>
<td>1.99</td>
</tr>
<tr>
<td>+ Imp/Antᵈ</td>
<td>.27</td>
<td>2.07</td>
</tr>
<tr>
<td>Initialᵃ (39)</td>
<td>.26</td>
<td>6.47</td>
</tr>
<tr>
<td>+ BIAᵇ</td>
<td>.26</td>
<td>2.41</td>
</tr>
<tr>
<td>+ Narᵉ</td>
<td>.29</td>
<td>2.19</td>
</tr>
</tbody>
</table>

Note. Significant models or R² change appear in boldface.

ᵃ Model includes Age and Gender. ᵇ Model includes Age, Gender, and the 3 scales from the WJ-III BIA. ᶜ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (APSD). ᵈ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (APSD). ᵉ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (APSD).
Table 9

Hierarchical Regression Results for the Total Matched on the Open-Ended Portion of
Reading the Mind in the Eyes, Children’s Version and the APSD Factors of Psychopathy

<table>
<thead>
<tr>
<th>Model (N)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (40)</td>
<td>R&lt;sup&gt;2&lt;/sup&gt;</td>
<td>F-value</td>
</tr>
<tr>
<td></td>
<td>.03</td>
<td>.49</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.16</td>
<td>1.35</td>
</tr>
<tr>
<td>+ CU&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.18</td>
<td>1.22</td>
</tr>
<tr>
<td>+ Imp/Ant&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.29</td>
<td><strong>2.34</strong></td>
</tr>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (39)</td>
<td>.03</td>
<td>.51</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.17</td>
<td>1.34</td>
</tr>
<tr>
<td>+ Nar&lt;sup&gt;e&lt;/sup&gt;</td>
<td>.22</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Note. Significant models or R<sup>2</sup> change appear in boldface.

<sup>a</sup>Model includes Age and Gender. <sup>b</sup>Model includes Age, Gender, and the 3 scales from the WJ-III BIA. <sup>c</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (APSD). <sup>d</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (APSD). <sup>e</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (APSD).
Table 10

Hierarchical Regression Results for Threat Emotions Attributions Made and the APSD

Factors of Psychopathy

<table>
<thead>
<tr>
<th>Model (N)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>F-value</td>
</tr>
<tr>
<td>Initialᵃ (40)</td>
<td>.24</td>
<td>5.87</td>
</tr>
<tr>
<td>+ BIAᵇ</td>
<td>.30</td>
<td>3.02</td>
</tr>
<tr>
<td>+ CUᶜ</td>
<td>.39</td>
<td>3.68</td>
</tr>
<tr>
<td>+ Imp/Antᵈ</td>
<td>.41</td>
<td>4.00</td>
</tr>
<tr>
<td>Initialᵃ (39)</td>
<td>.24</td>
<td>5.73</td>
</tr>
<tr>
<td>+ BIAᵇ</td>
<td>.31</td>
<td>3.12</td>
</tr>
<tr>
<td>+ Narᵉ</td>
<td>.39</td>
<td>3.51</td>
</tr>
</tbody>
</table>

Note. Significant models or R² change appear in boldface.

ᵃ Model includes Age and Gender. ᵇ Model includes Age, Gender, and the 3 scales from the WJ-III BIA. ᶜ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (APSD). ᵈ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (APSD). ᵉ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (APSD).
Table 11

*Hierarchical Regression Results for the Number of Missed Negative Emotions and the APSD Factors of Psychopathy*

<table>
<thead>
<tr>
<th>Model (N)</th>
<th>R²</th>
<th>F-value</th>
<th>Sig.</th>
<th>R² change</th>
<th>F-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (40)</td>
<td>.02</td>
<td>.44</td>
<td>.65</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.33</td>
<td>3.38</td>
<td>.01</td>
<td>.30</td>
<td>5.25</td>
<td>.00</td>
</tr>
<tr>
<td>+ CU&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.40</td>
<td>3.82</td>
<td>.00</td>
<td>.08</td>
<td>4.38</td>
<td>.04</td>
</tr>
<tr>
<td>+ Imp/Ant&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.33</td>
<td>2.74</td>
<td>.03</td>
<td>.00</td>
<td>.00</td>
<td>.96</td>
</tr>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (39)</td>
<td>.02</td>
<td>.39</td>
<td>.68</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.36</td>
<td>3.76</td>
<td>.01</td>
<td>.34</td>
<td>5.90</td>
<td>.00</td>
</tr>
<tr>
<td>+ Nar&lt;sup&gt;e&lt;/sup&gt;</td>
<td>.36</td>
<td>3.04</td>
<td>.02</td>
<td>.00</td>
<td>.01</td>
<td>.93</td>
</tr>
</tbody>
</table>

*Note.* Significant models or R² change appear in boldface.

<sup>a</sup>Model includes Age and Gender.  
<sup>b</sup>Model includes Age, Gender, and the 3 scales from the WJ-III BIA.  
<sup>c</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (APSD).  
<sup>d</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (APSD).  
<sup>e</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (APSD).
Table 12

Hierarchical Regression Results for Happé’s Strange Stories and the CPS Factors of Psychopathy

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>F-value</td>
</tr>
<tr>
<td>Initial(^a) (38)</td>
<td>0.21</td>
<td>4.76</td>
</tr>
<tr>
<td>+ BIA(^b)</td>
<td>0.29</td>
<td>2.56</td>
</tr>
<tr>
<td>+ CU(^c)</td>
<td>0.29</td>
<td>2.11</td>
</tr>
<tr>
<td>Initial(^a) (39)</td>
<td>0.20</td>
<td>4.60</td>
</tr>
<tr>
<td>+ BIA(^b)</td>
<td>0.34</td>
<td>3.38</td>
</tr>
<tr>
<td>+ Nar(^d)</td>
<td>0.35</td>
<td>2.81</td>
</tr>
<tr>
<td>Initial(^a) (38)</td>
<td>0.24</td>
<td>5.65</td>
</tr>
<tr>
<td>+ BIA(^b)</td>
<td>0.31</td>
<td>2.84</td>
</tr>
<tr>
<td>+ Imp(^e)</td>
<td>0.34</td>
<td>2.63</td>
</tr>
</tbody>
</table>

Note. Significant models or $R^2$ change appear in boldface.

\(^a\) Model includes Age and Gender. \(^b\) Model includes Age, Gender, and the 3 scales from the WJ-III BIA. \(^c\) Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (CPS). \(^d\) Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (CPS). \(^e\) Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (CPS).
Table 13

*Hierarchical Regression Results for the Forced-Choice Portion of Reading the Mind in the Eyes, Children's Version and the CPS Factors of Psychopathy*

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>F-value</td>
</tr>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (38)</td>
<td>.31</td>
<td>7.86</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.32</td>
<td>2.94</td>
</tr>
<tr>
<td>+ CU&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.32</td>
<td>2.40</td>
</tr>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (39)</td>
<td>.27</td>
<td>6.5</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.29</td>
<td>2.64</td>
</tr>
<tr>
<td>+ Nar&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.33</td>
<td>2.65</td>
</tr>
<tr>
<td>Initial&lt;sup&gt;a&lt;/sup&gt; (38)</td>
<td>.34</td>
<td>9.06</td>
</tr>
<tr>
<td>+ BIA&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.37</td>
<td>3.71</td>
</tr>
<tr>
<td>+ Imp&lt;sup&gt;e&lt;/sup&gt;</td>
<td>.46</td>
<td>4.39</td>
</tr>
</tbody>
</table>

*Note.* Significant models or R² change appear in boldface.

<sup>a</sup>Model includes Age and Gender.  <sup>b</sup>Model includes Age, Gender, and the 3 scales from the WJ-III BIA.  <sup>c</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (CPS).  <sup>d</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (CPS).  <sup>e</sup>Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (CPS).
Table 14

Hierarchical Regression Results for Open-Ended Portion of Reading the Mind in the Eyes, Children's Version and the CPS Factors of Psychopathy

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>F-value</td>
</tr>
<tr>
<td>Initial² (38)</td>
<td>.01</td>
<td>.23</td>
</tr>
<tr>
<td>+ BIA³</td>
<td>.13</td>
<td>.92</td>
</tr>
<tr>
<td>+ CU⁴</td>
<td>.23</td>
<td>1.54</td>
</tr>
<tr>
<td>Initial² (39)</td>
<td>.05</td>
<td>1.01</td>
</tr>
<tr>
<td>+ BIA³</td>
<td>.10</td>
<td>.73</td>
</tr>
<tr>
<td>+ Nar⁵</td>
<td>.12</td>
<td>.75</td>
</tr>
<tr>
<td>Initial² (38)</td>
<td>.01</td>
<td>.19</td>
</tr>
<tr>
<td>+ BIA³</td>
<td>.14</td>
<td>1.07</td>
</tr>
<tr>
<td>+ Imp⁶</td>
<td>.16</td>
<td>.99</td>
</tr>
</tbody>
</table>

Note. Significant models or R² change appear in boldface.

² Model includes Age and Gender. ³ Model includes Age, Gender, and the 3 scales from the WJ-III BIA. ⁴ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (CPS). ⁵ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (CPS). ⁶ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (CPS).
Table 15

Hierarchical Regression Results for Threat Emotions Attributions Made and the CPS

Factors of Psychopathy

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R^2</td>
<td>F-value</td>
</tr>
<tr>
<td>Initial^a (38)</td>
<td>.24</td>
<td>5.49</td>
</tr>
<tr>
<td>+ BIA^b</td>
<td>.31</td>
<td>2.85</td>
</tr>
<tr>
<td>+ CU^c</td>
<td>.38</td>
<td>3.19</td>
</tr>
<tr>
<td>Initial^a (39)</td>
<td>.17</td>
<td>3.77</td>
</tr>
<tr>
<td>+ BIA^b</td>
<td>.25</td>
<td>2.24</td>
</tr>
<tr>
<td>+ Nar^d</td>
<td>.25</td>
<td>1.82</td>
</tr>
<tr>
<td>Initial^a (38)</td>
<td>.21</td>
<td>4.76</td>
</tr>
<tr>
<td>+ BIA^b</td>
<td>.29</td>
<td>2.64</td>
</tr>
<tr>
<td>+ Imp^e</td>
<td>.31</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Note. Significant models or R^2 change appear in boldface.

^a Model includes Age and Gender. ^b Model includes Age, Gender, and the 3 scales from the WJ-III BIA. ^c Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (CPS). ^d Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (CPS). ^e Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (CPS).
Table 16

Hierarchical Regression Results for the Number of Missed Negative Emotions and the CPS Factors of Psychopathy

<table>
<thead>
<tr>
<th>Model (n)</th>
<th>Model Statistics</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>F-value</td>
</tr>
<tr>
<td>Initial$^a$ (38)</td>
<td>.03</td>
<td>.47</td>
</tr>
<tr>
<td>+ BIA$^b$</td>
<td>.29</td>
<td>2.55</td>
</tr>
<tr>
<td>+ CU$^c$</td>
<td>.29</td>
<td>2.06</td>
</tr>
<tr>
<td>Initial$^a$ (39)</td>
<td>.09</td>
<td>1.72</td>
</tr>
<tr>
<td>+ BIA$^b$</td>
<td>.29</td>
<td>2.69</td>
</tr>
<tr>
<td>+ Nar$^d$</td>
<td>.30</td>
<td>2.31</td>
</tr>
<tr>
<td>Initial$^a$ (38)</td>
<td>.04</td>
<td>.71</td>
</tr>
<tr>
<td>+ BIA$^b$</td>
<td>.35</td>
<td>3.49</td>
</tr>
<tr>
<td>+ Imp$^e$</td>
<td>.37</td>
<td>3.06</td>
</tr>
</tbody>
</table>

Note. Significant models or $R^2$ change appear in boldface.

$^a$ Model includes Age and Gender. $^b$ Model includes Age, Gender, and the 3 scales from the WJ-III BIA. $^c$ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and callous-unemotional traits (CPS). $^d$ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and narcissism (CPS). $^e$ Model includes Age, Gender, the 3 scales from the WJ-III BIA, and impulsive/antisocial behaviour (CPS).
At school today John was not present. He was away ill. All the rest of Ben's class were at school though. When Ben got home after school his mother asked him, "Was everyone in your class at school today?" Ben answers, "Yes, Mummy".
Appendix B

An Example of the Open-Ended Portion of Reading the Mind in the Eyes
Appendix C

An Example of the Forced-Choice Portion of Reading the Mind in the Eyes

A = Hate, like "Julia really, really doesn't like broccoli. In fact, she hates it."

B = Surprised, like "Bonnie was surprised that Jen wasn't at school. She thought she
would be there."

C = Kind, like "Susie does nice things like share her toys. Susie is kind."

D = Cross, like "My mom was unhappy with me when she caught me eating cookies
before dinner. She was cross."

hate

surprised

kind
cross
Appendix D

The Antisocial Process Screening Device

1. Blames others for his/her mistakes
2. Engages in illegal activities
3. Is concerned about how well she/he does at school or work
4. Acts without thinking of the consequences
5. His/her emotions seem shallow and not genuine
6. Lies easily and skillfully
7. Is good at keeping promises
8. Brags excessively about his/her abilities, accomplishments or possessions
9. Gets bored easily
10. Uses or cons other people to get what he/she wants
11. Teases, makes fun of other people
12. Feels bad or guilty when she/he does something wrong
13. Engages in risky or dangerous activities
14. Can be charming at times, but in ways that seems insincere or superficial
15. Becomes angry when corrected or punished
16. Seem to think that he/she is better than other people
17. Does not plan ahead or leaves things until the “last minute”
18. Is concerned about the feelings of others
19. Does not show feelings or emotions
20. Keeps the same friends
Appendix E

The Childhood Psychopathy Scale

1. Is he/she a warm and kind person?
2. Is he/she easily frustrated?
3. Does he/she make close friendships with other people?
4. Does he/she try to blame other people for things that he/she has done
5. Is he/she open and straightforward?
6. Does he/she try to be the center of attention? (Does he/she show off to get people to pay attention to him/her?)
7. Does he/she stay away from scary things and places?
8. Does he/she try to act charming in order to get his/her way?
9. Does he/she think about what he/she wants to do with the rest of his/her life?
10. Are his/her moods unpredictable? (Do his/her feelings change often and quickly?)
11. Will he/she usually tell a lie if he/she thinks he/she can get away with it?
12. Is he/she easily bored?
13. Does he/she show his/her feelings openly?
14. Does he/she try to see how much he/she can get away with?
15. Is he/she protective of people who are close to him/her?
16. Does he/she try to take advantage of other people?
17. Does he/she give, lend, and share things?
18. Is he/she considerate and thoughtful of other people?
19. When he/she starts working on something, does he/she stick with it?
20. Is he/she mean to other people?
21. Do his/her feelings come and go quickly?
22. Does he/she use his/her head before doing or saying something?
23. Does he/she have a hard time waiting for things he/she wants?
24. Does he/she usually pay back what he/she borrows?
25. Does he/she plan things ahead?
26. Does he/she usually feel guilty after doing something wrong?
27. Does he/she do dangerous things for the fun of it?
28. Can he/she be trusted?
29. Is he/she reliable and dependable?
30. Do people usually believe him/her when he/she tells a lie?
31. Does he/she tease and pick on other people?
32. Does he/she need to have things be exciting?
33. Is he/she talkative?
34. Do his/her feelings sometimes seem fake?
35. Does it bother him/her when he/she does something wrong?
36. Is he/she able to see how other people feel?
37. Does he/she get irritated or mad over little things?
38. Does he/she regret many things that he/she has done?
39. Does he/she set goals for himself/herself and try to reach them?
40. Does he/she try to get others to do what he/she wants by playing up to them?
41. Does he/she feel unfairly blamed for things he/she did not do?
42. Is he/she shy?
43. Does he/she think about his/her actions and behavior?
44. When he/she gets in trouble, is he/she a smooth talker?
45. Does he/she take a lot and not give much in return?
46. Does he/she concentrate well on things?
47. Does he/she tell stories to make himself/herself look good?
48. Does he/she have a quick temper?
49. Does he/she feel things very strongly? (Are his/her feelings intense?)
50. Does he/she try not to hurt other people's feelings?
51. Does he/she often break his/her promises?
52. Is he/she a good liar?
Appendix F

Demographic Information

Information About Your Child

1. Child’s gender: Male  Female

2. Child’s birth order:  1st  2nd  3rd  other

3. Birth date (M/D/Y):         

4. Birth weight:               

5. Was your child born prematurely?  Yes  No
   If Yes, Was it a multiple birth (e.g. twins)?  Yes  No
   If Yes, How many weeks prematurely was your child born? ______

6. Were there any complications with your child’s birth?  Yes  No
   If Yes, Please specify:

7. Does your child have any known major physical health problems? Yes  No
   If Yes, please specify:

8. Has your child been diagnosed with any form of developmental delay, learning or reading deficiency or disability, or cognitive or social impairment? (such as dyslexia, an autistic spectrum disorder, Down’s syndrome, nonverbal learning disability, specific language impairment, Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), Conduct Disorder (CD), Oppositional Defiant Disorder (ODD), Obsessive Compulsive Disorder (OCD), etc.)
   Yes  No
   If Yes, please specify what diagnosis he/she received:

9. Do you suspect that your child may have a form of developmental delay, learning or reading deficiency or disability, or cognitive or social impairment? (such as dyslexia, an autistic spectrum disorder, Down’s syndrome, nonverbal learning disability, specific
language impairment, Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), Conduct Disorder (CD), Oppositional Defiant Disorder (ODD), Obsessive Compulsive Disorder (OCD), etc.)

Yes   No

If Yes, please specify what type of delay you suspect:

10. Please estimate your child’s level of fluency in English (spoken) using the 5 point scale below, with 1 meaning nonfluent (cannot speak at all) to 5, meaning completely fluent.

   (Nonfluent)  1  2  3  4  5  (Fluent)

11. Is your child exposed to any languages other than English?

   Yes   No

   If Yes, please specify which language(s) and your best guess of how frequently they hear that language (e.g. 30% of the time, 75% of the time, etc.)

   Second Language: __________ Frequency: _____ %
   Third Language: __________ Frequency: _____ %
   Other languages & Frequency: ________________________________

   If Yes, please estimate your child's fluency in his/her second language (spoken) using the 5 point scale below, with 1 meaning nonfluent (cannot speak at all) to 5, meaning completely fluent.

   (Nonfluent)  1  2  3  4  5  (Fluent)

12. How often does your child have contact with children of a similar age (i.e. children that are within 2 years of your child’s age either older or younger) outside of school?:

   Daily   2-3 Times/week   4-5 Times/week   Once/week   2-3 Times/month
   Once/month   Other (please specify): ________________________________

13. Has your child been involved in any of the following activities over the past 2 years? Please check all that apply:

   Boy Scouts or Brownies/Guides _____
   Sunday school or a religious group _____
   Swimming Lessons _____
   Sports Teams _____
If Yes, how many different ones? _____
One-on-One Music, Art, or Dance Lessons _____
If Yes, how many different ones? _____
Group Music, Art, or Dance Lessons _____
If Yes, how many different ones? _____
Hobbies/Interest Groups (e.g. chess, bowling, crafts) _____
If Yes, how many different ones? _____
Play Groups _____
If Yes, how many different ones? _____
Other regular group activities your child is involved in?
Please specify: _______________________

14. Does your child currently have (or did he/she ever have) any imaginary friends?
   Yes  No

15. Does your child currently engage in (or did he/she ever engage in) pretend play
activities such as pretending to be a teacher, nurse, mother/father, superhero, cowboy,
etc.?  Yes  No
   If Yes, at what age did he/she begin?  ________
   If Yes, how often on average would you say your child engages/engaged in pretend play
activities?  Once a day (or more)  3-4 times a week  Once a week  Once a month
   Less than once a month

16. Was the place where your child was born rural, suburban, or in an urban area?
   Rural ______ Suburban _______ Urban_______
   If your child was not born in Vancouver, how long ago (years, months) did you move to
the  Vancouver area? __________________________

17. What is your child's ethnicity? (e.g. Asian)
   __________________________
Information About the Child’s Family

1. Please check the family structure that best describes your current family status:

Two parents: biological child

Two parents: adopted child

Two parents: child’s stepmother

Two parents: child’s stepfather

Single parent: mother

If Yes, for how long have you been a single parent? ______________

Single parent: father

If Yes, for how long have you been a single parent? ______________

Two single parents (e.g. joint custody)

If Yes: For how long have you been separated? ______________

Other (Please specify): ______________

2. How many living grandparents does the child have? __________

How often do either of the grandparents (mother’s side) interact with the child?

Daily 2-3 Times/week 4-5 Times/week Once/week 2-3 Times/month

Once/month Once/year or less Other (please specify): ______________

How often do either of the grandparents (father’s side) interact with the child?

Daily 2-3 Times/week 4-5 Times/week Once/week 2-3 Times/month

Once/month Once/year or less Other (please specify): ______________

3. How many other siblings does your child have? ______

Please list the dates of birth and genders of your other children:

<table>
<thead>
<tr>
<th>Date of Birth (M/D/Y)</th>
<th>Date of Birth (M/D/Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) __________________</td>
<td>M F</td>
</tr>
<tr>
<td>(2) __________________</td>
<td>M F</td>
</tr>
</tbody>
</table>

4. Mother’s current level of education:

Does not apply/Unknown __________ Primary School __________

Some High School __________ High School __________

Some College/University __________ Trade School Diploma __________
5. Father’s current level of education:

- Bachelor’s Degree
- Doctoral Degree
- Other (please specify)
- Master’s Degree
- Professional Degree

6. Mother’s current age:

- 17 or less
- 18-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 61-65
- 65+

7. Father’s current age:

- 17 or less
- 18-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 61-65
- 65+

8. Range of family income from all sources:

- 0 – 19,999
- 20,000 – 39,999
- 40,000 – 69,999
- 70,000 – 99,999
- 100,000–139,999
- 140,000 – 179,999
- 180,000 – 219,000
- Greater than 220,000

9. Mother’s Occupational status:

- Employed Full-time
- Employed Part-time
- Stay-at-home-Mom
- Student
- Unemployed
- Not applicable

10. Father’s Occupational status:

- Employed Full-time
- Employed Part-time
- Stay-at-home-Dad
- Student
- Unemployed
- Not applicable

11. How many waking hours per week does your child spend with Mom?
How many waking hours per week does your child spend with Dad?

12. What religion, if any, does your family practiceaffiliate with?
Christianity ___ Catholic ___ Protestant ___ Hindu ___ Jewish ___
Buddhism ___ Islam ___ Sikh ___ Secular/Nonreligious/Agnostic/Atheist ___
Other: ___________

13. How strongly do you hold your religious beliefs (i.e. not how often you follow your religious practices but how strongly do you believe in them)?
Very Strongly Somewhat Not Very Strongly