Callous-Unemotional Traits in Clinically Referred At-Risk Youth and Related Topographies of Antisocial Behaviour

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Abstract
The present study aimed to investigate callous-unemotional (CU) traits in a sample of clinically-referred at-risk youth in an outpatient setting. CU traits are associated with detrimental outcomes in youth, including an earlier onset of antisocial behaviour and more persistent patterns of offending (Frick, 2009). Recent revisions to the diagnosis of Conduct Disorder in the DSM-V have added a specifier designating youth who exhibit the affective features of psychopathy. This specifier includes four traits: callousness, lack of remorse and guilt, flat affect, and lack of concern about performance (American Psychiatric Association, 2013). Uncaring traits (i.e., a general lack of concern about performance in multiple domains) are correlated with the occurrence of criminal offending, whereas callous traits have been linked to violent offending (e.g., Kahn, Byrd, & Pardini, 2013). CU traits may be a combination of unique traits, each with different causes and related behavioural topographies (Kimonis et al., 2008). This study used semi-structured interviews and validated instruments to measure CU traits in a sample of n=30 youth with collateral informants. Correlations between specific CU traits and each topography were analyzed using a bivariate analysis. Two exploratory hierarchical multiple regression analyses were also used to determine any incremental predictive power of the lack of concern with performance specifier. Callous traits were positively correlated with aggressive behaviour. However, this relationship was not exclusive to only being correlated to violent acts as in previous research. Uncaring traits were significantly correlated with total occurrence of antisocial acts for self, but not parent-report forms. Adding the unconcerned with performance specifier significantly improved prediction of an empirically validated measure of risk ($p = .019$), and a validated measure of psychopathy ($p = .080$). While these exploratory analyses were conducted with a smaller sample than required for a robust assessment, they satisfied the remainder of assumptions for multiple regression analysis. Commonly used forensic risk assessments do not comprehensively assess lack of concern with performance, as described by the new callous-unemotional specifier in DSM-V. The findings of this study add support to a growing body of evidence for assessing lack of concern with performance in forensic risk assessments. Further research is needed on specific callous-unemotional traits and on the incremental predictive value of the unconcerned specifier with measures of risk in a larger sample of youth.
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Table of Contents

Abstract .................................................................................................................................................. i
Acknowledgements ............................................................................................................................ ii
Table of Contents ................................................................................................................................ iii
List of Tables ......................................................................................................................................... iv
List of Figures ........................................................................................................................................ v
Chapter I: Introduction .......................................................................................................................... 6
  Summary .............................................................................................................................................. 6
  Purpose .............................................................................................................................................. 6
  Overview ........................................................................................................................................... 7
Chapter II: Literature Review ............................................................................................................... 8
  Callous Unemotional Traits .................................................................................................................. 8
  Revisions to Conduct Disorder Diagnosis in DSM-V ........................................................................ 8
  Unique Characteristics of Callous-Unemotional Youth ..................................................................... 9
  Genetic Research ............................................................................................................................... 10
  Social Significance of CU Traits ....................................................................................................... 11
  Measuring Callous Unemotional Traits ............................................................................................. 11
  Basis for Research ............................................................................................................................ 11
Chapter III: Method ............................................................................................................................. 13
  Participants ....................................................................................................................................... 13
  Design and Setting ............................................................................................................................. 13
  Measures .......................................................................................................................................... 13
  Procedure ......................................................................................................................................... 15
Chapter IV: Results ............................................................................................................................... 16
  Participant Characteristics ................................................................................................................... 16
  Reliability ......................................................................................................................................... 16
  Concurrent Validity of the ICU ........................................................................................................... 16
  ICU Subscales and Antisocial Measures ............................................................................................ 17
  DSM-V Unconcerned Specifier .......................................................................................................... 17
  Regression Analyses .......................................................................................................................... 17
    Regression of antisocial acts on PCL:YV and Unconcerned Specifier. .............................................. 18
    Assumptions for Analysis I ............................................................................................................... 19
    Regression of antisocial acts on YLS/CMI and Unconcerned Specifier ........................................ 22
    Assumptions for Analysis II ............................................................................................................ 22
Chapter V: Discussion ............................................................................................................................ 25
  Thesis Summary ............................................................................................................................... 25
  Bivariate Analyses ............................................................................................................................ 25
    Callous measurements and violent acts ......................................................................................... 25
    Uncaring subscale and total antisocial acts .................................................................................... 25
    Unconcerned specifier ................................................................................................................... 26
  Regression Analyses .......................................................................................................................... 26
  Strengths and Limitations ................................................................................................................... 26
  Contributions to the Behavioural Psychology Field ............................................................................ 27
References ........................................................................................................................................... 28
List of Tables
Table 1. Percentage of Participants Meeting CU Specifier Criteria ........................................16
Table 2. Bivariate Analysis Results ..........................................................................................17
Table 3. Revised Hierarchical Multiple Regression Models .....................................................18
Table 4. Hierarchical-Multiple Regression Analysis Results for Analysis I ..............................18
Table 5. Hierarchical-Multiple Regression Analysis Results for Analysis II ............................22
List of Figures

Figure 1. Distribution of Residuals for Analysis I.................................................................20
Figure 2. Transformed PCL:YV scores against Total Antisocial Acts.........................20
Figure 3. Normal P-P Plot of Regression Standardized Residual for Analysis I........21
Figure 4. Distribution of Residuals for Analysis II.................................................................23
Figure 5. Transformed YLS/CMI scores against Total Antisocial Acts..........................23
Figure 6. Normal P-P Plot of Regression Standardized Residual for Analysis II ..........24
Chapter I: Introduction

Summary

Callous-unemotional (CU) traits can be described as a lack of empathy, remorse, and meaningful affect (Kahn, Byrd, & Pardini, 2013). These traits are also referred to as the affective facet of the psychopathy construct (Hare, 1993), and are associated with detrimental outcomes when present in youth (Frick, Ray, Thornton, Kahn, 2013; Kahn, Byrd, Pardini, 2013; McMahon, Witkiewitz, & Kotler, 2010), including an earlier onset of antisocial behaviour, and a more aggressive and persistent pattern of offending (Frick, 2009). Further, multiple studies have suggested unique causal pathways to the development of antisocial behaviour when CU traits are present in youth (Barry et al., 2000; Frick & White, 2008; Viding, 2004). These traits seem not only to designate more severe and aggressive antisocial youth, but youth with unique developmental precursors to their conduct problems (Kimonis et al., 2008). Ultimately, it appears that CU traits are important to understand with regard to various antisocial outcomes (Frick & Dickens, 2006).

While these traits are typically associated with the adult psychopathy construct (Frick, & Ellis, 1999; Serin et al., 2011; Viding, 2004), they appear to be present in a significant number of youth, particularly those with an existing diagnosis of conduct disorder (Kennedy, 2013), and in various antisocial youth populations (i.e., clinically-referred and custodial youth) (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; Rowe et al., 2010).

Purpose

Callous-unemotional traits appear to be a group of related but distinct impairments – each with different associated topographies. For example, Kimonis et al. (2008) found that callousness was linked to aggression, while uncaring traits were linked to antisocial behaviour. While their research findings are preliminary, these authors suggested that future research use different assessment methods to substantiate whether the same pattern of relationships can be found in other settings. The current study aimed to investigate these relationships in a sample of children and youth referred for a consultation through the Urgent Consult Clinic or Family Court Clinic. Both clinics are outpatient services of the Child and Adolescent Mental Health Division located at Hotel Dieu Hospital. Data were gathered through a comprehensive file review, semi-structured interviews with the child and collateral informants (e.g., parents), and the completion of a battery of psychometric assessment instruments (e.g., instruments for measuring levels of risk and psychopathy). This was done to replicate previous work as well as to expand our understanding of the callous/unemotional constructs in an adolescent forensic mental health setting.

This study examined in this sample the correlations between subscales of CU traits (i.e., uncaring, callous, unemotional) and a multitude of external variables—including total number of antisocial acts, current diagnoses, and predicted risk of antisocial behaviour as assessed by forensic risk-assessment instruments. One new measure assessed in this clinically-referred sample is the DSM-V diagnostic criteria for the ‘with limited prosocial emotions’ specifier for conduct disorder (American Psychiatric Association, 2013). This specifier includes additional CU traits relating to a specific lack of concern with performance, which is not included in existing measures of CU traits. The current study assessed the significance of this specifier as a predictor for
antisocial conduct (i.e., total number of antisocial actions), in comparison with existing measures that are well-validated predictors (i.e., measures of risk and psychopathy). An analysis was also be conducted to determine the strength of the relationship between each of the subscales of the revised ICU and various external variables (i.e., uncaring and antisocial behaviour; callousness and aggression).

It was hypothesized that the callous and uncaring subscales of the ICU would demonstrate similar relationships to the variables in this sample as they did in a study by Kimonis et al. (2008). Specifically, it was hypothesized that the callous subscale of the ICU would be positively correlated with measures of aggression, while the uncaring subscale and measures of total occurrence of antisocial behaviour (i.e., criminal offending) would be positively correlated. It was further hypothesized that the new unconcerned specifier would demonstrate a significant relationship with measures of antisocial conduct. Due to the limitation of a small sample size, the magnitude of these relations were expected to vary; however it was hypothesized that the subscales of the ICU as well as the new CU unconcerned specifier would demonstrate positive relationships with measures of antisocial behaviours.

**Overview**

The following section provides a review of the relevant empirical literature on callous-unemotional traits, including: a description of CU traits, the current methods for measuring these traits, their prevalence, social significance, developmental pathways for these traits, and early genetic research. The findings of Kimonis et al. (2008) on subscales of CU traits are also explored. Following the literature review, the study design and methodology are explained, and the study results are presented thereafter. Lastly, a discussion of the findings is presented.
Chapter II: Literature Review

Callous Unemotional Traits

Callous and unemotional (CU) traits can be defined as the absence of empathy, remorse, and meaningful affect (Kimonis et al., 2008). Individuals exhibiting these characteristics typically engage in callous manipulation of others for personal gain (Frick & White, 2008). While these traits are typically associated with the affective pillar of the adult psychopathy construct (Cleckley, 1976; Hare, 1993), they appear to be present in a significant number of youth, particularly those with an existing diagnosis of conduct disorder (CD) (Frick & White, 2008; Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; Kennedy, 2013). Further, there is growing evidence which suggests that understanding CU traits in youth is of critical importance, as they designate a distinctive subtype of antisocial youth (Frick, 2009). This subgroup of antisocial youth tends to exhibit a chronically severe and aggressive pattern of antisocial behaviour (Frick & White, 2008), and appears to have a developmental profile distinct from other conduct disordered youth (Viding, 2004). Also, similarities have been found between youth high in CU traits and psychopathic adults, including reward-focused response styles, fearlessness, and an early onset of police contact (see Barry et al., 2000). Ultimately, these traits appear to be very important to understand with regard to a variety of antisocial outcomes in youth (Kahn, Byrd, & Pardini, 2013).

Revisions to Conduct Disorder Diagnosis in DSM-V

While previous subtyping of conduct disorder has focused on childhood onset versus adolescent onset, recent research suggests an additional distinction can be made based on whether or not the youth exhibit CU traits (Frick, 2006a). There is accumulating evidence that suggests that youth with CU traits are an important subgroup of conduct disordered youth (Frick & Dickens, 2006). Youth with conduct disorder are more likely to display CU traits, both in community and clinically-referred samples (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; Kennedy, 2013). Furthermore, conduct disordered youth with CU traits exhibit similarities to adults with psychopathy (Frick & Dickens, 2006). Recent revisions to the DSM-V include a callous-unemotional specifier for conduct disorder labeled as ‘with limited prosocial emotions’ (“DSM-5 overview”, 2013). This new specifier designates a distinct group of individuals who appear to be more instrumentally aggressive, cruel, and treatment resistant (Frick & White, 2008). To meet criteria for this specifier, youth must demonstrate at least 2 of 4 traits over a period of at least 12 months, across multiple life domains. The specifiers include callousness, lack of remorse and guilt, flat affect, and being unconcerned about performance – this trait being of the most interest to this study.

A large study (n = 1136) by Kahn et al. (2012) found that between 10 to 32% of community-sampled and 21 to 50% of clinically-referred youth with conduct disorder also met criteria for the new CU specifier. By contrast, in youth without conduct disorder, only 2 to 7% in the community sample and 14 to 32% in the clinically-referred sample met the criteria for the specifier (Kahn et al., 2012). In an archival study by Kennedy (2013), data from a small sample of young offenders from the Family Court Clinic (FCC) were reviewed to assess the prevalence of CU traits. Like Kahn et al. (2012), Kennedy found that clients with a diagnosis of CD were significantly more likely to display CU traits than individuals without a CD diagnosis. Additionally, clients with a childhood onset of CD were more likely to display CU traits as compared to those with adolescent-
onset CD. Clients demonstrating comorbid attention deficit-hyperactivity disorder (ADHD) and CD were even more likely to demonstrate CU traits than clients with CD alone (Kennedy, 2013).

Overall, it appears that the prevalence of CU traits varies based on whether a community or clinically-referred sample is considered. Further, conduct disorder and CU traits appear to occur concomitantly, and there appears to be preliminary evidence that early-onset conduct disorder and comorbid ADHD further increase the presence of CU traits.

Unique Characteristics of Callous-Unemotional Youth

Youth with high levels of CU traits appear to differ from other antisocial populations in several ways (Beitchman et al., 2012; Brito et al., 2009; Munoz, Pakalniskiene, & Frick, 2011; Viding, 2004). These CU youth appear to be unique from other antisocial youth populations in terms of trajectories of offending, characteristics, treatment response, and casual factors (for a brief review, see Kimonis et al., 2008).

Youth with high levels of CU traits have unique characteristics that may serve as risk factors for antisocial behaviour (see Frick & White, 2008). These include a preference for risky and exciting activities, and lower levels of neuroticism and anxiety (Frick & Dickens, 2006; Frick & White, 2008). According to Viding (2004), psychopathic youth also exhibit a diminished response to negative stimuli, punishment cues, and impaired moral reasoning. That these neurocognitive markers are present in youth with psychopathic tendencies and in adults with psychopathy suggests psychopathy is a developmental disorder (Viding, 2004). Another distinguishing clinical characteristic of the CU subset of conduct-disordered youth is diminished treatment response (Frick & Dickens, 2006). Frick and Dickens reviewed four published studies which found that CU traits in adjudicated adolescents were associated with a poor treatment response and a higher rate of reoffending after completion and release from treatment programs, compared with conduct disordered youth without CU traits.

With regard to trajectories of offending, it appears that youth with high levels of CU traits have an earlier onset of police contact, and a more stable trajectory of aggressive offending (Frick, 2006a; Frick & White, 2008). This trajectory of offending is similar to that associated with adult psychopathy, with a more intense, persistent, and violent pattern of offending (Serin et al., 2011). Like adults with psychopathy, youth with conduct disorder and CU traits tend to exhibit higher amounts of instrumental aggression; this pattern of behaviour is in contrast to most conduct-disordered youth, who engage in heightened levels of reactive aggression relative to their peers (Frick & Dickens, 2006). Three recent reviews have studied the impact of callous-unemotional traits on recidivism, and found significant support for the notion that CU traits are associated with a chronic and severe trajectory of delinquent behaviour (Edens, Campbell, & Weir, 2007, Frick & Dickens, 2006; Frick & White, 2008).

While conduct disorder and CU traits appear to occur concomitantly, the causal factors seem to differ between CD youth with and without CU traits (Frick & Dickens, 2006). For instance, one study (Munoz, Pakalniskiene, & Frick, 2011) found that negative parenting characteristics were a risk factor for conduct-disordered youth, but not for conduct-disordered youth with callous unemotional traits. Similarly, Viding, Fontaine, Oliver, and Plomin (2009) found in a sample of 4508 monozygotic twins that negative parental influences were a risk factor for the development of conduct disorder in
youth without CU traits, but not for youth with CU traits. These findings suggest that antisocial youth with CU traits seem to be susceptible to a unique set of risk factors.

**Genetic Research**

While genetic research focused on callous-unemotional traits is sparse, recent studies have examined associations between CU traits and inherited antisocial behaviour, brain abnormalities, and genetic markers. With regard to the heritability of CU traits, there do appear to be some relationships of interest. First, CU traits appear to be highly heritable, at least compared to other personality traits (Viding, 2004). Second, the presence of CU traits may also increase the likelihood that antisocial behaviour is passed genetically. For example, Viding et al. (2008), found that high levels of CU traits increased the heritability of antisocial behaviour. Thus, when considering the development of callous-unemotional traits, there is an indication that genetic influences are a risk factor for the development of CU traits. Further, environmental risk factors (e.g., poor parenting practices) are less of a risk factor for youth with CU traits than for antisocial youth without these traits (Viding, 2004). As noted by Viding, this causal profile is similar to that observed in psychopathic adult offenders. A large twin study (n = 3687) (Viding, Blair, Moffit, & Plomin, 2005) found that in youth with antisocial behaviour and high levels of CU traits, there was a remarkably strong genetic influence with no environmental influence, whereas antisocial children scoring low on CU traits had only moderate genetic influence, and had a moderate environmental influence. While brain imaging has only recently been used to study CU traits (De Brito et al., 2009, Fairchild et al., 2013), there is early evidence that CU traits are associated with structural abnormalities in the amygdala, the orbital frontal cortex, and the superior temporal cortex (Blair, 2009). Recent research has found interesting relationships between abnormalities in these structures and CU traits. For example, a study by De Brito et al. (2009) used structural magnetic resonance imaging (SMRI) to study the grey matter concentrations of 25 typically developing boys compared with 11 boys with conduct problems and high levels of CU traits. The boys with CU traits and conduct problems displayed an increased volume of grey matter in the medial orbitofrontal and anterior cingulate cortices (De Brito et al., 2009). This increase in the grey matter of these structures may suggest delayed cortical maturation in structures that are involved in decision making, empathy, and moral reasoning.

This study is of great importance given that it was the first to demonstrate structural abnormalities within the medial orbital frontal cortex in a sample of children (Blair, 2009). A similar study by Fairchild et al. (2013) using SMRI assessed the grey matter volume in a sample of adolescent girls with conduct disorder. Like De Brito et al. (2009), they found a positive relationship between orbitofrontal cortex volume and CU traits measured by self-report. This relationship remained significant even after controlling for CD and ADHD symptoms. Considered together, these two studies suggest that multiple structural deficits are involved in the expression of CU traits.

Research by Beitchman et al. (2012) analyzed variations of genes related to chemicals (oxytocin and oxytocin receptors) recognized to be involved in human trust and affiliation in a sample of highly aggressive youth. There was a significant relationship between a gene polymorphism and callous unemotional traits (Beitchman et al., 2012). While these findings are preliminary, they are the first to find a significant relationship between oxytocin abnormalities and CU traits in children and adolescents.
Given the growing evidence linking structural and chemical abnormalities to CU traits, it appears that neuro-imaging may help further understanding psychopathic traits. Ultimately it appears genetic and neurocognitive research will play an important role in developing further understanding of psychopathy (Viding, 2004).

**Social Significance of CU Traits**

CU traits are associated with detrimental outcomes in youth (Frick, 2006a; Kahn et al., 2012), and are further associated with adult constructs of psychopathy (Hare, 1993). The presence of CU traits in adolescence and childhood may predict the development of psychopathy in adulthood, even after controlling for established risk factors like early-onset conduct disorder (see Kahn et al., 2012). Further, psychopathy is associated with a disproportionately large occurrence of involvement in major crime (Serin et al., 2011). CU traits have even been used to predict future offending and antisocial outcomes in youth (see Kahn et al., 2013; McMahon et al., 2010). Considering the negative outcomes associated with CU traits, an increased understanding of CU traits may have considerable value (Kimonis et al., 2008). An understanding of how psychopathic traits may occur early in children’s development could lead to early detection of these problems, and earlier treatment (Frick and Hare, 2001). A better understanding of CU traits could further aid in assessing youth who are at the highest risk for developing antisocial tendencies and psychopathy, i.e. youth that might be the best targets for intervention. Treatment of these traits early in their development is likely to produce more effective results than targeting these traits in adults (Frick & Hare, 2001).

**Measuring Callous Unemotional Traits**

The Psychopathy Checklist Revised (PCL-R), the Psychopathy Checklist Youth Version (PCL-YV) and the Antisocial Process Screening Device (APSD) all include items measuring CU traits in clients (Kahn at al., 2013). The Youth Level of Service-Case Management Inventory (YLS/CMI) similarly includes items targeting callousness (Hoge, 2005). However, while the PCL-R, PCL-YV, the YLS/CMI, and the APSD include items to measure CU traits, these instruments are designed to measure other factors as well, and thus only include a few items that measure CU traits alone. For this reason, the reliability and validity of detecting CU traits with these instruments may be limited as compared to the use of a screening scale measuring exclusively CU traits (Kahn et al., 2013). Due to such concerns, Frick (2004) developed a more robust measurement of CU traits; the Inventory of Callous-Unemotional traits (ICU). The 24-item questionnaire measures three subscales: Unemotional, Uncaring, and Callousness. A study of 248 youth by Kimonis et al. (2008) found the ICU to be a reliable and valid. Several studies cited by Frick (2011) also suggest the ICU is reliable and valid.

While valid instruments for measuring CU traits exist, research on understanding the underlying causes of CU traits is in its infancy (see Frick & Dickens, 2006). This may limit the development of more advanced tools to assess CU traits, which may limit the ability to target CU traits in their earliest development.

**Basis for Research**

Kimonis et al. (2008) aimed to assess the factor structure underlying the Inventory of Callous-Unemotional traits (ICU) in a sample of incarcerated adults. Similar to the original two tests of the instrument, a general CU factor was found with 3 independent subscales (see Frick, 2009).
Of considerable value, Kimonis et al. found that each subscale of the ICU was significantly correlated with distinct behavioural topographies. The uncaring subscale was correlated with measures of offending, while the callous scale was linked to measures of aggression. The unemotional subscale was related only to deficits in empathy and positive empathy characteristic of CU youth (Kimonis et al., 2008). Future research will need to use different methods and samples to substantiate whether these relationships can be replicated.

Similar to Kimonis et al., a longitudinal study by Kahn, Byrd, and Pardini (2012), found that the uncaring subscale predicted the participants’ total number of offenses. This is similar to the correlation observed by Kimonis et al. between the uncaring subscale and measures of delinquency.

The uncaring subscale of the ICU has the strongest empirical support for predictive utility (Kahn et al., 2013). It has been shown to be correlated with measures of instrumental aggression and measures of antisocial behaviour (Kahn et al., 2013). The new DSM-V specifier for conduct disorder in youth (American Psychiatric Association, 2013) includes a lack of concern about performance. Given the empirical utility of uncaring traits (Kahn et al., 2013), these characteristics may serve as predictors of antisocial behaviour. Thus, this specifier should be tested for predictive ability.

Based on this premise, the current study will use a sample of clinically-referred and custodial youth to assess the predictive ability of the *unconcerned* specifier, as it may provide value not currently being captured by existing measures of risk.
Chapter III: Method

Participants
There was a total of 30 participants, ages 12-17, of whom 17 were male (56.7%) and 13 were female (43.3%). These youth were present at Hotel Dieu Hospital for consultation with the Urgent Consult Clinic (UCC) or Family Court Clinic (FCC). The participants were composed of 25 clients from the UCC and 5 clients referred to the FCC. To be eligible for the study, participants had to be in the process of consultation at either clinic, and accompanied by a parent or legal guardian.

As part of its mandate, the FCC provides comprehensive services to families involved with Youth Court-related matters. Youth in this population are involved in the youth justice system and are suspected of having a mental health disorder. Typically, they have significant behavioural concerns and severe problems in multiple life domains. The UCC offers urgent psychiatric consultation for children and adolescents between the ages of 7 and 17, but does not typically accept clients younger than 12. Referrals are commonly accepted for assessing risk of suicide, self-harm, or imminent harm/threats to others. In most cases, only one consultation occurs at the UCC, although occasionally there is an opportunity to provide brief intervention services prior to a community referral. All youth visiting the UCC for consultation were approached for this study. Further, youth placed on the Inpatient Unit following a UCC referral were all approached to participate.

All candidates’ parents or legal guardians were invited to participate in the study at the time of clinic registration or after the consultation. Informed consent was required from both the parents or guardians and the child before they were able to take part in the study. If the clients’ parents or guardians agreed to the participation of their child, they were asked to sign an informed consent document. Limits to confidentiality were clearly explained in the document, as the participants being studied were an ‘at risk’ population. All participants were given an opportunity to ask questions about the research, to ensure that they were fully aware of what they were consenting to.

Design and Setting
The research study used a non-experimental, correlational design. The measures were collected through semi-structured interviews, client self-report, a comprehensive file review (where available), and use of collateral informants (i.e., parents). The researcher or the clinician at the FCC scored the psychometric instruments using information from these sources. Some clients at the UCC or FCC were scored on other psychometric instruments (e.g., ADHD screening questionnaires), which were also included in the participant’s research file.

The study was conducted at Hotel Dieu Hospital in a quiet office. The materials used during the interviews were two separate forms (e.g., youth self-report and parent report) of interview questionnaires, which were used to guide the semi-structured interviews.

Measures
Data collected on participants included date of birth, gender, current and past diagnoses, prior treatment referrals, number of suspensions or expulsions, past and current antisocial behaviour (self-report, parent report, and formal convictions). Psychometric measures included the APSD, the ICU (parent and self-report versions), the PCL-YV, and the YLS/CMI. The semi-structured interviews were guided by a series of
questions, in the format of either self-report questions or parent-report questions. The interview questions were drafted using the item descriptions from the YLS/CMI technical manual (Hoge, & Andrews, 2004), and the PCL:YV technical manual (Forth, Kosson, & Hare, 2003). Participants that were referred to the clinic for a forensic consultation were scored on the PCL:YV and YLS/CMI by the clinician rather than the researcher. Parent-report measurement scales included the Antisocial Process Screening Device (APSD) and the Inventory of Callous-Unemotional traits (ICU).

The Hare Psychopathy Checklist-Youth Version (PCL-YV; Forth, et al., 2003) is a similar instrument designed to measure traits of psychopathy in youth older than 13 years. The Youth Level of Service Case Management Inventory (YLS/CMI; Hoge, 2005) is a risk assessment tool for youth, which uses a variety of risk factors (e.g., antisocial attitudes) to determine appropriate levels of supervision and programming. The APSD (Frick & Hare, 2001b) is a 20-item measure to screen for early indicators of psychopathy in children younger than 14 years (Frick & Hare, 2001a). The Inventory of Callous-Unemotional traits (ICU; Frick, 2004) measures CU traits in youth using 24 items scored on a 4-point Likert scale.

Additionally measured were four new CU items based on the new DSM-V “unconcerned about performance” specifier for conduct disorder. These items were appended to both self-report and parent-report versions of the ICU. Using the total score from the unconcerned subscale, participants were each scored as meeting the criteria for the DSM-V unconcerned specifier or not meeting the criteria. A cutoff score of 8 (either in the parent or self-report form) was interpreted as the participant meeting the criteria for the specifier, as this required the Likert scale to be generally in agreement with all four of the unconcerned traits outlined in the DSM-V.

Parent-report CU trait screening was collected from the parents or legal guardians of the child using the parent-report form of the ICU (Frick, 2006b) and the APSD. Self-reported CU trait levels were assessed by having the youth complete the self-report ICU (Frick, 2006c). Scores from both the self-report and parent-report ICU were recorded as both total self-report or total parent-report ICU, and were also divided into subtotals to create the subscales of callousness, uncaring, unemotional, and unconcerned. A six-item subscale measuring callous-unemotional traits was also created from the APSD. A similar four-item version was also created from the APSD, as this has been found to demonstrate greater reliability (see for example Wymbs et al., 2012). The PCL-YV was divided into subscales using the three-factor model. This model has been demonstrated to provide an acceptable fit with community males (Sevecke, Pukrop, Kosson, & Krischer, 2009) and community females (Kosson, et al., 2013).

Several measures of antisocial conduct were collected during the study. One of the variables collected was the total number of antisocial acts committed by the youth. This was calculated by totaling all criminal acts, as well as reported fights and suspensions/expulsions. The incidences of antisocial acts were recorded during the interviews using the highest number reported by either self-report or parent-report. As subjects tended to answer in ranges for the total amount of times they had committed a particular offense (e.g., “10 to 20 times”), the highest value of the range was always used.

Criminal versatility of participants was also recorded. Each antisocial act reported was placed into a category based on the divisions used in the PCL-YV technical manual (Forth et al, 2003). These categories included: assault, robbery, arson, threatening, theft,
drug offenses, sexual offenses and several other categories. Versatility was calculated by adding the total number of categories the youth had committed one or more offenses in. The highest severity of aggression was also measured in terms of maximum effort and maximum damage. These items were each coded on a scale from 0 to 4. The researcher used a list of pre-defined objective criteria to determine this information.

**Procedure**

All study participants presented at the FCC or UCC for consultation, escorted by their parents or legal guardians. The study protocol was approved by both the Research Ethics Board at St. Lawrence College, and the Health Sciences Research Ethics Board at Queens University. Upon clinic registration, all clients were informed of the research, and invited to take part. If the parents/guardians and the child both consented (i.e., both parties had to consent), they were given three Likert-based questionnaires to complete while they waited for their consultation. This included the two questionnaires for the parent to fill out (APSD, and parent-report ICU), and one questionnaire for the youth (self-report ICU). Upon completion of the clinic consultation, participants were brought to a quiet office space in the clinic for the remaining interviews. Youth were interviewed separately (i.e., without parents present) during this process. Each interview lasted approximately 20 minutes. There was some variation in the data collection procedure depending on the clinic. Clients undergoing forensic consultation in the FCC were typically already being assessed with psychometrics (i.e., PCL-YV, YLS/CMI). Thus, the researcher did not score these instruments—the clinician’s scores were used for the study.

Pearson correlations were calculated between each of the subscales of the ICU and each of the external variables (e.g., total antisocial acts, total instances of aggression). To assess the concurrent validity of the ICU and the added DSM-V specifier, CU measures from the APSD and PCL-YV were also correlated to assess significance. While the use of a sample of convenience lead to a small number of participants than necessary for a robust analysis, an exploratory hierarchical multiple regression analysis was conducted to assess the utility of the new *unconcerned* specifier with regards to predicting delinquent behaviour. This analysis was conducted with the intent of exploring the potential significance of the specifier as it adds a dimension of callous-unemotional traits that is not currently measured by validated measures of risk (i.e., YLS/CMI, PCL:YV); however this analysis was conducted with this limitation in mind.
Chapter IV: Results

This section presents a description of participant characteristics, and reliability results for the psychometrics used in the study. Correlations between the subscales of the ICU, the DSM-V uninterested specifier, and the measures of antisocial behaviour are also presented. Finally, the results of hierarchical multi-regression analyses for the PCL:YV, YLS/CMI, and uninterested with performance specifier are presented.

Participant Characteristics

The mean age of the total sample was 14.63 years (SD = 1.86). Sixty percent of participants had a prior diagnosis of ADHD (combined, hyperactive or inattentive type), were referred for additional psychological testing to rule out ADHD, or received any type of attention-deficit diagnosis after the clinic consultation was complete. This represented the most frequent diagnosis in the study, followed by any type of anxiety disorder diagnosis (including social anxiety, obsessive compulsive disorder, generalized anxiety, PTSD, panic disorder, or phobia). Thirty percent of participants were diagnosed with an anxiety disorder, had previously been diagnosed with an anxiety disorder, or were referred for psychological testing to rule out an anxiety disorder diagnosis. Twenty-three percent of participants in the study met the DSM-V criteria for the diagnosis of conduct disorder, with 86% of these youth additionally meeting the criteria for the CU specifier. The distribution of participants meeting the CU specifier criterion across diagnostic categories is displayed in Table 1.

<table>
<thead>
<tr>
<th>Percentage of Participants Meeting CU Specifier Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>CU Specifier</td>
</tr>
<tr>
<td>No CU Specifier</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>Percentage with Specifier</td>
</tr>
</tbody>
</table>

Reliability

Total self-reported ICU scores and total parent-reported ICU scores were positively correlated (r = .48*, p = .016), indicating a strong positive relationship between parent-reported and self-reported ICU scores. Both parent and self-report ICU questionnaires demonstrated high internal consistency reliability as assessed by Cronbach’s alpha (α = .92, α = .87, respectively). The APSD demonstrated high internal consistency reliability (α = .91), as did the PCL:YV (α = .97), and the YLS-CMI (α = .96).

Concurrent Validity of the ICU

Callous-unemotional trait measures including the parent and self-report ICU, APSD-CU, and PCL-CU subscales were intercorrelated to assess concurrent validity. There was a strong positive relationship between CU levels reported on the APSD and the ICU (r = .67***, p < .001). However, the PCL-CU subscale was not significantly correlated with either the parent or self-report version of the ICU (r = .24, r = .38, respectively). The PCL:YV and YLS-CMI were reliably positively correlated at the .01
significance level with all measures of antisocial conduct, including total antisocial acts, antisocial versatility, total violent acts, maximum effort, and maximum damage.

**ICU Subscales and Antisocial Measures**

A Pearson bivariate analysis was conducted between the instruments used in the study (i.e., PCL:YV and YLS/CMI), the subscales of the ICU (parent and self-report forms), and each measure of antisocial conduct (total acts, total violent acts, versatility, maximum effort, maximum damage). Table 2 provides a summary of these results.

### Table 2

**Bivariate Analysis Results**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Antisocial Acts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td><strong>ICU Subscales</strong></td>
<td></td>
</tr>
<tr>
<td>PCL:YV</td>
<td>.70***</td>
</tr>
<tr>
<td>YLS/CMI</td>
<td>.59**</td>
</tr>
<tr>
<td>UWPS</td>
<td>.58**</td>
</tr>
<tr>
<td><strong>ICU Parent Report</strong></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.40*</td>
</tr>
<tr>
<td>Callous</td>
<td>.35</td>
</tr>
<tr>
<td>Unemotional</td>
<td>.37</td>
</tr>
<tr>
<td>Uncaring</td>
<td>.32</td>
</tr>
<tr>
<td><strong>ICU Self Report</strong></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.58**</td>
</tr>
<tr>
<td>Callous</td>
<td>.52**</td>
</tr>
<tr>
<td>Unemotional</td>
<td>.23</td>
</tr>
<tr>
<td>Uncaring</td>
<td>.52**</td>
</tr>
</tbody>
</table>

*Note. UWPS = DSM-V Conduct Disorder Unconcerned with Performance specifier.*

*a The PCL:YV and YLS/CMI were totalled omitting items measuring antisocial conduct.*

* * * p < .001.

**DSM-V Unconcerned Specifier**

The *unconcerned with performance* specifier was significantly positively correlated with total antisocial acts, violent acts, and criminal versatility ($r = .58$, $p = .001$, $r = .61$, $p = .001$, $r = .39$, $p = .038$, respectively). However, this specifier was not correlated with measures of maximum antisocial effort and damage, unlike the standardized measures (i.e., YLS/CMI, PCL:YV).

**Regression Analyses**

To assess whether the DSM-V *unconcerned about performance* specifier increases the prediction of validated measures of risk for antisocial conduct (i.e., the PCL:YV and YLS/CMI), a hierarchical multiple regression analysis was conducted. The criterion variable for the analysis was the total antisocial acts. The predictor variables were the YLS/CMI, the PCL:YV, and the *unconcerned* specifier. The initial regression model included the PCL:YV and YLS/CMI, and a second model added the unconcerned specifier. However, due to multicollinearity between the PCL:YV and YLS/CMI ($r = .90$), two separate hierarchical multi-regression analyses were conducted. The first
analysis used the PCL:YV for the first model, followed by the PCL:YV plus the unconcerned specifier in the second model. The second analysis used the YLS/CMI in place of the PCL:YV. Table 3 provides a summary of the models used in the two analyses. It is also worth noting that both analyses used a total score for the PCL:YV and YLS/CMI that omitted any items directly measuring antisocial conduct (e.g., the item measuring criminal versatility in the PCL:YV, or the current number of convictions in the YLS/CMI). Additionally, due to the positively skewed distribution of PCL:YV and YLS/CMI scores, both variables were transformed using a square root transformation. A Kolmogorov-Smirnov test indicated a non-significant effect for the adjusted distributions of the PCL:YV and YLS/CMI (D = .14, p = .162, D = .09, p = .200, respectively). The distribution of total antisocial acts showed a highly positive skew before the transformation, and thus required a stronger transformation (a square root transformation yielded a significant Kolmogorov-Smirnov test statistic of .29, p < .0005). A base-10 logarithm transformation was performed on the total number of antisocial acts. A second Kolmogorov-Smirnov test revealed the transformed data had an acceptable distribution (D = .13, p = .200). Unfortunately, transforming the scores on the measures of versatility and total violent acts did not produce acceptable distributions, either by square root or base-10 logarithm transformation, and no further analyses were conducted on these variables.

Table 3
Revised Hierarchical Multiple Regression Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Analysis I</th>
<th>Analysis II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PCL:YV</td>
<td>YLS/CMI</td>
</tr>
<tr>
<td>2</td>
<td>PCL:YV, Unconcerned Specifier</td>
<td>YLS/CMI, Unconcerned Specifier</td>
</tr>
</tbody>
</table>

Note. PCL:YV and YLS/CMI predictors were totalled omitting items directly measuring criminal conduct.

Regression of antisocial acts on PCL:YV and Unconcerned Specifier. The complete model including the PCL:YV and the unconcerned specifier was statistically significant, $R^2 = .845$, $F(2, 26) = 32.38$, $p < .0005$; adjusted $R^2 = .691$. The inclusion of the unconcerned specifier caused an increase in the $R^2$ value by .037, $F(1, 26) = 3.33$ $p = .080$. A lower standard of significance ($p < .10$) was used for this analysis provisionally, as it was exploratory. For a summary of analysis I results, see Table 4.

Table 4.
Hierarchical-Multiple Regression Analysis Results for Analysis I

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.68***</td>
<td></td>
</tr>
<tr>
<td>PCL:YV</td>
<td></td>
<td>.82***</td>
</tr>
<tr>
<td>Step 2</td>
<td>.04†</td>
<td></td>
</tr>
<tr>
<td>UWPS</td>
<td></td>
<td>.20†</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.85***</td>
<td></td>
</tr>
</tbody>
</table>

$n = 29$

Note. UWPS = Unconcerned with performance specifier.

$^† p < .10. ^* p < .05. ^** p < .01. ^*** p < .001.$
Assumptions for Analysis I. Analysis I was tested for the assumptions needed to conduct a valid multiple regression analysis. This included checking for a valid sample size, an independence of residuals, the presence of linear relationships between the dependent and independent variables, homogeneity of variance, an absence of multicollinearity, outliers, and an even distribution of residuals.

Sample size. A calculation using G*Power (Buchner, Erdfelder, Faul, & Lang, 2009) indicated that a sample size of 35 participants would be needed for a hierarchical multiple regression analysis, assuming an effect size of 0.24 (which was the observed outcome in this analysis), an alpha level of .80, and a significance level cut-off of .05. While this assumption was violated, the analysis was conducted to explore whether there might be a relationship warranting further investigation.

Independence of residuals. A Durbin-Watson test statistic of 1.64 indicated independence of residuals within the sample. While this test statistic was lower than ideal, it was still above the cut off score of 1.5, indicating an absence of significant positive autocorrelation.

Presence of linear relationships. Visual analyses comparing residuals to predicted values indicated linear relationships between the dependent variable and each of the independent variables (see Figure 1). A visual analysis of total PCL:YV score (square root transformed) against Total Antisocial Acts (base 10-logarithm transformed) also indicated a linear relationship (see Figure 2).

Homogeneity. The distribution of residuals appeared to be consistent over the predicted dependent values, indicating homogeneity of variance (see Figure 1).

Multicollinearity. There was no indication of multicollinearity in the independent variables, as the unconcerned specifier did not highly correlate with the total PCL:YV scores ($r = .33$), nor did the PCL:YV or unconcerned specifier produce a tolerance less than 0.1.). Collinearity statistics indicated a tolerance of .89 for both variables in the second model ($VIF = 1.12$).

Outliers. Analysis of Cook’s distance values indicated that there were no significant outliers present in the sample. A cut-off score of 1 was used to check for significant outliers. Review of the leverage values in the analysis indicated no concerning points, as all values were below a cutoff score of 0.2. Additionally, review of casewise revealed an absence of cases with standardized residuals greater than 3 standard deviations. Together, these results indicated that there were no strong outliers, leverage points, or influential points in the analysis.

Distribution of residuals. A visual analysis of the standardized residuals distribution indicated they were approximately evenly distributed (see Figure 3).
Figure 1. Distribution of Residuals for Analysis I.

Figure 2. Transformed PCL:YV scores against Total Antisocial Acts.
Figure 3. Normal P-P Plot of Regression Standardized Residual for Analysis I.
Regression of antisocial acts on YLS/CMI and Unconcerned Specifier. The complete model for analysis II, which included the YLS/CMI and the unconcerned specifier was statistically significant, $R^2 = .669$, $F(2, 26) = 26.32$, $p < .0005$; adjusted $R^2 = .644$. The inclusion of the unconcerned specifier in model II caused a statistically significant increase in the $R^2$ value of .080, $F(1, 26) = 6.29$, $p = .019$. A summary of the analysis II results is presented in Table 5.

Table 5. Hierarchical-Multiple Regression Analysis Results for Analysis II

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.59***</td>
<td>.77***</td>
</tr>
<tr>
<td>YLS/CMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.08*</td>
<td>.02*</td>
</tr>
<tr>
<td>UWPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.67***</td>
<td></td>
</tr>
<tr>
<td>$n$</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

Note. UWPS = Unconcerned with performance specifier. * $p < .05$. ** $p < .01$. *** $p < .001$.

Assumptions for Analysis II.

Sample size. G*Power (Buchner, et al., 2009) was used to calculate the required sample size for a hierarchical multiple regression with this effect size. Results indicated that 63 total participants were required, given an expected effect size of .13, a significance level of .05, and a statistical power of .80. Thus, the outcome of this analysis should also be considered tentative, and requiring further investigation before drawing firm conclusions.

Independence of residuals. A Durbin-Watson test statistic of 2.12 indicated there was also absence of autocorrelation in analysis II.

Presence of linear relationships. A visual analysis of the residuals versus predicted values graph (see Figure 4) indicated a linear relationship between the dependent variable and each of the independent variables. A visual analysis of the square root transformed YLS/CMI total score versus Total Antisocial Acts (base 10-logarithm transformed) also revealed a positive linear relationship (see Figure 5).

Homogeneity. The distribution of residuals appeared consistent across the predicted values (see Figure 4). This indicated absence of homoscedasticity.

Multicollinearity. The independent variables used in analysis II did not demonstrate a strong positive correlation ($r = .23$), using a cut-off correlation score of .70. Collinearity statistics also indicated the absence of multicollinearity in analysis II. The tolerance values for both variables in the second model were .95 ($VIF = 1.06$).

Outliers. Similar to analysis I, a review of the leverage values did not indicate any concerning points. An analysis of Cook’s distance values also indicated an absence of significant outliers, as all distance values met a cut-off score of 1. A casewise diagnostics similarly did not indicate any cases with standardized residuals greater than 3 standard deviations. Overall, there was no indication of significant outliers, leverage points, or influential points.
**Distribution of residuals.** A visual analysis of the standardized residuals distribution indicated an even distribution (see Figure 6).

![Graph showing distribution of residuals](image)

*Figure 4. Distribution of Residuals for Analysis II.*

![Graph showing transformed YLS/CMI scores against total antisocial acts](image)

*Figure 5. Transformed YLS/CMI scores against Total Antisocial Acts.*
Figure 6. Normal P-P Plot of Regression Standardized Residual for Analysis II.
Chapter V: Discussion

Thesis Summary

This section provides an overview of the results in relation to the three hypotheses: (a) the correlation of the callous subscale with violent acts, (b) the correlation of the uncaring subscale with total antisocial acts, and (c) the correlation of the unconcerned specifier with antisocial conduct. Strengths and limitations of the present study are also discussed, and recommendations are made for future research.

Bivariate Analyses

The bivariate analyses yielded interesting results for the subscales of the ICU and the unconcerned specifier. The validated measures used in the bivariate analysis (PCL:YV and YLS/CMI) were both positively correlated with each measured topography of antisocial acts, supporting the validity of the antisocial behaviour measures.

Callous measurements and violent acts. Similar to Kimonis et al.’s (2008) findings, both the parent and self-report versions of the ICU Callous subscale were positively correlated with measures of violent acts. However, the parent-report callous subscale of the ICU was not correlated with any other topography except violent behaviour. This is consistent with the hypothesis that callous traits are specifically linked to violence. Similarly, the self-report ICU callous subscale was only reliably correlated with total antisocial acts significantly. The correlation between the callous subscales and the measurements of total antisocial acts may have been a confound, given that the total antisocial variable also included total violent acts reported. However, to test this, a new total antisocial acts variable was computed omitting the total violent acts. This variable remained significantly correlated with the self-report ICU callous subscale \( r = .50, p = .009 \). Thus, this explanation did not clarify the relationship between callousness and total antisocial acts.

Uncaring subscale and total antisocial acts. The parent and self-report ICU uncaring subscales were not uniformly correlated with total antisocial acts. The self-report version of the uncaring demonstrated a higher correlation with total acts, as well as with total violent acts. These results suggest that uncaring traits are correlated with total reported antisocial acts. However, the patterns of relationships observed in the present study differed from those found by Kimonis et al. (2008). Specifically, the parent report uncaring subscale did not correlate significantly with total acts as in the original study, nor did it predict total antisocial acts better than the parent report unemotional subscale. This is different from the finding by Kimonis et al. (2008) that the unemotional subscale was only related to deficits in emotional processing rather than measurements of antisocial conduct. While different measures of antisocial behaviour were used in both studies, it was expected that similar relationships would be observed. Looking at the significance of the parent-report form of the ICU and each of the subscales, in comparison with the correlations observed between the self-report form and the antisocial measures, it is possible that the parent report form of the ICU was less valid in this sample than the self-report form, which could be due to any number of factors. Small sample size may also have been a contributing factor to the difference in the pattern of relationships between the two studies. Overall, it appears that while the self-report uncaring subscale was significantly related to total reported acts and violent acts, the relationship between the parent-reported uncaring subscale and these variables was less
significant. Once again, these relationships should be taken as tentative findings rather than robust results, as a small sample size likely contributed to the findings observed.

**Unconcerned specifier.** The specifier for lack of concern with performance was positively correlated with total antisocial acts, total violent acts, and criminal versatility (total categories of offenses). These correlations were stronger than relationships found between subscales of the ICU and antisocial conduct, which supports the predictive value of the unconcerned specifier.

**Regression Analyses**

The results from the hierarchical regression analyses also provided interesting results. Adding the unconcerned specifier to the PCL:YV increased the prediction (or R squared) of the total number of antisocial acts, although this effect was less significant than the effect for the analysis with the YLS/CMI. These results may be due to a variety of reasons. A violation worth noting is the sample size of the study. Typically for a multivariate analysis a larger sample is used. Using G*Power 3.1.9, a required sample size was computed. Assuming a statistical power of .80, a significance level of .05, and an effect size of .15 (a moderate effect size), the original combined analysis with the PCL:YV and YLS/CMI in the first model would require a sample size of 55 youth. This assumption was violated in this small sample. Based on the effect sizes observed in the present study, a minimum sample size of 63 would be required for the PCL:YV analysis, and a sample size of 35 for the YLS/CMI analysis.

The present study was exploratory. As the sample size was too small to support the statistical analysis method, a replication study with a larger sample size is needed. Another factor that may have contributed to the differences in the pattern of results among the analyses is the nature of the assessments used. The YLS/CMI is a validated measure of risk for youth, while the PCL:YV is more focused on measuring psychopathic traits (although this instrument is similarly used to assess risk in the forensic literature, see Edens et al., 2007). As the PCL:YV already assesses levels of psychopathic traits, the addition of the *unconcerned* specifier (which is a callous-unemotional trait) may be less likely to add predictive ability to an analysis that already controls for psychopathic traits. Given that psychopathic traits have been strongly linked to antisocial behaviour, and that the YLS/CMI scarcely measures these traits, the addition of any psychopathic trait may have inflated significance. Nonetheless, the addition of the *unconcerned* specifier increased prediction in each analysis, which should be replicated with a larger sample. Should future research indicate that the *unconcerned* specifier significantly adds to the predictive ability of the final model in the analysis, current forensic instruments could be improved by measuring the unconcerned trait.

**Strengths and Limitations**

This study had a number of limitations that should be addressed in future research in order to substantiate the findings regarding the unconcerned specifier. A larger sample is required to properly test whether the unconcerned specifier to the YLS/CMI and PCL:YV reliably improves the prediction of antisocial acts. The use of full-length interviews may resolve the multicollinearity problems encountered in the present study. The 20-minute time frame that was used required using questions that would allow more than one item to be scored simultaneously. While this strategy allowed the PCL:YV and YLS/CMI to be scored in a much shorter time than during a full interview, it likely caused a stronger relationship between the PCL:YV and YLS/CMI than expected. Finally, all variables
used in the study needed to be transformed before the regression analyses due to each variable being positively skewed. While transformations are common in multiple regression, there is a possibility that different results would have been obtained with data that was normally distributed without requiring transformation. Further, the measures of versatility and total violent acts in the study, which may have added substantial power to the analysis, were both very positively skewed, and could not be transformed to an acceptable distribution by square root or base-10 logarithm transformations. Thus, in order to use these variables in a future analysis, a more normal distribution will be required. This may be obtained by sampling a larger group of strictly conduct-disordered youth.

**Contributions to the Behavioural Psychology Field**

These findings provide preliminary support for the forensic efficacy of the *unconcerned* specifier, which is not currently measured by forensic assessment tools. Further, some support for the notion of multiple impairments underlying callous-unemotional traits were found in the study, although these relationships were less straightforward than those found by Kimonis et al (2008). This study supports the notion that youth scoring high on measures of CU traits are at a higher risk for criminal activity and violent offending, and that these youth may be the best suited for high intensity programming and supervision.

Should the results of the present study be confirmed by a more robust analysis, they suggest that the new specifier in the DSM-V conduct disorder diagnosis may grant significant incremental predictive value beyond existing forensic measures. Further, these results support further investigation into sub-traits of callous-unemotional traits and the potential unique risk factors for the formation of the various traits (callousness, unconcerned qualities) present in youth that demonstrate affective features of psychopathy.
References


