Investigating the Presence and Correlates of Callous-Unemotional Traits in Western Cape Children

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Abstract

Callous-unemotional traits are characterised by decreased affective responsiveness and a marked lack of concern for the wellbeing of others, reflecting deficits in affective empathy. Research investigating individuals with CU traits has consistently reported a corresponding pattern of antisocial behaviour that is of greater severity and frequency than is typically found for non-CU individuals with tendencies towards aggressive conduct. As such, the combination of CU traits, deficits in affective empathy and severe antisocial behaviour in adults is considered indicative of psychopathy. Recent international research has suggested that CU traits develop in childhood, and the behavioural and affective parallels between children with CU traits and adults with psychopathy proper implies that the presence of CU traits in childhood may be an early indicator of psychopathic tendencies in adulthood. In order to assess whether the concept of CU traits applies in the South African context, this study implemented quantitative measures and analyses to investigate the presence and correlates of CU traits in 96 male and female, school-age children from a middle-lower SES background in the Western Cape. Statistical analyses indicated that CU traits are present in South African children and revealed aggression, gender and intellectual functioning to be significant predictors of CU traits. In addition to indicating that CU traits and associated aggression are present in this population, these results have implications for behaviour-modification strategies aimed at reducing aggressive behaviour in children. Whilst the findings of this research were largely consistent with the literature, there were some important differences that warrant further investigation.

Keywords: callous-unemotional traits; affective empathy; aggression; psychopathy; development in childhood

Investigating the Presence and Correlates of Callous-Unemotional Traits in Western Cape Children.

It is well-known that South Africa has one of the highest rates of violent crime in the world (Bruce, 2010). The incidence of violent crime in South Africa is not only disproportionately high when compared to Western countries, but the type of violence perpetuated in these crimes is often gratuitous. Not only is this a major social burden, but it also has a deleterious effect on the economy as, annually, a considerable amount of the country's capital is pumped into a growing number of correctional facilities (Barbarin, Richter, & de Wet, 2001).

Given this, it would seem incumbent on researchers to investigate the causes of such antisocial behaviour in order to produce effective interventions that aim not only to change disruptive behaviour, but, ideally, to prevent it all together (Rose & Abi-Rached, 2013; Tomlinson, Swartz, & Warnich, 2009). Whilst it is necessary to consider the potential role of individual factors in the development of behavioural problems, it is important to note, also, the influence of macro-systemic issues on incidences of violent crime, particularly in a country that is still deeply affected by the legacy of Apartheid. Thus, this research project investigated the extent to which individual factors may influence aggressive behaviour, but was simultaneously aware that much of the aggressive behaviour seen in South Africa is a product of social and economic inequality.

When considering individual factors and aggression, an important consideration is that typical behaviour-modification strategies have proven ineffective for a large proportion of people with behavioural delinquency, particularly those guilty of repeated, severe aggressive conduct towards others (Hawes & Dadds, 2005). It has been established that whilst many conduct disordered individuals do not show signs of pathological disturbances of personality, a significant proportion do exhibit personality traits consistent with the definition of psychopathy. Psychopathy is characterised by a blatant disregard for the wellbeing of others and a proclivity towards violent behaviour that is typically unresponsive to intervention. These individuals show disturbances in emotion regulation, impaired impulse control and a marked lack of empathic concern (Decety, Skelly & Kiehl, 2013; Loney, Frick, Ellis & McCoy, 1998). Converging evidence from various experimental and correlational studies indicate that this particular personality profile reflects the manifestation of callous-unemotional (CU) traits (Barry et al., 2000; Dadds et al., 2009).

It has been suggested that the cause of antisocial behaviour in psychopathic individuals may be distinct from that of individuals who are conduct-disordered but not

psychopathic (Barry et al., 2000). This has inspired a substantial body of literature investigating the probability of differential developmental trajectories and neurological idiosyncrasies between these two groups, with an emphasis on identifying causal mechanisms in early childhood (Frick et al., 2003).

One noteworthy contribution of this line of research has been the confirmation of callous-unemotional interpersonal styles in children with early-onset conduct disorder (CD) (Frick et al., 2003). Crucial to supporting the validity of applying the term psychopathic to children is the observation that children with CU traits display analogous interpersonal, affective and behavioural styles to adults diagnosed with psychopathy proper (Barry et al., 2000; Loney et al., 1998). Additionally, it has been noted that the pattern of behaviour in children with CU traits typically worsens as the child matures, tending to be more aggressive and less responsive to treatment when compared to peers with conduct problems but no CU traits (Frick et al., 2003). Taken together, the presence of CU traits in children and the high incidence of treatment-resistant conduct problems in these children suggests that CU traits may be an early predictor of adult psychopathy. This line of thinking would suggest, then, that the causal mechanisms responsible for the adult psychopath's affective and social dysfunction are rooted in the developmental processes of childhood (Barker, Oliver, Viding, Salekin, & Maughan, 2011).

The investigation of different developmental pathways leading to antisocial behaviour has yielded further evidence supporting the neuropsychological distinction between conduct-disordered individuals with CU traits and those without. Investigations incorporating functional and structural neuroimaging methodologies have revealed significantly underdeveloped limbic system structures and abnormal functioning of the prefrontal cortex (PFC) in high CU individuals. These anomalies are of particular note as deficiencies in empathy and moral reasoning form a core feature of psychopathy, and these processes are highly reliant on the limbic system and the PFC (Decety, 2011; Decety, Michalska & Kinzler, 2011).

The ability of an individual to recognise and respond appropriately to the mental/emotional states of others – commonly referred to as empathy – is hypothesised to be an innate, evolutionarily-programmed mechanism responsible for the facilitation of the kind of prosocial behaviour necessary for the maintenance of functional society. Empathy has been broadly conceptualised as the capacity to understand and share the affective state of another person from his/her personal point-of-view (Decety et al., 2011; Decety, Norman, Berntston, & Cacioppo, 2012).

In order to define empathy in more concrete terms, researchers refer to empathic ability as being comprised of cognitive, affective and behavioural components (Dadds et al., 2009; Goubert, Vervoort, & Craig, 2013). It appears that individuals with psychopathy are able to infer the type and severity of another's distress (cognitive empathy), but show a marked impairment in terms of their capacity to represent another person's distress within themselves such that their affective state essentially 'mirrors' that of the person whom they are observing (affective empathy). It is this apparent lack of self-other emotional identification that is considered the driving force behind the formation of CU traits (Decety et al., 2013; Muñoz, Qualter, & Padgett, 2011; Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2012).

This pattern of disturbed emotional processing suggests two important consequences for social learning in children with CU traits. First, they tend to show reduced neurological and autonomic reactivity to stimuli that typically induce negative affective states, particularly fear and anxiety (Decety et al., 2013, Frick et al., 2003). Second, they show poor impulse-control in situations that require emotion regulation, such as recognising the possible benefits of delayed gratification. Implicit, here, is the idea that children with CU traits will exhibit a style of learning that is unresponsive to punishment, but highly responsive to reward. In contrast, children without CU traits are more responsive to disciplinary practices, and are therefore more likely to benefit from standard methods of behaviour-modification (Hawes & Dadds, 2005; Seara-Cardoso et al., 2012).

Traditionally, both intervention programmes and parenting strategies have adopted a correctional approach, which advocates punishing bad behaviour and rewarding good behaviour. However, given the neuropsychological profile of CU children outlined above, discipline-focused interventions are unlikely to succeed in changing the behaviour of children with psychopathic traits (Dadds et al., 2009; Hawes & Dadds, 2005). As such, identification of children with CU traits may be crucial to ensure that they are involved in interventions adapted to accommodate this atypical learning pattern.

There is a second, potentially major advantage to the routine implementation of CU measures. The testing of young children who either are identified as being at risk for conduct problems on the basis of genetic and environmental factors, or who show early signs of conduct disturbances, may yield information pertinent to the prevention of later antisocial outcomes. If these children were to be identified at a very young age, it may well be possible to influence their development such that, before becoming engrained, CU traits are replaced by more socially adaptive ones. This literal rewiring of neural connectivity is made possible

by the highly malleable nature of the young child's brain (Rose & Abi-Rached, 2013). One way in which this could be achieved is through parent-training that emphasises the importance of positive feedback and provides parents with useful alternatives to harsh and inconsistent disciplinary practices (Barbarin et al., 2001; Barker et al., 2011).

Rationale

As it stands, CU traits have not yet been verified as a reliable indicator of psychopathy in the South African population (Tomlinson et al., 2009). However, given the high rates of violent crime in South Africa, it may prove beneficial to establish the extent to which CU traits are present in the child population. Not only might this provide researchers with a clearer picture of how and why conduct disorder manifests in young South African children, but it could also allow for high-risk children to receive early, appropriate interventions.

In establishing the presence of CU traits, it is also necessary to establish whether the manifestation of CU traits in this population is analogous to that found in Western populations. Insofar as this is concerned, it is necessary to examine the behavioural and affective correlates of CU traits, as well as the extent to which they may vary as a function of other key potential covariates – namely, gender, age and general intellectual functioning. If the relationships found for said correlates, covariates and CU traits are similar for this population, as compared to Western populations (upon which the majority of the literature is founded), then it would be logically tenable to conclude that they are present in Western Cape children.

Specific Aims and Hypotheses

Research question 1. The primary question that this research addressed was the extent to which CU traits are present in South African children. To establish this, it was necessary to consider both the incidence and correlates of CU traits in this population, and to examine how these compared to children with CU traits in Western countries. Considering the well-established relationship between callous-unemotional interpersonal styles, aggressive behaviour and deficits in affective empathy, the following hypotheses were tested:

Hypothesis 1. Empathic capacity was hypothesised to be predictive of CU traits in children, such that high CU traits were expected to correspond with low levels of affective sharing. In other words, it was assumed that there would be an inverse relationship between the prevalence of CU traits and the expression of affective empathy.

Hypothesis 2. It was predicted that children with high CU-traits would display greater levels of aggressive externalising behaviour in comparison with low CU peers. Thus, it was

expected that a positive relationship between CU traits and incidences of aggression towards others would be found.

Methods

Research Design

This study formed part of a larger project looking at moral development in children and adolescents. Being an exploratory study, it implemented a quantitative, cross-sectional design to investigate the presence of callous-unemotional traits, and their association with affective empathy and aggression. Analysis of descriptive data as well as correlational analyses were implemented to investigate this, as well as the role of key potential covariates, including age, gender, IQ, attention and working memory. During both data collection and analyses, multiple parent-report (indirect) and child (direct) measures were used to assess, firstly, the relationship between the predictor variables and the outcome variable, and secondly, the influence of the aforementioned covariates on the presence of CU traits.

Participants

Purposive sampling techniques were used to collect data from children and one of their parents/primary caregivers. Ninety six children were included, all of whom were between the ages of 6 and 13 years old. This study included 47 male participants and 49 female participants. As such, the ratio of males-to-females was approximately equal across the sample overall, and was also approximately equally distributed amongst the different ages.

Owing to the limited time available in which to collect data for an Honours-level research project, it was not considered feasible to investigate the effects of SES, home language and race, as this would require a much larger sample size; as such, it was necessary to incorporate a sample that was homogenous with respect to these demographic variables. Thus, in order to ensure homogeneity, only coloured participants were included, all of whom were recruited from two public primary schools in the Western Cape, both subserving middle-lower class communities and using the English language as their primary teaching medium.

Exclusion criteria. For each child, medical history was taken into account and participants were excluded on the basis of pre-existing neurological conditions (including infantile meningitis), prior incursion of head-injuries (including loss of consciousness), and diagnoses of Autism Spectrum Disorders.

Measures

General measures. *Demographic information.* Parents were asked to complete a form (Appendix A) consisting of questions pertaining to household income, age, highest level

of parental education, home language and the child's medical history, as well as several other demographic variables. The purpose of this questionnaire was to ascertain whether or not the child met the inclusion criteria.

Socioeconomic status (SES). Indicators of SES were obtained from responses to the demographics questionnaire – namely, total yearly income and highest level of parent/primary caregiver education. These two indicators were used in conjunction as it is has been argued that the use of more than one indicator is a more robust index of SES in lower-middle income countries (Cooper, Lund, & Kakuma, 2012)

Child task measures. *Affective sharing.* The *Chicago Empathy for Pain* task has been developed to measure empathic concern and affective sharing (Decety et al., 2013). This measure assesses the visceral reaction of participants in response to photographs of people in pain, or not in pain. After viewing each image, participants were asked two questions: Question 1 reads 'How much pain is the person in the picture experiencing?', and question 2 asks 'How sorry do you feel for the person in the picture?'. Responses were indicated on a scale of 0 to 100, with scores ranging from 'no pain' to 'lots of pain' (question 1), and 'not bad' to 'very bad' (question 2).

The first question was used as a measure of affective sharing (i.e., the ability to viscerally represent the affective states of others within oneself), which was taken to indicate the participant's capacity for affective empathy (Decety, Michalska & Akitsuki, 2008). The second assessed empathic concern; for the purposes of this study, only the affective sharing component of the task was considered.

As it is a computer-based task, participants viewed the images on the researcher's computer, and responses were indicated on a touch-screen. All images were appropriate for young children and did not contain any explicit or gruesome content. All images depicted scenarios that are common to everyday life, and thus easily recognisable to young children (e.g., a box dropped on a foot). Additionally, the stimuli were culturally-neutral. No prior research has implemented the *Chicago Empathy for Pain Task* outside of the United States and Japan (Decety et al., 2013; Moriguchi et al., 2007). However, given the cultural-neutrality of the images, it is reasonable to expect that this task is appropriate for use in the South African context.

Measures of general intellectual functioning. *Wechsler Abbreviated Scale of Intelligence (WASI).* The *WASI* (Wechsler, 1999) was implemented to assess general intelligence. For the purposes of this study, the short-form of this scale was used. Thus, of the four subscales included in the full *WASI*, this study implemented only the Vocabulary and

Matrix Reasoning subtests; the former assesses verbal IQ (VIQ), and the latter is used as a measure of performance IQ (PIQ). In order to enable reliable comparisons across the entire age-range, all raw scores for each subscale were standardized according to age norms, after which the converted scores for VIQ and PIQ were summed to obtain a composite score reflecting each child's (short-form) full-scale IQ (FSIQ).

Whilst this measure has been widely used and verified for Western populations, there has been some speculation as to the reliability of using US standardisation norms to compare scores across different racial and cultural groups. However, both the reliability and cross-cultural validity of the full and short forms of the *WASI* have been evaluated and subsequently deemed appropriate for use in South Africa (Ferrett, 2011; Shuttleworth-Edwards et al., 2004). Furthermore, as the sample in this study was homogenous with respect to racial, cultural and socio-economic factors, it was not considered problematic to compare the IQ scores of children within this particular sample.

Digit Span task. The Digit Span subtest of the fourth edition of the *Wechsler Intelligence Scale for Children* (*WISC-IV UK*; Wechsler 2004) is comprised of two subscales, one of which assesses digit-span forwards, and the other, digit-span backwards. The former was employed as a measure of attention, whilst the latter assessed working memory capacity. Scores for each task were also standardised according to age-norms.

Parent-report measures. *Callous-unemotional traits.* The *Callous-Unemotional Screening Device (CUSD*; Appendix B*)* is a parent-report measure consisting of 9 items designed to detect callous-unemotional interpersonal styles, and is therefore considered sensitive to individuals with low affective empathy (Barker et al., 2011). The *CUSD* is a modified combination of the *Strengths and Difficulties Questionnaire* (*SDQ*; Goodman, 1997) and the *Antisocial Process Screening Device* (*APSD*; Frick & Hare, 2002).

The *CUSD* has only been administered to South African school-children in one other research project, in which an alpha co-efficient of .66 was reported, indicating a moderate level of reliability – particularly for a scale comprised of so few items. Importantly, the participants in that sample were comparable to the sample included in this study in terms of SES and demographic parameters (Malcolm-Smith, Woolley & Ward, 2015).

Both the *SDQ* and the *APSD* have been used widely in American and Western-European populations, in which they are reported to have high predictive validity (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000; McMahon, Witkiewitz & Kotler, 2010). Prior research has indicated that the APSD is a strong predictor of later antisocial behavioural outcomes, and the SDQ has high convergent validity with other psychometric tests assessing

for disorders of childhood, particularly with respect to conduct-oppositional disorders (Dadds, Fraser, Frost & Hawes, 2005; Goodman, 2001; Goodman et al., 2000; McMahon et al., 2010).

In adapting the *CUSD* from these two measures, items were constructed based on factor analyses indicating the sensitivity of aspects of the *SDQ* and *APSD* to the callous-unemotional factor. The *CUSD* has since been reported as a more efficient predictor of antisocial tendencies in comparison with independent administration of both the *SDQ* and the APSD (Dadds et al., 2005). Thus, the *CUSD* was considered the most appropriate measure of CU traits for the purposes of this research.

Affective empathy. The *Questionnaire of Cognitive and Affective Empathy* (*QCAE*; Appendix C) was employed as a second, parent-report measure of dispositional affective empathy (Reniers, Corcoran, Drake, Shrayne & Völm, 2011). This questionnaire consists of two subscales, one assessing dispositional cognitive empathy, and the other, dispositional affective empathy. For the purposes of this research, only the latter subscale was used. The full questionnaire consists of 31 questions and responses to each item are recorded on a four-point Likert-scale, ranging from "strongly agree" to "strongly disagree". This measure has been implemented in South Africa in previous research, and has been shown to be reliable within this context; Louw's (2014) reliability analysis of the affective subscale yielded a Cronbach's alpha value of .88 for a sample consisting of 92 participants of similar demographic characteristics to those included in this study.

The affective component of this questionnaire requires parents to report on children's concern for the emotional well-being of others, particularly with respect to observing others in distress. Thus, this measure was used to assess the extent to which child participants are able to vicariously experience the affective states of others (Reniers et al., 2011). This second empathy measure was included in order to obtain a more robust assessment of each child's capacity for affective empathy; the *Chicago Empathy for Pain* task and the *QCAE* assess the behavioural and dispositional dimensions of this construct, respectively.

Externalising behaviour. The *Child Behaviour Checklist* (*CBCL*; Appendix D; Achenbach & Rescorla, 2001) was used to assess for aggressive behavioural tendencies. This measure has been designed to assess for a range of behavioural and emotional problems in children and adolescents. It is comprised of two subscales, with one addressing internalising behaviour, and the other, externalising behaviour. This study defined aggression in terms of scores on the externalising subscale of the *CBCL*. This subscale consists of a set of questions assessing the extent to which the child persistently engages in problematic behaviours, such

as destruction of property, aggression towards others, truancy/disobedience, inappropriate sexual conduct and attention-seeking behaviour (Achenbach & Rescorla, 2001).

Thus far, the majority of studies implementing the *CBCL* have been concerned with Western populations, in which the *CBCL* appears to possess good psychometric properties (Achenbach & Rescorla, 2001). However, studies have demonstrated high cross-cultural validity for the *CBCL*, showing that it functions as an effective predictor of various problems of childhood, including delinquent behaviour, in multiple non-Western countries (Crinjen, Achenbach & Verhulst, 1999; Roessner, Becker, Rothenberger, Rohde, & Banaschewski, 2007).

Despite not being formally verified in South Africa, it has been used by numerous researchers investigating conduct problems in South African populations (Barbarin, Richter, & de Wet, 2001; Cluver, Gardner, & Operario, 2007). Furthermore, psychometric analyses of the externalising subscale in this context have yielded alpha co-efficients of .87 and .88, indicating strong internal-consistency for South African samples (Malcolm-Smith et al., 2015; Palin et al., 2009).

General Procedure

Once ethical approval was granted for the larger study, permission was obtained from the two primary schools to recruit participants from their respective student bodies. Parents/primary caregivers were informed of the study, and demographic questionnaires, consent forms and further relevant information (e.g., inclusion/exclusion criteria) were distributed to those who showed interest.

Collection of parent data. Parents whose children who meet the criteria for inclusion were contacted, and asked to complete the relevant questionnaires. Parents were asked to sign a consent form (Appendix E) informing them that participation was entirely voluntary, and that they could withdraw their own and their children's participation from the study at any point, without penalty. Included in this form was an assurance that all data would remain confidential. Participants were assured that no identifying information would be included in research reports or publications using their data. There were minimal potential risks of participation for children or parents; parents were informed that children would be allowed to rest if they became fatigued during testing. In order to ensure that all questions were understood, parent-reports were administered in the presence of the researcher in one session consisting of 60-90 minutes in total. Upon completion of all questionnaires, they received R100 as compensation for their time. Finally, parents and schools were guaranteed feedback regarding the results of the study upon completion of the research project.

Collection of child data. Considering the vulnerability of child populations, children were asked to sign a written assent form (Appendix F) before the commencement of the first session, in which children were informed that they could choose not to participate in the research, without negative consequence. Child-assessments took place separately from parent-sessions, and were conducted in a quiet room on the school premises. Each child was individually assessed in two separate sessions of 45-60 minutes each, held on separate days. Children completed the tasks in the presence of a researcher, and received stickers and/or sweets during both sessions. At the conclusion of both child and parent sessions, all participants were debriefed and thanked for their participation.

Data Analysis

Both descriptive and inferential statistical analyses were employed to investigate the hypotheses. A preliminary analysis of the distribution of the data revealed minor problems with normality for *CUSD* scores, with residual plots indicating a slight negative skew. Initially a log-transformation was applied to correct for this. However, this had very little effect. As CU traits are not expected to be normally distributed in the population, and because the skew was very slight, all subsequent analyses were run on the untransformed dataset. Reliability analyses were conducted to examine the internal consistency of the *CUSD*, the affective subscale of the *QCAE*, and the externalising subscale of the *CBCL*.

A power analyses was performed to compute the minimal sample size required for a multiple regression analysis to detect significant relationships between CU traits, affective empathy and aggressive behaviour, assuming a small-moderate effect size ($\eta2 =.34$). This was estimated by averaging the relevant effect sizes in 5 comprehensive analyses, all of which examined the relationship between these same variables, as well as the potential influences of age and gender (see: Cottle, Lee, & Heilbrun, 2001; Jolliffe & Farrington, 2004; McMahon et al., 2010; Muñoz et al., 2011; Viding, Simmons, Petrides & Frederickson, 2009). The analysis revealed that, in order to detect a small-to-moderate effect size (i.e., $\eta2 =.34$) using a regression analysis with parameters of $\alpha = 0.05$, and $\beta = 0.2$, a minimum sample size of 70 participants ($N = 70$) was required. Thus, the included sample size of 96 participants was considered sufficiently large to ensure that statistical analyses performed on the data maintained a high level of power, thereby reducing the likelihood of Type II errors (Kelley & Preacher, 2012).

Pearson's correlation-coefficients were calculated for all variables, so as to determine the associative strength between individual variables and measures included in both the initial and final models. Finally, two hierarchical regression analyses were employed to investigate

the proposed predictors of CU traits, after which a final model representing significant predictors was constructed using a simultaneous regression analysis. All assumptions for the second and final regression models were upheld. All analyses were conducted using the *SPSS* (Version 22) software package (IBM Corp, 2013).

Results

Sample Characteristics

Table 1

Sample characteristics across key study variables

Domain	Full sample (N = 96) Mean (SD)	Females (n = 49) Mean (SD)	Males (n = 47) Mean (SD)	t	p
Family income	123928.11 (116837.47)	122085.69 (112315.79)	125848.93 (122562.54)	.00	.987
Parent HLOE	11.10 (2.16)	11.13 (2.36)	11.07 (1.95)	.74	.393
Age	9.66 (2.45)	9.77 (2.41)	9.54 (2.52)	.00	.950
IQ	89.22 (12.69)	90.92 (14.04)	87.49 (10.99)	1.34	.041
Attention	8.98 (2.81)	9.37 (2.91)	8.57 (2.68)	1.39	.423
Working memory	7.81 (2.62)	8.08 (2.53)	7.53 (2.71)	1.03	.612
Affective subscale of *Chicago Empathy for Pain Task*	83.96 (11.25)	84.14 (10.36)	83.77 (12.22)	.16	.528
Affective subscale of *QCAE*	6.18 (8.34)	7.10 (7.89)	5.21 (8.88)	1.10	.286
Externalising subscale of *CBCL*	7.57 (5.71)	6.76 (5.64)	8.43 (5.73)	1.44	.750
CUSD	13.88 (2.56)	14.43 (2.38)	13.30 (2.63)	2.21	.506

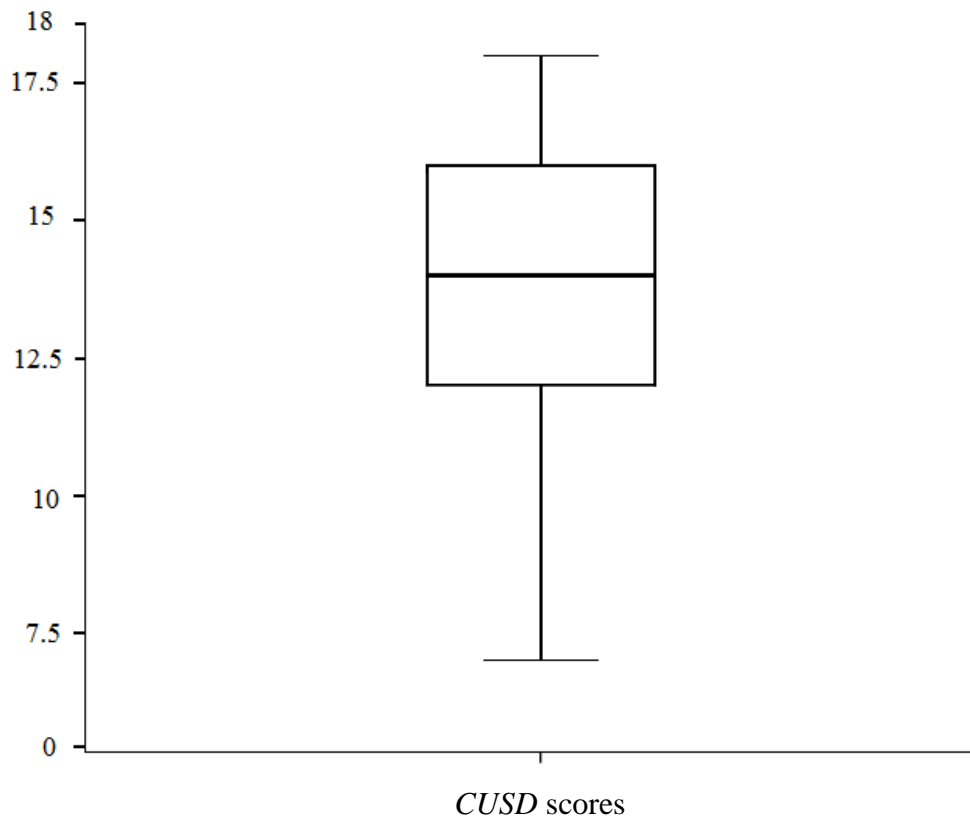*Note: p* is significant at the .05 level

CUSD scores

Figure 1. Boxplot showing distribution of *CUSD* scores.

Descriptive analyses of the data (see Table 1) revealed that the majority of scores on the CUSD (*M* = 13.88; *SD* = 2.56) fell in the upper-middle range of possible scores for this item, for which 0 is the minimum possible score and the maximum is 18; for this measure, lower scores indicate higher CU traits, and vice-versa. As can be seen in Figure 1, there was some variability amongst children for CU traits, and several participants exhibited high CUSD scores. Closer analysis of the data also indicated that of the overall sample (*N* = 96), 25 participants scored one standard deviation below the mean, indicating that approximately 26% of the sample exhibited elevated CU traits. In addition, the spread of scores for the *CBCL* (*M* = 7.57; *SD* = 5.71) indicated that a substantial proportion of participants' scores fell one standard deviation above the mean, suggesting a higher-than-usual incidence of aggressive behaviour. Furthermore, a closer inspection of the *CBCL* scores revealed that 20 children scored high on the *CBCL*, of which 9 had high CU traits.

The data for the *Chicago Empathy for Pain Task* (*M* = 83.96; *SD* = 11.96) and the affective subscale of the *QCAE* (*M* = 6.18; *SD* = 8.34) showed a negative skew, however, this was very slight and therefore did not warrant any transformations of the data. Descriptive analysis of the data for total yearly family income revealed that participants fell within the low-middle SES bracket (*M* = 123928.11; *SD* = 116837.47), and responses pertaining to

parent/primary caregiver HLOE (M = 11.10; SD = 2.16) indicated that the highest level of education obtained by parents/primary caregivers ranged from primary school education to some tertiary education.

Finally, to ensure that there was no interaction between gender and any other key variables that might confound the results, a series of t-tests were performed to identify potential problems with including males and females in a single group. The analyses revealed no significant gender differences, with the exception of IQ, which was shown to be higher on average for female children than for male children. However, as the mean difference in scores between males and females was very small and because the effect size was also small (d = .27), this was not considered problematic.

Reliability Analyses

A reliability analysis of the *CUSD* yielded a Cronbach's alpha value of .59, indicating a low-moderate level of reliability (George & Mallery, 2003). However, considering that the strength of Cronbach's alpha is largely contingent on the number of items in a scale, a low-moderate alpha value is to be expected for a scale of such short length. Therefore, this does not necessarily suggest that the *CUSD* is unreliable or inappropriate for use in this population.

The affective subscale of the *QCAE* was shown to have an acceptable level of reliability, as indicated by a Cronbach's alpha value of .74. A third reliability analysis was conducted to evaluate the externalising subscale of the *CBCL*, for which an alpha value of .85 revealed a high level of internal consistency for this measure (George & Mallery, 2003). Considering that these scales have not been formally verified for use in South African populations (specifically, in lower SES areas), the indication of acceptable-to-high levels of internal consistency within these scales is reassuring.

Predicting CU Traits with Multiple Linear Regression Analyses

Relationships between key study variables. As can be seen in Table 2, zero-order correlations were examined to determine whether or not there existed any significant relationships between the key study variables. Gender, IQ and the CBCL were significantly correlated with scores on the *CUSD*. There was a weak positive correlation for gender (r = .222, p < .05), suggesting a higher incidence of CU traits amongst male children as compared to female peers. *WASI* and *CUSD* scores were shown to have a moderate positive relationship (r = .389, p < .001), suggesting an inverse relationship between CU traits and intelligence. There was also a moderate negative relationship between the *CUSD* and *CBCL* (r = -.431, p <

.001), such that children with increased aggressive behaviour were significantly more likely to exhibit higher CU traits.

Interestingly, the *CBCL* was also significantly – although weakly – positively correlated with attention ($r = .224$, $p < .05$), although there was no significant association between the *CBCL* and scores on the *WASI*; this, despite the fact that IQ and attention are also inter-correlated. Both indicators of SES were positively correlated with each other, and both were also seen to have a significant positive, although weak, relationship with child IQ, such that increased parent/primary caregiver HLOE and family income was related to greater performance on the short-form *WASI*. Lastly, analysis of the zero-order correlations revealed a weak positive relationship between SES and performance on the affective component of the *Chicago Empathy for Pain Task* ($r = .173$; $p < .05$); no such relationship was found for SES and the *QCA*E.

Table 2

Zero-order correlations for key study variables

Measures	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. CUSD	-										
2. Family income	-.020	-									
3. Parent HLOE	-.005	.451**	-								
4. Age	.073	.079	.156	-							
5. Gender	.222*	-.016	.014	.047	-						
6. IQ	.389**	.217*	.269*	.014	.136	-					
7. Attention	.082	-.021	.012	.071	.142	.177*	-				
8. Working Memory	.014	.071	.161	.257*	.105	.268*	.169*	-			
9. Affective subscale of *Chicago Empathy for Pain task*	-.058	.173*	.079	-.155	.016	.025	.024	.004	-		
10. Affective subscale of *QCAE*	.082	-.075	.008	.007	.113	-.080	.165	-.013	.084	-	
11. Externalising subscale of *CBCL*	-.431**	.040	.056	.083	-.147	-.131	.224*	.055	-.055	-.061	-

Notes. Gender was coded as 0 for males and 1 for females

  Higher scores on the CUSD indicate low CU traits; low scores indicate higher CU traits.

  * p < .05
  ** p < .00

Modelling the relationship between affective empathy, aggression and CU traits.

An initial hierarchical regression analysis was conducted to investigate the extent to which the predictor variables and covariates may have impacted on the presence of CU traits. As these variables were all investigated as potential predictors of the outcome variable, all were entered into the first regression for the purposes of an initial exploratory analysis. The order in which each variable was entered into the hierarchy was determined by the initial assumptions as to the relationships between the predictors, covariates and the outcome variable, despite the fact that the zero-order correlations did not fully support the relationships that were expected. This was done in order to maintain consistency with respect to the hypotheses of this study, in which it was proposed that aggression and empathy would be the strongest predictors of CU traits. As such, in order to control for any potential effects of SES and the covariates on the predictive strength of affective empathy and aggression, these were entered into the hierarchy prior to the hypothesised main predictors.

Although participants were considered relatively homogenous with respect to SES, and therefore SES was not expected to function as a predictor of CU traits, descriptive data indicated that there was some variation in total family income and parent/primary caregiver HLOE, which were also moderately correlated. As such, these were entered together into the first block. Age and gender were not correlated, and were entered into the second and third blocks, respectively.

The covariates of IQ, attention and working memory were all correlated and therefore entered together as a fourth block. Owing to the fact that the inter-correlation matrix revealed no significant correlation between the two affective empathy measures, these were entered separately, with the *Chicago Empathy for Pain Task* comprising the fifth block, and the affective subscale of the *QCAE* in the sixth. Lastly, the *CBCL* was entered in the seventh block of this regression analysis as it was expected to have the strongest association with CU traits.

Table 3

Initial regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	R Square Change	F	F Change	Sig.
1	.02	.00	-.02	2.58	.00	.02	.02	.981
2	.08	.01	-.03	2.59	.01	.19	.52	.473
3	.23	.05	.01	2.54	.05	1.3	4.61	.035
4	.47	.22	.16	2.35	.16	3.49	6.13	.001
5	.47	.22	.15	2.36	.00	3.04	.14	.709
6	.48	.23	.15	2.36	.01	2.83	1.09	.300
7	.60	.36	.28	2.17	.13	4.73	17.08	.001

1. Predictors: Parent HLOE, Family income

2. Predictors: Parent HLOE, Family income, Age

3. Predictors: Parent HLOE, Family income, Age, Gender

4. Predictors: Parent HLOE, Family income, Age, Gender, Attention, Working memory, IQ

5. Predictors: Parent HLOE, Family income, Age, Gender, Attention, Working memory, IQ, *Chicago Empathy for Pain Task*

6. Predictors: Parent HLOE, Family income, Age, Gender, Attention, Working memory, IQ, *Chicago Empathy for Pain Task*, Affective subscale of *QCAE*

7. Predictors: Parent HLOE, Family income, Age, Gender, Attention, Working memory, IQ, *Chicago Empathy for Pain Task*, Affective subscale of *QCAE*, Externalising subscale of *CBCL*

Table 5

Coefficients for predictors in model 7 of initial analysis

Variables	*B*	Std. Error	Beta	*t*	*p*
Family income	.00	.00	-.04	-.37	.713
Parent HLOE	-.08	.12	-.07	-.64	.523
Age	.12	.10	.12	1.27	.207
Gender	.52	.46	.10	1.14	.259
IQ	.07	.02	.37	3.74	.001
Attention	.08	.09	.09	.94	.350
Working memory	-.10	.09	-.12	-1.11	.268
Affective subscale of *Empathy for Pain Task*	-.02	.02	-.07	-.75	.456
Affective subscale of *QCAE*	.02	.03	.06	.70	.487
Externalising subscale of *CBCL*	-.17	.04	-.39	-4.13	.001

Gender, general intellectual functioning and aggression as predictors of CU traits. A secondary regression analysis was performed on those variables indicated as significant in the previous analysis. Retaining the same order of entry, gender was entered into the first block, measures of intellectual functioning were entered into the second, and the *CBCL* was added to the third. The purpose of this second analysis was to investigate the effect sizes of each predictor on the outcome variable, and specifically, to determine the extent to which each predictor accounts for the overall proportion of variance explained in the final model.

Table 4

Second model summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	R Square Change	F	F Change	Sig.
1	.22	.05	.04	2.51	.05	4.89	4.89	.029
2	.44	.19	.16	2.35	.14	5.41	5.36	.002
3	.57	.33	.29	2.15	.14	8.82	18.31	.001

1. Predictors: Gender

2. Predictors: Gender, Attention, Working memory, IQ

3. Predictors: Gender, Attention, Working memory, IQ, Externalising subscale of *CBCL*

Table 5

Coefficients for predictors in final model

Variables	B	Std. Error	Beta	*t*	*p*
Gender	.58	.45	.11	1.27	.206
IQ	.07	.02	.33	3.52	.001
Attention	.10	.08	.11	1.19	.237
Working Memory	-.80	.09	-.08	-.91	.367
Externalising subscale of *CBCL*	-.16	.04	-.39	-4.28	.001

As can be seen in Table 4, the final model is significant at the level of $p < .001$, and explains 33% of the variance in the overall sample. Of the overall variance explained by the final model, gender accounts for 5%, general intellectual functioning accounts for 14%, and the *CBCL* explains the remaining 14%. The addition of this last measure appears to have had the greatest impact on the accuracy of the model, with the effect size increasing substantially from model 2 to model 3.

Consistent with the zero-order correlations, the beta values for the variables in the final model indicated that externalised aggression was the strongest predictor of CU traits in this sample, and the contribution of IQ was also significant. Conversely, the contribution of gender appears non-significant, despite the fact the fact that gender was significant in the regression analyses. It is likely that this is representative of gender's shared variance with IQ and as such, gender was retained as a predictor in the final model.

Furthermore, in isolation from IQ, working memory and attention also did not seem to have contributed significantly to the model. It should also be remembered that there were three measures subsumed under the heading of 'general intellectual functioning', and although these are all assumed to assess aspects of the same underlying construct, each measures a different domain. Considering this alongside the fact that the *CBCL* explained same proportion of variance in the model as IQ, attention and working memory combined, insofar as a single measure can be said to account for the variance in the model it is reasonable to assume that the *CBCL* has the highest predictive validity of all potential individual predictor variables investigated.

Additional Correlational Analysis of High CU Subset

An additional correlational analysis was conducted on the high CU subset alone ($n =$ 25); high CU participants were isolated from the rest of the sample by identifying those who fell one standard deviation below the mean and subsequently excluding all other participants' data from the analysis. Because of the over-representation of low CU participants, it was suspected that the relationship of affective empathy to both CU traits and aggression may have been obscured. In order to investigate this, a bivariate correlational analysis was run assessing the Pearson product-moment correlation coefficients between scores on the *CUSD*, the affective subscale of the *Chicago Empathy for Pain Task*, the affective subscale of the *QCAE* and the externalising subscale of the *CBCL*.

Table 6

Zero-order correlations amongst measures of CU traits, affective empathy and externalised aggression for high CU subset

Measures	1.	2.	3.	4.
1. *CUSD*	-			
2. Affective subscale of *Chicago Empathy for Pain Task*	-.07	-		
3. Affective subscale of *QCAE*	.34*	-.03	-	
4. Externalising subscale of *CBCL*	.14	-.14	-.38*	-

Note. *Correlation is significant at the 0.05 level (1-tailed)

As evidenced in Table 6, the additional analysis revealed that in this high CU subgroup the association between scores on the *CUSD* and the affective subscale of the *QCAE* was significant ($r = .34$, $p < .05$). Additionally, the zero-order correlation between said subscale of the *QCAE* and externalised aggression was also significant ($r = .38$, $p < .05$). Whilst the small sample size ($n = 25$) limits the extent to which these findings may be considered legitimately significant, it is nonetheless worth noting that this finding is promising and might be replicated in a larger sample.

Discussion

The primary aim of this project was to investigate the extent to which CU traits are present in this population and, therefore, to provide some indication as to the utility of assessing CU traits as an early indicator of adult psychopathy in the South African context. As such, the objectives of this research were twofold: Firstly, it aimed to establish whether or not CU traits were present in this population, and in doing so, aimed to investigate if, amongst Western Cape children with higher CU traits, the patterns of behaviour and affective empathic responses are comparable to those seen in high CU children in international Western populations, in which greater incidences of aggression and concurrent deficiencies in affective empathy are well-established predictors of callous-unemotional interpersonal styles. A secondary aim of this research was concerned with exploring other potential covariates of CU traits – namely, age, gender and general intellectual functioning – and this was also done for the purposes of comparing international findings with results obtained in a South African context.

The Incidence of CU Traits in Western Cape Children

In terms of the presence of CU traits in Western Cape children, it appears that not only are CU traits present to a greater degree in this population than in international populations, with 26% of the children in this study exhibiting high CU traits, but that they are also present in a higher proportion of children with aggressive behaviour than is usually found for international samples. As evidenced by the descriptive analyses of the data, 45% of children exhibiting antisocial behaviour also exhibited elevated CU traits. This is a far greater proportion than is generally reported for child, adolescent and adult populations (approximately 25%) in the international literature (Frick et al., 2003; Fanti, Frick & Georgiou, 2009).

Interpreting these statistics alongside each other, it is also evident that a substantial proportion of children with high CU traits did not exhibit a tendency towards aggressive behaviour ($n = 16$). This suggests that not all children present with concurrent elevations in CU traits and externalized aggression. Indeed, it is reasonable to presume that some children – perhaps those with higher intelligence – may be more adept at behavioural regulation (i.e., less impulsive) and conforming to social norms. Importantly, this study only measured externalized aggression; the aforementioned set of high CU children without evidence of externalized aggression may be engaging in different types of aggression (i.e., internalized or instrumental aggression).

Affective Empathy and Aggression as Predictors of CU Traits

Contrary to the expectation that decreased affective empathy would be associated with higher CU traits, affective empathy was not found to be predictive of CU traits. However, consistent with the large body of literature demonstrating an association between aggressive externalising behaviour and high CU traits, the results of this study did provide evidence in support of the second hypothesis, which posited outward expressions of aggression as a significant predictor of the outcome variable.

Although affective empathy deficits were not shown to be predictive of CU traits in the overall sample, nor were any such deficits found to be related to increased aggression, the very fact that increased aggression was predictive of *CUSD* scores suggests that a proportion of children exhibiting aggressive behaviour also have reduced emotional responsiveness and concern for others, indicating a potential predisposition to psychopathic tendencies. In addition, the correlation between these two variables indicates that the prevalence of CU traits increases substantially as a function of aggressive behaviour; this is consistent with the notion that aggressive behaviour in children with CU traits is more severe and frequent than that of their conduct-disordered peers without CU traits (Barker et al., 2011; Dadds et al., 2005).

Supporting the suggestion that the relationship between CU traits, affective empathy and externalised aggression are comparable in South African and international children is the correlation between the affective component of the *QCAE* and the *CUSD* that was found for the high CU subset alone, in which affective empathy decreased significantly as a function of elevated CU traits. Whilst the small sample size included in this additional analysis does limit the validity of these results they may, nonetheless, point to a need to distinguish between conduct-disordered children with and without CU traits in South Africa, so as to ensure that they receive interventions that take into account their atypical learning styles.

Empathy development in childhood. Callous-unemotional traits are, by definition, representative of a lack of emotional empathy, and as such, it was assumed that there would be an inverse relationship between affective empathy and CU traits. However, although various models of psychopathy – and the conceptualisation of CU traits and its correlates – have been verified for adults and adolescents, it should be kept in mind that extrapolating these models to children may, at times, yield inconsistent results, owing to the fact that children are still in the process of developing those affective and intellectual capacities that are the subject of study in adults with psychopathy proper.

This is not to say that the concept of CU traits should not be applied to children; as discussed, there is robust evidence that many conduct-disordered children display similar affective and behavioural qualities typically seen in adults with high CU traits, and the analysis of the high CU subset demonstrated this same pattern (Barker et al., 2011; Barry et al., 2000; Loney et al., 1998). Rather, it is merely worth remembering that, for this reason, there are bound to be differences across certain study variables when comparing children and adults, and this is an argument for further investigation of potential age effects and different developmental pathways to violence.

Problems with measuring and conceptualising empathy. Whilst no significant relationship was found between affective empathy and CU traits or externalised aggression for the overall sample, this may be reflective of the complex nature of the empathy construct and difficulties in measuring it. It is, therefore, possible that the specific measures used to assess affective empathy were themselves problematic. Supporting this interpretation is the fact that statistical analyses showed no significant correlation between the *Chicago Empathy for Pain Task* and the affective subscale of the *QCAE*, demonstrating a lack of convergent validity between these two measures. Given that these are posited to assess the same underlying construct, this finding is concerning.

The fact that affective empathy was found to have no associations with either scores on the *CUSD* or the *CBCL* raises concerns as to the validity of the *Chicago Empathy for Pain Task* and the affective subscale of the *QCAE* for use in this population. Even if no correlation between increased aggression and high *CUSD* scores were found, it should still be expected that there would be, at the very least, a significant positive correlation between increased affective empathy and lack of aggression, especially given the high internal reliability of both the *QCAE* and the *CBCL*. Additionally, taking into consideration the fact that self- and parent-report measures are inherently subjective – and therefore susceptible to social-desirability biases – it is also possible that responses on the *QCAE* were, to an extent, unreliable. However, when considering the analysis run on the high CU subset, the significance and direction of the relationships between this measure and both the *CUSD* and the externalising subscale of *CBCL* could indicate that the *QCAE* is, in fact, sensitive to deficits in affective empathy.

With respect to the *Chicago Empathy for Pain Task*, descriptive data suggest that children may have had difficulty with interpreting meaningful differences between various points on the response scale, with the vast majority of scores tending towards the upper-extremes. This is a commonly-reported issue with using Likert-type scales, particularly for

measures in which points on the scale are ill-defined or too numerous, and could account for the apparent ceiling effect seen for the much of the data, suggesting that this task has low discriminant validity (Cronbach, 1946; Ogden & Lo, 2012).

However, considering that only a quarter of individuals in the overall sample had high CU traits, it is highly likely that this relationship was obscured by the relative over-representation of non-CU children. Supporting this is the fact that the analysis run only on the high CU subset suggested that South African children with CU traits are presenting with analogous empathy deficits to those reported in international research on child and adolescent populations. Being based on so small a sub-sample, this proposition should be considered tentatively, but it does suggest an avenue for future research.

Age and Gender as Predictors of CU Traits

In accordance with various exploratory correlational studies demonstrating significant gender differences between high and low CU groups, this study found that male children were significantly more likely to exhibit high CU traits than were their female peers, although the association between gender and CU traits was weak. Several of the aforementioned studies also revealed that, amongst conduct-disordered individuals both with and without CU traits, females tend to score higher on measures of affective empathy and lower on measures of aggression, whilst the opposite pattern has been observed for males (Dadds et al., 2009; Essau, Sasagawa & Frick, 2006; Viding, Frick & Plomin, 2007; Viding et al., 2009).

However, in light of the fact that no significant effect of gender was found for aggressive behaviour, the finding that gender is a significant predictor of scores on the *CUSD* is unexpected, especially considering the fact that there was an almost equal distribution of males and females in the sample. It should be noted that whilst there was also no association between gender and scores on either the *Chicago Empathy for Pain Task* or the affective subscale of the *QCAE*, given that neither measure was found to be predictive of CU traits this is, in retrospect, unsurprising. The sources of variation in *CUSD* scores amongst male and female children may likely be attributable to other psychosocial factors that were not examined in this study, such as differential socialization of males and females and parents' own gender biases, both of which may have influenced their perceptions of their children's temperaments and behaviours.

As predicted, no significant association between age and *CUSD* scores was found. Considering that one of the core arguments for a distinction between conduct-disordered individuals with and without CU traits rests on the assumption that psychopathic personality traits are stable and have their developmental origins in early childhood, these results are

consistent with the conceptualization of CU traits. Furthermore, the finding that gender and aggressive behaviour significantly predict *CUSD* scores in this sample corresponds with similar observations of previous research in Western populations utilizing samples comprised of children, adolescents and adults, alike (Viding et al., 2007; Viding et al., 2009). Combining this with the finding that approximately one quarter of the sample had high CU traits, this provides further evidence that CU traits are present in this population.

An Inverse Association between CU Traits and Intelligence

Although intelligence is a significant predictor of CU traits, the relationship is an inverse one. A long-standing assumption in the literature defining the characteristics of individuals with CU traits is that, contrary to their non-CU conspecifics, these individuals do not exhibit deficits in verbal intelligence. Rather, psychopathic and high CU individuals are generally considered to have above-average intelligence and, indeed, this is often cited as the reason such individuals are so adept at manipulating others (Loney et al., 1998; Salekin, Neumann, Leistico & Zalot, 2004). In stark opposition to that particular body of literature, this study revealed a moderate negative relationship between intellectual ability and CU traits as measured by the *CUSD*.

That being said, there is substantial variation within the overall body of literature investigating the association between psychopathy and intelligence, and there have been significant developments since Cleckley's (1976) and Loney et al.'s (1998) initial suggestions that psychopathy and CU traits are linked to higher verbal intelligence. Not only are the findings from multiple investigations inconsistent, but there also appears to be a differential relationship between psychopathy and intelligence, in which different dimensions of each construct exhibit significantly different associations with each other (Johansson & Kerr, 2005; Salekin et al., 2004; Vitacco, Neumann & Wodushek, 2008). Distinctions have been made between the different dimensions of psychopathy (affective, interpersonal, antisocial and lifestyle), based on Neumann, Forth, Kosson and Hare's (2005) four factor model of psychopathy, and their relation to IQ and, specifically, to verbal and creative intelligence (Salekin et al., 2004; Vitacco et al., 2008).

Several lines of research have demonstrated a positive relationship between the interpersonal factor, whilst the affective and lifestyle factors were negatively associated with IQ, and the antisocial factor has yielded inconsistent relationships across studies, with findings ranging from no significant relationship to a positive relationship for this factor and IQ (Harpur, Hare & Hakstian, 1989; Hart, Forth & Hare, 1990; Salekin et al., 2004; Walsh, Swogger & Kosson, 2004). Suggestions have been put forward to account for the variability

inherent in the literature, many of which note, firstly, that the measures of psychopathy and IQ vary across studies, and secondly, that there are also discrepancies in the definitions of psychopathy in said studies, thus potentially limiting their comparability (Salekin et al., 2004; Vitacco et al., 2008). This may be one reason for the inconsistency between the results of this study and other investigations of the relationship between these two constructs. Another possible reason is that, as males were more likely to have high CU traits, and females more likely to have higher IQ scores, the influence of gender may have confounded the relationship between CU traits and intelligence.

Intelligence and the affective factor of the psychopathy construct. As alluded to, above, the *CUSD* is sensitive to deficiencies in affective empathy (and, as such, indicative of interpersonal style), and it is therefore reasonable to consider items on the *CUSD* as being analogous to those components of the *Hare Psychopathy Checklist-Revised* (*PCL-R*; Hare, 1999) that load on the affective – or callous-unemotional – factor (Dadds et al., 2005). Given this, the fact that IQ was negatively correlated with *CUSD* scores is in-line with the observations of several previous investigations incorporating the four-factor model of psychopathy.

Moreover, as discussed, whilst the four-factor model and the correlates of CU traits have been verified for adult populations, there may be important differences in child populations owing to the fact that intellectual capacity is still developing in childhood, especially with respect to very young children. Furthermore, given that IQ was also shown to be significantly, positively correlated with SES, it would seem important to consider the potential role of macro-systemic issues in the development of both CU traits and IQ.

 SES, Violent Criminality and the Development of CU Traits

Given the severity of macro-systemic issues in South Africa, it is an unfortunate fact that the vast majority of South African citizens are living in impoverished areas and thus fall into the lower SES bracket, as did this sample. Although this study included participants from a limited range of SES – and therefore could not adequately investigate differences in CU traits across SES – it is nonetheless worth considering the role of socio-economic factors with respect to violent criminality and the presence of CU traits, especially considering the fact that, in various international studies, low SES has been shown to be positively related to conduct disorder and psychopathic traits (Johnson, Cohen, Dohrenwend, Link & Brook, 1999; Lahey, Loeber, Burke & Applegate, 2005; Walsh & Kosson, 2007).

In attempting to account for the higher incidences of violent crime in low SES communities, arguments have been made in support of the idea that children within these

communities experience a greater exposure to aggressive behaviour, consequently become desensitised to violence, and this manifests as callousness or lack of concern for others (Kimonis, Frick, Centifanti & Aucoin, 2008; Margolin & Gordis, 2000; Walsh & Kosson, 2007; Weilder & Widom, 1996). The positive relationship between family income and affective empathy found in this study is consistent with this proposition, and as such, it is an argument worth considering. Certainly, if CU traits were a product of desensitisation, this would have important implications for treatments. Owing to the fact that such traits would then not necessarily be innate – but rather, learned – such individuals are likely to show typical learning patterns of learning, and to be responsive to standard treatments.

However, the *Chicago Empathy for Pain Task* may be unreliable, and this should therefore be considered with caution, especially considering that no relationship was found between said task and CU traits. Lastly, the fact that firstly there was no association between *CUSD* scores and either index of SES suggests that within this sample, the presence of CU traits may be dissociable from the potential effects of desensitisation to violence.

Limitations and Directions for Future Research

This study had several limitations. Firstly, in the absence of an experimental design incorporating a control group, it did not permit adequate comparison between high and low CU participants. Having to rely on correlational analyses alone, it was therefore not possible to draw causal inferences regarding the aetiology and development of CU traits. Furthermore, the age-range included in this study was limited, in that it did not assess children of a very young age, nor did it include adults. Assessing the relative differences across all age ranges – with respect to CU traits as well as affective empathy and aggression – would not only provide deeper insight into whether or not the concept of different developmental trajectories applies in the South African context, but would also allow researchers to verify the psychopathy construct in this non-Western population. As such, it is recommended that any future study addressing these questions incorporate both a longitudinal and cross-sectional design.

So as not to belabour the point, the lack of sensitivity of the empathy measures (as discussed, above) will be mentioned only briefly. Suffice to say that, being reliant on the subjectivity of the participant, said measures are susceptible to social desirability bias and may have also have been interpreted inconsistently, and with some difficulty. To avoid these potential confounds, empathic responsiveness should ideally be assessed via physiological measures, such as skin-conductance responses, or neuroimaging techniques, such as fMRI scans. Furthermore, future research efforts should ideally incorporate a wider range with

respect to SES, race and culture, so as to determine if and how these factors might differentially affect the presentation of CU traits. Lastly, it would appear that the contradictory findings reported across studies considering CU traits and IQ warrants a deeper investigation into the differential relationship of IQ to the various dimensions of the psychopathy construct.

Conclusion

This study investigated the extent to which callous-unemotional traits are present in Western Cape children, and found that CU traits are not only present, but their prevalence appears to be higher than what is normally seen for international samples. The results indicated that externalised aggression, gender and general intellectual functioning are significant predictors of CU traits, such that individuals with higher CU traits are significantly more likely to display increased aggressive behaviour, be male, and have lower IQ scores, as compared to non-CU peers. Although affective empathy was not found to be predictive of CU traits, it is suspected that this relationship was obscured by the combination of an over-representation of non-CU participants and possible issues regarding the sensitivity of the empathy measures.

These findings are largely consistent with those for Western populations, and as such, it appears that the concept of CU traits does apply in the South African context. This has implications regarding treatments aimed at reducing the incidence and severity of aggressive behaviour in childhood, in that firstly, it points to the utility of assessing for CU traits in children with aggressive behaviour, and secondly, it suggests a potential need for the development of early-intervention strategies that take into account the different learning styles of children with CU traits.

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Appendix A

DEMOGRAPHIC QUESTIONNAIRE

International research guidelines suggest that researchers report some attributes of all research participants (e.g., children's gender, parents' educational background, etc.). To help us collect this information, we are asking you to complete this brief questionnaire. All your answers are kept private, and won't be used in a way that identifies you or your child. If you are uncomfortable answering any of the items, feel free to ignore them.

Today's Date: _____

Who is completing this questionnaire? (Please √)

☐ Biological parent   ☐ Grandparent   ☐ Nanny

☐ Foster parent   ☐ Aunt/Uncle   ☐ Friend

☐ Stepparent   ☐ Sibling   ☐ Other: _____

Are you the child's primary caregiver? (Circle one)   Y / N

Your gender: M / F

Child's Information

Child's date of birth (including the year): _____

Child's gender: M / F

Child birth order: Child number _____ out of _____ children.

Ages of siblings: Boy / Girl Age: _____

                           Boy / Girl Age: _____

                           Boy / Girl Age: _____

Child's height (in cm):_____ Child's weight (in kg): _____

Child's home language: _____

Child's race (Please √):

☐ Black South African   ☐ Coloured   ☐ Indian

☐ Black African (Other)   ☐ White/Caucasian   ☐ Other: _____

Please list any serious health problems this child has had:

_____

_____

_____

Was this child born more than two weeks early?   Y / N

Please list any medications this child is taking for behavior issues, attention difficulties, or issues related to moods and feelings:

_____

_____

_____

Does this child currently attend (Please √):

☐ Daycare/Crèche   ☐ Grade R

☐ Preschool   ☐ Primary school (Grade: _____)

Household Information

Who does this child currently live with? (Please √ **all** that apply)

☐ Biological parent   ☐ Grandparent   ☐ Nanny

☐ Foster parent   ☐ Aunt/Uncle   ☐ Friend

☐ Stepparent   ☐ Sibling   ☐ Other: _____

Who is this child's primary caregiver?

☐ Biological parent   ☐ Grandparent   ☐ Nanny

☐ Foster parent   ☐ Aunt/Uncle   ☐ Friend

☐ Stepparent   ☐ Sibling   ☐ Other: _____

Languages currently spoken at home:

   Home language:_____

   Other: _____

Religion(s) practiced in the home: _____

<u>Primary Caregiver Information</u>

Current age: _____

Marital Status:

☐ Married   ☐ Divorced   ☐ Widow/Widower

☐ Single   ☐ Remarried   ☐ Separated

Current job title:

       Mother: _____

       Father: _____

       Primary caregiver: _____

Total family/household income last year:

☐ Less than R35 000   ☐ R176 000-R225 000   ☐ R376 000-R425 000

☐ R36 000-R75 000   ☐ R226 000-R275 000   ☐ R426 000-R475 000

☐ R76 000-R125 000   ☐ R276 000-R325 000   ☐ R476 000-R525 000

☐ R126 000-R175 000   ☐ R326 000-R375 000   ☐ More than R525 000

Appendix B

The Callous-Unemotional Screening Device

Please complete all questions: The response options for each question are 0 = not at all true; 1 = sometimes true; 2 = definitely true			
My child/ This child	**0 = not at all true**	**1 = sometimes true**	**2 = definitely true**
1. Is concerned about other people's feelings	☐	☐	☐
2. Feels guilty if s/he does something wrong	☐	☐	☐
3. Break promises	☐	☐	☐
4. Shares with other children	☐	☐	☐
5. Is helpful if someone is hurt, upset or ill	☐	☐	☐
6. Is kind to younger children	☐	☐	☐
7. Volunteers to help others	☐	☐	☐
8. Is disobedient to adults	☐	☐	☐
9. Is inconsiderate of other people's/children's feelings	☐	☐	☐

Appendix C

QCAE (Child)

	People differ in the way they feel in different situations. Below you are presented with a number of characteristics that *may or may not apply to your child*. Read each characteristic and indicate how much you agree or disagree with the item by selecting the appropriate box. Answer quickly and honestly.	Strongly agree	Slightly agree	Slightly disagree	Strongly disagree
1.	My child sometimes finds it difficult to see things from another's point of view.				
2.	My child is usually objective when he/she watches a film or play, and doesn't often get completely caught up in it.				
3.	My child tries to look at everybody's side of a disagreement before he/she makes a decision.				
4.	My child sometimes tries to understand his/her friends better by imagining how things look from their perspective.				
5.	When my child is upset at someone, he/she will usually try to "put him/herself in the person's shoes" for a while.				
6.	Before criticizing somebody, my child tries to imagine how he/she would feel in their place.				
7.	My child often gets emotionally involved in his/her friends' problems.				
8.	My child is inclined to get nervous when others around him/her seem nervous.				
9.	People my child is with have a strong influence on his/her mood.				
10.	It affects my child very much when one of his/her friends seems upset.				
11.	My child often gets deeply involved with the feelings of a character in a film, play, or novel.				
12.	My child gets very upset when he/she sees someone cry.				
13.	My child is happy when he/she is with a cheerful group and sad when others are glum.				
14.	It worries my child when others are worrying and panicky.				
15.	My child can easily tell if someone else wants to enter into a conversation.				
16.	My child can quickly pick up if someone says one thing but means another.				
17.	It is hard for my child to see why some things upset people so much.				
18.	My child finds it easy to put him/herself in somebody else's shoes.				
19.	My child is good at predicting how someone will feel.				
20.	My child is quick to spot when someone in a group is feeling awkward or uncomfortable.				
21.	Other people tell my child he/she is good at understanding what others are feeling and what others are thinking.				
22.	My child can easily tell if someone else is interested or bored with what he/she is saying.				
23.	Friends talk to my child about their problems as they say that my child is very understanding.				
24.	My child can sense if he/she is intruding, even if the other person does not tell him/her.				
25.	My child can easily work out what another person might want to talk about.				
26.	My child can tell if someone is masking their true emotion.				
27.	My child is good at predicting what someone will do.				
28.	My child can usually appreciate the other person's viewpoint, even if he/she does not agree with it.				
29.	My child usually stays emotionally detached when watching a film.				
30.	My child always tries to consider the other person's feelings before he/she does something.				
31.	Before my child does something, he/she tries to consider how his/her friends will react to it.				

Appendix D

The Externalising Subscale of the Child Behaviour Checklist

1. **About how many close friends does your child have? (Do *not* include brothers & sisters)**

   ☐ None   ☐ 1   ☐ 2 or 3   ☐ 4 or more

2. **About how many times a week does your child do things with any friends outside of regular school hours? (Do *not* include brothers & sisters)**

   ☐ Less than 1   ☐ 1 or 2   ☐ 3 or more

3. **Does your child receive special education or remedial services or attend a special class or special school?**

   ☐ No   ☐ Yes - **kind of services, class, or school:** _____

   _____

   _____

4. **Has your child ever had a serious head injury?**

   ☐ No   ☐ Yes – **please describe:** _____

   _____

Below is a list of items that describe children and youths. For each item that describes your child *now or within the past 6 months*, please mark the *2* if the item is *very true or often true* of your child. Mark the *1* if the item is *somewhat or sometimes true* of your child. If the item is **not true** of your child, mark the **0**. Please answer all items as well as you can, even if some do not seem to apply to your child.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

☐ 0 ☐ 1 ☐ 2   2. Drinks alcohol without parents' approval (describe):

_____

_____

_____

☐ 0 ☐ 1 ☐ 2   3. Argues a lot

☐ 0 ☐ 1 ☐ 2   16. Cruelty, bullying, or meanness to others

☐ 0 ☐ 1 ☐ 2   19. Demands a lot of Attention

☐ 0 ☐ 1 ☐ 2   20. Destroys his/her own things

☐ 0 ☐ 1 ☐ 2   21. Destroys things belonging to his/her family or others

☐ 0 ☐ 1 ☐ 2   22. Disobedient at home

☐ 0 ☐ 1 ☐ 2   23. Disobedient at school

☐ 0 ☐ 1 ☐ 2   26. Doesn't seem to feel guilty after misbehaving

☐ 0 ☐ 1 ☐ 2   28. Breaks rules at home, school, or elsewhere

☐ 0 ☐ 1 ☐ 2   37. Gets in many fights

☐ 0 ☐ 1 ☐ 2   38. Gets teased a lot

☐ 0 ☐ 1 ☐ 2   39. Hangs around with others who get in trouble

☐ 0 ☐ 1 ☐ 2   43. Lying or cheating

☐ 0 ☐ 1 ☐ 2   57. Physically attacks people

☐ 0 ☐ 1 ☐ 2   63. Prefers being with older kids

☐ 0 ☐ 1 ☐ 2   67. Runs away from home

☐ 0 ☐ 1 ☐ 2   68. Screams a lot

☐ 0 ☐ 1 ☐ 2   72. Sets fires

☐ 0 ☐ 1 ☐ 2   73. Sexual problems (describe):

_____

_____

_____

☐ 0 ☐ 1 ☐ 2   81. Steals at home

☐ 0 ☐ 1 ☐ 2   82. Steals outside the home

☐ 0 ☐ 1 ☐ 2   86. Stubborn, sullen, or irritable

☐ 0 ☐ 1 ☐ 2   87. Sudden changes in mood or feelings

☐ 0 ☐ 1 ☐ 2   88. Sulks a lot

☐ 0 ☐ 1 ☐ 2   89. Suspicious

☐ 0 ☐ 1 ☐ 2   90. Swearing or obscene language

☐ 0 ☐ 1 ☐ 2   94. Teases a lot

Below is a list of items that describe children and youths. For each item that describes your child *now or within the past 6 months*, please mark the *2* if the item is *very true or often true* of your child. Mark the *1* if the item is *somewhat or sometimes true* of your child. If the item is **not true** of your child, mark the **0**. Please answer all items as well as you can, even if some do not seem to apply to your child.

0 = Not True (as far as you know)   1 = Somewhat or Sometimes True   2 = Very True or Often True

☐0   ☐1   ☐2   95. Temper tantrums or hot temper

☐0   ☐1   ☐2   96. Thinks about sex too much

☐0   ☐1   ☐2   97. Threatens people

☐0   ☐1   ☐2   99. Smokes, chews, or sniffs tobacco

☐0   ☐1   ☐2   101. Truancy, skips school

☐0   ☐1   ☐2   104. Unusually loud

☐0   ☐1   ☐2   105. Uses drugs for nonmedical

purposes (**don't** include alcohol or tobacco) (describe):

_____

_____

_____

☐0   ☐1   ☐2   106. Vandalism

Appendix E

Parental Consent Form

CONSENT FORM

The research project and the procedures associated with it have been explained to me. I hereby give my permission for my child to participate in the above-described research project.

Child's name: _____

Parent/guardian's name: _____

Date: _____

Signature of parent/guardian: _____

Please provide a contact number below should you be willing to complete the additional questionnaires (for which you will be compensated with R100 upon completion), and indicate which time/s would be most convenient to receive this phone call.

Phone: _____

Time/s: _____

Appendix F

Child Assent Form

The Development of Moral Reasoning and Empathy

Assent Form

Hello! We want to tell you about a research study we are doing. A research study is a way to learn more about something. We would like to find out more about how children feel about good and bad behaviour, and how they understand what other people are feeling and thinking.

If you agree to join this study, you will be asked to do some tasks on the computer. For example, we will show you some pictures and ask you how you feel about them. We will also show you some short movies on the computer screen. These are not the kind of movies you see on TV. They are movies that we made to help us study how children feel about good and bad behaviour. It is very important that you watch the pictures carefully. You will also be asked to do some other tasks, like tell us the meaning of some words, and we will ask you to answer questions about short stories we will read to you.

Together these tasks will take about 90 minutes. We will take a break after you've done some of the tasks. We can take other short breaks too if you get tired.

You do not have to join this study. It is up to you. No one will be angry with you if you don't want to be in the study or if you join the study and change your mind later and stop.

Do you have any questions about the study? If you think you can do it and you don't have any more questions about it, will you sign this paper? If you sign your name below, it means that you agree to take part in this study.

Child's Signature: _____   Date: _____

Interviewer's Signature: _____   Date: _____