Validity of the Comprehensive Assessment of Psychopathic Personality Disorder – Institutional Rating Scale in a Canadian Sample of Incarcerated Serious and Violent Young Offenders

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Abstract

Psychopathy is a personality disorder typically characterized by dysfunctions relating to affect, interpersonal relationships, and behavioural style. There is debate as to whether antisocial behaviours represent a defining feature of psychopathy or secondary symptoms that are consequential to the remaining core traits. Further, there is debate as to whether the "gold standard" measure of psychopathic traits – the Psychopathy Checklist (PCL) by Hare (1991, 2003) fully represents the construct of psychopathy. Given these concerns, a new measure of psychopathic personality disorder (PPD) that is purely personality focused and which represents a more comprehensive array of psychopathic symptoms was developed by Cooke, Hart, and Logan (2005). This dissertation consists of a series of analyses that together explore the construct validity of this new instrument, the Comprehensive Assessment of Psychopathic Personality – Institutional Rating Scale (CAPP-IRS) in a sample of incarcerated serious and violent young offenders. Given that evidence supports a biological pathway towards the development of PPD, neurological development during childhood and adolescence is first discussed in order to make the case for the need to consider age-graded analyses. The first analysis then tests the theoretical structure of the CAPP-IRS using internal structural reliability analyses and a confirmatory factor analysis with 186 male and female incarcerated youth. The second analysis explores the empirical structure of the CAPP-IRS using an exploratory factor analysis with a sub-sample of 147 male incarcerated youth. The third analysis explores the convergent and divergent validity of the CAPP-IRS domains with similar and dissimilar constructs using correlational analyses in the sub-sample of male incarcerated youth. In addition to these analyses, this dissertation explores the absence of PPD from criminological theory, and discusses the historical precedence for criminologists to utilize instead the more simplistic construct of low self-control proposed by Gottfredson and Hirschi in their general theory of crime (1990). The dissertation concludes with some suggestions for integrating PPD into developmental and life-course criminological theory, and considers why this integration should be facilitated by the CAPP-IRS as opposed to the construct defined by the PCL.

Keywords: Psychopathy; young offenders; personality; serious and violent young offending; low self-control; developmental and life-course criminology

For my family.

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Table of Contents

List of Tables

List of Figures

Chapter 1.

Introduction

Psychopathy is a personality disorder that raises the risk for contact with the criminal justice system. Although popular in the field of psychology, this construct was for many years rejected by criminologists who preferred instead to utilize the similar but more simplified general theory of crime, which posited that low self-control was the single explanatory variable required to explain all crime and analogous behaviour (Gottfredson & Hirschi, 1990). Yet, criminological theory appears now to be returning to its roots by considering biological explanations for antisocial behaviours, and acceptance of psychopathy is growing among criminologists as an explanation for antisocial behaviours. This dissertation provides the results of a series of analyses testing the validity of a new measure of psychopathic personality disorder, the Comprehensive Assessment of Psychopathic Personality – Institutional Rating Scale (CAPP-IRS) in a Canadian sample of incarcerated serious and violent young offenders.

Psychopathic Personality Disorder

Psychopathy is a personality disorder that can only be diagnosed in adults 18 years of age and older. Psychopathic Personality Disorder (PPD) is typically characterized by problems in three main areas of functioning: affect (e.g. shallow emotions, callousness), interpersonal relations (e.g. manipulation, superficiality), and behavioural controls (e.g. impulsivity and irresponsibility) (Hare, 1991, 2003). In some models, antisocial behaviours compose a fourth area of functioning (Hare & Neumann, 2005, 2006, 2010). Psychopathic traits are commonly measured by the Psychopathy Checklist-Revised (PCL-R, Hare, 1991, 2003) for adults and the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003) for youth. Both scales encompass a 20-item measure that scores each dysfunctional trait as absent (0), possibly present (1), and definitely present (2), rendering a total possible score out of 40. Absence of the trait is taken to mean that an individual does not have the particular dysfunction

in question; e.g. they do not display impulsivity or callousness towards others. As such, each item represents a continuum of dysfunction with respect to each particular trait; higher scores reflecting more dysfunction (2), and lower scores reflecting no dysfunction (0). These 20 traits are said to work in concert to produce the construct of psychopathy. A perfect score of 40 would represent the prototypical psychopath who is characterized by dysfunction with respect to each possible identifying feature of psychopathy. Scores on this scale that exceed a certain cut-point (typically 30+) are used to categorically represent the presence of psychopathy (Hare, 2003).

Although PPD is not diagnosable until 18 years of age, it is commonly acknowledged that traits of this disorder are manifested much earlier in the life-course, even as young as early childhood, as well as during adolescence (e.g. Cleckley, 1941, 1964, 1976; Farrington, 2005; Frick & White, 2008; Hare, 1993, 2003; Lykken, 1995; Lynam, 2002, 1998, 1997, 1996; Rutter, 2005). While adolescence is a developmental stage characterized by instability and change, personality is said to stabilize over the life-course, making it difficult to treat this disorder during adulthood (Hart, Watt, & Vincent, 2002). There has been debate concerning the validity of extending the construct to adolescents, given the natural proliferation of similar traits during adolescence as well as the potential negative effects associated with labeling (e.g. Edens, Skeem, Cruise, & Cauffman, 2001; Hart et al., 2002; Seagrave & Grisso, 2002; Skeem & Cauffman, 2003). Adolescents are learning and developing important skills, including taking the perspectives of others, being aware of long-term consequences, and regulating moods and emotions (Edens et al., 2001). However, it is important to note that assessments of trait dysfunction during adolescence are made using other adolescents as the standard (Forth et al., 2003); in other words, youth that exhibit dysfunction regarding personality traits do so compared to others at the same stage of mental, emotional, and physical development. Further, research has empirically demonstrated that traits consistent with those that define adult psychopathy are both reliably and validly measurable during childhood and adolescence, form a similar structural model as found when applied to adult samples, and are associated with future patterns of aggressive and other antisocial behaviours, similar to the association between adult psychopathy and antisocial behaviour (Barry, Frick, & Killian, 2003; Brandt, Kennedy, Patrick, & Curtin, 1997; Caputo, Frick, & Brodsky, 1999; Christian, Frick, Hill, Tyler, & Frazer, 1997; Corrado, Vincent, Hart, & Cohen 2004; Forth, Hart, & Hare, 1990; Frick, 2009; Frick, Cornell, Barry, Bodin, & Dane, 2003; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Gretton, Hare, & Catchpole 2004; Gretton, McBride, O'Shaughnessy, & Kumka, 2001; Jones, Cauffman, Miller,

& Mulvey, 2006; Kruh, Frick, & Clements, 2005; Lynam & Gudonis, 2005; Salekin, Brannen, Zalot, Leistico, & Neumann, 2006; Salekin, Rosenbaum, & Lee, 2008; Stouthamer-Loeber, 1986; Vincent, Vitacco, Grisso, & Corrado, 2003). Consequently, researchers have developed a variety of psychopathy assessment tools to measure the presence, stability, and correlated outcomes of psychopathy beginning early in childhood and continuing through into adolescence, with the goal of providing further clarity on the etiology and development of this construct (Skeem & Cauffman, 2003). Such findings may result in successful interventions at a time when personality traits are still malleable.

Stability of Psychopathic Traits Over Time

There has now been a substantial amount of research into the stability of psychopathic traits over the lifecourse, and while the previous studies are limited by some methodological weaknesses, the research that has been conducted has generally found evidence of moderate stability. Using adult samples, Schroeder, Schroeder, and Hare (1983) found strong stability (.89) for PCL total scores among incarcerated male criminals. Similarly, Harpur and Hare (1994) employed a cross-sectional approach with a sample of adolescent and adult offenders and forensic psychiatric patients to identify that, similar to non-psychopathic offenders, psychopaths commit criminal activity at a decreasing frequency in their older adult years. However, they continued to manifest the interpersonal and emotional traits at relatively stable levels. Other research with adults found strong stability for one month intervals (ranging from .73 to .80 for symptoms scores, and .79 to .89 for total scores), and moderately strong stability for PCL:R total scores (.60 for men and .65 for women) for a two year period of time (Alterman, Cacciola, & Rutherford, 1993; Rutherford, Cacciola, Alterman, & McKay, 1996; Rutherford, Cacciola, Alterman, McKay, & Cook, 1999). However, Lee (2006) cautioned that the observed stability may be an artefact of substance dependence symptoms rather than stable personality traits, as these studies were all based on samples of substance-dependent adults.

Unfortunately, the majority of the adult research has been limited by the methodological approaches utilized. For instance, Harpur and Hare (1994) utilized a cross-sectional research design and so could not determine whether the observed differences were due to age or cohort. Moreover, the common use of the PCL-R might have created an artificially high level of stability through its historical nature: assessment focuses on life-long expression of these traits,

therefore making it impossible to measure change over time, as similar information is used in both assessments (Lee, 2006).

More recently, studies have begun to focus on the emergence of psychopathic traits among children and adolescents and to prospectively study these characteristics over time. These recent results have demonstrated support for the stability of psychopathic characteristics over relatively long periods of time. For instance, the results with adult samples were recently supported by a four-year longitudinal study by Frick and colleagues with children (2003). Children in Grades 3 through 6 were assessed for psychopathic traits using the childhood measure of psychopathy, the Antisocial Process Screening Device (Frick & Hare, 2001). This measure is said to represent a similar construct of psychopathy in children aged six to 13; a separate self-report measure for use with youth was also developed (Caputo et al., 1999). Research has demonstrated that the APSD is composed of three underlying factors that are similar to those found with youth and adults; these are the callous-unemotional traits (i.e. affective dimension), narcissistic traits (i.e. interpersonal dimension), and impulsive traits (i.e. behavioral dimension) (Frick, Bodin, & Barry, 2000; Vitacco, Rogers, & Neumann, 2003). However, the extent to which these results could be applied to adolescents is limited, as adolescents face many unique developmental factors and pressures as compared to youth. Furthermore, the results were obtained using the APSD, which has been shown in previous research to inadequately measure the core traits of psychopathy similar to the PCL:YV (Lee, Vincent, Hart, & Corrado, 2003).

The results over four years indicated impressive levels of stability among the majority of children. These results were obtained for the APSD total scores (year 2 = .88; year 3 = .87; year 4 = .80), as well as for each of the callous-unemotional traits (.76, .86, and .71), narcissistic traits (.88, .84, and .77), and impulsive traits (.86, .73, .72). Lee (2006) summarized that the youth scoring towards the high ends of the callous-unemotional traits (said to reflect the core traits of psychopathy; Harpur, Hare, & Hakstian, 1989; Cooke, Michie, Hart, & Clark, 2005), consistently stayed at these high ends, while a smaller group of children showed declining rates of callous-unemotional dysfunction. However, as previously mentioned, the small sample size in each group (20 stable lows, 12 stable highs, and 8 decreasers) limited the extent of this analysis, as did the nature of aggregated analysis rather than use of more sophisticated individual-level measurements of change (see Lynam, Loeber, & Stouthamer-Loeber, 2008).

Barry, Barry, Deming, and Lochman (2008) studied the stability of psychopathic characteristics (callous-unemotional traits, impulsive conduct problems, and narcissism) across three points in time among 80 aggressive children aged 9 to 12. Psychopathy ratings were made by teachers and parents using the Antisocial Process Screening Device (Frick & Hare, 2001). Over the two year follow up period, both sets of ratings demonstrated moderate stability. Interestingly, the researchers also found support for a relationship between psychopathy and social-relationship problems, as measured by child, teacher, and peer ratings of social competence. In effect, children with psychopathic characteristics experienced more social problems than children without these characteristics; this is likely the result of the dysfunctional personality traits that result in rejection by peers.

Despite its contributions towards understanding the stability of psychopathy over time, this study was limited by its relatively small sample size (n=80) and relatively short follow up period (two years). In addition, the ratings across informants did not exhibit strong stability; in other words, teacher-parent rating correlations were relatively week and many were non-significant. This suggests that the moderate stability over time within parent ratings and within teacher ratings may instead be the result of ingrained perceptions held by teachers or parents about a particular child's behaviour; in effect, rather than demonstrating the stability of the construct, the researchers may have demonstrated the repeated measures reliability of the raters. This possibility is supported by the fact that teacher ratings over time demonstrated weaker stability than parent ratings, likely reflecting the change in teachers over the years (Barry et al., 2008).

Other studies have similarly demonstrated that the interpersonal and callous features of psychopathy are moderately stable within childhood. Using a single measure of stability, Dadds, Fraser, Frost, and Hawes (2005) found a moderate (r = .55) correlation over the period of a year in a sample of children (aged 4 to 9) drawn from the community. A similar measure (r = .50) was found for rank order stability of parent-ratings of interpersonal and callous features over a period of eight years that followed children into adolescence (Obradović, Pardini, Long, & Loeber, 2007). Pardini and Loeber (2008) replicated these results in adolescence in a community sample of 506 males. The results indicated that interpersonal callous traits measured during adolescence (aged 14 to 18) were predictive of adulthood (aged 26) antisocial personality. This is important, as it suggests the construct of psychopathy is relatively stable over this part of the

life course. While the interpersonal callous traits explained only approximately 10% of the variance in the antisocial personality syndrome in adults, this was likely due to the measures employed, as antisocial personality has been criticized for not adequately measuring the personality features of psychopathy (Hare, Hart, & Harpur, 1991).

These authors identified that while the interpersonal callous trajectories did not substantially change, there was significant individual variability over time in terms of some increases and some decreases. It is important to note that this study used parent-ratings of interpersonal and callous traits, therefore the observed change may have been an artefact of the parent's perceptions of their adolescent/young adult children changing over time. However, the fact that some ratings went up while others decreased lessens the severity of this limitation, as these effects would be expected to cancel each other out within the group.

Interestingly, few studies have reported stability coefficients among adolescent samples using the PCL:YV, which is widely regarded as the "gold standard" measure of psychopathy for adults (e.g. Lynam & Gudonis, 2005). Skeem and Cauffman (2003) reported fair total (.58) and factor (from .45 to .55) test-retest coefficients over a period of one month; however, these ratings were made by the same individuals, which may have contributed towards somewhat higher stability than would otherwise be expected. More recently, Lee (2006) tested the six month stability of both the PCL:YV and the self-report APSD in a sample of 112 incarcerated youth. To avoid the limitations of Skeem and Cauffman (2003) and Harpur and Hare (1994), separate raters were assigned to the second interview and were blind to results of the initial rating, and the PCL:YV was rated considering the past six months, as opposed to over the lifetime (Lee, 2006). The results indicated moderate levels of stability for both measures, with interpersonal and behavioural traits exhibiting stronger stability than the antisocial and affective traits. Lee (2006) summarized these results by suggesting that the weaker stability could be a result of measurement difficulties (i.e. behavioural and interpersonal traits are more easily observed than are underlying emotional dysfunction). Alternatively, she suggested that the emotional dysfunction of psychopathy could actually reflect a normative developmental trait that youth grow out of as they move towards adulthood and begin to take the perspectives of others.

More recently, several studies have begun to follow the stability of psychopathic traits over the transition from adolescence to adulthood. Blonigen, Hicks, Krueger, Patrick, and

Iacono (2006), who followed 920 male and female twins from late adolescence (17) to early adulthood (24) using the Multidimensional Personality Questionnaire to track the stability of psychopathic traits. Similar to Harpur and Hare (1994), Blonigen and colleagues reported stability over this time period for Fearless Dominance traits (i.e. Interpersonal-Affective), and declining propensity towards Impulsive Antisociality (i.e. Social Deviance). Therefore, it appears as though the core traits of psychopathy exhibit stability over much of the life course. However, despite the somewhat longer length of follow up (seven years) compared to other studies, the literature continues to be limited by relatively short follow up periods. In addition, the researchers only collected stability measures at two points in time, and therefore reflected stability and change over a small developmental period (Blonigen et al., 2006; see Lenzenweger, 2006 for an in-depth discussion of this issue). Nevertheless, this study made several important contributions to the understanding of stability and change in psychopathic traits over time. For instance, this important finding suggests that the personality and behavioural traits of psychopathy follow distinct developmental pathways (Blonigen et al., 2006). While several studies have since employed more reliable longitudinal methods to identify relatively high stability coefficients (e.g. Schroeder et al., 1983; Rutherford et al., 1999), the length of follow-up was fairly limited, at 10 months and two years, respectively.

Lynam, Caspi, Moffitt, Loeber, and Stouthamer-Loeber (2007) used the Childhood Psychopathy Scale (CPS; Lynam, 1997) to demonstrate moderate stability (.31) with Psychopathy Checklist: Screening Version (Hart, Cox, & Hare, 1995) ratings of psychopathic traits over an 11 year span (aged 13 to 24). It is important to note that these results were obtained from 271 participants in the Pittsburgh Youth Study, a sample that was not inherently antisocial; it is possible that the stability estimates may have been higher if the sample had come specifically from an offender population where rates of psychopathy tend to be higher (9% in the current sample, as opposed to between 20% and 30% of the typical offender sample).

This study, and a second one using the same sample (Lynam et al., 2008), provided additional evidence to support the position that psychopathy is a propensity. The authors in each study tested the incremental predictive utility for adult psychopathy by controlling for other well known developmental correlates of crime (socioeconomic status, parenting styles, impulsivity, peer delinquency, verbal IQ, previous delinquency, and race). Only childhood

psychopathy scores were consistently predictive of adult psychopathy scores, suggesting that developmental factors have little effect on adult psychopathy (Lynam et al., 2008).

Loney, Taylor, Butler, and Iacono (2007) reported on the results of six years of stability measures across two developmental periods (adolescence and adulthood) among 578 male twins. Measures of emotional detachment and antisociality were taken using subscales of the Minnesota Temperament Inventory (MTI); these subscales were created to measure the traits of psychopathy as identified by Cleckley (1976). Similar to the previous studies discussed, these traits showed moderate stability over the six year period, with the antisocial symptoms declining slightly more in adulthood than the detachment symptoms (Loney et al., 2007). This latter finding is consistent with Moffitt's (1993) proposition that there are two trajectories of offenders, those who commit crime starting early in life and who continue to exhibit antisocial and criminal behaviours across the life course (Life Course Persistent, or LCP offenders), and those who become involved in criminality during adolescence for reasons such as peer pressure and seeking independent status, but who largely desist from crime in adulthood (Adolescent Limited, or AL offenders). This proposition was also supported by the results of Lynam et al. (2008). The majority of their results were consistent with a propensity based theory of psychopathy, as other predictors of crime (e.g. low SES, poor parenting, deviant peers) were found to have a limited effect on boys who were high on psychopathic traits at 13 and again at 24. However, they also observed that the participants in the sample who weakened the stability of psychopathy measures over time were those who were low in psychopathic traits at the first assessment, but who were rated high on psychopathic traits in young adulthood. Their research further indicated that these particular boys also tended to grow up in poorer SES environments, had deviant peers, and experienced more physical punishment by their parents; in effect, these boys represented Moffitt's (1993) AL offenders. Given this, the results supported psychopathy as a propensity (for LCP offenders), and as a developmental factor (for AL offenders).

Recent results from Vaughn and DeLisi (2008) also support that LCP offenders can be related to psychopathic offenders. Their study with 723 incarcerated males identified that psychopathy uniquely and significantly contributed to the prediction of career criminals, over and above the effects of standard demographics and mental health variables. In fact, the use of psychopathic traits allowed for at least 70% of career criminals to be correctly classified, and nearly doubled the explanatory power of the regression model for career criminality. Given this,

it appears there is substantial support to link the two fields of developmental and propensity theories in explaining criminal behaviour among both hard-core and normative offenders.

In summary, research has generally provided support for the moderate stability of psychopathy over childhood to adolescence, and again through adolescence to adulthood. it is possible that the variation in stability coefficients could be accounted for by those in the mid-range of psychopathy. For instance, Frick and colleagues (2003) noted that those in the extreme high or low ends of psychopathic traits tended to show the most stability. This suggests that the observed variations over periods ranging up to 11 years may actually reflect developmental influences over the non-psychopaths.

PPD and Antisocial Behaviours

PPD exhibits a strong relationship with antisocial behaviours, including participation in crime. Studies conducted with both adult (Kosson, Smith, & Newman, 1990; Salekin, Rogers, & Sewell, 1996) and youth samples (Corrado et al., 2004; Gretton et al., 2004; Gretton et al., 2001; Vincent et al., 2003) similarly demonstrate that measures of psychopathic traits, in particular, the PCL scales, are consistent predictors of frequency and speed to general and violent recidivism following release from custody, and are also associated to a variety of other criminal justice behaviours and outcomes, including institutional aggression (Dolan & Rennie, 2006; Edens, Buffington-Vollum, Colwell, Johnson, & Johnson, 2002; Spain, Douglas, Poythress, & Epstein, 2004; Stafford & Cornell, 2003), age at first arrest (Blackburn & Coid, 1998; Hemphill, Templeman, Wong, & Hare, 1998), and criminal versatility (Campbell, Porter, & Santor, 2004; Simourd & Hoge, 2000).

Yet, despite the consistent associations between PPD and antisocial behaviours, in particular, criminal offending, this perspective has historically been ignored by criminologists. In the 1990s, two similar perspectives on antisocial behaviour emerged: the general theory of crime (Gottfredson & Hirschi, 1990) and PPD (Hare, 1996). Despite their overwhelming similarity, the fields of criminology and psychology, respectively, nearly exclusively adopted these theories (Wiebe, 2003). Common to both perspectives, certain individuals were said to seek easy and simple gratification of their desires, regardless of social norms typically preventing such fulfillment, have difficulty delaying this gratification, have troubles with planning,

and tended to be self-centred, insensitive to the suffering of others, be sensation seeking, and be gregarious. Yet whereas Gottfredson and Hirschi (1990) reduced their theory down to one simple construct of low self-control (LSC), Hare's (1993, 2003) conceptualization of psychopathy integrated these characteristics alongside additional personality traits. As the principle of Occam's Razor states that all other things being equal, simple explanations (theories) are preferred to more complex ones as they are easier to test and refute (Heidt & Wheeldon, 2015), Gottfredson and Hirschi's (1990) explanation was more palatable to criminologists, primarily due to its parsimony.

Of note however, Gauch (2002) observed that "parsimony and accuracy are always in conflict" (p. 318) and given that human behaviour is complex and dynamic, it may not be the ideal approach to criminological theorizing. In fact, the recent trend towards developmental and life-course criminology (DLC) has shifted the field away from fairly simplistic static theories of crime to more complex dynamic trajectories towards offending. Further, although the general theory has been one of the most tested theories of crime and has received wide empirical support, research findings have also challenged each of its three main propositions. Moreover, while a second major reason for criminologists preference for LSC over PPD may have resulted from the tautology presented by the most commonly used operationalization of PPD (the Hare PCL scales), reconceptualizations of PPD have removed this limitation. These shifting trends suggest that there is a move towards integrating PPD into criminological theorizing.

Conclusion

Given the challenges perceived with utilizing the Hare PCL scales to assess for PPD, researchers have proposed new conceptualizations of psychopathy that specifically focus on the personality characteristics of this disorder. One such measure is the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2012), which is a recent attempt to more fully explicate and measure psychopathy for both youth and adults. The CAPP proposes six domains of personality traits that are historically and clinically relevant to psychopathy (e.g. Cleckley, 1941; Hall & Benning, 2006; Karpman, 1941; McCord & McCord, 1964). The focus is on the personality aspects of the disorder while participation in criminality and other antisocial behaviours are excluded. One instrument designed to measure this model is designed to apply in institutional settings (CAPP-IRS). This overarching goal of this

dissertation is to test the validity of this measure using a sample of incarcerated serious and violent young offenders. However, the dissertation begins in Chapter 2 by first reviewing criminological theory over the previous century, before exploring the relevance of psychopathic personality disorder to explanations of antisocial behaviours and comparing its utility to that of the General Theory of Crime. Given that the sample utilized to validate the CAPP-IRS is an adolescent one, Chapter 3 contextualizes PPD through a discussion of neurological development during childhood and adolescence. In Chapter 4, the first set of analyses are conducted using the full sample of Canadian incarcerated male and female serious and violent young offenders. In this chapter, the structural reliability of the CAPP-IRS is considered both for the total sample, as well as by gender, while the initial validity tests are conducted using confirmatory factor analyses with the male youth. Chapter 5 provides an alternative structural model of the CAPP-IRS among incarcerated male serious and violent young offenders by conducting an exploratory factor analysis. In Chapter 6, the analysis returns to testing the validity of the theoretical CAPP-IRS by conducting a series of correlational analyses with other established measures of PPD and analogous disorders, as well as with some dissimilar disorders. Chapter 7 provides a summation of the analytical findings as they relate to the internal validity of the CAPP-IRS and makes recommendations to improve the developmental appropriateness of the instrument.

Chapter 2.

Integrating PPD into Criminological Theory

Currently, the closest theory to psychopathic personality disorder that is widely accepted among criminologists is the general theory of crime (Gottfredson & Hirschi, 1990). Although the authors resolutely expressed that their theory is not biological, the results of several recent studies have led to conclusions that the main component of the general theory of crime – low self-control – is a neurological trait. These recent findings make clearer the probable association between low self-control and PPD. Further, removing the antisocial behaviours from the current most popular measure of PPD, the Hare PCL scales, would result in even greater reconciliation between these two constructs (Wiebe, 2003). However, given that PPD emphasizes additional personality traits as a core part of the construct, PPD can be considered an extension of the more simple notion of low self-control. While historically this may have made PPD less palatable to criminologists, who have typically preferred more parsimonious explanations for criminal behaviour, recently developed measures of PPD have likely reduced a major barrier to greater integration of PPD into criminological theorizing, particularly given the recent growth of developmental and life-course criminology (DLC) theoretical perspectives. This chapter provides an overview of these two major constructs and concludes with a discussion of the role of PPD in modern day criminological theorizing.

Criminological Theory in Disarray

Criminology has historically been challenged by a multiplicity of ideological approaches guiding the explanations of crime and deviance. Furthermore, denunciation of certain criminological perspectives (i.e. biological) has led criminologists to fail to integrate or even outright reject some plausible theories of criminal behaviour (Rafter, 2008; Wright & Miller,

1998). Thus, even at the beginning of this millennium, Walsh and Ellis (2004) maintained that criminology was characterized by theoretical disarray.

The origins of contemporary criminological theories have been traced back to the 18th and 19th centuries. The enlightenment-derived classical theory posited first by the Italian philosopher Cesare Beccarria, and later by the English philosopher Jeremy Bentham, asserted that individuals are rational beings who choose to engage in crime if the benefits outweigh the costs (Heidt & Wheeldon, 2015; McLaughlin, Muncie, & Hughes, 2003). This simplistic view of deviance and criminality was rather quickly modified in the 19th century when it became obvious to neo-classical theorists (positivists) that the ability to engage in rational choice was mitigated by certain factors, such as age and mental illness (McLaughlin et al., 2003). By the last decades of the 19th century, rational choice theories of crime were challenged not only by psychological positivism, which focused on the role of mental illness, but also by sociological positivism, which focused on social conditions and the enormous explosion in urban poverty, and biological positivism, which integrated recent scientific breakthroughs concerning human evolution and heredity (McLaughlin et al., 2003). By the 1960s, the biologically based theories had largely become focused on Eysenck's personality perspective, which integrated certain patterns of key inherited personality traits, namely psychoticism, extraversion, and neuroticism, with environmental conditions to explain participation in crime (Eysenck & Eysenck, 1970).

Despite these initial interdisciplinary origins of criminological theories, by the third decade of the 20th century, sociologically based theories were dominant (Ellis, 2005; Salisbury, 2013; Walsh & Ellis, 2004; Wright & Miller, 1998), whereas theories positing the importance of individual difference through the lens of biology or psychology were frequently rejected by mainstream criminology (Cauffman, Steinberg, & Piquero, 2005; DeLisi, Wright, Vaughn, & Beaver, 2009; Ellis, 2005; Gottfredson & Hirschi, 1990; Heidt, 2011; Walsh & Ellis, 2004; Wright & Miller, 1998), possibly due in part to the reaction to unethical applications of biological criminology (e.g. eugenics, genocide; Rafter, 2008). This left individual-level explanations for crime and criminality to be absorbed by criminal psychologists or biologists, who sought to identify criminogenic traits (Wiebe, 2003). In contrast, sociological criminology did not locate the causes of crime in the individual; rather, they located it in the social environment (Wiebe, 2003). Most sociological theories focused on the material and cultural motivations for crime, adopting perspectives such as criminal opportunities, poverty strains, greed, and sub-cultural

rationalizations of deviancy (e.g. Agnew, 1985, 1999, 2006; Cohen & Felson, 1979; Merton, 1938; Shaw & McKay, 1942; Sutherland, 1939). Even the General Theory of Crime (Gottfredson & Hirschi, 1990), which built its theory around the single individual-level trait of low self-control argued for sociological roots, explicitly rejecting the role of psychology in its cause.

Thus, most contemporary criminological theories assumed a social cause of crime. For example, Hirschi's (1969, 2002) preeminent social bonding theory of delinquency and Sampson and Laub's (1993, 2003) subsequent age-graded theory of informal social control placed virtually all of their explanation on the prosocial relationship/bond ties between a child/youth and their family and/or key community institutions, including schools, organized sports, and churches/synagogues/temples. The fundamental premise of these control theories were that without such prosocial bonds, virtually all youth likely would become delinquents and subsequently criminals. Furthermore, Hirschi (1969, 2002) asserted that it was these bonds that established the self-control of basic impulsive antisocial and inherently selfish impulses of children, which were fundamental for prosocial behaviour in adolescence and adulthood.

Hirschi carried over several key propositions from his original theory into his collaboration with Gottfredson in their seminal 1983 publication where they asserted that the age-crime curve was invariant across historical periods, cultures, and demographic groups, had the same covariates at all age stages, and could not be explained by traditional criminological theories involving sociological, psychological, or biological variables (Hirschi & Gottfredson, 1983). They then explicated these key hypotheses into their 1990 General Theory of Crime (GTC), which is based on the fundamental and single explanatory variable, LSC, and its causal connection to antisocial propensities resulting from low self-control based parenting practices. In other words, parents who failed to appropriately socialize their children, likely as a result of their own failure to develop self-control, produced children with a propensity towards crime and deviance due to an inability to control their instinctive impulses towards activities providing instant gratification, even if that gratification came at the expense of others.

Even before Hirschi's pioneering social control theory and Gottfredson and Hirschi's pre-eminent GTC, both built around psychological constructs, such as attachment, commitment, and self-control, sociological theorists were incorporating key psychological constructs into sociological theories of crime. This practice was evident for Merton's classic strain theory, in

which he posited that when the means of obtaining common established cultural goals, usually economic success, are frustrated or blocked, as they commonly are for certain societal classes, individuals experience strain and, depending on their personality and socialization, may react in some form of antisocial manner, including social withdrawal, self-harm, or deviance, for instance through aggression towards others or engagement in property crime (Merton, 1938). By the end of the 20th century, Robert Agnew (Agnew, 1985, 1992, 1999, 2002, 2006; Agnew & Brezina, 2010) revised this traditional strain theory to include more current psychological constructs as sources of strain, such as cognitive dissonance between expectations and achievements, as well as negative emotional reactions to and poor cognitive coping with trauma-related relationship failures and/or victimization experiences of self and others. Similarly, sociologically-based learning theories, such as Sutherland's (1939) differential association theory and Akers' (1998; Burgess & Akers, 1966) social learning theory focused on the transmission of cultural and societal norms, utilizing psychological concepts such as modeling and reinforcement to explain how criminal behaviour was learned (Heidt & Wheeldon, 2015).

The approach of the 21st century brought a significant paradigm shift with the publication of three major criminological perspectives focusing on individual-level constructs in the explanation of antisocial behaviour: Wilson and Herrnstein's (1985) *Crime and Human Nature,* Gottfredson and Hirschi's (1990) *A General Theory of Crime*, and Moffitt's (1993) developmental taxonomy (DeLisi, 2013). Wilson's (1975) and later Wilson and Herrnstein's (1985), perspective constituted the initial fundamental challenge to traditional sociological criminological theories. Suggesting that "crime cannot be understood without taking into account individual predispositions and their biological roots" (Wilson, 1975: 103), they presented a theory of crime based on key constitutional constructs, such as intelligence, gender, and temperament, arguing that such individual predispositions affect ability to internalize rules, leading to a resistance to classical conditioning or learning from experience. Importantly, they also explicitly asserted that psychopathy, or the related and broader subsuming, antisocial personality disorder (APD), was the major "criminogenic personality trait" (Wilson & Herrnstein, 1985: 198). It appeared, therefore, that there was major cross-discipline use of constructs and propositions from developmental psychology to the more recently emerged developmental criminology theories. Moffit's (1993) developmental taxonomy softened this perspective somewhat; although still integrating constitutional differences, Moffitt explained the offending of a small subgroup of what she labeled as early onset life-course persistent offenders using neuropsychological factors,

contextualizing their effect with reference to social constructs (e.g. poverty). Yet, whereas these perspectives are integrative in nature, reflecting the dual roles of nature (biology) and nurture (environment), Gottfredson and Hirschi (1990) built their theory solely around the individual-level psychological variable of low self-control and explicitly resisted integration with other potential causal variables of antisocial behaviours. Still, this theoretical approach to antisocial behaviour was popularly received by criminologists (e.g. Cohn & Farrington, 1999; Wright, 2000).

The General Theory of Crime

The general theory of crime is essentially reduced down to the single individual-level variable of LSC, which is fundamentally defined as the tendency to pursue short-term, immediate pleasure without considering long-term consequences (Gottfredson & Hirschi, 1990). Gottfredson and Hirschi (1990) derived their conceptualization of LSC by incorporating several of the fundamental attributes of criminal and more common antisocial and marginal behaviours. “Crime” involved behaviours that typically elicited or required: immediate and easy gratification; few, if any, long-term benefits; exciting, risky, or thrilling acts; little to no skill or planning; and pain or discomfort for victims. Correspondingly, LSC was exhibited in acts that “tend to be impulsive, insensitive, physical (as opposed to mental), risk-taking, short-sighted, and nonverbal” (Gottfredson & Hirschi, 1990: 90). In other words, rather than identify the causes of criminality by studying the individual or their environment, the approach taken by most other criminological theorists, Gottfredson and Hirschi (1990) developed their theory by studying crime, identifying the common characteristics of criminal behaviours, and labeling these as evidence of LSC.

The general theory contains three major propositions. Most importantly, the key initial proposition of this theory is that individual differences in LSC emerged early in life, stabilized during childhood, and persisted over the course of life. Secondly, although research now suggests that self-control has a neurological basis (Beaver, Wright, & DeLisi, 2007), Gottfredson and Hirschi (1990) postulated that ineffective parenting was the fundamental cause of LSC. Thirdly, they proposed that LSC explained virtually all types of high-risk and serious antisocial behaviours, including smoking, use of alcohol and illegal drugs, gambling, having children out of wedlock, illicit sexual activity, and, of course, persistent criminality. Largely because of

subsequent empirical support, as well as its parsimony, the GTC became a dominant theory in criminology (Cauffman, Steinberg, & Piquero, 2005).

In addition to being parsimonious, a second appealing perspective of LSC to criminologists was its relative ease of measurement. As Gottfredson and Hirschi (1990) indicated that LSC would be evident from participation in antisocial and deviant behaviours, they proposed a simple counting-based methodology to measure this construct. In measuring LSC, Hirschi and Gottfredson (1995) later stated that "the best available operational measure of the propensity to offend is a count of the number of distinct problem behaviors engaged in by a youth (that is, a variety scale)" (p. 134). Despite the aforementioned similarities in the description of LSC and PPD, measurement of PPD was much less direct, involving a lengthy interview, review of file information, and inferring of the presence of unobservable personality characteristics from these sources of information (Hare, 1991, 2003). Simplicity for criminologists was preferable, as their ultimate goal was to predict antisocial behaviours, as opposed to understanding the underlying nature of the conceptual syndrome. Thus, LSC was more methodologically acceptable to criminologists than the complex approach required for psychopathy assessments. Using behavioral measures of LSC for the most part, extensive studies of the GTC have been conducted and the main theoretical claims have generally been supported empirically.

Stability Postulate

Proposition one concerned the early onset and life-course stability of LSC. Gottfredson and Hirschi (1990) indicated that by 10 years of age, levels of self-control should be set and should remain generally stable through adolescence and into adulthood; specifically, they stated that "the differences between people in the likelihood they will commit criminal acts persist over time" (1990: 107). Turner and Piquero (2002) interpreted this to mean that relative to others, levels of self-control should remain stable over time; however, individual-levels of self-control could increase, though not decrease, given ongoing socialization (Turner & Piquero, 2002). Still, this postulate directly conflicts with competing theories of crime (i.e., developmental life-course theories) that emphasized that explanatory variables for criminal participation vary according to the stage of the life course and that integration of biological, psychological, and sociological explanations is necessary (Heidt & Wheeldon, 2015). For instance, Sampson and Laub's (1993,

2003) age-graded theory of informal social control recognized that the social bonds described by Hirschi's (1969) social bonding theory varied according to age. Whereas attachment to family was of primary importance to explaining criminal trajectories originating in childhood, attachment to peers and schools exerted a stronger influence over criminal trajectories in adolescence, and these shifting bonds could result in a transition off of a criminal trajectory towards a more pro-social path. In contrast, according to the General Theory key constructs from developmental theories such as "career criminals", "turning points", and adolescent limited" offenders were unnecessary, as levels of self-control alone were required to explain all crime and analogous behaviour. In effect, those with LSC simply persisted in crime regardless of other risk or protective factors (Hay & Forrest, 2006).

Still, the stability postulate received some empirical support. Arneklev, Cochran, and Gainey (1998) supported the short-term (four months) stability of self-control in college students while Turner and Piquero (2002), using a national probability sample of 500 children and adolescents, identified moderate levels of stability over a four-year period using an accelerated cohort model with groups spanning the life-course between childhood and adulthood. Specifically, they found support for the between-group rankings, in that offenders and non-offenders, after the age of 8, consistently differed in their levels of self-control. However, their within-group analysis demonstrated change on the attitudinal measures of self-control obtained after age ten. Their data suggested that prior to age 10, non-offenders develop more self-control than offenders but that in late adolescence and adulthood, development of self-control occurred at a faster pace than amongst non-offenders, resulting in some non-significant differences in levels of self-control. Similarly, Hay and Forrest (2006) found that the vast majority (84%) of their sample of seven to 15 year olds displayed strong absolute stability while half (54%) displayed near-perfect relative stability of self-control, and stability was evident from as early as seven years old. However, consistent with Gottfredson and Hirschi's (1990) acknowledgement that for a small group of individuals with LSC socialization continues to influence SC, this study identified that a small proportion (6%) of their sample experienced substantial changes in levels of SC, even after ten years of age; for 1% of the sample, levels of SC decreased substantially whereas for the remaining 5%, SC was actually developed.

Winfree, Taylor, He, and Esbensen (2006) examined the five-year stability of a global operationalization of self-control as well as two specific underlying components of LSC,

impulsivity and risk taking, in a sample of nearly 1,000 adolescents. While their findings actually supported Gottfredson and Hirschi's (1990) hypothesis that between-group levels of self-control (in this case, offenders with LSC versus nonoffenders with LSC, and offenders with high SC compared to nonoffenders with high SC) should not vary, their results also conflicted with the stability postulate, as levels of self-control increased over time for both sets of nonoffenders and for the offenders with LSC, whereas offenders with higher levels of SC did not show a consistent pattern of change. Generally speaking, levels of impulsivity declined over the five years where levels of risk seeking did not change in any predictable way.

Whereas Winfree et al.'s (2006) findings supported the between-group stability of SC levels, in contrast, using a two year prospective study with a sample of 750 African-American pre-adolescent (ages 10 to 12 at Wave 1) children from two American states, Burt, Simons, and Simons (2006) concluded that "the assumption of stability in between-individual rankings in self-control after age 10 is unsound" (p. 379). Of note for the general theory's second postulate, in addition to quality of parenting, levels of self-control were also influenced by three other types of social relationships. Importantly, the instruments used to measure LSC differed across these studies. Whereas Arneklev et al. (1998) used only an attitudinal measure, Turner and Piquero (2002) utilized a mix of behavioral (waves 1 through 4) and attitudinal (waves 5 through 7) measures, while Burt et al. (2006) applied a cognitive self-report measure of self-control. Of note, Turner and Piquero's (2002) operationalization of self-control involved proxy measures rather than a standardized self-control scale.

Thus, research to date has generated only limited support for the stability hypothesis. Rather than being set by age 10 and remaining relatively consistent for the duration of the life-course, levels of self-control appear to vary, increasing for some but also at times decreasing for others. These findings bring into question the veracity of Gottfredson and Hirschi's (1990) second postulate, that of the cause of LSC.

Ineffective Parenting Postulate

Proposition two stated that the major cause of LSC was ineffective parenting, a statement which has been both somewhat supported and also challenged empirically (Buker, 2011). Based on the pioneering developmental studies by, first, Glueck and Glueck (1930) and

later, McCord and McCord (1969), Gottfredson and Hirschi (1990) asserted that to help their children develop self-control, parents must: a) monitor their children; b) recognize when unacceptable deviant acts occur; and c) correct/punish unacceptable deviant behaviours. Should parents fail to meet these conditions the child will be unsocialized and unable to control their inherent impulsivities. Thus, the objective of this prosocialization process is to teach the child to delay immediate gratification and begin to understand both short and long-term consequences of engaging in unacceptable acts. While Gottfredson and Hirschi acknowledged that criminality was often intergenerational, they argued that rather than being indicative of high heritability, parental criminality was explained by their own ineffectual childhood socialization. In other words, there is a cycle of failed socialization where the parents of delinquents themselves have LSC and, consequently, do not know how to supervise, recognize, and/or punish deviance in their own children; moreover, given their own levels of LSC, they are less likely to value prosocial disciplined behaviours.

In a sample of nearly 2,500 middle school students, Unnever, Cullen, and Pratt (2003) found some support for this postulate using Grasmick, Tittle, Bursik, and Arneklev's (1993) measure of self-control and a parental monitoring scale. However, several other studies have expanded the concept of parenting style beyond what Gottfredson and Hirschi (1990) initially described. Hay (2001) empirically supported the hypothesis that ineffectual parental socialization preceded, and was correlated with, LSC in children, though he expanded the conceptualization of effective parenting to include elements of Baumrind's authoritarian parenting, including warmth, support, and use of consistent discipline (Burt et al., 2006). In other words, multiple parenting patterns (e.g. type of control) were associated with LSC rather than just that suggested by the general theory (amount of control), a finding that was echoed in other subsequent studies (Buker, 2011). Moreover, several studies since have found that a large amount of variance in self-control has typically been left unexplained after parenting effects have been empirically controlled for and can be accounted for by other factors, such as Attention Deficit Hyperactivity Disorder (Unnever et al., 2003), neuropsychological deficits (Beaver et al., 2007), and social bonds other than with parents (Burt et al., 2006). Burt and colleagues' (2006) research demonstrated that while improvements in quality of parenting were partially responsible for the instability in levels of self-control over a two-year period, levels of self-control were also strongly affected by the children's attachment to teachers and their relationships with prosocial and delinquent peers. In other words, while parents contribute an

important role to the development of self-control in their children, other influences, including the education system and biological makeup, also exert influences over self-control levels (Buker, 2011).

Despite Gottfredson and Hirschi's (1990) explicit claim that "the magnitude of the genetic effect is near zero" (p. 60), a substantial amount of current empirical data now indicates that the roots of LSC are biological in nature. Significantly, in two gene-based studies using National Longitudinal Study of Adolescent Health data, Beaver and colleagues (Beaver, Ratchford, & Ferguson, 2009; Beaver, Shutt, Boutwell, Ratchford, Roberts, & Barnes, 2010) identified genetic influences over levels of self-control. In the first study, they identified that genetics strongly influenced both LSC and bonding with drug-using peers and that once genetic and non-shared environmental factors were controlled, parenting had no effect on levels of self-control (Beaver et al., 2009). In the second study, Beaver et al. (2010) found evidence that a nature-nurture interaction between a particular genetic polymorphism and exposure to delinquent peers modified levels of self-control. Similarly, using a sample of kindergarteners who had participated in the nationally representative Early Childhood Longitudinal Study, Wright and Beaver (2005) compared 310 twins with a random sample of 1,000 other kindergarten students and identified that once genetic variables were considered, the effect of parenting on levels of self-control were reduced.

Another major study using the same American nationally representative sample found that parenting effects over the development of self-control were weakened once biological variables were considered. In a sample of nearly 3,000 children in kindergarten and grade 1, Beaver and colleagues (2007) convincingly argued that for the most part, parenting effects were relatively weak and inconsistent over levels of self-control among children; instead, neuropsychological measures appeared to play the primary role in affecting self-control among young children. Of note, Moffitt's (1993, 1994) developmental taxonomy similarly identified that neuropsychological factors were a major etiological factor related to the life-course persistent trajectory. In a subsequent study using National Longitudinal Study of Adolescent Health data, Beaver, DeLisi, Vaughn, and Wright (2010) empirically supported the integrated roles of LSC, neuropsychological deficits (as measured by verbal IQ), and genetic dysfunctions (specifically, Caspi's monoamine oxidase A, or MAOA genotype; Caspi, McClay, Moffitt, Mill, Martin, Craig et al., 2002) in explaining adolescent delinquency. Specifically, the interaction between

neuropsychological deficits and MAOA predicted delinquency, although once LSC was considered, this effect was weakened. Significantly, their findings also indicated that the combination of neuropsychological deficits and the MAOA genotype predicted levels of SC. They interpreted these findings to indicate that there were genetic influences on self-control, levels of which then affected criminogenic propensity (Beaver et al., 2010).

Beaver et al. (2007) noted that the finding regarding the effect of neuropsychological factors over LSC was particularly significant given current knowledge into brain development, which suggests that development of the pre-frontal cortex, where self-control is presumed to lie, is incomplete in adolescence and is ongoing through into at least early-adulthood (Beaver et al., 2007; see also Cauffman et al., 2005). Thus, evidence that self-control is neuropsychological can also be used to explain the lack of consistent findings for the stability of self-control beyond the age of 10: as the pre-frontal cortex continues to develop, so to do levels of self-control. Similar findings were obtained in Beaver and Wright's (2005) research on birth complications, where they identified that anoxia (deprivation of oxygen during childbirth) exerted the strongest and most consistent effect over levels of self-control, ostensibly through the damage that occurs to the prefrontal cortex. In contrast, parental involvement (amount of time, effort, and energy spent interacting with the child) was only weakly related to LSC in kindergarten, and was non-significant during Grade 1. In effect, these findings have led to speculation that self-control is a form of executive functioning (e.g. Beaver et al., 2007; Wikström & Treiber, 2007), implying that it has a biological cause. Significantly, as discussed in Chapter 3, current theorizing regarding the roots of PPD have likewise implicated executive functioning and the prefrontal cortex as plausible causal factors. Consequently, as will be discussed later in this chapter, at least one approach has explored whether PPD and LSC are a single construct (Wiebe, 2003).

Sole Explanation of Crime Postulate

Proposition three identified LSC as the only explanatory variable of crime and deviance. This proposition is inconsistent with the propositions of developmental criminology, where longitudinal studies have identified multiple pathways composed of differing risk factors that lead towards different patterns of offending (e.g. Blumstein, Cohen, & Farrington, 1988; Moffitt, 1993; Sampson & Laub, 1993). Thus, while there is consistent evidence to support the conclusion that LSC is strongly related to crime and deviance (e.g. Arneklev et al., 1993; Burt et al., 2006;

DeLisi, 2001; Pratt & Cullen, 2000; Tittle, Ward, & Grasmick, 2003; Unnever et al., 2003; Vazsonyi, Pickering, Junger, & Hessing, 2001; Wiebe, 2006), other studies, including a meta-analysis (Pratt & Cullen, 2000), demonstrated that other biological, psychological, and social factors are simultaneously relevant to explaining crime and deviance. In a sample of nearly 2,500 students, Unnever et al. (2003) found that parental monitoring not only influenced levels of self-control but also exhibited its own direct effect on self-reported delinquency and self-reported arrests. Burt et al. (2006) drew similar conclusions regarding the direct influence of parenting style over delinquency.

A major study examining this postulate was recently conducted by Sweeten, Piquero, and Steinburg (2013) using a prospective research design involving multi-city cohort samples (n=1,300) of youth from ages 15 to 25 and including two types of crimes, ranging from simple property crimes to the most serious violent crimes. Of interest was what they perceived as the "inexplicability hypothesis" whereby Gottfredson and Hirschi (1990) accepted that age had a direct but inexplicable effect on crime but, inconsistent with developmental criminology, rejected that age was a proxy for other developmental change stemming from psychological, biological, or sociological variables. Importantly, this study considered multiple theories of offending and conducted multi-level longitudinal models to assess the direct effects of age on criminal trajectories while controlling for the effect of 40 time varying covariates (variables from hypotheses stipulated in competing theories, including social control, procedural justice, learning, strain, psychosocial maturity, and rational choice) on the impact of age. This study also included an extensive set of conceptual domains and related operational indicators of LSC, including impulse control, suppression of aggression, emotional self-regulation, moral disengagement, future outlook, and psychosocial maturity (Sweeten et al., 2013). The findings of this study were more consistent with developmental criminology than with Gottfredson and Hirschi's (1990), as they concluded that over two-thirds of the crime drop between the decade of 15 to 25 was accounted for by changes in the psychological and sociological variables included in the study, with the strongest effects coming from variables related to social learning theory (i.e. exposure to antisocial peers and antisocial peer pressure).

Unfortunately, Sweeten and colleagues did not consider the contribution of biological variables to participation in crime, such as neurological developmental. Previously, Cauffman, Steinberg, and Piquero's (2005) research with high school students indicated that whereas LSC

was useful in differentiating non- or minor offenders from offenders, neuropsychological (i.e. frontal lobe functioning) and biological (i.e. heart rate) variables were necessary to distinguish between more serious offenders. These findings aligned to a degree with Moffitt's (1993) developmental taxonomy. In effect, whereas LSC had utility in explaining general deviance among adolescent limited offenders, neuropsychological and biological variables were uniquely relevant to the offending behaviours of the more life course persistent subgroup.

Further challenging this postulate, several recent Canadian studies have identified multiple pathways to persistent aggressive and criminal behaviours. In a series of articles stemming from a longitudinal cohort study with 400 children aged three to five concerning the development of aggression, Lussier and colleagues utilized a set of risk/protective factors indexed on the Cracow risk management instrument for serious and violent children and youth (Corrado, Roesch, Hart, & Gierowski, 2002; Lussier & Corrado, 2009) and found support for the developmental criminological theoretical perspective that there are several pathways to aggressive and antisocial behaviours beginning in the earliest stages of life, including pre/peri-natal (Lussier, Tzoumakis, Corrado, Reebye, & Healey, 2011), genetic (Lussier et al., 2011), and socioeconomic (Lussier & Healey, 2010; Lussier, Corrado, Healey, Tzoumakis, & Deslauriers-Varin, 2010). Similarly, Corrado and Freedman (2011) speculated that four pathways originated from the earliest developmental stages, including prenatal development and early childhood. These included: a high reactive/low reactive temperament pathway; a prenatal development pathway, particularly implicating fetal alcohol spectrum disorder; a serious childhood trauma disorder pathway; and an early onset callous/unemotional personality trait pathway. Consistent with Moffitt (1993), a fifth pathway denoted an adolescent onset for both risk factors and subsequent antisocial behaviours.

DeLisi (2009) observed that those at the extremes of aggression (extreme lows, as well as extreme highs) are identifiable in childhood and their trajectory on that pathway remains stable over time. He suggests that psychopathy is responsible for the stable pathway towards a highly aggressive antisocial style. Supporting this, McCuish, Corrado, Lussier, and Hart (2014) recently observed that higher youth psychopathy scores were associated with membership in serious offending trajectories (high-rate slow desister or high frequency chronic offending); of note, however, at a factor level the association was driven by Factor 4 (Antisocial Behaviour) scores and independently, Factors 1 through 3 were unrelated to serious offending trajectories.

Still, several studies on career criminals by DeLisi, Vaughn, and others argued that offenders with psychopathic traits (specifically, unemotional, narcissistic, impulsive, and fearless characteristics) were significantly more likely to be categorized as career criminals than offenders without psychopathic traits, and may even represent the same population (DeLisi & Piquero, 2011; Vaughn & DeLisi, 2008; Vaughn, Howard, & DeLisi, 2008). In addition, callous/unemotional traits were implicated in two of Corrado and Freedman's (2011) pathways, the personality traits pathway and the extremely low temperament pathway, and was identified by Lussier et al. (2011) as one of the most substantial risk factors for high levels of physical aggression among preschoolers. Callous unemotional traits have been the focus of a series of studies by Frick (Caputo et al., 1999; Christian et al., 1997; Frick et al., 2003, 2005; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Frick, O'Brien, Wootton, & McBurnett, 1994; Frick & Viding, 2009; Kruh et al., 2005), who has implicated them as the hallmark symptoms of early PPD. Importantly, these studies established that the presence of CU traits by ages three predicted earlier onset of offending and a greater accumulation of police contacts by adolescence. Flexon and Meldrum (2013) demonstrated that CU traits predicted violent behaviour among a community sample of adolescents; significantly, these effects occurred even after controlling for the effects of LSC. Thus, there is consistent support for a psychopathic traits pathway towards aggression which appears to originate in childhood with the expression of CU traits.

As noted in the Introductory chapter, since its official introduction to criminologists in a 1996 publication by Hare, there have been relatively few attempts to integrate PPD into criminological theories, including those within the developmental criminology perspective, until relatively recently (e.g. DeLisi, 2009; Fox, Jennings, & Farrington, 2015; Wiebe, 2003). In fact, critics of this approach, such as Walters (2004), argued that PPD did not add any substantial explanatory power beyond the key propositions of the General Theory, and the gold standard measure of PPD, the PCL, was fundamentally flawed due to its tautology. Still, as discussed in Chapter 4, the extant research supports that additional explanatory power is provided by the more personality-focused factors of psychopathy and, while the PCL is flawed by its heavy reliance on antisocial behaviours, more recent conceptualizations of PPD have fundamentally advanced this construct to a viewpoint more consistent with personality theory. These advances have considerable implications for the integration of PPD into existing criminological perspectives.

Criminological Resistance to PPD

A fundamental difference that distinguishes PPD from LSC is the inclusion of an array of additional personality traits related to affective and interpersonal dysfunctions. Nonetheless, PPD, as measured by the PCL, is heavily indexed on measures of LSC. The items composing Factor 3 (Item 3 Need for Stimulation, Item 9 Parasitic Lifestyle/Orientation, Item 13 Lack of Realistic Long-Term Goals, Item 14 Impulsivity, and Item 15 Irresponsibility) are all essentially indicators of LSC whereas the items composing Factor 4 (Item 10 Poor Anger/Behavioural Control, Item 12 Early Behavioural Problems, Item 18 Juvenile Delinquency/Serious Criminal Behaviour, Item 19 Revocation of Conditional Release, and Item 20 Criminal Versatility) are common outcomes of having LSC. Despite the similarities between psychopathy and LSC, criminological theories have largely ignored or avoided incorporating the more complex PPD construct in favour of the more parsimonious LSC construct.

A decade ago, Walters (2004) published a scathing critique of psychopathy as a theory of crime. One major concern was the tautology presented in the measurement of psychopathic traits. Specifically, he criticized the PCL measure of PPD for its tautology, noting that “to have value, however, a model must avoid the tautology that comes with failure to distinguish between criterion (psychopathy) and outcome (serious criminality)” (Walters, 2004: p. 133). In their discussion of the causes of crime, Gottfredson and Hirschi also challenged existing psychological explanations for crime by stating that “it seems fair to say that no one has found an independently measured personality trait substantially correlated with criminality” (1990: 109). They seemed to explicitly focus on psychopathy when they noted that “scale scores obviously cannot be used to establish the existence of a trait of personality independent of the tendency to commit criminal acts” (1990: 109). In other words, psychological criminology was limited by a tautology in measurement as scales measuring personality factors associated with criminality used criminal behavior to establish the presence of that trait. It should be noted that a similar critique was levied by Akers (1991) regarding the operationalization of LSC. As Gottfredson and Hirschi (1990) indicated that LSC would be evident from participation in antisocial and deviant behaviours, they proposed a simple counting-based methodology to measure this construct. In other words, consistent with the critiques levied at the PCL measure of psychopathy, there is a potential validity issue in measuring LSC in that the operationalization of LSC consisted of several attributes of the phenomena it purports to explain. Akers (1991) specifically argued that using LSC to explain criminal propensity was a tautological approach, as

they were one and the same, specifically noting that “we cannot know that a person has low self-control (stable propensity to commit crime) unless he or she commits crime or analogous behavior” (p. 204).

Still, this critique of the most commonly used measure of PPD was valid. Hare (1991, 2003) initially identified 22, later reduced to 20, characteristics indicative of PPD, touching on traits related to affective (emotional) dysfunction, interpersonal relationships, and behavioural styles. Additionally, he proposed that antisocial behaviours were an essential theoretical component of psychopathy. Yet this operationalization introduced a tautology, as it meant using measures of antisocial behaviours to explain participation in antisocial behaviours.

Others have cautioned that tendencies (traits) were separate from characteristic adaptations (acts), and that acts can stem from a variety of psychological tendencies (e.g. promiscuity may stem from a tendency to be impulsive or a desire to manipulate) and therefore it is difficult to correctly classify people according to their behaviours (Lilienfeld, 1994; Lykken, 2006). Similarly, Cooke, Michie, Hart, and Clark (2004) noted that while a symptom is considered a direct outcome of a disorder that contributes towards its diagnosis, a consequence may be a non-specific predictor of the disease and is considered an effect of the disorder. Given that many other traits on the PCL are assessed through reference to antisocial acts, Cooke et al. (2004) argued that the PCL was oversaturated with antisocial content, and that antisocial behaviours, such as participation in crime, carried a substantial weight in the assessment of psychopathy. Given this, Skeem and Cooke (2010) suggested it would be difficult for a non-criminal psychopath to be diagnosed as psychopathic despite manifesting all the core features of psychopathy, while Blackburn (2007) argued that the oversaturation of criminality on the PCL “obscured the nature of psychopathy as a disorder of personality characterised by interpersonally harmful behaviour that need not take criminal form” (2007: 142). Essentially then, Hare’s operationalization of PPD led to an inability to distinguish psychopathy from criminality.

Thus, given that the antisocial behaviours measured on the PCL are themselves predicted from the remaining personality traits referenced in the measure (e.g., engaging in a wide variety of criminal activity is an outcome of personality traits such as lacking remorse, being impulsive and risk-taking, and being callous towards others) and that the inclusion of

antisocial behaviours results in defining a construct using the very behaviours it predicts, Hare's operationalization of PPD was seen to include an inherent tautology that clouded comprehension regarding the nature and causes of the construct and the true relationship between dysfunctional personality traits and participation in antisocial behaviours.

Besides the fundamental criticism that the PCL version of PPD was inherently tautological, Walters (2004) further asserted that it provided an explanation only for a small number of non-predatory criminals. Specifically, he cited studies observing that using the PCL criteria, only between 15% and 30% of criminals would be considered psychopathic (Salekin, Rogers, Ustad, & Sewell, 1998). Still, despite the fact that only a minority of offenders may be categorically considered as psychopathic, research has attributed a significant portion of criminal activity to their actions and, as Vaughn and DeLisi (2008) reported, the small group of psychopathic offenders are much more likely to be classified as career criminals. Similar findings have been observed with youth. For instance, Campbell et al. (2004) reported that psychopathic youth were the most violent and versatile in their offending. Corrado et al. (2004) observed that male young offenders with higher PCL:YV scores recidivated more quickly and frequently and with a greater variety of criminal activity than male young offenders with lower PCL:YV scores. Similarly, Salekin (2008) found that psychopathy significantly predicted both general and violent delinquency over a three- to four-year span among child and adolescent delinquents, even after controlling for other known predictors of delinquency. In addition, rather than apply to only non-predatory criminals, psychopathy has demonstrated utility in explaining premeditated crimes, such as murder (Millon & Davis, 1998; Porter, Woodworth, Earle, Drugge, & Boer, 2003) and sexual offending (Jackson & Richard, 2007; Knight & Guay, 2006). Thus, despite Walters' (2004) critique that psychopathy only explained the behaviour of small number of criminals, this construct appears to have utility in explaining a great deal of and variety in criminal activity (DeLisi, 2009; Fox et al., 2015).

Another concern reported by Walters (2004) were studies reporting that between 50% and 75% of adult psychopaths tested false-positive (Freedman, 2001), and that others had expressed concern for the potential for even higher false positive rates for juveniles given their tendency to express many psychopathic-like traits as a natural consequence of adolescent development (Edens et al., 2001; Seagrave & Grisso, 2002). In effect, Walters argued that the application of the PCL could have potential negative effects as a consequence of inaccurate

labeling, a concern which is likely to deter criminologists from using in favour of the less pejorative concept of self-control (DeLisi, 2009).

These issues, along with the rejection over the last century of biological and psychological explanations for criminal behaviour, culminated in the widespread unpopularity of PPD among criminologists. However, given the recent trends towards biological research in the search for the causes of crime, as well as the introduction of new measures of psychopathy that eliminate reliance upon antisocial behaviours as defining characteristics of the disorder, PPD appears to be gaining ground as a more popular perspective with which to understand participation in antisocial behaviours. Importantly, new conceptualizations and operationalizations of PPD avoid direct reference to criminal behaviours, thus avoiding the tautology issue and allowing for researchers to explore how psychopathy may contribute to criminality, rather than being defined by criminality.

Integrating LSC and PPD

Research with LSC has supported its utility in predicting crime and other behaviours. However, PPD is now becoming more popularly received by criminologists, for instance, among those studying career criminals (Fox et al., 2015). One reason for the growing popularity of PPD among criminologists may be that despite the appeal offered by the simplicity of LSC, as well as its ability to explain a substantial proportion of offending (Pratt & Cullen, 2000), the general theory of crime's reliance on a single construct means that it presents an incomplete explanation for antisocial behaviour (e.g. Sweeten et al., 2013). While LSC is indexed in measurements of PPD, particularly through reference to the trait of impulsivity, PPD integrates other personality characteristics that expand the application of the construct to a wider variety of individuals and which allow it to explain a much larger range of offending and other behaviours than LSC.

The general theory has also been criticized as too static a theory (DeLisi, Hochstetler, & Murphy, 2003). Specifically, Gottfredson and Hirschi (1990) assumed that the cause of crime (LSC) originated prior to 10 years of age, and did not differ by crime or by criminal. This stability hypothesis is inconsistent with more modern developmental criminological theories, which have identified multiple causes of crime, and multiple points in the life course when life events can

result in transitions on or off of pathways towards delinquency (e.g. Sampson & Laub, 1993, 1995). PPD has the potential to account for the numerous offending trajectories that have been proposed in criminology, as variations in the individual personality characteristics underlying PPD can elevate or reduce risk for offending. Whereas LSC offers a propensity-based explanation for criminality, PPD presents a more developmentally-oriented explanation, as the underlying personality characteristics have the potential to change over time and their influence over participation in antisocial behaviours may likewise change according to developmental period. For instance, whereas some characteristics, such as callous and unemotional traits, seem relevant to antisocial behaviours at any point in the life course, other characteristics, such as grandiosity or parasitic lifestyle may be less relevant to offending during adolescence when these traits are more commonly expressed by a larger segment of the population.

In addition, the general theory of crime is simply too general when applied within criminal populations. LSC is essentially another representation of the construct of impulsivity, which refers to the inability to consider the longer-term consequences of behaviours and delay gratification. This a common symptom in many psychopathologies related to antisocial behaviours, including Attention Deficit Hyperactivity Disorder and Antisocial Personality Disorder and it is therefore not particularly useful in distinguishing subtypes of the criminal population (Lynam & Miller, 2004). Moreover, despite its name, the general theory of crime cannot account for all forms of criminality. It relies upon a single construct to explain crime and analogous behaviours, and so when applied to crimes more consistent with the presence of self-control (e.g. white collar crimes such as embezzlement, or predatory crimes, such as premeditated murder), it falls short (e.g. Benson & Moore, 1992). Furthermore, while it is an important, although limited, construct for explaining criminal behaviour, its utility is also restricted by the authors' proposed stability of this construct. Specifically, Gottfredson and Hirschi's (1990) proposed that LSC emerged early in life (prior to age 10) and was subsequently relatively stable over time. Thus, this construct has limited temporal variability, and so provides limited insight into the shifting nature of varying trajectories of offending that have been identified. Moreover, it is inconsistent with developmental and life-course criminological theories, which suggest that factors relevant to offending behaviours vary according to the stage of development (LeBlanc & Loeber, 1998; Loeber & LeBlanc, 1990; Sampson & Laub, 1993).

As demonstrated by previous empirical research, LSC has utility in predicting antisocial behaviour, and it is simplistic in that it does so with a single personality trait. However, its utility is also limited by this narrow conceptualization, as it falls short of explaining all criminal behaviour and all criminals. Although more complex, PPD has the added benefit of integrating alongside low self-control other constructs important to antisocial behaviour that, importantly, can help distinguish and explain the behaviour of different types of criminals. In other words, PPD has added utility over the more specific LSC.

It should be noted that many of the aforementioned issues with PPD were a consequence of utilizing a categorical, as opposed to dimensional, model of personality classification; however, research has since clearly supported that psychopathy is a multidimensional construct as opposed to a distinct qualitative taxon (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Bishopp & Hare, 2008; Gretton et al., 2004; Guay & Knight, 2003; Guay, Ruscio, Knight, & Hare, 2007; Krueger, 2002; Lee, 2006; Lynam & Derefinko, 2006; Lynam et al., 2008; Marcus, John, & Edens, 2004; Paulhus & Williams, 2002; Poythress & Skeem, 2006; Walters, Duncan, & Mitchell-Perez, 2007; Widiger, 2006). Thus, DeLisi (2009) argued that given its ability to represent a continuous measure of psychopathic traits, PPD could be applied to a wide range of offenders rather than exclusively with the most extreme offenders. In addition, while the measurement issues with the PCL scales limit its applicably outside of criminal populations, more recently developed personality-based PPD measurements can use a dimensional approach to study the presence and severity of psychopathic traits in non-offending populations as well.

DeLisi (2009) more recently advanced the theoretical perspective that “psychopathy is the purest and best explanation of antisocial behavior. Indeed, psychopathy is the unified theory of crime…” (p. 256). Regarding the key explanatory construct put forth by the general theory, he questioned whether LSC was possibly “merely a watered down, less specified form of psychopathy” (p. 257). In his earlier work (DeLisi, 2003, 2005; DeLisi & Vaughn, 2008) he suggested that LSC was in fact a proxy for psychopathy, while arguing that most of self-control’s predictive validity was actually accounted for by other psychopathic traits, primarily narcissism, as well as guiltlessness (Vaughn, DeLisi, Beaver, Wright, & Howard, 2007).

Fox and colleagues (2015) recently challenged the absence of PPD from DLC criminology. In their review, they summarized key findings from PPD research that supported the need to integrate this perspective into DLC theories, including that: 1) psychopathy was a key predictor of offending onset and persistence, offending frequency and variety, time until recidivism, and criminal careers; 2) traits of psychopathy were visible early in life and were stable from childhood through to adulthood; and 3) key psychopathic traits appear to be biological in nature. Since "…DLC aims to identify the causes and correlates of offending over the life span, focusing on the within-individual variations that result in criminal and delinquent behaviour" (p. 274), and since "many risk factors and personality traits of psychopathy are also similar to those proposed by DLC theories for antisocial and criminal behavior" (p. 274) they argued that psychopathy should be explicitly integrated into criminological theorizing as a key explanatory construct. Again, however, a major limitation of the existing research associating psychopathy with offending has been the limited contribution offered by the core personality traits (the affective and interpersonal traits) relative to the strong predictive value offered by the antisocial behaviours (Corrado et al., 2004; McCuish et al., 2014; Skeem & Cooke, 2010). Thus, it remains to be seen whether a personality-based operationalization of psychopathy will yield the same relationship with criminal offending. Still, the ability of CU traits assessed as early as three years of age to predict onset of and frequency in offending, as well as the likelihood of an adulthood diagnosis of psychopathy, suggests that the association between psychopathy and offending will remain, despite the shift away from inclusion of antisocial behaviours in its conceptualization and operationalization.

Conclusion

A key theme of this dissertation is that the most important construct, low self-control, of one of the dominant criminological theories, the general theory of crime, lacks sufficient explanatory power in explaining and predicting the broad range of criminal offending types and criminal trajectories. In contrast, psychopathy is a much more theoretically complex and potentially more powerful construct in criminological theories. However, there has been substantial debate about the underlying nature of psychopathy and whether it has been appropriately conceptualized and operationalized by Hare on his PCL. As previously discussed, one of these debates centres around the tautology of the PCL due to its inclusion of antisocial behaviours, such as criminality, in the definition and measurement of the construct. Many of the

antisocial behaviours measured on the checklist could themselves be predicted from the remaining personality traits referenced in the measure. This issue, along with the historical tendency to reject biological explanations of criminal behaviour (Heidt & Wheeldon, 2015; Rafter, 2008) likely explain why psychopathy has not been fully incorporated into the dominant criminological theories. Recently however, new personality-focused measures of PPD that remove reference to antisocial behaviours have been proposed, one of these being the CAPP-IRS. The CAPP-IRS removes the tautology in measurement of PPD and AB by excluding direct measurement of overt antisocial behaviours. Further, it improves on the oversimplification of LSC by conceptualizing additional domains of personality traits more consistent with general personality theories, which also broadens its application to non-criminal populations. It is also more dynamic than the PCL, allowing for change in the severity and expression of its underlying traits and may therefore be more developmentally appropriate.

Thus, the recent criminological trend towards re-integrating biological and biosocial perspectives on crime, as well as the introduction of new measures of psychopathy that reduce the reliance on antisocial behaviours, have together arguably increased the utility of PPD for criminological theorizing. This dissertation explores the validity of one such new measure of psychopathy; first however, it is essential to establish the biological roots of this personality disorder and explore its development over the first two decades of the life-course.

Chapter 3.

Brain Development and PPD

Introduction

The brain is a possible etiological factor for psychopathic personality disorder (PPD) and is also implicated in the theory of low self-control (LSC). Subsequently, it is essential to understand the stages of brain development and maturation as they occur across the periods of prenatal development, through infancy and childhood, and into the adolescent periods (early, middle, and late adolescence). Importantly, development over these early periods of life set the stage for later brain maturation and mastery of important cognitive skills relevant to PPD. Psychopathic personality disorder differs from other developmental psychopathologies (e.g. schizophrenia, bipolar) in that rather than being triggered in adolescence through a combination of genetic predisposition with environmental/social experiences (i.e. Luna & Sweeney, 2004; Masten, 2004), it onsets much earlier in life. In childhood, evidence of future PPD is already observable, i.e. through the expression of callous/unemotional traits that are similar to adult psychopathic traits and which set the stage for future long-term involvement in antisocial behaviours (Barry, Frick, DeShazo, McCoy, Ellis, & Loney, 2000; Caputo et al., 1999; Christian et al., 1997; Frick, 2009; Frick et al., 2003; Frick et al., 1999; Frick et al., 1994; Frick et al., 2005; Jones & Viding, 2007; Kotler & McMahon, 2005; O'Brien & Frick, 1996; Pardini, Lochman & Frick, 2003). Thus, understanding the brain structures contributing to PPD is critical, as the vulnerable developmental period during which successful intervention may take place likely occurs much earlier in life than previously anticipated. This chapter provides an overview of brain development and maturation throughout childhood and adolescence and discusses the possible contributions of neurological dysfunction towards increased risk for engaging in antisocial behaviours.

Explaining The Age-Crime Relationship

Since the early 1900s, theorists have recognized a curvilinear relationship between age and crime, where criminal activity tends to increase during adolescence, peak around 16 or 17 years old, and then subsequently decrease (Hirschi & Gottfredson, 1983; Sweeten et al., 2013). However, the explanation for this relationship has been debated. Hirschi and Gottfredson (1983) theorized that age had a direct influence on offending, whereas developmental theorists suggest that developmental constructs (such as particular sociological and psychological constructs experienced during adolescence, including victimization, association with deviant peers, and identity development) mediated the relationship between age and crime (e.g. Sampson & Laub, 1993). In support of the developmental explanation for the age-crime relationship, trajectory analyses that statistically examine the changes in offending rates within similar groups of individuals identified multiple pathways along which the age-crime curve progresses, including late-onset early-desistance of delinquency, late-onset late-desistance from delinquency, and early-onset late desistance, the latter of which typically involves high-persistency or chronic pathways most consistent with psychopathy (e.g. Farrington, Piquero, & Jennings, 2013; Lacourse, Côté, Nagin, Vitaro, Brendgen, & Tremblay, 2002; Lacourse, Dupéré, & Loeber, 2008; Laub & Sampson, 2003; Moffitt, 1993; Nagin, Farrington, & Moffitt, 1995; Nagin & Land, 1993; Nagin & Tremblay, 1999; Piquero, Farrington, & Blumstein, 2007). Moffitt's (1993) groundbreaking research identified two major typologies of young delinquents. She concluded that virtually all adolescents engage in some deviance or crime but that most age-out as they approach late adolescence/early adulthood. These adolescent-limited (AL) offenders appear to primarily be involved in delinquency as a result of peer influence and as a way of testing their independence relative to adults. As they begin to enter life stages where other influences, such as romantic relationships, further schooling, and employment, become more important, they desist from crime and delinquency as it becomes a barrier to reaching these other goals. In contrast, the much smaller group of life-course persistent (LCP) offenders onset in crime and deviance at a much earlier age than the AL group, engage in higher levels of crime and deviance during adolescence, and persist in these antisocial behaviours through adulthood (Moffitt, 1993).

While Hirschi and Gottfredson (1983) argued that the relationship between age and crime was direct and that attempts to explain this relationship through reference to yet

unidentified correlates of crime was a mistake, Steinberg and Morris (2001) argued that given the broad developmental changes children and adolescents undergo in multiple areas, including interpersonal, biological, neurological, and cognitive functioning, it was more likely that research had not yet involved the right combination of constructs to model in longitudinal studies to truly understand the mediating effect of crime correlates on the relationship between age and crime. In fact, Sweeten et al. (2013) tested the effect of constructs from six sociological and psychological criminological theories (social control, social learning, strain, psychosocial functioning/self-control, rational choice, and procedural justice) and found that although age did contribute significantly to crime participation, up to half of the variance could be explained by each of these other theories independently. Taken together, forty different correlates of crime from these six theories accounted for nearly three-quarters (69%) of the relationship between age and crime (Sweeten et al., 2013). Thus, this important study supported the application of developmental theories measuring sociological and psychological constructs in explaining why crime increases and peaks during adolescence.

Unfortunately, none of the theories tested by Sweeten et al. (2013) included constructs directly related to neurological functioning. Yet, understanding the contributions of neurological dysfunction is essential to understanding the relationship between psychopathic personality disorder and crime, as most recent theories of psychopathy posit neurological causes, and manifestations of psychopathic traits closely resembles one of the trajectories of criminal offending consistently identified in these analyses, i.e. the small subgroup of early onset chronic pathway (e.g. Brame, Nagin, & Tremblay, 2001; Broidy, Tremblay, Brame et al., 2003; Lacourse et al., 2002; Laub & Sampson, 2003; Nagin & Land, 1993; Nagin et al., 1995; Nagin & Tremblay, 1999).

Significantly, Moffitt's later research (Moffitt, Lynam, & Silva, 1994) identified that LCP offenders exhibited neuropsychological dysfunction, as indexed by verbal intelligence and verbal memory, at age 13. Thus, whereas AL offenders eventually gained cognitive control through normative brain maturation and so aged-out of the impulsive and emotionally-charged behaviours that led to delinquent participation, LCP offenders, many of whom would likely qualify for a later diagnosis of psychopathy (Vaughn & DeLisi, 2008) continued to exhibit problems controlling their dominant emotional responses and so continued to act impulsively and inappropriately. The difficulty, at least in psychopathy research, is determining which

individuals will age-out and which will persist. Yet, the fact that LCP offenders differed in their neuropsychological profile suggests one avenue for discerning those who will exhibit stability in these traits over time from those who will exhibit them solely during the stormy emotional period of adolescence.

Thus, neurological constructs provide important contributions towards developmental criminological theories. It is necessary then to review the early developmental periods as they are largely responsible for setting the eventual course of crime and delinquency involvement that one will follow. In particular, a review of neurological development appears necessary, given the accumulating research providing support for biological causes of crime generally, and psychopathy specifically.

Child and Adolescent Development

Childhood and adolescence are major developmental periods in the life course where the human body undergoes a significant amount of growth. In particular, the brain experiences two periods of development that coincide with these age ranges. Firstly, from the moment of conception until puberty begins, a child's brain is experiencing near constant growth; during this period, the brain also undergoes neuronal 'pruning', where pathways within the brain are strengthened or eliminated, depending on their use. Thus, the very early stages of life are critically important for the brain's development and have long-term implications for involvement in crime and deviance should the brain not be stimulated adequately or appropriately. Secondly, although the brain's synaptic connections are largely made during childhood, the onset of puberty coincides with the loss of grey matter and development of white matter, where the oft-used synaptic connections between neurons are covered in fatty substance (myelination) which enhances the rate of communication between neurons. This process not only speeds up communication but also facilitates communication between different regions of the brain, as well as between the brain and body, and corresponds with higher brain functioning and more complex thought processes. Therefore, inadequate white matter growth during adolescence has significant implications for future participation in crime and deviance. Given the extensive development of the brain across the childhood and adolescence developmental stages, these periods of life are therefore critical for shaping future pathways that may or may not involve crime and deviance.

Brain Development

Prior to discussing the important developmental sequences in brain structures and functioning, it is necessary to first provide a basic overview of the human brain. The brain is divided into three major areas: the brainstem, the cerebellum, and the cerebrum. The cerebrum is the largest part of the brain and is mostly composed of the neocortex. The cerebrum is divided into four lobes: occipital, parietal, temporal, and frontal. Each of these lobes can be divided into right and left, consistent with the division of the cerebrum and neocortex into the right and left hemispheres. The occipital lobes are responsible for visual recognition of objects and written words. The parietal lobes interpret sensations, such as touch, temperature, and pain, and messages, such as visual and auditory, from different parts of the brain. The parietal lobes make connections between these sensations and messages and store memories related to them. Although the parietal lobe plays a role in the formation of memory, the temporal lobes are the main structures associated with memory, as well as the interpretation of emotions, language, and sounds. Lastly, in addition to controlling basic skills, such as eye movement and speech, the frontal lobes are responsible for the most advanced skills and tasks, including planning, problem solving, social behaviour, self-awareness, and self-control. The frontal lobes house the prefrontal cortex, which has been extensively studied and implicated in both psychopathic personality disorder and low self-control, as well as in related disorders, including Attention Deficit Hyperactivity Disorder. Thus, the remainder of the discussion will primarily focus on the development and maturation of the frontal lobes between conception and late adolescence.

The Process of Brain Development and Maturation

Brain growth begins shortly after conception with the development of the brain stem and lower brain where the basic autonomic skills necessary for life (e.g. breathing, cardiac rhythm) are housed. Development continues in a linear fashion from the posterior or back of the brain (i.e. occipital lobes) to the anterior or front of the brain (i.e. frontal and temporal lobes). In effect, this means that lower-order basic life skills (e.g. seeing, breathing, and moving) are developed first while the higher-order, more advanced processes (e.g. self-control, reasoning, planning, and working towards a goal) are developed later in life (Giedd, Blumenthal, Jeffries, et al., 1999; Gogtay, Giedd, Lusk, et al., 2004; Hudspeth & Pribram, 1990).

During prenatal development, millions of neurons develop, migrate throughout the brain, and begin to connect through a process of synaptogenesis where, over time, these connections will either be enhanced through myelination or pruned, depending on their frequency of use (Nelson, 2004). At birth, the brain is home to approximately one billion neurons, or brain nerve cells, that compose the grey matter covering the surface of the cerebrum. Grey matter also contains synapses, the structures that assist neurons in communicating to each other. Synapses communicate through molecular structures, such as axons, located at their endpoints. Communication along synaptic pathways is assisted by neurotransmitters, some of which (e.g. dopamine, serotonin) have been implicated in biological theories of crime and deviance.

From the moment of conception through adolescence, exposure to different environmental stimuli encourages the growth of both the number and complexity of synaptic pathways between particular neurons; thus, communication pathways throughout the brain and between the brain and body are affected by environmental conditions (Nelson, 2004). Over time, synaptic axons undergo a process of myelination whereby the axons are insulated by a fatty substance that speeds the transmission of electrical impulses or messages between neurons up to 100 times the speed of communication between unmyelinated neurons – this is the developmental process where grey matter transforms into white matter, reflecting brain maturation (Benes, 1999; Giedd, 2004). Importantly, those connections that are used more frequently become better developed and myelinated, whereas non- or under-stimulated pathways are pruned, where non- and under-stimulated neurons and synaptic pathways are effectively removed from the brain. Thus, over the course of brain development, some grey matter becomes white matter, while other grey matter (underused neurons) dies off. The complementary processes of myelination and pruning are referred to as arborization (Giedd, 2004). Together, they facilitate faster brain processing and communication, and allow for the development of more complex brain functioning, such as higher thought processes. These processes have important implications for the role of the environment in the development of brain structures and cognitive skills (Giedd, 2004). Both novel and repeated experiences encourage neurons to form synaptic pathways that facilitate faster communication. A poorly stimulated brain will prune more neuronal connections and result in a lower volume of grey matter, which limits the extent to which myelination can occur and, subsequently, affects the individual's ability to engage in complex cognitive activities that require the quick execution of higher-order mental processes. Thus, myelination and pruning occur even in the very early

stages of life, setting the stage for greater efficiencies in information processing and more complex thinking later in life (Wright, Boisvert, Dietrick, & Ris, 2009).

Although white matter development tends to follow a linear path with increases occurring steadily over time, albeit at slightly different rates for each of the four lobes, grey matter development actually follows a non-linear path, with a surge in growth appearing shortly before adolescence, followed by a decrease in growth post-adolescence (Giedd, 2004; Giedd et al., 1999). A possible explanation is that there is a growth in brain size shortly before an individual enters adolescence, during which developmental stage new synaptic pathways are formed based on environmental experiences (Giedd et al., 1999). Post-adolescence, understimulated neurons and synaptic pathways will be pruned, explaining at least some of the decline in grey matter as an individual enters early adulthood (Gogtay et al., 2004).

Whereas white matter development is fairly consistent across the four lobes, there is much greater regional variation in development of cortical grey matter, some of which is gender-based (Giedd, 2004; Giedd et al., 1999). The growth of grey matter peaks around one to two years earlier for females (Table 1), with the exception of the occipital lobe which does not appear to have a peak stage of growth but instead exhibits a steady increase into adulthood (Giedd et al., 1999). Correspondingly, the overall size of cortical grey matter is approximately 10% larger in males. Post-adolescence, grey matter declines again, with the steepest decline occurring in the parietal lobes and the slowest in the frontal and temporal lobes (Giedd, Clasen, Lenroot, et al., 2006; Giedd, 2004; Giedd et al., 1999). Interestingly, the declines in grey matter do not differ by gender. While white matter growth has been attributed to myelination and pruning, the U-shaped pattern of grey matter growth has not yet been explained (Giedd, 2004; Giedd et al., 1999).

Table 1: Average age of peak growth in cortical grey matter (Giedd et al., 1999)

Cortical Lobe	Male	Female
Frontal	12.1 years	11.0 years
Parietal	11.8 years	10.2 years
Temporal	16.5 years	16.7 years
Occipital	n/a	n/a

Brain Development through Infancy and Childhood

Although the brain continues to mature post-adolescence (Giedd, 2004; Sowell, Thompson, Tessner, & Toga, 2001), all four lobes undergo substantial growth and maturation during infancy and childhood. In particular, the occipital and parietal lobes undergo a significant amount of maturation in these periods of the life course, resulting in the abilities to see, hear, talk, attend to things, and spatially orient (Giedd et al., 1999; Sowell, Thompson, Holmes, Batth, et al., 1999; Sowell et al., 2001). However, the temporal and frontal lobes (dorsofrontal in particular, which is responsible for executive functioning) are slower to develop, with maturation continuing through adolescence and into early adulthood (Giedd et al., 1999; Sowell et al., 2001). Still, the structural and functional change that sets the stage for this future maturation occurs in infancy and childhood, which results in the emergence of some unrefined cognitive abilities, such as ability to delay/inhibit response, hold information in mind, and retrieve hidden objects (Diamond, 2002). For instance, Humphrey (1982) found that the skill level involved in focusing attention selectively and ignoring distracting stimuli increased between ages five and nine. Similarly, Stuss (1992) discussed a study by Passler, Isaac, and Hynd (1985) in which children between six and eight years demonstrated mastery of some selective attention based tests, yet still did not demonstrate mastery of all attentional skills even by early adolescence.

Again, brain development tends to proceed from the posterior to the anterior, meaning that the brain structures associated with simple unconscious functions such as motor coordination (the primary motor cortex) are the first to develop, after which areas responsible for spatial orientation, attention, speech, and language (the parietal lobes) develop (Gogtay et al., 2004). The frontal lobes similarly develop from the posterior to the anterior. There are substantial increases in grey matter in the frontal lobe across childhood (especially in the first year of life, again between three and six years, and again between seven and eleven years) and into adolescence, peaking in the early adolescent stage (11 to 12 years old) (Giedd, 1999). Brain volume then begins a slow decline through adolescence as unused neurons are pruned. Simultaneously, a significant amount of frontal lobe myelination occurs across adolescence and subsequently into early adulthood, resulting in growths in white matter volume, the implications of which are that cognitive abilities continue to mature beyond the teenage years and into young adult years (Braver, Cohen, & Barch, 2002; Giedd, 1999, 2004; Luna & Sweeney, 2004; Sowell et al 1999, 2001, 2003).

Brain Development in Adolescence

Adolescence has been described as a period full of heightened “storm and stress” (Hall, 1904). During this developmental period adolescents experience substantial changes in their emotions, yet their cognitive development lags behind, increasing the potential for participation in risky behaviours. Importantly, the onset of puberty has been occurring earlier and earlier over the last several decades, which is significant as the onset of puberty drives the development of many affective or emotional systems (Dahl, 2004). In contrast, the trajectory of cognitive development has not shifted; important cognitive skills, including reasoning, planning, logic, problem solving, appreciation of consequences, and inhibitory control are likely not associated with pubertal onset; rather, they tend to develop with age and experience, with their maturation persisting beyond even the adolescent stage (Dahl, 2004; Giedd, 2004; Sowell, Peterson, Thompson, Welcome, Henkenius, & Toga, 2003; Luna & Sweeney 2004). Therefore, adolescents are experiencing puberty, a developmental process associated with increases in sensation seeking, risk-taking, and emotional intensity, at earlier ages, yet many important cognitive skills that can constrain these traits, such as reasoning and self-regulation, do not fully develop until late-adolescence and, more likely, even into early adulthood (Dahl, 2004).

The brain undergoes “explosive changes” throughout adolescence (Giedd, 2004: 83). However, rather than undergoing increases in computational capacity, development during adolescence seems to primarily involve the integration of different brain functions across cortical regions and the significant pruning of unused or redundant synaptic questions (Giedd, 1999; Luna & Sweeney, 2004; Spessot, Plessen, & Peterson, 2004). Thus, while childhood is characterized by the growth of grey matter, which for most lobes of the brain peaks just prior to puberty, adolescence instead involves myelination and the development of white matter, as well as significant synaptic pruning of unused synapses, which together facilitates communication between various brain regions, results in faster processing of cognitive responses, and leads to more complex cognitive skills and higher-order mental processes (Giedd, 2004; Luna & Sweeney, 2004). For instance, Sowell and colleagues (1999) compared nine healthy children to nine healthy adolescents and determined that between seven and 16 years of age grey matter in the dorsal-frontal lobe underwent significant transition into white matter.

By mid-adolescence, the maturation of the parietal, temporal, and occipital lobes appears largely complete (Giedd, 2004). In contrast, changes to the frontal lobe continue at

least into the second decade of life (Giedd, 2004; Hudspeth & Pribram, 1990; Sowell, Thompson, Holmes, Jernigan, & Toga, 1999; Sowell et al., 2001, 2003). Similar to the development of the brain, the maturation of the frontal lobe follows a posterior to anterior pathway. This linear pathway is significant, as the important cognitive executive functions are housed in the pre-frontal cortex (PFC), which is located in the anterior of the frontal lobe (Braver et al., 2002; Diamond, 2002; Sowell et al., 2001). Thus, development of these important skills continues into the second decade of life, which has significant implications for self-control (Luna & Sweeney, 2004; Sowell et al., 1999, 2003; Zelazo & Müller, 2011; Spessot et al., 2004).

Executive functions generally reflect the ability to engage in conscious control of mental processes and behaviours, or the integration of mental processes and actions with internal goals (Miller & Cohen, 2001; Zelazo & Müller, 2011). They involve higher order mental skills, such as planning, reasoning, decision-making, self-regulation, and behavioural inhibition. Although some forms of executive functioning, such as response inhibition and selective attention, begin to develop around the end of the first year of life and continues developing during early childhood (two to five years old), it is during adolescence that the PFC begins to mature and adolescents begin to hone the cognitive skills learned earlier in life (Luna & Sweeney, 2004). For instance, although response inhibition begins to develop in infancy (as demonstrated by infants' abilities to shift attention in the Go/No-Go task and attend to the variable of interest in the Stroop task), these tasks require significant brain effort compared to adults, and it is not until mid-adolescence that the PFC develops sufficiently to consistently override impulses to look at novel stimuli and maintain attention in another direction (the antisaccade task) (Luna & Sweeney, 2004).

However, while adolescents begin performing similarly to adults on many executive function measurements, they do not reach adult-level execution on some skills until adulthood, nor do they exhibit adult-like circuitry in terms of the brain structures utilized during the execution of cognitive tasks (Diamond, 2002; Giedd, 2004; Giedd et al., 1999; Luna & Sweeney,

2004; Zelazo & Müller, 2011).[1] For instance, Tamm, Menon, and Reiss (2002) found that there was no difference in performance accuracy on a Go/No-Go task between the ages of eight and 20; however, the speed with which participants learned to inhibit their responses increased with age. As another example, adults utilize the dorsolateral PFC (DL-PFC) to engage in executive functioning and other complex cognitive skills, such as concentration and inhibition of dominant responses (Diamond, 2002; Braver et al., 2002). Whereas adults rely on their DL-PFC to perform executive functions, children rely more on the parietal regions (Luna & Sweeney, 2004). Adolescence marks the transition towards utilizing the DL-PFC; however, as the DL-PFC does not fully mature and become integrated with other brain regions until the second decade of life, its use is not regular during adolescence, resulting in inconsistent response inhibition and other executive functioning (Giedd, 2004). Thus, although older adolescents perform at or very near to adult-levels on many cognitive skills, including reasoning, decision making, and the ability to appreciate long-term consequences for their actions, they continue to exhibit inconsistent response inhibition and as such, participate in reckless behaviours, such as aggression, drug use/abuse, and other illegal behaviours (Dahl, 2004; Leslie, Loughlin, Wang, Perez, Lotfipour, & Belluzi, 2004; Luna & Sweeney, 2004).

As previously noted, adolescence is a difficult period that is full of storm and stress. Arnett (1999) identified that one of the three central areas of difficulty for adolescents involved mood disruptions. He noted that adolescents are much more likely than individuals at younger or older life stages to experience wide and rapid swings in mood, and more likely to experience periods of depressed moods. This is important as incomplete emotional regulation plays an important role in adolescents' inability to consistently exert cognitive control over their impulses. The ventro-medial (VM) PFC, which is connected to the amygdala, is associated with emotional regulation whereas "cold cognition", involving tasks such as logic or sorting, is associated with the left side of the PFC, which also happens to be where the DL-PFC is located (Zelazo & Müller, 2011). As cold cognition is controlled by a part of the PFC not connected to emotional structures, adolescents can successfully engage in these tasks consistently. However, in

[1] It should be acknowledged that the PFC is likely supported in its execution of cognitive control by other brain structures and systems, and that part of the PFCs inability to consistently engage in cognitive control is not solely due to immaturity and ongoing myelination, but also that these others systems are not yet fully integrated with the PFC, and will not be until the second or third decade of life (Luna and Sweeney, 2004).

emotionally-charged or “hot cognition” situations, the emotional VM-PFC takes over, thus preventing the brain from utilizing the same structures adults would (the DL-PFC) to exert cognitive control and make appropriate decisions. In effect, although both adolescents and adults can experience the emotional nature of certain situations, the more mature DL-PFC of adults can generally inhibit the inappropriate desire to respond emotionally whereas the dominating nature of the VM-PFC in adolescence means they cannot yet consistently inhibit inappropriate emotional responses. Significantly, people with psychopathic traits also exhibit issues with controlling inappropriate dominant responses, implying that DL-PFC impairments may be at play.

In effect, PFC immaturity is likely responsible for the tendency for adolescents to engage in high-risk behaviours despite their ability to cognitively appreciate the potentially negative consequences. In particular, the DL-PFC is associated with self-control, or the ability to inhibit impulses and consider the consequences of one’s actions, of which the failure to acquire is considered a major risk factor for crime and deviance (Gottfredson & Hirschi, 1990). As an adolescent develops these important cognitive skills, their behaviour becomes more controlled; thus, it is likely that the maturation of the PFC is associated with the aging-out phenomenon, or the desistance from crime and deviance that typically comes with age (Wright et al., 2009). Significantly, research findings conclude that these regions of the brain differ in structure and function among offenders with PPD, suggesting that their failure to desist from crime and deviance may be the result of underdeveloped synaptic pathways between regions and structures in the brain, inadequate myelination of synaptic neurons, particularly in the frontal lobe, or likely, both. However, assessing psychopathic traits during adolescence becomes even more complex than during adulthood as, given this ongoing cognitive and emotional maturation, many adolescents exhibit psychopathic-like traits, such as impulsiveness, stimulation seeking, shallow affect, emotional instability, grandiosity, and egocentricity (Edens et al., 2001; Hart et al., 2002; Seagrave & Grisso, 2002). Still, the existing research supports that psychopathic traits can be both reliably and validly assessed in adolescents (e.g. Barry et al., 2000; Brandt, et al., 1997; Corrado et al., 2004; Forth et al., 1990; Gretton et al., 2004; Gretton et al., 2001; Lynam & Gudonis, 2005; Salekin et al., 2008; Stouthamer-Loeber, 1986; Vincent et al., 2003). One explanation for the early emergence of psychopathic traits is that psychopathic personality disorder is a propensity, or an underlying condition that no matter what developmental stage, exerts the same influence on the individual, although it may be manifested in different ways.

Neurological explanations of psychopathy fit this framework, as they suggest that underlying neurological dysfunctions are a plausible source of psychopathic personality disorder that are present and stable from early in life.

Differing Brain Structure and Function in PPD

Research over the last several decades concluded that individuals exhibiting high levels of psychopathic traits differ in both their brain structure and function from individuals with low levels of psychopathic traits. Raine and Yang (2006) observed that certain structural brain components, including the corpus callosum, hippocampus, and prefrontal grey matter appeared related to psychopathy, while Müller, Gänsβauer, Sommer, Döhnel, Weber, Schmidt-Wilcke, and Hajak (2008) identified reductions in grey matter volume in the frontal and temporal brain regions. In a meta-analysis of 39 studies involving over 4500 participants, Morgan and Lilienfeld (2000) reviewed the extant literature linking antisocial behavior with deficient executive functioning. Their analysis supported the relationship, but noted that the strength of the relationship depended somewhat on the operationalization of antisocial behaviour. Effect sizes were stronger for psychopathy than for antisocial personality disorder; however, the relationships with both constructs were weaker than the relationships between measures of executive functions and more general forms of delinquency and criminality. Unfortunately, the authors acknowledged that their meta-analysis was unable to differentiate between the different regions of the brain that may play a role in executive functioning, including the dorsolateral and orbitomedial areas. It is possible then that the inclusion of brain regions not specifically implicated in psychopathy may have weakened the resulting effect size; as mentioned above, research suggests the frontal cortex in particular is associated with psychopathic traits in both children and adults.

The frontal cortex, which is the last brain region to fully mature, consists of structures including the pre-frontal cortex (PFC), responsible for executive functions, such as selective attention, planning, and behavioural inhibition, and the more specific orbitofrontal cortex, which is responsible for controlling voluntary goal-directed behaviour (Schoenbaum, Chiba, & Gallagher, 1998; Tremblay & Schultz, 2000). These structures, as well as two others located elsewhere but which work in conjunction with the frontal cortex – the amygdala and the

hippocampus – have all been associated with psychopathic traits. Thus, these four structures will be discussed in additional detail.

Frontal Cortex

Research has identified differences with both the structure and function of the PFC between study participants with low and high psychopathy scores. Two studies with community psychopaths (Raine, Lencz, Bihrle, LaCasse, & Colletti, 2000; Yang, Raine, Lencz, Bihrle, LaCasse, & Colletti, 2005) reported reduced prefrontal grey matter volumes in subjects with high psychopathy scores compared to both normal and substance dependent control groups. In the second study, Yang and colleagues (2005) demonstrated that the differences in grey matter volume were distinct to "unsuccessful" (criminally convicted) psychopaths. Prefrontal grey matter volume among "successful" (community psychopaths with no convictions) psychopaths did not differ from the control group, whereas grey matter volume of unsuccessful psychopaths was one-fifth (22.3%) smaller than either controls or successful psychopaths.

The neurological distinction between successful and unsuccessful psychopaths was especially notable, as one of the theoretical differences between "primary" (successful) and "secondary" (unsuccessful) psychopaths has been the ability to control behavioural impulses (i.e., behavioural inhibition), which is an executive function. Yang et al. (2005) suggested that secondary psychopaths may be unsuccessful in their criminal endeavours due to additional executive dysfunctions, such as poor decision making abilities and reduced attention to cues of danger or impending punishment, all of which are controlled by the PFC. The findings by Yang and colleagues thus identify an important role for the PFC in the expression of secondary/unsuccessful psychopathy. The pathway towards primary/successful psychopathy has not yet been elucidated, although there appears to be a strong heritability component, at least for the underlying callous-unemotional traits (e.g. Jones & Viding, 2007).

A limitation of the above studies was the inability to parse out specific sections of the PFC. However, two subsequent studies (de Oliveira-Souza, Hare, Bramati, Garrido, Ignácio, Tovar-Moll, & Moll, 2008; Tiihonen, Rossi, Laakso et al., 2008) found reduced grey matter volume specifically within the orbitofrontal cortex, which is located in the PFC and which appears to play a role in decision making and behavioural control, and in fear acquisition

through stimulus-reinforcement learning (Birbaumer, Veit, Lotze, Erb, Hermann, Grodd, & Flor, 2005; de Oliveira-Souza et al., 2008; Rolls, 2004).

In fact, experimental studies had previously identified plausible roles for the OFC in psychopathy, leading some authors to speculate that psychopathy was associated with orbitofrontal cortex damage specifically, rather than prefrontal cortex dysfunction more generally (Morgan & Lilienfeld, 2000). Studies alternatively concluded that psychopaths failed to anticipate or respond to punishment (Aniskiewicz, 1979; Lykken, 1957), evidenced impairments in their ability to shift attention/inhibit punished responses when already engaged in goal-directed behaviour (Newman, Patterson, Howland, & Nichols, 1990; Newman, Schmitt, & Voss, 1997) failed to inhibit a previously learned (rewarded) behaviour when the reward was no longer provided (Lapierre, Braun, & Hodgins, 1995), persisted in reward-seeking behaviour while faced with increasing loss (Blair, Colledge, & Mitchell, 2001; Newman, Patterson, & Kosson, 1987; Siegel, 1978), and chose smaller short-term gains rather than larger long-term ones (Bechara, Damasio, Damasio, & Lee, 1999; Mitchell, Colledge, Leonard, & Blair, 2002). Lykken (1957) initially provided empirical support for Cleckley's (1976) clinical observation that psychopaths fail to learn from punishment by demonstrating poor passive avoidance of punishment, which he attributed to a general trait of fearlessness. However, subsequent theorizing around the relationship between psychopathy and failure to learn from punishment has focused more specifically on the inability of psychopaths to attend to cues of punishment once already engaged in reward-seeking behaviour. Thus, an alternative explanation for these findings is the Response Modulation Hypothesis, which proposed that when already occupied in a "dominant response set" (i.e. actively engaged in an activity that provides a reward for certain behaviours), individuals high in psychopathy have difficultly attending to contextual or peripheral cues that may be competing for distraction (e.g. Newman et al., 1997; Patterson, Kosson, & Newman, 1987; Patterson & Newman, 1993). These findings all implicate the OFC, as it is involved in controlling reward- and punishment-oriented behaviours (Rolls, 2004).

As previously suggested, the inability to anticipate and change behaviour in the face of impending punishment likely increases the likelihood of criminal justice system contact among unsuccessful psychopaths. In contrast, research suggests successful psychopaths do not suffer from executive dysfunction. In fact, Ishikawa, Raine, Lencz, Bihrle, and Lacasse (2001) found stronger levels of executive functioning among successful psychopaths even compared to a

community sample of non-psychopathic men who had never previously been criminally convicted, which may be one reason for their ability to avoid criminal justice system contact. However, both Aniskiewicz (1979) and Lykken (1957) found that low-anxious (primary) psychopaths were less affected by impending or anticipated punishment than high-anxious (secondary) psychopaths who acted more similarly to control (non-psychopathic) participants.

Amygdala

An area of the brain subjected to substantial theoretical speculation and empirical research in regards to psychopathy is the amygdala. The amygdala – located in the medial temporal lobes and part of the limbic system, along with the hippocampus, septum, and basal ganglia – coordinates the physiological response to emotional cues through the release of neurotransmitters (DeLisi, Umphress, & Vaughn, 2009). The amygdala is implicated specifically in the processing of fearful and sad emotions whereas other emotions (e.g. anger, happiness) are processed through other neural circuits, such as the orbitofrontal cortex (Blair, Morris, Frith, Perrett, & Dolan, 1999; DeLisi et al., 2009).

Blair (1995, 2005, 2006) formulated his violence inhibition mechanism (VIM) and Integrated Emotions System (IES) theories around the amygdala. Briefly, when a predatory animal is attacking another animal and the victimized animal shows submission and fear (i.e. through fearful expressions), the predatory animal will end their attack. Humans generally engage in a similar process; however, the psychopath's VIM appears to be deficient, which Blair (1999) attributes to an amygdala dysfunction that prevents the accurate interpretation of others' fearful expressions (Blair, 1999). Blair and colleagues empirically supported this theory both in regards to recognition of fearful expression (e.g. Blair et al., 2001; Blair, Mitchell, Peschardt, Colledge, Leonard, Shine, Murray, & Perrett, 2004) as well as fearful vocal affect (Blair, Mitchell, Richell, Kelly, Leonard, Newman, & Scott, 2002). Thus, a deficient VIM would lead to psychopathic traits, including lack of empathy and lack of remorse, and consequently increase the risk of other psychopathic traits, namely those related to antisocial behaviours.

Structural and functional brain imaging studies, as well as physiological studies, have consistently identified differences in the amygdala between psychopaths and controls. When faced with fearful stimuli, a healthy amygdala should be activated (DeLisi et al., 1999). Among healthy subjects, several studies identified activation in the left amygdala in response to fearful,

but not angry, expressions (Birbaumer et al., 2005; Blair et al., 1999; Jones, Laurens, Herba, Barker, & Viding, 2009; Morris, Frith, Perrett, Rowland, Young, Calder, et al., 1996). In contrast, Marsh, Finger, Mitchell, Reid, Sims and colleagues (2008) observed reductions in left amygdala activation in response to fearful, but not angry, expressions among 12 adolescent (10 to 17 years old) boys with callous unemotional traits but not among the 12 boys diagnosed only with ADHD, nor among the 12 healthy boys. Likewise, Sterzer, Stadler, Krebs, Kleinschmidt, and Poutska (2005) measured left amygdala reductions in 13 early adolescent (9 to 15 years old) boys with severe conduct disorder who were exposed to negative affective (not specifically fearful) valence images; interestingly, this association appeared to be due to aggressive behaviour, as the strength of the relationship increased alongside the extent of aggressive behaviours. Jones et al. (2009) also identified a reduction in activity, although in the right amygdala, among a sample of early adolescent boys with conduct problems and callous unemotional traits; similarly, Veit, Flor, Erb, Hermann, Lotze, Grodd, and Birbaumer (2002) observed a reduction in the right amygdala during an aversive conditioning study. In contrast, Birbaumer et al. (2005) observed a lack of amygdala activation in the frontolimibic circuit, which includes the left amygdala, among 10 adult male psychopathic offenders undergoing a fear conditioning exercise, though unlike the healthy controls, the psychopathic sample did exhibit a small amount of activation in the right amygdala. Similarly, Kiehl, Smith, Hare, Mendrek, Forster, Brink, and Liddle (2001) observed reduced affect-related activation in both the left and right amygdala, in addition to reduced activation in other parts of this limbic system. In contrast, the psychopathic offenders were more likely to show affect-related activation in structures located outside of the limbic system (the left anterior superior temporal gyrus/inferior frontal gyrus, and right infereior frontal gyrus). Similarly, Gordon, Baird, and End (2004) found that male college students with higher scores on the Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996) utilized their DLPFC when responding to affective tasks, whereas lower scoring students used their amygdala.

These findings may be a result of size differentials of the amygdala between psychopaths and healthy controls. Structurally speaking, the amygdala of psychopaths appears to differ from non-psychopaths in terms of bilateral volume (Yang, Raine, Narr, Colletti, & Toga, 2009). Yang et al. (2009) detected significant bilateral volume reductions in the amygdala of 27 psychopaths as compared to 32 healthy controls. Interestingly, as the score on the PCL-R increased, amygdala volumes significantly decreased; this correlation was particularly strong for

the affective and interpersonal domains of the PCL-R, as opposed to the behavioural or antisocial domains, suggesting that the core personality features of psychopathy are associated both to amygdala volume and, consequently, ability to detect negative emotions (fear and/or sadness) in others. The finding that the amygdala reductions were associated with the core traits of psychopathy was particularly important as this provides further evidence that psychopathy is a disorder with a neurobiological basis that may be developmentally understood, and which may have roots as early as prenatal development. In fact, a study by Sterzer, Stadler, Poustka, and Kleinschmidt (2007) observed reduced bilateral grey matter in the amygdala, as well as the anterior insula, among early adolescent (9 to 15 years old) boys with conduct disorder; moreover, reductions in grey matter in the anterior insula were correlated with lack of empathy. In effect then, there is evidence to support the neurological roots of lack of empathy as young as the early adolescent period, which is consistent with the functional findings provided by Jones et al. (2009), and with research on the development of emotional processing among children demonstrating that as young as 10 years of age, children have the distinct neural networks in place to process emotions similarly to adults, although this ability is continuing to mature (Lobaugh, Gibson, & Taylor, 2006).

Importantly, the psychopaths used in Yang's study were actually community psychopaths, meaning that although they displayed many of the emotional, interpersonal, and behavioural characteristics of the prototypical psychopath, they had not been convicted of a crime. Thus, they may differ in important ways, both criminally and in terms of their brain structure and function, compared to unsuccessful (i.e. criminalized) psychopaths. Further, correlations with the behavioural and/or antisocial factors of psychopathy may have been uncovered using criminal, as opposed to community, psychopaths. Regardless, the finding of significant volume reductions in the amygdala provided support for theories seeking to explain how and why psychopaths engage in violence against others. In particular, these results support the work of Blair and his theory of psychopathy involving amygdala dysfunction, which he attributed to be the underlying cause of psychopath's inability to recognize fearful expressions.

Of note, such research findings have been extended to samples of children and youth, suggesting that amygdala dysfunction may be a causal factor of core psychopathic traits (e.g. Blair & Coles, 2000; Blair et al., 2001; Stevens, Charman, & Blair, 2001). Blair and Coles (2000) conducted a study with 55 young male and female adolescents, aged 11 to 14, and found that

as total and factor scores on the Psychopathy Screening Device (PSD) increased, the ability to recognize sad and fearful facial expressions decreased. Similarly, in Blair et al.'s (2001) study, increasing amounts of intensity were required for 28 children and adolescents (nine to 17 year olds) with psychopathic tendencies, again assessed through the PSD, to accurately recognize sad expressions, and even at full intensity, these children were significantly more likely than the 31 non-psychopathic comparison participants to incorrectly identify fearful expressions. Interestingly, while the Stevens et al. (2001) study found similar results for sad and fearful facial expressions among their sample of 18 nine to 15 year old troubled males, those with psychopathic traits only showed the selective impairment for sad vocal tones, and not for fearful vocal tones. Regardless, these findings are significant as they suggest that early threats to the amygdala may contribute towards the development of future psychopathic traits, thus lending support to a neurobiological/neurocognitive developmental theory of psychopathy. Further, later research using a similar facial expression recognition task concluded that adult psychopaths only showed deficits in fear recognition (Blair et al., 2004). Given this, at some point in development, even those with psychopathic traits appear to develop the ability to accurately recognize sad facial expressions, while their impairments regarding recognition of fearful expressions appear to persist further into life. Such findings underscore the importance of considering psychopathy through a developmental lens and subsequently adopting age-graded analyses.

Importantly then, the research to date suggests that neurological impacts early in life, possibly even prenatally, result in reliance upon atypical brain structures for important functions, including information processing, emotional regulation, and behavioural controls. In effect, as a result of early neurological events, the brain of future psychopaths is re-wired and as development occurs, these differential pathways become hard-wired. Given that atypical brain structures are used to carry out these functions, psychopathic individuals are predisposed to challenges in accessing typical emotional and behavioural controls, increasing the risk of future antisocial behaviours against others

In addition to the structural and functional differences between psychopaths and comparison subjects, physiological data similarly suggests that psychopathic individuals experience abnormally low levels of anxiety and fearfulness. Research on fear conditioning involved exposure to shock or other forms of punishment where participants would be exposed

to an unconditioned stimulus that they would learn to associate with a painful stimuli. For instance, participants would first be exposed to a tone (unconditioned stimulus), which would subsequently be paired with an administered shock. Over repeated exposures, participants became conditioned to associate the experience of the stimulus with a negative event (conditioned stimulus). Once this conditional learning occurred, when again exposed to the conditioned stimulus, the participant should display physiological signs of fearful anticipation, such as an increased heart rate or sweating (skin conductance response) or startle responses (Lang, Bradley, & Cuthbert, 1990; Sanders, Wiltgen, & Fanselow, 2003).

Overwhelmingly, research concluded that while healthy participants and non-psychopathic offenders made these conditioned associations and displayed increased heart rate and skin conductance responses, psychopathic subjects did not show similar degrees of physiological arousal indicating that fewer and/or different cognitive resources are attending to the presence of such aversive stimuli, resulting in a failure to anticipate and react to impending punishment (Glenn, Raine, Venables, & Mednick, 2007; Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993; Osumi, Shimazaki, Imai, Sugiura, & Ohira, 2007). These findings conclude that physiologically, psychopaths differ from non-psychopathic subjects. Importantly, this difference appears to emerge early in life: the study by Glenn and colleagues (2007) utilized a prospective longitudinal design to demonstrate that high-scoring adult psychopaths were significantly less fearful and inhibited and significantly more stimulation seeking as three-year olds (as measured by skin conductance responses). Thus, in addition to the neurological data, there is also physiological evidence that the biological pathways towards adult psychopathy appear to begin at a very young age.

Yet, while no doubt a major contributing source of psychopathic traits, the amygdala is not alone in its differential function and structure among psychopaths; other brain structures, particularly the orbitofrontal cortex (previously discussed) and hippocampus, have also been identified as a source of fearlessness.

Hippocampus

The hippocampus is primarily involved in learning, memory, and spatial relationships. However, it also plays an important role in emotional and adaptive behaviour, specifically relating to fear conditioning to contextual stimuli through its spatial functions by acquiring and

retrieving stimuli-effect associations (Boccardi, Ganzola, Rossi, et al., 2010; Burman et al., 2006; Phillips & LeDoux, 1992; Sanders et al., 2003). According to Phillips and LeDoux (1992), while the amygdala is primarily involved in fear conditioning, the specific neurological processes engaged in forming the conditional response depends on the complexity of the incoming stimuli – more complex stimuli, such as those involving spatial situations require the hippocampuses involvement. For instance, an earlier study involving recall of a negative emotional event found that whereas non-psychopathic offenders recalled central details of the event (i.e. the colour of a woman's coat) better than peripheral details (i.e. the colour of a car in the background), reflecting a narrowing of attention in emotional situations, psychopathic offenders were equally likely to recall peripheral as central details, supporting the hypothesis that psychopaths struggle with processing emotional information and recall emotional content similarly to how they would recall neutral content (Christianson, Forth, Hare et al., 1996). Although this study was not directly brain-based, its focus on a recall task implies that the divergence is likely explained by hippocampal functions.

Consistent with structural findings concerning the amygdala, researchers have identified structural differences in the shape of the hippocampus when comparing psychopaths to healthy controls and/or to non-psychopathic offenders. Boccardi and colleagues (2010) observed a longitudinal depression, as well abnormally enlarged borders of both sides of the hippocampus, among violent high-scoring psychopaths as compared to healthy controls and mid-scoring psychopathic offenders, while Laakso, Vaurio, Koivisto and colleagues (2001) reported a significant negative correlation between the regional volumes of the right and left anteposterior axis of the hippocampus, which – significantly – is where contextual stimuli is received; although they also observed negative correlations between PCL-R scores and total hippocampal volume on both the right and left sides, these scores did not reach statistical significance.

Several other studies failed to find differences in total overall hippocampal grey matter volume when comparing individuals with either psychopathy or antisocial personality disorder (APD) with healthy controls (Barkataki, Kumari, Das, Taylor, & Sharma, 2006; Boccardi et al., 2010; Raine, Ishikawa, Arce, et al., 2004). It should be noted that some major distinguishing factors of psychopathy from APD are the deficient fear conditioning, dysfunctional emotional processing, and deficient response inhibition of psychopaths (Boccardi et al., 2010); thus, the failure to detect differences in hippocampal volumes of offenders with APD versus healthy

controls should not necessarily be taken as evidence that psychopaths do not differ from non-psychopaths in their hippocampal volume. Further, while these studies compared total hippocampal grey matter volume between different levels of psychopathy (e.g. medium versus high) and factors of psychopathy (Factor 1 and 2 of the PCL-R), only one study examined whether there were differences between successful (primary) and unsuccessful (secondary) psychopaths. Raine et al. (2004) found that among unsuccessful (criminally convicted) psychopaths, the right hippocampus exhibited greater volume than the left, implying that more synaptic pathways had been formed on this side. However, this abnormality was not found among successful psychopaths (high-scoring psychopaths who had committed crimes but had never been convicted).

Generally speaking, the right brain is more responsible for processing of emotional and affective content (e.g. Day & Wong, 1996). Functional studies have supported the role of the hippocampus in affective or emotional processing. Interestingly, criminals high in psychopathy displayed significantly decreased activation of the hippocampal system when exposed to affective stimuli; however, no change in activation was noted for neutral stimuli (Kiehl et al., 2001). Instead, the psychopathic group showed increased activation bilaterally of the temporal and frontal cortices. In other words, psychopaths were using different neural structures than non-psychopaths to process emotionally laden stimuli. In a different study, substance abusing psychopathic participants exhibited increased cerebral blood flow when processing emotional, as opposed to neutral, words whereas non-psychopathic participants exhibited increased flow when processing neutral, as opposed to emotional words (Intrator, Hare, Stritzke, et al., 1997). Presumably the emotional valence of words assists non-psychopaths in more quickly processing the meaning and relevance of affective than neutral content but the emotional connotation was lost on psychopaths, forcing them to work harder to interpret the meaning of the information (Intrator et al., 1997). This implies that normative neural pathways for emotional processing involving the amygdala and hippocampus are absent in the brains of psychopaths (Intrator et al., 1997; Kiehl et al., 2001) which could explain why in another study, criminal psychopaths displayed significantly longer mean reaction times to emotional word content compared to non-psychopathic participants (e.g. Williamson, Harpur, & Hare, 1991). In a recent text-analysis study, criminal psychopaths struggled to appropriately verbally convey emotions. Hancock, Woodworth, and Porter (2013) analysed offence narratives provided by homicide offenders and determined that the language of psychopathic homicide offenders was

substantially less fluent than non-psychopathic homicide offenders, suggesting that verbally conveying an emotional event to others in an appropriate manner was cognitively taxing to psychopaths.

Together, these studies strongly suggest that criminal psychopaths utilize a distinct neurological system of emotional information processing that relies on different brain circuitry than non-psychopaths and which therefore requires a greater expenditure of time and resources to complete. Unfortunately, the extent to which this abnormal neural circuitry applies to non-criminal psychopaths is not known, as such research typically involves offender populations. Further, although these findings lend support to early (possibly even during prenatal development) biological neurodevelopmental disruptions rather than environmental effects, it is not known whether this circuitry becomes 'hardwired' during childhood, adolescence, or early adulthood, which would have significant implications for successful 'rewiring'. However, as noted above, there is some existing evidence to demonstrate that some of these neurological differences are apparent from a young age, which consequently poses important implications for assessing psychopathy in childhood and adolescence.

The Need for an Age-Graded Analysis

Research is accumulating to support that PPD is a neurological condition characterized by dysfunctions in several areas, including the prefrontal cortex (with respect to executive functioning), amygdala and hippocampus (with respect to deficient fear anticipation and conditioning), and the orbitofrontal cortex (with respect to behavioural control weaknesses). Several studies denoted differences in brain structure and function early in life among those with disorders identified as precursors to PPD (i.e., conduct disorder). Given the research findings concerning the ongoing development and maturity of the brain, it is clear that in order to truly comprehend the development of PPD it is necessary to explore the expression of psychopathic traits at different stages of the life course. This particularly applies to adolescence, given the ongoing maturation of the PFC and the implications for cognitive control over impulsive desires. When exploring the development of psychopathic traits, it is therefore important to consider not only how these traits may be expressed differently and have different meaning between childhood, adolescence, and adulthood, but also to look at change specifically within each of these developmental periods. For instance, when exploring adolescent psychopathy, it is

important to consider that, corresponding with neurological development, certain psychopathic traits may be more meaningful or indicative of the disorder when expressed during some of the respective stages of early, middle, and late adolescence than at others. As will be discussed in the following chapters then, the analyses to be conducted in this dissertation will consider the expression of psychopathy from a developmental perspective whenever possible.

Chapter 4.

Structural Reliability and Confirmatory Factor Analysis of the CAPP-IRS

Introduction

As previously discussed, psychopathy is a personality disorder that encompasses interpersonal, affective, and behavioural dysfunctions, such as being cold and callous towards others, remorseless, impulsive, irresponsible, manipulative, egocentric, and superficial (Hare, 2003). These traits are represented on Hare's 20-items PCL-R for adults and PCL:YV (Forth et al., 2003) for youth, which have become the standard tools used in PPD diagnosis and research.

Over the last three decades, the PCL measures of psychopathy have been subjected to a wide variety of empirical validation. Initially the PCL items were subjected to exploratory factor analyses, which suggested that the PCL was represented by two broad domains: the personality-focused Interpersonal/Affective items (Factor 1) and the more overt Behavioural items (Factor 2) (Brandt et al., 1997; Hare, Harpur, Hakstian, Forth, Hart, & Newman, 1990; Harpur, Hakstian, & Hare, 1988; Harpur et al., 1989). However, this structure was challenged by Cooke and Michie in 2001 when they argued that the personality items representing the Factor 1 interpersonal and affective items of psychopathy were better organized into two distinct factors. Although the Behavioural items were left on a single factor, Cooke and Michie (2001) argued theoretically and empirically for the exclusion of items indicated by overt antisocial behaviours (Table 1), namely, Items 10, 12, 18, 19, and 20. Although their analysis supported this modification to Hare's model of psychopathy, Hare and colleagues soon challenged the removal of items indexing antisocial behaviours and introduced a two-facet four-factor model of psychopathy in which the items removed by Cooke and Michie (2001) were represented by the fourth factor of Antisocial Behaviour (Hare & Neumann, 2006, 2010; Vitacco, Neumann,

Caldwell, Leistico, & Van Rybroek, 2006). This exchange has led to ongoing debates concerning the correct factor structure of the PCL scales and, by extension, the construct of PPD itself.

Table 2: 2-, 3-, and 4-Factor Models of the PCL Scales

PCL-R (PCL:YV) Items	2-Factor (Hare et al., 1990)	3-Factor (Cooke & Michie, 2001)	2-Factor, 4-Facet (Hare & Neumann, 2005)
1. Glibness/Superficial Charm (Impression Management)	1	1	1
2. Grandiose Sense of Self-Worth	1	1	1
3. Need for Stimulation	2	3	3
4. Pathological Lying	1	1	1
5. Conning/Manipulative	1	1	1
6. Lack of Remorse or Guilt	1	2	2
7. Shallow Affect	1	2	2
8. Callous/Lack of Empathy	1	2	2
9. Parasitic Lifestyle (Parasitic Orientation)	2	3	3
10. Poor Behavioral Controls (Poor Anger Control)	2	-	4
11. Promiscuous (Impersonal) Sexual Behavior	-	-	-
12. Early Behavioral Problems	2	-	4
13. Lack of Realistic, Long-Term Goals	2	3	3
14. Impulsivity	2	3	3
15. Irresponsibility	2	3	3
16. Failure to Accept Responsibility	1	2	2
17. Many Short-Term Marital (Unstable Interpersonal) Relationships	-	-	-
18. Juvenile Delinquency (Serious Criminal Behaviour)	2	-	4
19. Revocation of Conditional Release*	2	-	4
20. Criminal Versatility*	-	-	4

* Different definition/scoring for the youth manual

Understanding not only which personality traits are symptomatic of psychopathy but also how they go together is essential. When some traits are related to each other more than they are to other traits, they produce a coherent sub-scale that has theoretical importance, as they

allow for speculation regarding common etiology, consequential behaviours, and relationships with other psychopathologies. This is also important at an empirical level, as it will affect the ability to establish the external validity of proposed measurement scales since these different factors may have distinct relationships with other personality and mental health issues, including internalizing (e.g. depression, anxiety) and externalizing (e.g. antisocial personality, borderline personality) disorders. Of course, the particular factor structure that is identified is dependent not only upon the model's conceptualization and the symptoms included in the measurement in the first place, but also the particular sample in which they are expressed, such as a criminal population as opposed to a general population, which likely explains the relevance of antisocial behaviours to Hare's conceptualization and operationalization of PPD, but not to Cleckley's.

The accurate division of psychopathic traits into their distinct factors is critical for criminologists, as it affects identification and explication of the relationship of psychopathic personality disorder with important criminal justice outcomes. Generally, the PCL total score as well as sub-scales have been reliable predictors of important criminal justice outcomes both for adult and young offenders, including frequency and time to general and violent recidivism (Corrado et al., 2004; DeLisi & Vaughn, 2008; Edens, Campbell, & Weir, 2006; Gretton et al., 2004; Gretton et al., 2001; Harris, Rice, & Cormier, 1991; Hart, Kropp, & Hare, 1988; Hemphill, Hare, & Wong, 1998; Porter, Birt, & Boer, 2001; Salekin, 2008; Salekin et al., 1996; Schmidt, McKinnon, Chatta, & Brownlee, 2006; Vaughn & DeLisi, 2008; Vincent, Odgers, McCormick, & Corrado, 2008; Vincent et al., 2003; Walsh & Kosson, 2007; Walters, Knight, Grann, & Dahle, 2008). Although some research previously suggested that they appear to better predict short- than long-term recidivism among youth (Cauffman, Kimonis, Dmitrieva, & Monahan, 2009; Edens & Cahill, 2007), more recent studies have associated high levels of psychopathic traits in adolescence with longer-term criminal career trajectories (McCuish et al., 2014; Vaughn & DeLisi, 2008; Vaughn et al., 2008).

The PCL scales have been utilized extensively in criminal justice decision making because of their predictive validity regarding recidivism among previously incarcerated offenders, especially when compared to the utility of key criminological related constructs, such as socioeconomic status, family influences, and demographic variables. Accordingly, PCL scores frequently affect management decisions relating to institutional placement and

sentencing decisions, such as time served prior to parole eligibility (Harris et al., 1991; Salekin, 2008; Zinger & Forth, 1998).

In addition, PCL scores are predictive of both the onset of criminality and career criminality; high-scorers offend at a significantly earlier age and accumulate over twice as many convictions than low-scorers, and several hundred percent more likely to be classified as a career criminal (Blackburn & Coid, 1998; Vaughn & DeLisi, 2008). Psychopathy scores further predict various forms of adult offender and young offender institutional misconduct (Buffington-Vollum, Edens, Johnson, & Johnson, 2002; Das, de Ruiter, Lodewijks, & Doreleijers, 2007; Dolan & Blackburn, 2006; Dolan & Rennie, 2006; Douglas, Ogloff, Nicholls, & Grant, 1999; Douglas, Strand, Belfrage, & Fransson, 2005; Doyle, Dolan, & McGovern, 2002; Edens et al., 2002; Edens & Campbell, 2007; Gray, Hill, McGleish, Timmons, MacCulloch, & Snowden, 2003; Guy, Edens, Anthony, & Douglas, 2005; Heilbrun, Hart, Hare, Gustafson, Nunez, & White, 1998; Hildebrand, de Ruiter, & Nijman, 2004; Hill, Rogers, & Bickfrod, 1996; Murrie, Cornell, Kaplan, McConville, & Levy-Elkon, 2004; Nicholls, Ogloff, & Douglas, 2004; Skeem & Cauffman, 2003; Spain et al., 2004; Stafford & Cornell, 2003; Young, Justice, & Erdberg, 2004).

However, consistent with Cooke and Michie's (2001) criticism of inclusion of the antisocial behaviours, several authors found that, at least for young offenders, this predictive relationship was primarily based on the contributions made by Factor 4 of the PCL:YV (Cauffman et al., 2009; Corrado et al., 2004; Gretton et al., 2004; Hill, Neumann, & Rogers, 2004; McCuish et al., 2014; Vincent et al., 2008; Vitacco et al., 2006; Vitacco, Neumann, & Jackson, 2005; Walters et al., 2008). Factor 4 consists of indicators of overt antisocial behaviours; therefore, there has been an ongoing theoretical debate regarding the dominance of antisocial behaviours as opposed to the expected predominance of the affective and interpersonal factors, which are often interpreted to represent the "core" traits of psychopathy (Skeem & Cooke, 2010). Moreover, frequent participation in a range of antisocial acts, including criminal behaviours, contributes to high scores on Factor 4 of the PCL, which raises a key construct validity issue concerning a tautological relationship if Factor 4 then predominately predicts antisocial behaviours, including criminal offending. The ongoing theoretical debate, therefore, has focused on whether antisocial behaviours should be considered outcomes of psychopathy rather than as defining symptoms of psychopathy. While initially, traits such as criminal versatility and serious violations of conditional release were considered symptomatic in

the Hare PCL scales, the standard critique has been that criminality in particular, but also related serious antisocial behaviours, should be considered outcomes of other psychopathic traits, such as callousness, lack of remorse, and impulsivity (e.g. Cooke & Michie, 2001; Cooke et al., 2004; Cooke, Michie, & Hart, 2006; Cooke, Michie, & Skeem, 2007; Lilienfeld, 1994, 1998; Skeem & Cooke, 2010).

Historically, Cleckley (1941, 1964, 1976) did not consider antisocial behaviours as central to his psychopathy construct as a defining clinical feature. Yet, in composing the PCL, Hare (1991, 2003) included several antisocial behaviour indicators, such as the criminal behavioural trends of criminal versatility, juvenile delinquency/serious criminal behaviours, and serious revocations of conditional release. Moreover, he also conducted his scale validations using prison inmates. This is significant, as factor analysis is sample dependent; sample characteristics, such as degree of criminality among participants, affect which individual measurement items are relevant and where and how they load onto their respective factors. Predictably then, antisocial behaviours were confirmed as relevant domain traits of psychopathy. This led Cooke et al. (2004) to assert that it would be difficult for an individual to receive a diagnosis of psychopathy if not heavily involved in antisocial acts, given that seven of the 20 PCL items were directly or indirectly based on such behaviours. Not surprisingly, PPD has since been described as the most important clinical construct for the criminal justice system (Hare, 1998) and is a central construct in criminological theory , with one criminologist referring to it as the quintessential theory of crime (DeLisi, 2009) and others arguing for its inclusion in DLC theories (Fox et al., 2015). Yet only between 15% to 30% of criminally incarcerated individuals are diagnosed with PPD, while the majority (50% to 80%) can be diagnosed with the more behaviourally focused Antisocial Personality Disorder (Ogloff, 2006; Salekin et al., 1998). The remaining 13 personality-focused items on the PCL help distinguish psychopathic from this larger population of offenders. Unfortunately, given the pre-eminence of the antisocial behaviours, the PCL is not as discriminating in the general population where overt antisocial behaviours occur less frequently and, consequently, it may be more difficult to detect PPD in communities using the PCL.

Furthermore, the utility of the affective and interpersonal traits of psychopathy in predicting and understanding antisociality has been difficult to assess given the confounding effects of overt (e.g. criminal versatility) and covert (e.g., modus operandi) indicators of

antisocial behaviours that appear on the other factors of the PCL (Cooke & Michie, 2001; Cooke, et al., 2004; DeLisi, 2009). It is possible that the close relationship between psychopathy and antisocial behaviours is at least partly the result of the manner in which psychopathy was initially conceptualized and operationalized by Hare. Whether such a relationship would hold using more personality-focused measures of psychopathy, such as the PPI, remains to be seen. It is important to explore such personality-focused measures given that the tautology inherent to Hare's PCL limits comprehension of the nature of the relationship between psychopathy and antisocial behaviours, as well as the etiology of the disorder itself (Farrington, 2005). In effect, without this exploration, it will continue to be difficult to understand the relationship between psychopathy and serious antisocial behaviours, especially criminality.

As a consequence of the ongoing theoretical debate concerning the inclusion of antisocial behaviours as primary symptoms of PPD rather than as outcomes of the remaining psychopathic traits, the empirical debate concerning the structure of psychopathy likewise continues. The PCL scales have been subjected to numerous confirmatory factor analyses in order to identify whether the 2, 3, or 4 factor model is the most appropriate. The 2-factor model has largely been replaced by the other models. However, while there is empirical support for the more theoretically elaborate 4-factor model (Hare & Neumann, 2005, 2006; Jones et al., 2006; Neumann, Hare, & Newman, 2007; Neumann, Kosson, & Salekin, 2007; Neumann, Kosson, Forth, & Hare, 2006; Neumann, Vitacco, Hare, & Wupperman, 2005; Salekin et al., 2006), it remains theoretically problematic (Cooke et al., 2004; Jones et al., 2006; Skeem & Cooke, 2010). Using the PCL to predict criminal justice outcomes, including time to, frequency of, and form of recidivism following release from custody means that the relationship between psychopathy and such antisocial behaviours is likely overstated, given the predominance of antisocial behaviours. In criminological theory and research it has been somewhat axiomatic that the best predictor of future criminal behaviour, generally, has been past criminal behaviour. In other words, it is not at all evident that PCL based instruments contribute fundamentally to the existing theories of serious criminality beyond the relative predictive power of the Factor 4 traits.

Nonetheless, a central theme of this dissertation is that psychopathy, measured more fully, is central to theories of serious criminality (e.g. DeLisi, 2009; Farrington, 2005; Fox et al., 2015). The nature of the remaining items of psychopathy, including callous-unemotional, lack of remorse, impulsiveness, and shallow affect, increase the risk for antisocial behaviours, such as

criminality and should contribute their own predictive power. In addition, identifying the key symptoms of PPD and their relationship to antisocial behaviours is important for preventative purposes. Again, including antisocial behaviours as traits *of* psychopathy rather than traits *resulting* from psychopathy creates a tautology of measurement that prevents understanding of whether and why psychopathy is a predictor of antisocial behaviours (Farrington, 2005; Jones et al., 2006; Walters, 2004).

Movement towards Personality-Based Conceptualizations of PPD

The debate regarding the relevance of antisocial behaviours to the construct of psychopathy has been ongoing for at least a decade now, with some experts questioning whether the PCL measures present adequate representations of this construct or whether they are perhaps too focused on the antisocial, and in particular, criminality aspects of this disorder to the exclusion of other psychological variables historically important to PPD, such as a lack of anxiety and hostility that are not directly indexed on the PCL scales (Cooke & Michie, 2001; Cooke et al., 2006; Cooke et al., 2004; Cooke, et al., 2007; Hall, Benning, & Patrick, 2004; Hare, 2003; Lilienfeld & Andrews, 1996; Lynam & Derefinko, 2006; Patrick, 2010; Skeem & Cooke, 2010; Smith & Newman, 1990; Verona, Patrick, & Joiner, 2001). Given these theoretical critiques, new personality based measures of psychopathy that propose new conceptualizations of psychopathic personality disorder have been developed, including the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke et al., 2012), which is a recent attempt to more fully explicate and measure psychopathy for both youth and adults.

The Comprehensive Assessment of Psychopathic Personality (CAPP)

The CAPP proposes a hierarchical 33-symptom six-domain model of psychopathy that is more consistent with original and most current clinical conceptualizations of psychopathy (e.g. Cleckley, 1941; Karpman, 1941; McCord & McCord, 1964; Hall & Benning, 2006; Cooke et al., 2004). Accordingly, the focus is on the personality aspects of the disorder while participation in criminality and other antisocial behaviours are excluded. Furthermore, it provides a more finite distinction among the different domains of dysfunction provided by the PCL; the traditional three personality-focused psychopathy factors have been reconfigured and expanded into six domains. The PCL Factor 1 Arrogant and Deceitful Interpersonal Style, for example, included

interpersonal issues (glibness/superficial charm, grandiose sense of self-worth, pathological lying, and conning/manipulative) that are now dived into the *Dominance* domain*,* referring to the degree of control the individual seeks in their relationships with other people (e.g. being *domineering*, *manipulative*, and *insincere*) and *Self domain,* concerning perceptions and understanding of one's own identity (e.g. *self-centredness*, *unstable self-concept*, and a *sense of uniqueness*).Similarly, the emotional dysfunction on the PCL that is indexed in Factor 2 Deficient Affective Experience (callous/lack of empathy, lack of remorse/guilt, shallow affect, and failure to accept responsibility) is now divided in the CAPP into the *Attachment domain* that references the quality of the individuals relationships with others (e.g. being *uncommitted* or *uncaring*) and *Emotional domain* that involves the ability to experience and regulate emotions (e.g. *lacking anxiety*, *emotional depth*, and *emotional stability*). In the four facet model of the PCL, the original behaviour domain was divided into the Factor 3 Impulsive and Irresponsible Behavioural Style (need for stimulation, parasitic lifestyle, lack of realistic long-term goals, impulsivity, and irresponsibility) and the Factor 4 Antisocial Behaviours (poor behavioural controls, early behavioural problems, juvenile delinquency, revocation of conditional release, and criminal versatility). In the CAPP, the above Factor 3 symptoms are further divided into the *Behavioural* domain, focusing on the ability of the individual to regulate their own behaviour (e.g. *lacking perseverance*, *sensation seeking,* and *unreliable*), and *Cognitive* domain, concerning underlying thought processes that influence behaviours (e.g. *suspicious* and *intolerant* towards others). Most importantly, given that the CAPP is a fully clinical derived personality-based measure, there is no reference to any of the distinctly and potentially tautological behavioural items found in the PCL Factor 4 (Cooke et al., 2012). Critically, the CAPP references key personality symptoms the PCL has been criticized for failing to include, in particular, a lack of anxiety as well as suspiciousness, antagonistic, restless, unattached, and having an unstable self-concept.

Each of the six interconnected yet distinct domains of personality is denoted by a specific set of representative symptoms for a total of 33 symptoms (Cooke et al., 2012).[2] It is

[2] Although the original CAPP manual reflected Gregarious as a symptom of the Dominance domain, and Sensation Seeking as a symptom of the Behavioural Domain, the CAPP-IRS interview and scoring manual do not contain reference to these symptoms. Further, while the original CAPP manual mentions Distractible on the Cognitive Domain, the CAPP-IRS interview and scoring manual refer to Lacks Concentration.

important to note that at this time, the CAPP six-domain structure of psychopathy is entirely theoretical and the 33 symptoms putative. In these early stages of instrument development, the CAPP therefore is purposively overinclusive of possible symptoms indicative of psychopathy rather than risk under-specifying the construct (Cooke et al., 2012).

The CAPP-Institutional Rating Scale (CAPP-IRS) is designed to measure the CAPP model of psychopathy (Cooke et al., 2012). Based on a detailed semi-structured interview and file review, the 33 CAPP symptoms are measured on a seven point scale based on their degree of presence and severity of dysfunction. The adult CAPP version is currently undergoing translation and testing in several countries. The initial results indicated good content validity of the proposed symptom model (Hoff, Rypdal, Mykletun, & Cooke, 2012; Kreis et al., 2012). In addition, Pedersen, Kunz, Rasmussen, and Elasass (2010) identified strong internal consistency of the CAPP-IRS domain scores. Using a slightly modified CAPP-IRS, McCormick (2007) conducted a similar analysis of a small sample of incarcerated youth and found support for the interrater reliability and internal consistency of the CAPP-IRS total and domain scores. Specifically, Cronbach's alpha was good (.87) for the total score, although somewhat weaker for the domain scores (*Attachment* α = .85; *Behaviour* α = .79; *Cognitive* α = .72; *Dominance* α = .74; *Emotional* α = .67; *Self* α = .79). The removal of *Unstable self-concept* from the *Self* domain increased the domain alpha from .79 to .83 (McCormick, 2007). However, this study sample was only 30 youth, and, therefore, replication with a larger sample prior to restructuring the CAPP-IRS with youth is required.

Two case studies found that that the CAPP-IRS provided a much more clinically detailed picture of symptomatology than the PCL scales. Dawson, McCuish, Hart, and Corrado (2012) compared the PCL:YV and CAPP-IRS profiles of two adolescent males incarcerated for extremely serious violent offences. Kreis and Cooke (2012) compared the PCL:SV and CAPP-IRS profiles of two incarcerated adult women. Both studies specifically selected individuals with suspected high levels of supposed psychopathic traits. While the PCL scales provided useful clinical information for all four individuals regarding their particular dysfunctions, the CAPP-IRS provided fuller insight based on its greater number of clinically based symptoms and their conceptual assignment to six personality domains. For instance, Dawson and colleagues (2012) noted that although their two offenders received nearly similar factor scores on the PCL, the CAPP-IRS yielded more insight into the distinctive patterns that resulted in the same

approximate score. Salekin, Barker, Ang, and MacDougall (2012) noted that the CAPP-IRS profile of these two serious young offenders were consistent with primary and secondary forms of psychopathy, a key theoretical and clinical distinction not easily facilitated by the PCL with its more limited range of measured traits and domains.

Still, Salekin and colleagues (2012) recently critiqued the CAPP as having some inaccurate and indistinct symptom organization. In addition, the early prototypically findings suggested that several symptoms, in particular, *Unstable self-concept, Lacks concentration,* and *Lacks pleasure* were less representative of psychopathy (Hoff et al., 2012; Kreis, Cooke, Michie, Hoff, & Logan, 2012). Overall, however, prototypicality studies conducted have identified good content validity of the proposed CAPP model. Using a sample of 132 international mental health professionals, Kreis and colleagues (2012) found that 25 of the 33 symptoms were rated as highly prototypical of psychopathy whereas nine foil symptoms (perfectionistic, strange, dependent, restrained, self-conscious, considerate, cautious, shy, and conscientious) received low prototypicality scores At the domain level, the *Attachment*, *Dominance*, and *Self* domains were viewed as most prototypical while the *Cognitive* domain received the lowest prototypicality scores. These results were basically replicated by Hoff and colleagues (2012) in their combined sample of 211 forensic mental health professionals, 32 correctional staff, and 553 Norwegian community residents. Yet, in addition to the symptoms of *Lacks planfulness* and *Lacks concentration*, Hoff's respondents also perceived that *Restless* and *Lacks perseverance* were not prototypical of psychopathy. Further, *Lacks pleasure* and *Unstable self-concept* were not rated as prototypical in two of their three samples (Hoff et al., 2012). Whereas Kreis et al. (2012) concluded that the majority of CAPP symptoms were both representative of and specific to psychopathy, Hoff and colleagues (2012) identified that several of the problematic symptoms were more representative of the broader general impulsivity construct. This suggested that impulsivity is a trait common to many forms of psychopathology, and, therefore, is not particularly useful in distinguishing psychopathy. In other words, the more important psychopathy symptoms appeared to be related to the domains based on aspects of interpersonal functioning (i.e., the *Dominance*, *Attachment*, and *Self* domains).

While these prototypicality analyses have suggested overall good content validity of the proposed CAPP model, it is essential that the hypothesized relationships of these symptoms to the overall six domain construct of psychopathy be explored with an applied sample of ratings.

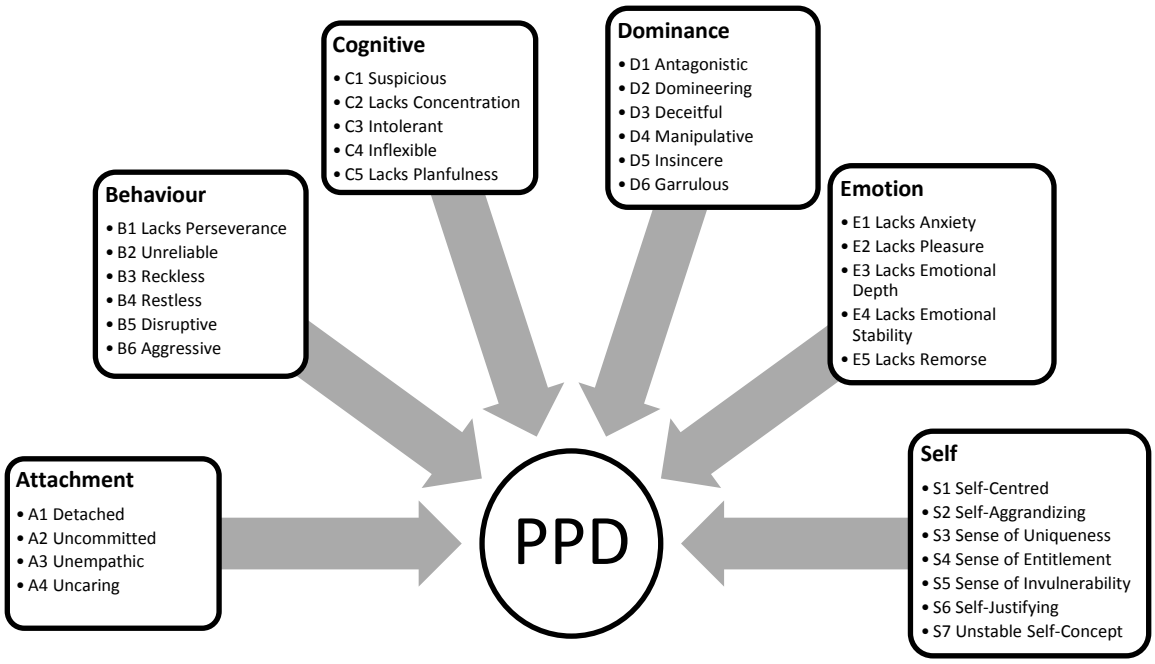
Further, beyond the prototypicality studies, the unidimensionality of the domains has yet to be established (Hoff et al., 2012; Kreis et al., 2012). As mentioned above, in the prototypicality studies the *Attachment* and *Behavioural* domains initially achieved good fit, whereas the other four domains required some modification (symptom removal) before achieving good fit. Specifically, Kreis et al. (2012) found that the symptoms preventing a good fit were *Lacks planfulness* from the *Cognitive* domain, *Antagonistic* from the *Dominance* domain, *Lacks pleasure* from the Emotional domain, and *Unstable self-concept* from the Self domain. Hoff et al.'s (2012) findings were essentially identical, with the added problematic symptoms of *Lacks concentration* (*Cognitive*) and *Garrulous* (*Dominance*).

Again, these analyses were conducted using ratings of the prototypical psychopathic provided by samples of mental health professionals and laypeople. There is a need to test the internal structural reliability of the theoretical six-domain model, as well as the unidimensionality of each domain before subjecting this theoretical 6-domain model to a confirmatory factor analysis. These are important first steps in establishing the construct validity of the CAPPs conceptualization of PPD.

Current Study

There are two major themes in this chapter. The first is to examine the internal structural reliability and unidimensionality of the 33-symptom model, as well as the theoretically organized 6-domain structure of the CAPP using CAPP-IRS ratings assigned to incarcerated serious and violent youth. The second major theme of this chapter is the utilization of confirmatory factor analysis with this sample of incarcerated serious and violent young offenders to examine the CAPPs theoretical structure (Figure 1) i.e., to test the extent of support for the organization of the proposed symptomatology. The current study therefore continues the analysis of the CAPP-IRS internal structure through a focus on classical test theory techniques using a larger sample of 186 incarcerated youth. Specifically, the internal structural reliability and theoretical structure of the CAPP will be tested using a sample of CAPP-IRS ratings collected from serious and violent young offenders remanded to custody in two youth detention centres in British Columbia.

Figure 1: The 33 Symptom 6-Domain Theoretical CAPP Model of Psychopathy



Methodology

Procedure

The study data was collected from a larger Social Sciences and Humanities Research Council funded Simon Fraser University study led by Dr. Raymond Corrado with incarcerated serious and violent young offenders in British Columbia, Canada (the ISVYO project). Permission to review the files of all remanded youth in Burnaby and Victoria youth custody centres and to invite those youth to participate in the ISVYO study was given by the British Columbia Ministry of Child and Family Development; further, ethical approval for both the larger and current study was provided by the Simon Fraser University Research Ethics Board. The interviews were conducted by male and female trained undergraduate and graduate Criminology students from Simon Fraser University.

Following the introduction of the *Youth Criminal Justice Act* in 2003, only youth who had committed a violent offence and/or who were serious (chronic) offenders should be remanded to

custody and receive a sentence involving incarceration. Between 2005 and 2011, the ISVYO project collected data from youth remanded to Burnaby and Victoria. All youth entering these custody centers were invited to participate in the study; however, those who were determined to be suffering from mental disability (e.g. borderline intelligence) or who were housed in the Intake Assessment Unit (IAU) for psychiatric illnesses (e.g. substance-induced psychosis) were excluded from participating. Youth were informed regarding the purpose and nature of the study and were instructed that their participation would not result in any criminal justice system benefits (e.g. reduction to sentence). Those who gave their consent to participate were invited to complete a series of structured and semi-structured interviews while in custody; as a thank you for participating, youth were given a drink and a snack to consume during the interview. The structured Time 1 interview collected data regarding risk factors for offending, such as demographic, education, family, and mental health profiles, as well as self-reported criminal history. A second semi-structured interview collected personality data used in the CAPP and PCL assessments. A third interview was conducted with youth who were incarcerated for over a month; this Exit interview focused on experiences while incarcerated and goals for release. File data was also coded for all youth. For the purposes of the current study, only data from the first two interviews will be analysed.

Sample

Day 1 interview (demographic and risk factor profile) data was available for 186 youth who had also completed the CAPP-IRS. The vast majority (78.5%) of these 186 youth were male. Over half (59.2%) were Caucasian, while a large percentage (29.9%) self-reported Aboriginal descent. Youth ranged in age from 12 to 18 and were an average of 15.86 years old (SD = 1.20). Before arriving in custody, youth were most commonly living with their natural mother (19.5%), with foster parents (17.3%), with a friend/significant other (13.0%), or with a relative (12.4%). Less than half (43.2%) were attending school prior to arriving in custody.

The youth were remanded for an average of four charges (X = 4.14, SD = 2.73); most commonly charges involved administrative offences (60.7%), although violent offences were the next most common reason for incarceration (51.7%), followed by property (44.3%), driving (9.5%), and drug (7.5%) offences. Only one-third (36.3%) of youth were incarcerated for the first time; on average, youth self-reported having been incarcerated nearly three times before the

current remand (*X* = 2.76, *SD* = 3.39), with an average first age in custody of 14.30 years old (*SD* = 1.62). The most common self-reported prior offences included breaching probation (92.3%), common assault (88.5%), drug offences (83.1%), break and enter (76.0%), threats/intimidation (74.0%), and motor vehicle theft (72.8%). In effect, the youth participating in this study appeared to be serious offenders who were regularly involved in a mix of administrative, property, and violent crimes.

Measures

CAPP-IRS

The only measure analyzed in this chapter was the CAPP-IRS (Cooke et al., 2005). Each symptom on the CAPP-IRS is measured on a seven-point scale where the score reflects the persistence of symptomatic manifestation across time, situations, and relationships and the corresponding degree of dysfunction, impairment, and/or distress it causes to the self or others. The current study analysed only domain and symptom scores. No analyses were conducted on the three adjectival descriptors for each symptom and the behavioural indicators that help characterize the extent to which the symptom is present and maladaptive,

In an earlier analysis with 30 youth from the same sample, McCormick (2007) concluded that the CAPP-IRS had excellent overall interrater reliability (Intraclass Correlation Coefficient = .91) and good to excellent domain reliabilities (ICCs from .69 to .86), similar to research with the PCL (Dolan & Rennie, 2006; Gretton, Hare, & Catchpole, 2004; Jones et al., 2006; Lynam et al., 2007; Salekin, Brannen, Zalot, Leistico, & Neumann, 2006; Skeem & Cauffman, 2003; Vincent, 2002) and the CAPP-IRS with adults (Pedersen et al., 2010). These findings were particularly important, given that the CAPP-IRS symptom assessments utilize a much wider 7-point scale than the three-point PCL assessment suggesting interrater reliability would be more difficult to consistently achieve. However, interrater reliability for the individual symptoms tended to be weaker (McCormick, 2007).

Prior to any analyses being conducted, several steps were taken to inspect the data for issues that could affect the multivariate analyses. First, analyses of missing data were conducted. 200 male and female youth had completed the CAPP-IRS interview; however, one or more symptom scores were missing for 25 different youth. Where possible, the author

substituted in a symptom score for the youth based on an evaluation of their associated descriptive data scores. For instance, one youth was missing a rating for the severity of the *Detached* symptom of psychopathy. This symptom is represented by the three adjectival descriptors of *remote*, *distant*, and *cold* each rated on a scale of 0 (not at all descriptive) to 3 (very descriptive), as well as the seven indicators of 'unattached to others', 'uncaring towards others', 'does not keep friends for long', 'does not have any friends', does not report even superficial warmth or affection for another person', 'describes self as a loner who does not value the company of others', and 'the company of others is described in negative terms', each measured on a dichotomous scale (no or yes). By evaluating the available ratings of these descriptors and indicators, the author estimated the approximate apparent severity of the symptom. This process allowed symptom scores to be imputed for 10 youth. The remaining 15 youth were deleted from the dataset given that the additional descriptive information was also unscored. No youth were missing domain scores.

Total scores ranged from 0 to 147 out of a possible 0 to 231 (Table 2). Currently, no cut-point exists for determining the presence of PPD using the CAPP. However, as a reference point, one-fifth (21.2%) of the sample met the criteria for youth psychopathy using a cut-off of 27 on the PCL:YV. Using an independent samples t-test to compare gender, male and female youth did not significantly differ on the domain and total scores.

Table 3: CAPP-IRS Descriptive Scores

	Full Sample (n=185)				Males (n=147)		Females (n=38)	
Domain	**Minimum**	**Maximum**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Attachment	0	20	6.80	4.94	6.64	4.94	7.37	4.97
Behaviour	0	34	14.47	6.64	14.04	6.33	16.13	7.59
Cognitive	0	21	10.07	5.16	9.73	5.13	11.34	5.15
Dominance	0	29	9.50	6.58	9.51	6.70	9.44	6.21
Emotional	0	25	9.31	5.33	9.12	5.53	10.02	4.48
Self	0	30	9.38	6.46	9.17	6.43	10.18	6.61
Total	0	148	59.51	28.60				

Next, the symptom, domain, and total CAPP-IRS scores were screened individually for univariate outliers using boxplots. While one youth had an outlying value on the *Self* domain and the CAPP total score, the remaining domains had no univariate outliers. Unfortunately at the

symptom level, 37 outliers were detected across 28 different youth. Three symptoms in particular had a large number of outliers (E2 *Lacks pleasure* = 13, S3 *Sense of uniqueness* = 7, and S4 *Sense of entitlement* = 6) and therefore they could be ideal variables for transformation. However, as the intended analyses in this dissertation include factor analysis, transforming variables is not ideal as it could degrade the clarity of model interpretation and fit. Further, although seven youth had outlying values on two symptoms and one had outlying values on three symptoms, and could therefore be considered for deletion from the dataset, the removal of cases is not ideal as it reduces necessary information and power of the analysis. The remaining 20 youth had extreme values on only one symptom; therefore, it could be possible to recode their score to a smaller number. However, changing values is not ideal as it essentially involves a misrepresentation of data. Thus, prior to making any changes to the data it was first checked for normality and multivariate outliers to determine whether these univariate outliers posed true problems to the data.

Univariate normality was first examined by looking at the individual skewness and kurtosis of each domain and symptom. Although the Shapiro-Wilk's test ($p > .05$) indicated that all domains except *Behaviour* were abnormally distributed for males, all skewness and kurtosis levels were within +/- 1. In contrast, all domains and total score for female youth were normally distributed; although the kurtosis values were slightly above -1 for both the *Attachment* and *Dominance*, both were below three times the value of the standard error (Table 3). The normal Q-Q plots generally indicated normality of all domains, with minor deviations for the *Dominance, Emotional,* and *Self* domains for males, and the *Emotional* domain for females.

Table 4: Normality Distributions of CAPP-IRS Domains and Total Score (n=185)

Symptom	All (n=185)		Males (n=147)		Females (n=38)	
	Skewness (SE = .179)	Kurtosis (SE = .355)	Skewness (SE = .200)	Kurtosis (SE = .397)	Skewness (SE = .383)	Kurtosis (SE = .750)
Attachment	.456	-.617	.568	-.438	.035	-1.049
Behaviour	.268	-.245	.215	-.191	.207	-.620
Cognitive	.037	-.866	.118	-.825	-.294	-.694
Dominance	.579	-.267	.668	-.121	.140	-1.102
Emotional	.462	-.176	.610	-.071	-.395	-.644
Self	.664	.000	.796	.255	.197	-.537
Total	.205	-.419	.306	-.194	-.180	-.907

However, at the symptom level the data was more problematic. Using the larger than +/- 1 of skewness or kurtosis guideline for normality of data, eight symptoms appeared to be abnormally distributed for the whole sample of youth (Table 4). Unfortunately, a Shapiro-Wilk's test ($p > .05$) indicated that all symptoms were abnormally distributed. Visual inspection of normal Q-Q plots suggested that six in particular, C3 *Intolerant*, D5 *Insincere*, D6 *Garrulous*, E2 *Lacks pleasure*, S3 *Sense of uniqueness*, and S4 *Sense of entitlement* were abnormally distributed for the sample, consistent with the results below. In addition, the normal Q-Q plots showed a slight deviation from the line for B5 *Disruptive*, D3 *Deceitful*, D4 *Manipulative*, E1 *Lacks Anxiety*, E3 *Lacks emotional depth*, S2 *Self-centred*, and S7 *Unstable self-concept*.

Table 5: Normality Distributions of CAPP-IRS Symptoms

Symptom	All (n=185)		Males (n=147)		Females (n=38)	
	Skewness (*SE* .179)	**Kurtosis (*SE* .355)**	**Skewness (*SE* .200)**	**Kurtosis (*SE* .397)**	**Skewness (*SE* .383)**	**Kurtosis (*SE* .750)**
A1 Detached	.989	.181	*1.055*	.312	.605	-.885
A2 Uncommitted	.969	.017	*1.063*	.134	.704	.064
A3 Unempathic	.276	-.922	.369	-.824	-.101	-1.190
A4 Uncaring	.148	-.939	.221	-.710	-.132	-1.476
B1 Lacks Perseverance	.285	-.617	.442	-.288	-.286	-1.017
B2 Unreliable	.393	-.503	.456	-.184	-.119	-1.189
B3 Reckless	-.289	-.565	-.315	-.488	-.342	-.762
B4 Restless	.781	-.603	.814	-.592	.663	-.651
B5 Disruptive	.680	-.326	.735	-.232	.439	-.602
B6 Aggressive	-.126	-.809	-.138	-.807	-.080	-.759
C1 Suspicious	.489	-.637	.497	-.614	.480	-.659
C2 Lacks Concentration	.538	-.638	.633	-.459	.171	-.952
C3 Intolerant	***1.131***	*1.158*	.989	.838	*1.614*	*2.454*
C4 Inflexible	.309	-.692	.467	-.467	-.250	-.800
C5 Lacks Planfulness	.063	-.893	.130	-.782	-.244	-1.062
D1 Antagonistic	.098	-.824	.244	-.693	-.509	-.470
D2 Domineering	.662	-.827	.588	-.994	.685	-.992
D3 Deceitful	.724	-.040	.740	-.082	.319	*-1.217*
D4 Manipulative	.600	-.412	.570	-.454	.658	-.381

Symptom	All (n=185)		Males (n=147)		Females (n=38)	
	Skewness (*SE* .179)	Kurtosis (*SE* .355)	Skewness (*SE* .200)	Kurtosis (*SE* .397)	Skewness (*SE* .383)	Kurtosis (*SE* .750)
D5 Insincere	***1.070***	.569	*1.031*	.369	.778	-.411
D6 Garrulous	***1.466***	*1.640*	*1.591*	*2.056*	.860	-.598
E1 Lacks Anxiety	.629	-.388	.658	-.446	.602	.171
E2 Lacks Pleasure	***1.571***	*2.172*	*1.696*	*2.738*	*1.176*	.622
E3 Lacks Emotional Depth	.873	-.240	.827	-.321	.995	-.213
E4 Lacks Emotional Stability	.198	-.854	.325	-.713	-.380	-.563
E5 Lacks Remorse	.097	*-1.310*	.065	*-1.335*	.229	*-1.181*
S1 Self-Centred	.638	-.639	.668	-.612	.515	-.750
S2 Self-Aggrandizing	.956	.352	1.048	.420	.155	*-1.278*
S3 Sense of Uniqueness	***1.328***	.775	*1.419*	.970	.890	-.253
S4 Sense of Entitlement	***1.303***	*1.145*	*1.508*	*2.028*	.718	-.636
S5 Sense of Invulnerability	.373	-.737	.384	-.796	.004	*-1.251*
S6 Self-Justifying	.257	*-1.037*	.222	-.992	.334	*-1.272*
S7 Unstable Self-Concept	.827	-.067	.900	.243	.338	-1.000

These statistics were run again for males versus females. D3 *Deceitful* and S6 *Self-justifying* were slightly abnormally distributed for females, according to a slightly large kurtosis; however, these kurtosis values were less than three times the standard error of the kurtosis for females and thus were deemed acceptable. The lack of normal distribution for C3 *Intolerant* appeared to be due to issues among the female sample as both the skewness and kurtosis values exceeded three times the value of the standard error; although the skewness and kurtosis values were close to 1 for the male sample, they were within an acceptable range. However, the problems with A1 *Detached*, A2 *Uncommitted*, D5 *Insincere*, D6 *Garrulous*, S3 *Sense of uniqueness* and S4 *Sense of entitlement* were caused by males. Only E2 *Lacks pleasure* was abnormally distributed for both the male and female subsamples. Although E5 *Lacks remorse* had a large kurtosis for females, it was less than three times the value of the standard error and therefore not problematic; moreover, the normal Q-Q plots for both males and females on this symptom showed only minor deviations from the line.

Although some of the CAPP-IRS symptoms were abnormally distributed for male and female incarcerated youth, removing cases from the dataset prior to analysis is not ideal given the loss of information and power. Further, when examining the data for multivariate outliers, only one youth's scores would be considered problematic according the Mahalanobis d-squared p1 value (considered problematic if < .001; see Table 5). The analyses was computed with and without this one youth's scores and no substantial differences in the results were observed. Further, although the chi-square value can be problematic when conducting a CFA with abnormally distributed data, MLE procedures are generally robust to threats to normality and fit indices can provide additional information over that provided by the goodness of fit test. Therefore, the youth's information was left in the dataset so as to contribute slightly more power to the analyses.

Table 6: Top 10 Observations for Mahalanobis Distance

Observation #	Mahalonobis d-squared	P1	P2
184	68.550	.000	.049
166	65.474	.001	.007
161	62.205	.002	.003
124	62.025	.002	.000
1	60.913	.002	.000
171	59.989	.003	.000
95	58.854	.004	.000
148	58.706	.004	.000
85	58.643	.004	.000
172	57.578	.005	.000

Analytic Strategy

In the first step towards testing the theoretical structure of the CAPP in a sample of incarcerated serious and violent young offenders, the internal consistency reliability and structure of the CAPP-IRS was explored using Cronbach's alpha, which estimates the similarity of responses to items said to compose a single scale (Green & Salkind, 2005). Alpha coefficients for the CAPP-IRS total scale as well as each of the six domain scales were

produced, as were estimates for the effect on alpha should a symptom/domain be removed. Mean inter-item correlations, squared multiple correlations, and corrected item-total correlations for the total and domain scales were also analysed. Although data was collected for only 38 female youth, analyses were conducted for the whole sample as well as by gender to determine whether there were any important gender based scale reliability issues in the assessment of psychopathy using the CAPP-IRS.

The second stage of analysis involved model testing. Confirmatory factor analysis (CFA) allows researchers to adopt theory-driven modelling approaches by specifying the factor structure in advance and using fit indices to test how well the sample data fits that structure. The current study therefore employed a CFA with the theoretical six-domain structure of the CAPP-IRS (Cooke et al., 2012). Consistent with CFA-based PCL research (e.g. Hare & Neumann, 2005; Hill, Neumann, & Rogers, 2004; Kosson, Cyterski, Steuerwald, Neumann, & Walker-Matthews, 2002; Salekin et al., 2006), the current study used root-mean-square error of approximation (RMSEA), standardized root-mean-squared residual (SRMR), the goodness-of-fit index (GFI), and adjusted GFI (AGFI) as measures of absolute fit, and Tucker-Lewis Index (TLI) and comparative fit index (CFI) as measures of relative fit. Good model fit will be indicated by RMSEA values of .05 or lower, SRMR of .08 or lower, a CFI, TLI, and AGFI of .90 or above, and GFI over .95 (Neumann et al., 2007). ML, which assumes multivariate normality, will be used to estimate the factor loadings. Covariances were produced between the six domains as they are assumed to be somewhat correlated, given that together they represent the latent hieararchical construct of PPD. As CAPP-IRS symptoms are measured on a seven-point interval scale, parcelling/creating testlets was unnecessary.

Given that there is some debate regarding the consistency of psychopathy symptoms between males and females (e.g. Kreis & Cooke, 2011, 2012), the CFA was performed only with the sample of male youth, as the sample size of female participants was too small to allow for a reliable analysis (n=38). All analyses were performed using the Statistical Package for the Social Sciences (SPSS) as well as Amos, a sub-program of SPSS used for model testing.

Results

Internal Structure of the CAPP-IRS

The first step of analysis involved running Cronbach's alpha, mean inter-item correlations, squared multiple correlations, and corrected item-total correlations for all 185 youth, and then separately by gender. Using the six CAPP-IRS domains to represent the overall hierarchical construct of PPD resulted in a nearly excellent value of Cronbach's alpha (.894) and a mean inter-item correlation of .591 indicating a moderately-strong relationship between all domain scores, suggesting that the set of domains used to represent PPD shared variance between them in measuring PPD, but also contained some unique variance. Importantly, all domains contributed equally and reliably to the hierarchical measure of PPD; specifically, alpha values consistently decreased very slightly from .894 should any one domain be removed from the scale (Table 6). The corrected item-total correlation values, which estimate the correlation between each domain and the total PPD score after removing each domain so as not to inflate the overall correlation, were all moderately-strong and positive, indicating again that each domain was a good measure of the construct of PPD (Green & Salkind, 2005).

Table 7: Internal Structural Reliability of the CAPP-IRS Total Score (n=185)

Domains	Alpha (α) if item deleted from scale	Squared Multiple Correlation (SMC)	Corrected Item-Total Correlation
Attachment	.875	.628	.730
Behavioural	.870	.653	.752
Cognitive	.884	.571	.661
Dominance	.868	.624	.761
Emotional	.874	.618	.724
Self	.878	.570	.700

Next the internal structure analyses at the total score level were repeated by gender (Table 7). The total score Cronbach's alpha for males (α = .893) and females (α = .897) were both essentially excellent. Again, all domains appeared to be important and equal contributors to the overall assessment of psychopathy in each of male and female incarcerated youth as the value for Cronbach's alpha would essentially remain the same should any one domain be deleted. Further, the total scale mean inter-item correlation for both males (.587) and females (.606) were moderately-strong. Likewise, the corrected item-total correlations for each domain

were strong and positive for both genders, which indicated that for both males and females, the CAPP domains were good measures of the overall hierarchical construct of psychopathy. Males and females generally only differed with regard to the squared multiple correlations. For males, the percent of variance explained in each domain by the other five domains was fairly consistent, with a low of 54.9% for the *Cognitive* domain and a high of 66% for the *Attachment* and *Emotional* domains. In contrast, the SMCs for females showed a less consistent proportion of shared versus unique variance, as the percent of variance explained in each domain by the remaining five domains varied substantially, with a high of 73% for the *Behavioural* domain and a low of 45% for the *Emotional* domain.

Table 8: Internal Structural Reliability of the CAPP-IRS Total Score by Gender

	Males (n=147)					*Females (n=38)*				
Domains	***X***	**SD**	**α if deleted**	**SMC**	**Corrected Item-Total Correlation**	***X***	**SD**	**α if deleted**	**SMC**	**Corrected Item-Total Correlation**
Attachment	6.65	4.94	.873	.663	.733	7.37	4.97	.882	.590	.715
Behaviour	14.04	6.33	.870	.634	.739	16.13	7.59	.869	.730	.806
Cognitive	9.73	5.13	.886	.549	.632	11.34	5.15	.875	.690	.762
Dominance	9.51	6.70	.867	.625	.760	9.45	6.21	.867	.692	.792
Emotional	9.12	5.53	.869	.663	.748	10.03	4.48	.893	.452	.632
Self	9.17	6.43	.877	.577	.697	10.18	6.61	.883	.610	.701

Next, each domain contributing towards the measurement of overall PPD was independently examined for individual levels of domain internal consistency reliability. Each domain is measured by distinct yet theoretically related symptoms. Symptoms are measured on a seven-point scale, where 0 indicates the symptom is not present/dysfunction and six represents extreme presence/dysfunction.

As displayed in Table 8, youth tended to produce non-dysfunctional scores for all symptoms of *Attachment*, with the highest average coming from *Unempathic*. A series of independent samples t-tests at an alpha of .05 indicated that there were no significant differences in the average *Attachment* symptom scores by gender. The *Attachment* domain had a “good” measure of internal consistency (α = .845); generally, removing any of the symptoms from this domain would slightly decrease the reliability of the scale. However, the symptom of *Uncommitted* did not follow this pattern, and removing it would essentially leave the internal reliability of the Attachment domain unchanged. *Uncommitted* also had the lowest SMC,

indicating that the other three symptoms explained only slightly more than one-third of its variance, whereas around 50% or more of the variance in the other three symptoms could be accounted for by the remaining symptoms, suggesting greater coherence among the other three symptoms than with *Uncommitted*. While the mean inter-item correlation of these symptoms was moderately strong (.581), *Uncommitted* also had the lowest corrected item-total correlation; however, this correlation was still moderate in strength, suggesting a need for further consideration of the theoretical relevance of this symptom to the domain of Attachment.

Table 9: Internal Structural Reliability of the Attachment Domain (n=185)

Symptoms	*X*	*SD*	Scale α	α if Item Deleted	SMC	Corrected Item-Total Correlation
A1 Detached	1.34	1.50	.845	.798	.491	.692
A2 Uncommitted	1.02	1.16		.849	.387	.571
A3 Unempathic	2.32	1.77		.791	.618	.722
A4 Uncaring	2.11	1.50		.760	.642	.777

With regards to gender, Cronbach's alpha for both males (α = .842) and females (α = .853) indicated a "good" level of reliability (see Table 9). *Uncommitted* appeared to fit slightly better for females than males, as the SMC reached nearly 50% for females whereas it remained at approximately 38% for males. Importantly, the domain score for *Attachment* was not substantially improved by the removal of any one symptom for both genders.

Table 10: Internal Structural Reliability of the Domains by Gender

	Males (n=147)					Females (n=38)				
Symptoms	Mean IIC	α	α if Deleted	SMC	CIC	Mean IIC	α	α if Deleted	SMC	CIC
A1 Detached	.579	.842	.782	.527	.718	.591	.853	.847	.428	.607
A2 Uncommitted			.847	.384	.565			.857	.441	.591
A3 Unempathic			.799	.578	.700			.761	.786	.811
A4 Uncaring			.761	.613	.768			.753	.794	.822
B1 Lacks Perseverance	.385	.772	.729	.504	.560	.410	.804	.754	.603	.657
B2 Unreliable			.708	.564	.657			.766	.567	.597
B3 Reckless			.725	.383	.569			.766	.404	.600
B4 Restless			.788	.141	.333			.840	.135	.269
B5 Disruptive			.716	.489	.599			.712	.737	.814
B6 Aggressive			.760	.400	.440			.790	.506	.488

	Males (n=147)					Females (n=38)				
Symptoms	**Mean IIC**	**α**	**α if Deleted**	**SMC**	**CIC**	**Mean IIC**	**α**	**α if Deleted**	**SMC**	**CIC**
C1 Suspicious	.333	.712	.674	.243	.447	.262	.645	.658	.145	.245
C2 Lacks Concentration			.687	.259	.425			.533	.441	.506
C3 Intolerant			.701	.223	.369			.631	.231	.309
C4 Inflexible			.605	.404	.615			.580	.210	.435
C5 Lacks Planfulness			.646	.309	.514			.529	.432	.513
D1 Antagonistic	.453	.833	.833	.300	.466	.436	.821	.800	.413	.560
D2 Domineering			.800	.450	.638			.753	.628	.751
D3 Deceitful			.787	.620	.695			.792	.650	.598
D4 Manipulative			.799	.497	.638			.774	.676	.675
D5 Insincere			.783	.607	.710			.786	.555	.642
D6 Garrulous			.827	.322	.493			.838	.301	.346
E1 Lacks Anxiety	.341	.710	.721	.124	.317	.156	.476	.577	.097	-.007
E2 Lacks Pleasure			.652	.442	.506			.422	.142	.255
E3 Lacks Emotional Depth			.571	.578	.695			.329	.385	.426
E4 Lacks Emotional Stability			.682	.210	.418			.391	.120	.295
E5 Lacks Remorse			.670	.337	.459			.327	.237	.368
S1 Self-Centred	.410	.822	.772	.550	.706	.451	.826	.771	.628	.741
S2 Self-Aggrandizing			.769	.645	.747			.772	.737	.824
S3 Sense of Uniqueness			.795	.513	.602			.803	.605	.604
S4 Sense of Entitlement			.795	.445	.601			.790	.599	.664
S5 Sense of Invulnerability			.809	.310	.495			.807	.477	.554
S6 Self-Justifying			.805	.404	.548			.810	.573	.587
S7 Unstable Self-Concept			.835	.133	.337			.857	.194	.278

IIC = Inter-item Correlation; SMC = Squared Multiple Correlation; CIC = Corrected Item-Total Correlation

On the *Behaviour* domain, youth overall scored the least symptomatic on *Restless* and *Disruptive*, whereas they were the most symptomatic on *Reckless*. Male and female youth differed significantly on only one of the *Behaviour* symptoms; specifically, females scored statistically significantly higher on the *Unreliable* symptom (X = 3.03, SD = 1.87) than males (X = 2.35, SD = 1.35), t (47.5) = -2.11, p = .041.

While Cronbach's alpha for this domain was above acceptable and nearly reached the good range (α = .783), the mean inter-item correlation was only moderate in strength (.383). The issue on this domain appeared to result from the symptom of *Restless* as removing this symptom would increase the overall domain internal reliability to good (Table 10). Further, this symptom consistently demonstrated weak correlations with all other symptoms (Lacks Perseverance *r* = .227; Unreliable *r* = .257; Reckless *r* = .293; Disruptive *r* = .259; Aggressive *r* = .170) and was the only symptom with a weak corrected item-total correlation. Thus it is not surprising the amount of variance explained in this symptom by the remaining five symptoms was only 11%. In short, the symptom of *Restless* did not relate well to others on the Behaviour domain, suggesting it is a potential candidate for removal from the model in the future. Moreover, given the statistics displayed above in Table 9, it was a problematic symptom for male and female youth alike.

Table 11: Internal Structural Reliability of the Behaviour Domain (n=185)

Symptoms	*X*	*SD*	Scale α	α if Item Deleted	SMC	Corrected Item-Total Correlation
B1 Lacks Perseverance	2.30	1.48	.783	.736	.515	.592
B2 Unreliable	2.49	1.49		.724	.560	.643
B3 Reckless	3.45	1.57		.738	.385	.581
B4 Restless	1.63	1.73		.803	.114	.321
B5 Disruptive	1.83	1.64		.717	.544	.658
B6 Aggressive	2.77	1.67		.773	.409	.439

Youth generally scored low on all *Cognitive* symptoms, with the highest level of dysfunction being noted in the symptom of *Lacks planfulness* and the least dysfunction with the symptom of *Intolerant*. Male and female youth differed significantly with respect to two of the cognitive symptoms. Female youth scored higher on the symptom *Lacks concentration* (*X* = 2.68, *SD* = 1.86) than male youth (*X* = 1.97, *SD* = 1.68), *t*(183) = -2.30, p = .023, and the symptom *Inflexible* (*X* = 2.66, *SD* = 1.38) than males (*X* = 2.05, *SD* = 1.46), *t*(183) = -2.32, p = .021.

Table 12: Internal Structural Reliability of the Cognitive Domain (n=185)

Symptoms	*X*	*SD*	Scale α	α if Item Deleted	SMC	Corrected Item-Total Correlation
C1 Suspicious	1.83	1.47	.699	.674	.188	.395
C2 Lacks Concentration	2.11	1.74		.656	.299	.448
C3 Intolerant	1.13	1.24		.690	.204	.349
C4 Inflexible	2.17	1.46		.598	.355	.583
C5 Lacks Planfulness	2.82	1.70		.621	.324	.518

Cronbach's alpha indicated a good level of internal consistency for the *Cognitive* domain (α = .699). However, the mean inter-item correlation was weak (.318); in fact, all pairwise inter-item correlations on this scale were less than .50 in strength with the exception of *Lacks Planfulness* and *Lacks Concentration* (*r* = .507). The issue with this domain did not appear to result from any one symptom in particular. In fact, removing any one symptom from the domain would drop the reliability of the scale to below "good", with the largest effect coming from the symptom of *Inflexible*. Overall, the symptoms measuring the *Cognitive* domain together achieved a good level of internal reliability; however, the inter-symptom relationships were not particularly strong as indicated by the relatively weak inter-item correlations and low SMCs. Of note, the symptoms of *Suspicious* and *Intolerant* correlated produced relatively weak corrected item-total correlations, suggesting that they may be problematic in representing *Cognitive* dysfunction in incarcerated young offenders. Given the statistics in Table 9, while these two symptoms appeared the most problematic for male youth, female youth had a less than acceptable Cognitive domain reliability, with issues coming from the symptoms of *Suspicious*, *Intolerant*, as well as *Inflexible*. In particular, removing *Suspicious* from the *Cognitive* domain for females would slightly improve the scale reliability of this domain. Thus, assessing *Cognitive* dysfunction in incarcerated female young offenders appeared to be somewhat problematic, particularly due to the assessment of *Suspicious*.

On the *Dominance* domain, youth scored highest on the symptom of *Antagonistic*, while they exhibited almost no symptoms of *Garrulousness* (Table 12). Male and female youth differed significantly on one of the *Dominance* domain symptoms. Specifically, females scored significantly higher on the symptom *Antagonistic* (*X* = 2.74, *SD* = 1.57) than males (*M* = 2.07, *SD* = 1.51), *t*(183) = -2.39, p = .018.

Table 13: Internal Structural Reliability of the Dominance Domain (n=185)

Symptoms	*X*	*SD*	Scale α	α if Item Deleted	SMC	Corrected Item-Total Correlation
D1 Antagonistic	2.21	1.54	.826	.825	.307	.466
D2 Domineering	1.44	1.51		.787	.470	.648
D3 Deceitful	1.71	1.46		.783	.611	.669
D4 Manipulative	1.71	1.54		.789	.518	.640
D5 Insincere	1.41	1.51		.778	.582	.690
D6 Garrulous	1.02	1.43		.824	.289	.466

With regards to the total sample, together, the six symptoms produced a "good" level of internal consistency reliability (Cronbach's α = .826) for the *Dominance* domain. Interestingly, removing either *Antagonistic* or *Garrulous* from this scale would have no real effect on the internal reliability of the *Dominance* domain. Further, these symptoms in particular were not well explained by the remaining symptoms (*Antagonistic* SMC = .307, *Garrulous* SMC = .289) and they had the weakest corrected item-total correlations, although these correlations were still moderate in strength. These two symptoms were the weakest regardless of whether the data was based on male or female youth (Table 9). However, *Garrulous* appeared more problematic for females than *Antagonistic*; removing *Garrulous* for females would actually improve the overall reliability of the *Dominance* domain, whereas removing *Antagonistic* would cause a slight drop in the domain reliability. For males, the reliability of the domain remained essentially the same should either of these symptoms be removed.

Generally, youth scored in the low dysfunction range for all Emotional domain symptoms; particularly for *Lacks pleasure* and *Lacks emotional depth* (Table 13). Male and female youth differed with regard to only one Emotional symptom; female youth scored significantly higher with regards to *Lacks emotional stability* (X = 3.37, SD = 1.76) than male youth (X = 2.36, SD = 1.66), $t(183) = -3.29$, p = .001. Together, these five symptoms produced an unacceptable level of internal reliability in measuring this domain (Cronbach's α = .670). In particular, the symptom measuring *Lacks anxiety* appeared problematic; removing it would increase the reliability of the domain, though not quite to an acceptable level, and it did not relate well to the other symptoms according to its extremely low SMC and corrected item-total correlation. In fact, *Lacks anxiety* was correlated only weakly with each other symptom (Lacks Pleasure r = .114, Lacks Emotional Depth r = .220, Lacks Emotional Stability r = .205, Lacks

Remorse *r* = .212). In fact, all pairwise correlations with respect to this domain were weak, with the exceptions of Lacks Pleasure/Lacks Emotional Depth (*r* = .568) and Lacks Emotional Depth/Lacks Remorse (*r* = .546).

Table 14: Internal Structural Reliability of the Emotional Domain (n=185)

Symptoms	*X*	*SD*	Scale α	α if Item Deleted	SMC	Corrected Item-Total Correlation
E1 Lacks Anxiety	2.06	1.63	.670	.687	.081	.264
E2 Lacks Pleasure	1.01	1.35		.608	.366	.463
E3 Lacks Emotional Depth	1.28	1.47		.530	.506	.634
E4 Lacks Emotional Stability	2.57	1.73		.639	.172	.381
E5 Lacks Remorse	2.38	1.90		.617	.313	.436

The *Emotional* domain was a particular issue for female youth, as Cronbach's alpha was poor (whereas it was acceptable for male youth), and all symptoms had low SMCs, suggesting that they did not relate well to each other in explaining Emotional dysfunction in female incarcerated youth. In particular, *Lacks anxiety* was a particularly poor item for female youth and removing it from the *Emotional* domain would substantially improve the reliability of this scale. In contrast, the issues for male youth appeared to result from the low SMCs for *Lacks anxiety* and *Lacks emotional stability,* though removing either would not produce substantial gains to the overall scale reliability of the *Emotional* domain for males.

Youth were essentially non-symptomatic on all Self domain items (Table 14). Male and female youth differed significantly on one Self symptom; female youth scored significantly higher on *Unstable self-concept* (*X* = 2.08, *SD* = 1.58) than male youth (*X* = 1.22, *SD* = 1.24), *t*(49.3) = -3.12, p = .003. Together, these symptoms produced a "good" measure of reliability (Cronbach's α = .822). Generally, all symptoms appeared to be relevant contributors towards the measure of Self Dysfunction. Only one symptom was weak compared to the others; removing *Unstable self-concept* would increase this scale's reliability to .835 (although still in the same range of reliability), and this variable was not well explained by/related to the other symptoms according to its SMC and corrected item-total correlation. This symptom appeared problematic for both male and female youth; removing it would increase the domain alpha somewhat, and the SMCs and corrected item-total correlations were low for both genders.

Table 15: Internal Structural Reliability of the Self Domain (n=185)

Symptoms	*X*	*SD*	Scale α	α if Item Deleted	SMC	Corrected Item-Total Correlation
S1 Self-Centred	1.59	1.51	.822	.772	.550	.706
S2 Self-Aggrandizing	1.22	1.26		.769	.645	.747
S3 Sense of Uniqueness	0.77	1.08		.795	.513	.602
S4 Sense of Entitlement	0.80	1.08		.795	.445	.601
S5 Sense of Invulnerability	1.67	1.28		.809	.310	.495
S6 Self-Justifying	1.93	1.64		.805	.404	.548
S7 Unstable Self-Concept	1.39	1.36		.835	.133	.337

Confirmatory Factor Analysis

Given the identified issues of structural reliability for female young offenders in particular and the speculation in prior research of a slightly different makeup of the prototypical female psychopath (e.g. Kreis & Cooke, 2011), the CFA was conducted only with the sample of 146 incarcerated male serious and violent young offenders. The test was conducted with the theoretical six-domain CAPP model proposed by Cooke and colleagues (2012). The six domains were covaried as presumably there should be a moderate degree of correlation between them, given that together they are said to represent the hierarchical construct of psychopathy.

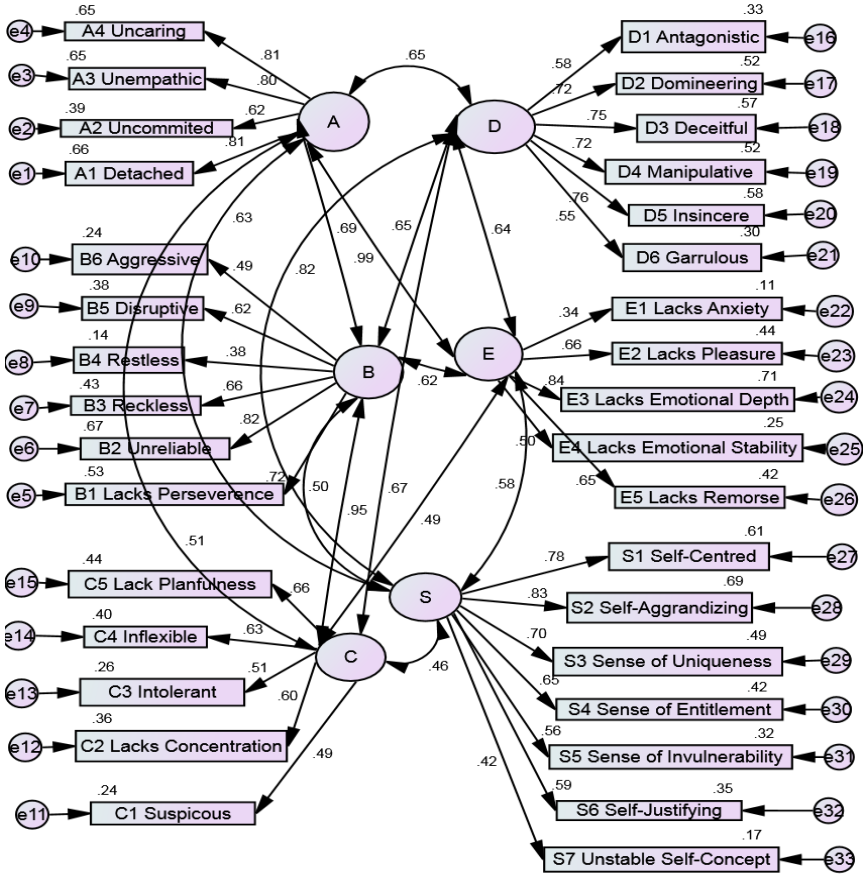
The six domains were generally moderately correlated together, with values ranging from *r* = .460 between the *Cognitive* and *Self* domains to *r* = .985 between the *Attachment* and *Emotional* domains (Table 15). The strong correlations between the *Attachment* and *Emotional* domains, *Self* and *Dominance* domains, and *Behaviour* and *Cognitive* domains were not particularly surprising, given that each partnership represents somewhat of a breakdown of the factors on the PCL scales. However, these high values will likely pose problems when attempting to model fit as it will lead to difficulty in clearly loading symptoms onto one intended domain. In other words, given the high correlations between these particular domains and therefore common variance in explaining the construct psychopathy, it is unlikely that the assigned symptoms will load strongly and distinctly onto their proposed domains; instead, cross-loadings are likely to occur for these symptoms and the correlated factors.

Table 16: Correlations between the Six Domains in Male Young Offenders (n=147)

Domains	Attachment	Behaviour	Cognitive	Dominance	Emotional	Self
Attachment	—					
Behaviour	.692	—				
Cognitive	.515	.950	—			
Dominance	.650	.646	.666	—		
Emotional	.985	.618	.493	.637	—	
Self	.625	.497	.460	.816	.577	—

The chi-square goodness of fit test indicated that the theoretical six-factor model of the CAPP-IRS was not a good fit to the data, x^2 (480) = 1760.95, p = .000. As this test is sensitive to sample size, additional fit indices were produced. Still, all absolute (RMSEA = .135, pclose = .000; SRMR = .136; GFI = .554, AGFI = .479) and relative (TLI = .552; CFI = .593) fit indices indicated that the six-factor theoretical CAPP-IRS model was a poor fit to this sample of incarcerated serious and violent male young offenders. Despite the poor model fit, the symptom parameters were generally moderate to strong with standardized regression weights ranging from .337 (*Lacks anxiety*) to .842 (*Lacks emotional depth*) (Figure 2). All regression values were significant at p < .001.

Figure 2: CFA Results of the Theoretical Six-Domain CAPP-IRS (n=147)



In examining the standardized regression weights, two of the symptoms identified in previous research as less prototypical of psychopathy had very low regression values (*Unstable self-concept* β = .417, *Restless* β = .376), as did *Lacks anxiety* (β = .337). Two additional symptoms (*Aggressive* β = .494 and *Suspicious* β = .494) also had betas below .5. With regard to these five symptoms, although the modification indices suggested that covarying some of their error terms could reduce the chi-square value by up to 50 points (e.g. by co-varying e22 and e31), this was not done. The error terms that appeared to be correlated tended to come from different domains and either violated an assumption of independence by suggesting an error term be correlated with latent factor (e.g. covary e10 with Behaviour) or did not have a theoretical reason for covariance. While two of the suggested modifications did make some theoretical sense (covarying the error terms for *Restless* and *Lacks Concentration*, as well as

for *Lacks anxiety* and *Sense of invulnerability*), this would only have reduced the chi-square value by approximately 65 points and its large starting value, as well as the distance of the fit measures from acceptable fit values suggested that a great number of such modifications would need to be made to render the proposed theoretical model a good fit in the current data. Instead, it may be more appropriate to start from an unstructured model and use an exploratory factor analysis to determine the best model fit in this dataset.

Discussion

Gender

While research with the PCL scales tends to identify lower mean psychopathy scores in female than male samples (Forouzan & Cooke, 2005; Salekin et al., 1997; Vitale, Smith, Brinkley, & Newman, 2002), in the current study male and female youth did not differ significantly on their total CAPP-IRS scores. There are two potential explanations for this finding. Firstly, males tend to be more overt and expressive than females, with a greater prevalence for diagnoses relating to externalizing disorders, such as Conduct Disorder and Oppositional Defiance Disorder, whereas females tend to be more covert and internalizing, with a greater tendency for internalizing diagnoses, such as Depression or Anxiety. As the PCL:YV is heavily indexed by criminal and antisocial (i.e. externalizing) behaviours, males may therefore tend to score higher than females. In fact, in a study with a female population using the two-factor model of the PCL, three of the nine behavioural (Factor 2) items (*failure to accept responsibility, many short-term marital relationships,* and *revocation of conditional release*) did not load onto any factor for female samples, while another three (*poor behavioural controls, impulsivity, lack of realistic long-term goals*) did not cleanly load onto a single factor, and two more (*need for stimulation, irresponsibility*) loaded onto a different factor than in male samples (Salekin et al., 1997). Thus, females appear to exhibit a different psychopathic profile than males. In contrast, as the CAPP-IRS is a personality-focused representation of psychopathic traits, females may perform more similarly to males on the dysfunctional problem profile obtaining total scores that are consistent with male offenders, although potentially exhibiting a different combination of symptomatology.

A second potential explanation for the similar CAPP-IRS total scores is the nature of the sample in this current study. After the *Youth Criminal Justice Act* was introduced in 2003, restrictions were placed on the type of young offender who could be remanded and/or sentenced to custody. Specifically, youth must have committed a violent offence and/or they must have demonstrated a serious history of offending in order to be incarcerated. Previous to this, under the *Young Offenders Act* female youth were often incarcerated for protection purposes, i.e. to remove them from the dangers of the street (Corrado, Odgers, & Cohen, 2000). Thus, the severity of youth incarcerated in custody has increased and may have resulted in female and male youth displaying equally severe problem profiles, which would correspond with females scoring higher on psychopathy measures. In fact, although PCL:YV scores were not obtained for all 201 youth in the current sample, an analysis of the 99 youth with this measure completed supports this second explanation; female youth actually scored higher on the PCL:YV (X = 23.15, SD = 5.55) than male youth (X = 20.63, SD = 7.06), $t(97) = -1.23$, $p > .05$. However, this analysis was conducted with only 13 females and therefore both of these proposed explanations should be tested in future research with larger and varying (e.g. non-serious and violent, community) samples.

Despite the consistency in total scores, some interesting domain and symptom differences were noted for male versus female incarcerated serious and violent young offenders. At the domain level, the *Emotional* domain of the CAPP-IRS showed poor scale reliability for females. While one symptom (*Lacks anxiety*) was particularly problematic and removing it would improve the scale reliability fairly substantially, none of the five symptoms appeared to operate particularly well for the female offenders. Thus, for some reason in the particular sample the CAPP-IRS did not appear to be accessing the *Emotional* domain of psychopathy (i.e. lacking of anxiety, pleasure, emotional depth, emotional stability, and remorse) well for serious and violent female young offenders. Given that this sample was composed of particularly serious and violent offenders, it is likely that these females have complex psychological issues related to their emotional well-being which the student researchers found difficult to consistently interpret. Moreover, the difficulty in assessing the emotional profile of incarcerated serious and female young offenders may have been made even more complex given the tendency to expect females to show emotions. In effect, the absence of expressed emotions may have been particularly notable for observers operating under this stereotype, who then introduced bias into their assessment of the degree to which the

female sample is lacking in “typical” emotions leading the researchers to perceive the lack of emotional expression as more dysfunctional when coming from a female youth than a male youth.

The hypothesis that female young offenders in the current sample were likely experiencing significant psychological issues affecting their emotional expression was partially supported by the tendency for females to score significantly higher on the symptom *Lacks emotional stability* than for male youth. Notably, this is consistent with the suggested prototypical female psychopath identified by 132 international mental health professionals in Kreis and Cooke’s (2011) study. In their study, only three CAPP symptoms were perceived to be more prototypical for female than male psychopaths, one of which was *Lacks emotional stability.* Their study also identified that the *Emotional* domain was ranked only above the *Cognitive* domain with respect to its perceived importance to psychopathy in females. In fact, for both the male and female prototypical psychopath, the *Dominance, Self,* and *Attachment* domains were the most prototypical of psychopathy, with the *Behavioural, Emotional,* and *Cognitive* domains being ranked as the least relevant (Kreis and Cooke, 2011). It is possible then that the poor internal structural reliability of the *Emotional* scale was partly due to an innate bias to focus on the interpersonal domains rather than the emotional and thought disturbance aspects of psychopathy. More elaboration and discussion on the contributions of the *Emotional* and *Cognitive* domains to psychopathy in the CAPP-IRS manual may alleviate this issue, although it is possible that some of the symptoms on these domains simply are less relevant or even non-applicable to the construct in question.

In fact, the *Cognitive* domain was also somewhat problematic with regards to its overall structural reliability, particularly for the females. In particular, it appeared that female youth were more likely than male youth to be perceived as having disturbances relating to *Suspiciousness, Intolerance,* and *Inflexibility*. However, an important limitation to this generalization was that the *Cognitive* domain reliability was less than acceptable for female youth whereas it was acceptable for males. Thus, similar to the *Emotional* domain, the CAPP-IRS appears to involve an unreliable measure of the *Cognitive* symptoms of psychopathy in females, in particular, due to the poor internal structural reliability of *Suspicious* for female youth.

Interestingly, the results indicated that one of the two better-performing items on the *Cognitive* domain was *Lacks planfulness* which, if dropped from the *Cognitive* domain, would reduce the alpha value of the scale. Yet, this was one of the consistently poorly operating symptoms detected in two previous studies with the CAPP-IRS (e.g. Hoff et al., 2012; Hoff, Rypdal, Hysted, Hart, Mykletun, Kreis, & Cooke, 2014). Overall, the mean inter-item correlations on this domain were low for both genders as were the squared multiple correlations for each symptom, suggesting that this domain does not represent a particularly cohesive structure of psychopathy symptoms. This will be explored further in the next chapter.

At a symptom-specific level, the descriptive statistics indicated that females scored higher on the symptoms of *Unreliable* (Behaviour domain), *Lacks concentration* and *Inflexible* (Cognitive domain), *Antagonism* (Dominance domain), *Emotional stability* (Emotional domain), and *Unstable self-concept* (Self domain) than males. These results were somewhat consistent with the perceived prototypical psychopathic female presented by Kreis and Cooke's (2011) research. Specifically, the only three symptoms perceived as being stronger in female than male psychopaths in their study were *Lacks emotional stability*, *Unstable self-concept*, and *Manipulative*. As the prototype study was conducted considering adult offenders, it is possible that the significantly higher symptom scores for these additional symptoms in the current study reflect a developmental difference; in other words, the tendency to be unreliable, inflexible, antagonistic, and lacking in concentration may be particularly strong symptoms for adolescent females as opposed to adolescent males. However, a more likely explanation is that these results were sample-specific and unlikely to be replicated in other research with similar samples. Item response theory analyses would be helpful to determine whether these particular symptoms are particularly relevant for young female offenders.

Overall, the current study found that incarcerated serious and violent female young offenders did not differ from incarcerated serious and violent male young offenders in total CAPP-IRS scores, although they were more symptomatic than males on six CAPP-IRS symptoms and consistent with males on the rest. This suggests, similar to research with the PCL, that the internal consistency reliability of psychopathy may be slightly lower for female samples than males, and that the symptom-level profile of psychopathy may differ somewhat by gender. However, the current results were obtained using a sample of only 38 incarcerated

serious and violent young female offenders, and therefore must be viewed as only preliminary findings that must be re-analysed in larger female samples.

CAPP-IRS Internal Structure Reliabilities

Overall, the results of this study indicated that the total CAPP-IRS score neared "excellent" in strength of its internal structural reliability. The alpha value in the current study was somewhat lower (α = .894) than that obtained by Pedersen et al.'s (2010) analysis with an adult sample (α = .96); however, it is important to note that the CAPP-IRS model used in the current study was built with an adult sample in mind. Thus, the high value obtained, in addition to the moderately-strong mean inter-item correlations and squared multiple correlations, support the ability to analyse the CAPP-IRS total scores in incarcerated young offender samples. However, the results of the domain specific analyses suggest that some improvements can be made to this instrument prior to using it in adolescent samples for clinical purposes.

Overall, the domain scales consistently demonstrated good to excellent internal structural reliability. As previously discussed however, one concern emerged regarding the *Cognitive* domain. Although this domain achieved a "good" level of internal reliability, the mean inter-item correlation was low, suggesting that the symptoms used to represent this domain may not measure a concise construct, at least in incarcerated young offenders. In fact, some of these symptoms may be more representative of other forms of psychopathology than they are of psychopathy. For instance, being *Suspicious* of others, which is described as being questioning of others' intentions and is exemplified through the adjectival descriptors of being distrustful, guarded, and hypervigilant (Cooke, Hart, Logan, & Michie, 2012), is common to other disorders, such as paranoid schizophrenia. The researchers in the current study did not have access to the youth's forensic file and as such, were not aware of other confirmed diagnoses that may have influenced the expression of symptomatology measured on the CAPP-IRS. Some youth may have therefore been assessed as being *Suspicious* as a result of a conflicting diagnosis but they may not have scored as high on some or all of the other symptoms of this domain, thus weakening the coherence of this domain. Further research that controls for official diagnoses is necessary to further explore this potential explanation. Another suggestion stems from the observation of a low corrected item-total correlation for *Suspicious* with the other cognitive items. Rather than relate to symptoms of being *Intolerant, Inflexible,* and *Lacks*

planfulness, the trait of being *Suspicious* may actually relate more closely to items relating to being domineering. Because they themselves are *Manipulative, Insincere, Deceitful*, and *Antagonistic* individuals high on the *Dominance* domain may be understandably suspicious of the motives of others.

Another possible explanation for the relatively low inter-item correlations on this domain is that the way in which some the symptoms are described may not be developmentally appropriate for youth. *Intolerant,* one of the more problematic symptoms on this domain, is measured with a variety of questions, such as “Have you thought any of the people around you were fairly decent or respectable, or have they been mostly worthless and out for what they could get”, as well as “Who has criticised you for saying unkind things about them?”. Yet, to assess this symptom in youth, it may be helpful to ask more direct questions, such as “Have you ever disliked someone because of how they looked?” or “Do you generally like most people or do most people bug you?”. These questions may touch on common sources of intolerance during adolescents and their more direct wording may help elicit more evidence for or against this particular symptom. Thus, the suggested questions for each symptom on this domain should be reviewed to determine whether there are varying degrees of developmental appropriateness that make some *Cognitive* symptoms more easily measured than others.

These explanations may also apply to the poor performance of a handful of CAPP-IRS symptoms. For example, with regards to *Attachment*, it appeared that removing *Uncommitted* would slightly improve the reliability of this scale. In other words, the symptom of *Uncommitted* did not appear to relate well to its partner symptoms of *Detached, Unempathic,* and *Uncaring*. In particular, *Uncommitted* shared a weak correlation with *Unempathic* (r = .420), and was only moderately related to *Detached* (r = .560) and *Uncaring* (r = .543). Interestingly, *Uncommitted* is defined as being unbound to others and is represented by the adjectives unfaithful, undevoted, and disloyal. However, the description of the other three symptoms of this domain all imply some form of emotional component. *Detached*, represented by the adjectives of remote, distant, and cold, is described as being emotionally disconnected from others. *Unempathic*, measured by being uncompassionate, cruel, and callous, is defined as being unable to emotionally understand others. *Uncaring*, indicated by the adjectives unconsiderate, thoughtless, and neglectful, means lacking warmth or affection towards others. Thus, it is possible that the weaker inter-item correlations for *Uncommitted* was due to its non-emotional description.

Rewriting this item to touch on more of an emotional component may increase the reliability of this particular scale, though of course it might also have the unwanted affect of further increasing the already extremely strong correlation between the *Attachment* and *Emotional* domains.

A second problematic symptom was *Restless* from the *Behaviour* domain. *Restless* contributed to a weaker domain-level alpha value, and this symptom did not correlate well with other domain symptoms. The *Behaviour* domain describes dysfunction in relation to "establish[ing] adaptive strategies to deal with life tasks in a systematic, consistent, or planned manner" (Cooke et al., 2004). Yet, many of the descriptions of these symptoms appear to touch on an emotional component: *Lacking perseverance* (being idle, undisciplined, and unconscientious) and being *Reckless* (being rash, impetuous, and risk taking) imply a lack of concern for one's own success, while being *Unreliable* (undepdendable, untrustworthy, and irresponsible), *Aggressive* (threatening, violent, and bullying), and *Disruptive* (disobedient, unruly, and unmanageable) imply a lack of concern for other people's needs or feelings. In contrast, being *Restless* is more specifically physiological in its theme (i.e., being overactive, fidgety, and energetic), which may be the cause of its failure to converge with the remaining five symptoms on this domain. As the CAPP is a personality-focused measure of psychopathy, this symptom in particular likely will not fit well with any of the other 32 symptoms of psychopathy and could be a good candidate for future removal from the model and measure. However, it may have a better fit on the *Cognitive* domain, given that it reflects a lack of focus, consistent with other symptoms found here. Further research should first test for improvement of fit by moving this symptom to the *Cognitive* domain prior to making the decision to eliminate it.

Two symptoms from the *Dominance* domain were also potentially problematic for this youth sample. Removing either *Antagonistic* or *Garrulous* would not cause the internal reliability of this domain to suffer, and both had low SMCs. Given that the scale reliability would essentially remain the same if they were removed from the scale, it is possible that much of the variance they were contributing to the *Dominance* domain was accounted for by another symptom already on the domain. In examining the symptom descriptions of the *Dominance* domain, each problem symptom did in fact seem to somewhat closely resemble one other symptom on the scale. *Garrulous* is described as being talkative or wordy, constantly engaging in chatter, and is indicated by the adjectives of being glib, verbose, and pretentious. A similar

symptom would be *Insincere*, which is described as being fake and not genuine and which is indicated through the adjectives of being superficial, slick, and evasive. Together, these symptoms represent the Impression Management item on the Psychopathy Checklist, which is described as a person who is “glib and superficial”. It is possible that the researchers, who were also trained to administer the PCL:YV, were conflating the measurement of these two domains. Although not directly measured on the PCL:YV, the description of *Antagonistic*, which is opposing others through being hostile, disagreeable, and contemptuous, is somewhat similar in nature to being *Domineering*, described as trying to rule/hold power over others and which is indicated by being arrogant, overbearing, and controlling.

In fact, when examining the inter-item correlations, these two symptoms generally exhibited weak pairwise correlations with the exception of the other two aforementioned similar symptoms. Although *Garrulous* had one moderately strong correlation with *Insincere* (r =.550), the correlations with the other four symptoms were much weaker (*Deceitful* r =.418, *Domineering* r =.396, *Manipulative* r =.303, and *Antagonistic* r =.226). Likewise, although *Antagonistic* had a moderately strong correlation with *Domineering* (r = .520), it was weakly correlated with the remaining symptoms of *Manipulative* (r = .410), *Insincere* (r =.330), *Deceitful* (r =.321), and *Garrulous* (r =.226). In contrast, all correlations between the other four symptoms were greater than r = .5. In effect, *Antagonism* and *Garrulous* did not relate to most other symptoms on their domain, and removing them would not have an effect on the scale reliability as the variance they contributed to explaining in the *Dominance* domain would be at least somewhat accounted for by their similar symptoms. There are two possible consequences of this explanation. Either these two symptoms could be removed from the scale and the similar symptoms of *Domineering* and *Insincere* could be rewritten to specifically include what *Antagonistic* and *Garrulous* attempted to measure, or the four symptoms of *Antagonistic*, *Domineering*, *Insincere*, and *Garrulous* could be rewritten more precisely to reduce potential symptom overlap.

Interestingly, although both *Antagonistic* and *Garrulous* were problematic for males, *Antagonistic* was not a problem for females. It is possible that the other symptoms of being dominant only emerge for females when they are particularly antagonistic. In effect, when female youth are rated as more hostile, disagreeable, and contemptuous their tendencies to be *Domineering*, *Deceitful*, *Manipulative*, and *Insincere* may be more easily observable. As females

in this sample were rated as significantly more *Antagonistic* than males, this could explain why *Antagonistic* did not exhibit scale reliability issues for the female sample. However, *Garrulousness* may not have followed this pattern because the researchers may have expected girls to be more talkative than males, and therefore the rating of this symptom may have been more consistent at all levels of *Antagonism*¸ leading to low correlations with the other five symptoms on the *Dominance* domain (*Domineering r* = .476, *Antagonistic r* = .342, *Insincere r* = .277, *Manipulative r* = .152, *Deceitful r* = .025).

Lacks Anxiety was a very problematic symptom in this sample of youth, correlating very weakly with the other four symptoms (*Lacks pleasure, Lacks emotional depth, Lacks emotional stability,* and *Lacks remorse*) on this domain. It is interesting that it was *Lacks anxiety* that seemed not to relate to the other *Emotional* domain symptoms and not *Lack of emotional stability*, as Salekin and colleagues (2012) suggested that the *Emotional* domain appeared to consist of two different dimensions, one of which was represented by *Lacks emotional stability* and the other which was represented by the remaining symptoms (i.e., lacking emotions generally). This symptom was much more problematic in the female sample than the males – removing it from the female measure would substantially improve the scale reliability. This was not entirely unexpected given that Kreis and Cooke's (2012) research suggested that lacking anxiety is viewed as much more prototypical of male psychopaths than female. It is not necessarily that females do not exhibit a lack of anxiety; in fact, this symptom on average exhibited the second highest level of dysfunction (*x* = 2.26 versus *Lacks emotional stability x* = 3.37, *Lacks remorse x* = 2.24, *Lacks pleasure x* = 1.16, and *Lacks emotional depth x* = 1.00). Instead, as suggested by prior research with adolescents where psychopathy has been associated with the presence of anxiety (e.g., Frick et al., 1999; Salekin, Leistico, Neumann, DiCicco, & Duros, 2004) it may simply be that for females, *Lacks anxiety* is more symptomatic of other psychopathologies than psychopathy and therefore while somewhat common among females, it does not correspond with higher levels of other *Emotional traits*.

The last problematic symptom came from the *Self* domain. Removing the symptom of *Unstable self-concept* would improve the reliability of this scale. Notably, this symptom was also identified as problematic by several other studies. *Unstable self-concept* was not identified as prototypical of psychopathy in either previous study (Hoff et al., 2012; Kreis et al., 2012) and the measurement of this symptom was fairly unreliable in McCormick's (2007) interrater reliability

analysis. Further, Cooke and colleagues (2012) identified this symptom as one likely on the outskirts of the psychopathy profile, as either an irrelevant or secondary symptom of psychopathy, and Hoff et al. (2014) suggest that whereas the other symptoms on the *Self* domain appear to tap grandiosity, *Unstable self-concept* taps something else and may be better related to other psychopathological constructs, such as borderline personality disorder. In effect, it appears that for youth, *Unstable self-concept* is problematic because it is natural in adolescence to experience challenges to one's self-identity. Since youth naturally have a malleable sense of self, it may not be appropriate to include *Unstable self-concept* on a measure of psychopathy, particularly at the adolescent stage when self-concept is naturally fluctuating due to experiments with identity formation.

At the domain level, the domains with the most coherent structure, according to Cronbach's alpha, were *Attachment* (α = .845), *Dominance* (α = .833), and *Self* (α = .822). Interestingly, in two previous studies these three domains were identified as the most prototypical of male and female psychopaths (Hoff et al., 2012; Kreis et al., 2012). The current results may therefore be a reflection of the observed trend to anticipate issues with interpersonal relationships among people with psychopathic traits. In addition, symptoms on these domains are likely easier to assess as they are often expressed in interpersonal situations, such as during the course of an interview. The domains with the least coherence – *Emotional* (α = .710) and *Cognitive* (α = .712) are likely much harder to observe and assess as they reflect more internalized traits, such as feelings and thoughts. Symptoms of these domains are likely difficult for youth to express adequately during the course of an interview, resulting in difficulty reliably detecting dysfunction. Still, although the total sample structural reliability scores were weaker for the *Emotional* and *Cognitive* domains, they were at acceptable levels.

Model Fit

The results of the current analysis suggested that the six-domain hierarchical model of psychopathy proposed by the CAPP-IRS is not a good fit for male incarcerated serious and violent young offenders. Although many of the standardized regression weights were at least moderate in strength, the overall fit of the theoretical model was far from acceptable and the modification indices suggested that many revisions would be necessary to achieve an acceptable fit.

Five symptoms in particular stood out in the current analysis as particularly weak, according to their standardized regression weights. These were *Lacks anxiety* (β = .336), *Restless* (β = .380), *Unstable self-concept* (β = .426), *Suspicious* (β = .495), and *Aggressive* (β = .496). It is possible that these five symptoms are irrelevant to the psychopathic construct. Indeed, two of them (*Restless* and *Unstable self-concept*) have been identified as problematic in other research (Hoff et al., 2012; Kreis et al., 2012). These two are symptoms that made their way into the CAPP as a result of the authors' attempt to be over-inclusive at the symptom level. Specifically, Cooke and colleagues (2012) suggested that these symptoms, as well as *Lacks concentration* and *Lacks pleasure,* are those some would consider secondary or irrelevant symptoms to the construct of psychopathy. In fact, research by Hoff (Hoff et al., 2012) found that *Restless* was not seen as a symptom of the prototypical psychopath by any of their samples of mental health professionals, correctional staff, or community residents, and *Unstable self-concept* was a problematic symptom in both their study and the one by Kreis et al. (2012). In the current study, the results of both the internal structural reliability and confirmatory factor analyses support that both *Restless* and *Unstable self-concept* are problematic symptoms. As suggested by Hoff and colleagues (2012), it is likely that *Restless* is not specific enough to psychopathy; rather, it is an element of being impulsive, and therefore is a common symptom to many other forms of psychopathology. In fact, *Restless* may not have exhibited utility in the current study as it is a trait common to all serious and violent young offenders, regardless of their overall level of psychopathic traits. Similarly, *Unstable self-concept* may be common to many adolescents as this developmental period is known for being one of identity exploration and experimentation; in effect, trying on different personas. Given their poor performance on both analyses in the current study, these two symptoms are potential candidates for removal from the CAPP-IRS, at least in its application to youth samples. Yet, while not a distinguishing feature of adolescent psychopathy, it is possible that these symptoms are more useful at identifying psychopathic personality disorder among other samples, such as among adult female offenders or community members. Thus, more research needs to be conducted before concluding that certain symptoms on the CAPP are unnecessary.

On the other hand, rather than be irrelevant to psychopathic personality disorder, these symptoms may be indirectly relevant, in that they are secondary symptoms that are the consequence of other symptoms listed in the model. In the current study, one of the suggested modifications for better model fit was to add a path from *Lacks concentration* to *Restless*. Thus,

it is possible that, as previously suggested by Cooke and colleagues (2012) *Restless*, which is indicative of the inability to relax or sit still (i.e., being overactive, fidgety, energetic) is not itself a direct symptom of psychopathy but instead, may caused by an inability to focus (i.e., being distractable, inattentive, or unfocused). Similarly, Salekin and colleagues (2012) cautioned that although a strength of the CAPP is its breadth of symptoms, it may include some symptoms that are somewhat idiosyncratic. In Dawson et al.'s (2012) case study analysis, *Unstable self-concept* was a useful symptom in that it helped distinguish their two youth offenders, both of whom demonstrated a substantial number of psychopathic traits. Yet, rather than being an important symptom of psychopathy, *Unstable self-concept* may be a consequence of a particular symptom combination. Therefore, while a strength of the CAPP is its ability to provide insight into the heterogeneity of psychopathy given the significant array of potential symptom combinations, much more work needs to be completed to conclude which symptoms are primary key distinguishing symptoms of this disorder, and which symptoms appear only in the presence of particular symptom combinations.

An alternative explanation for the poor performance of some CAPP symptoms and the overall poor model fit is that they may be relevant symptoms of psychopathy but located on the wrong domain. Of note, the analysis determined that some domains experienced substantial pairwise correlations. For instance, the *Attachment* and *Emotional* domains were almost perfectly correlated (r = .985), suggesting that although *Attachment* intends to measure emotional connection to others whereas *Emotional* intends to measure ones personal emotional experiences, they are not measuring unique sets of traits. Thus, the problematic symptom *Lacks anxiety* may be more appropriately located on the *Attachment* domain or, more likely it is a consequence of the other *Emotional* symptoms, in particular, *Lacks emotional depth*. An exploratory factor analysis is necessary to determine whether this symptom is correlated with symptoms from other domains or whether it appears to stand alone and, therefore, represent more of a secondary symptom of psychopathy.

Another potential cause of the high inter-domain correlations may be due to the way in which certain symptoms are assessed. For instance, on the *Cognitive* domain, *Intolerant* is defined as being unwilling to hear or accept or lacking respect for different views, practices, opinions, and beliefs, and is indicated by the adjectival descriptors of being narrow-minded, bigoted, and hypercritical. To measure being narrow-minded, the suggested interview questions

are “Have you thought any of the people around you were fairly decent or respectable, or have they been mostly worthless and out for what they could get? Have you been fast to make judgements about other people?” Yet, these questions could also inform assessments on the *Self* domain, specifically, a *Sense of uniqueness* (feeling one of a kind, that others are not equal to them), as well as the *Dominance* domain, specifically, the symptom of *Antagonistic* (being hostile, disagreeable, or contemptuous of others). To measure being bigoted, the suggested interview questions include “How have you gotten on with the people around you? Whose company have you enjoyed/avoided? Have you fallen out with anyone? Why”. Rather than uniquely tapping into being *Intolerant*, these questions seem to touch also on emotional qualities that are necessary to form relationships. The answers to these questions could therefore be affected by symptoms on the *Emotional* domain, such as the degree to which the youth *Lacks pleasure* and *Lacks emotional depth*, as the inability to feel emotions will affect their ability to get along with others around them. Lastly, hypercritical is measured using questions including “Who has criticised you for saying unkind things about them?” and “Have you been able to forgive the people around you who have disappointed you or let you down?”. Rather than explicitly measure the degree to which a youth is *Intolerant* due to being hypercritical, these questions could tap into the *Attachment* domain; specifically, the degree to which a youth is *Detached* or emotionally disconnected from others. In effect, the questions used to assess some symptoms may not be specifically enough worded and may lead to superficially high correlations between some symptoms and, subsequently, some of the domains. There are three possible responses to this explanation. Firstly, the questions and model structure could remain as proposed but those applying the CAPP-IRS could be specifically instructed to only apply information gathered for one symptom to the symptom in question and not to use that information as evidence of other similar symptoms. Secondly, the model structure could remain as is but the questions could be revised to more narrowly assess the symptom in question. Thirdly, the model structure could be revised to allow for symptoms with overlapping sources of information to converge into their own domain. If these symptoms are able to be assessed using similar questions, this suggests they may in fact be related to each other as part of a greater unidimensional construct.

A similar explanation for the strong correlation values comes from Salekin and colleagues (2012), who argued that in some cases, the behavioural indicators used to describe symptoms from one domain may also reflect symptoms from other domain. In the example they provided, they noted that some of the indicators of *Unempathic* on the *Attachment* domain (e.g.

being indifferent or unconcerned about the suffering of others, being able to describe extreme violence without any real emotion) may also be indicative of *Lacks remorse* on the *Emotional* domain. Similarly, they suggested that the descriptor of being disorganised for the symptom *Lack planfulness* (*Cognitive*) is similar to the behavioural indicators on *Lacks perseverance* (*Behaviour*), which include having an untidy living area, having poor time keeping skills, and paying half hearted attention to work and other tasks. In effect, Salekin and colleagues (2012) suggested that behavioural indicators used to enhance or describe symptomatology may be used to inform more than one symptom, leading to superficially high correlations. That said, behavioural indicators, such as those identified by Salekin et al. (2012) are not supposed to be used to score the CAPP-IRS symptoms but are instead supposed to be used to enhance their description; thus, if used properly, they should not be influencing the rating of these symptoms. It is possible then that this issue could be fixed with better training and more explicit instructions in the CAPP-IRS manual. However, the fact that these indicators could possibly represent more than one symptom suggests possible model misspecification and a need to allow the multidimensionality of psychopathy to converge in a different way than currently theoretically proposed. Thus, the next step in exploring the structure of psychopathy as proposed by the CAPP is an exploratory factor analysis.

Limitations

There were several limitations to the current analysis. Although it was a useful and much needed exercise to assess the construct validity of the CAPP using real-life applications, any factor analysis is dependent upon the sample it is based on. In other words, the theoretical 33-item six-domain CAPP-IRS structure may be an accurate reflection of the nature of psychopathy in other samples, it simply was not a good fit for this sample of 147 incarcerated serious and violent male youth.

As the analysis was conducted on a sub-set of male youth rather than the full sample of male and female incarcerated young offenders, the sample size was reduced to 147 youth. Although the PCL:YV has similarly used small samples (i.e. Kosson et al. 2002 analysed 115 youth whereas Salekin et al., 2006 analysed 130), a larger sample size would have been ideal considering the large number of symptoms (33) being analysed in the current study. In addition, a larger sample size would have permitted an analysis of the application of the CAPP-IRS to

female young offenders. Further, a larger sample size might have allowed for a developmentally focused analysis. The current sample was limited to adolescents between 12 and 18 years of age, the bulk of whom (73%) were between the ages of 16 and 18. Ideally, separate CFAs would have been performed for younger versus older adolescents; however, a CFA with 33 symptoms and only 38 subjects would have been unreliable. Moreover, a sample covering a wider age range (i.e. extending backwards into childhood and forward into early adulthood) would provide more insight into the development of psychopathy over the early life course; in particular, which symptoms are more reliably assessed and more relevant to psychopathy at different stages in life. However, as the current study was part of a larger study focused on incarcerated adolescents, such analyses were not possible at this time.

It is important to qualify that the broad interpretation of the results from a factor analysis is limited to the variables included in the instrument being analysed; in other words, any conclusions regarding the structural validity of the scale apply only to the CAPP-IRS and not to the construct of psychopathic personality disorder. The same critique applies to the PCL; although numerous studies have supported the two-, three-, and two-factor four-facet models of the PCL, these results should not be equated with the construct of psychopathy. However, combining the results obtained from the current study and from studies utilizing the PCL will improve understanding of the construct of PPD as these studies have used multiple approaches to explore the construct.

Conclusion

The CAPP model has the potential to substantially improve understanding of psychopathic personality disorder, given its greater symptomatology, ability to measure symptoms dynamically, and reduced focus on antisocial behaviours. Unfortunately, despite fairly good results at the structural reliability level, the current theoretical model proposed in the CAPP was unsupported in an application of model testing to a sample of serious and violent incarcerated young male offenders. However, many of the CAPP symptoms showed promise as relevant indicators of psychopathy. Consequently, an exploratory factor analysis should provide some insight into an improved model while comparisons at the domain level with other known measure of psychopathic personality disorder will provide useful information on the construct validity of this model.

Chapter 5.

Exploratory Factor Analysis of the CAPP-IRS

Introduction

As noted previously in this dissertation, given recent concerns with the over-reliance of the Hare PCL scales on antisocial behaviours and the lack of reference to some clinically important symptoms of psychopathy, researchers have begun to rely on more personality-focused measures of PPD, such as the CAPP-IRS (Cooke et al., 2005). However, the results of the previous chapter suggested that the theoretical CAPP-IRS domain model had a poor fit in a sample of incarcerated serious and violent male young offenders. Thus, the intent of this chapter is to identify alternative model structures via an exploratory factor analysis conducted with the same sample of incarcerated serious and violent male young offenders. First however, a review of the personality theory literature as it relates to PPD is provided, as this will inform the interpretation of the subsequent results of this analysis.

The Underlying Nature of the Psychopathic Personality

Personality traits are relatively stable biological structures that guide our behaviours and actions. They are latent constructs, in that they are internal and therefore not directly visible; instead, they must be measured by inference from overt behaviours, such as criminality or other forms of antisocial behaviour (Krueger, 2002; Livesley, Schroeder, Jackson, & Jang, 1994). Together, these guiding traits can be organized hierarchically to represent structures of personality and personality disorder, including psychopathic personality disorder, with broad superfactors or higher order factors located at the top of the hierarchy, each of which is then represented by a range of individual but somewhat interrelated lower order traits (Krueger, 2002; Watson, Clark, & Harkness, 1994).

While other measures have since been developed (e.g. the Psychopathic Personality Inventory, Lilienfeld & Andrews, 1996; the Antisocial Process Screening Device, Frick & Hare, 2001; and the Childhood Psychopathy Scale, Lynam 1997), the traits of psychopathic personality disorder are commonly measured by the Psychopathy Checklist-Revised (PCL-R, Hare, 1993, 2003) for adults and the Psychopathy Checklist: Youth Version (PCL:YV; Forth et al., 2003) for youth. These scales represent a 20-item measure of psychopathy that scores each dysfunctional trait as absent (0), possibly present (1), and definitely present (2), rendering a total possible score out of 40. Absence of the trait is taken to mean that an individual does not have the particular dysfunction in question; e.g. they do not display impulsivity or callousness towards others. As such, each item represents a continuum of dysfunction with respect to each particular trait; higher scores (2) reflecting more dysfunction and lower scores (0) reflecting no dysfunction (0).

These 20 traits are said to work in concert to produce the construct of psychopathy. A perfect score of 40 would represent the prototypical psychopath who is characterized by dysfunction with respect to each possible identifying feature of psychopathy. Scores on this scale that exceed a certain cut-point (typically 30+) are interpreted to indicate the presence of psychopathy; as such, the PCL can provide a diagnosis as a psychopath, which some say represent a qualitatively distinct category of dysfunction (Arrigo & Shipley, 2001; Cleckley, 1964, 1976). Personality disorders generally, as referenced in the Diagnostic and Statistical Manual (DSM), were in fact historically conceptualized as categorical constructs, where evaluations of dysfunction were made based on whether the individual in question surpassed a cut-off score and therefore fell into the range for diagnosis (e.g. Costa & McCrae, 1992; Livesley, 2001, 2007; Livesley et al., 1994; Shedler & Westen, 2004; Ullrich & Marneros, 2004). However, this categorical approach has since been critiqued for several reasons, including 1) that the cut-off score is often arbitrarily determined yet it implies that there is a clear distinction between normal and abnormal personality; 2) that there is a high degree of comorbidity between the “distinct” personality disorders, because an individual can possess an array of distinct symptomatology underlying a single personality disorder; and 3) because an individual with a categorical diagnosis may be assigned traits related to the disorder that they do not actually possess (Blackburn, Logan, Renwick, & Donnelly, 2005; Costa &McCrae, 1992; Livesley, 2001, 2007; Livesley et al., 1994; Lynam & Widiger, 2001; Ullrich & Marneros, 2004; Widiger & Costa, 2012). For instance, two individuals who both meet the criteria for PPD may reach that diagnosis with

different symptomatology, thus leading to distinctive subtypes of individuals with the same disorder, while labelling an individual a psychopath implies that they possess at least 15 psychopathic traits but does not necessarily mean that they are characterized by all 20 (e.g. Benning et al., 2003; Cooke et al., 2005; Karpman, 1941; Widiger & Costa, 2012).

Rather than viewing psychopathy as a distinct taxon or category, other researchers have suggested that it is more appropriate to refer to this construct – and other personality disorders more generally – as a dimensional construct, composed of an array of underlying personality traits that are extreme variants of the normal personality and which result in negative manifestations or dysfunction (Bishopp & Hare, 2008; Guay et al., 2007: Livesley et al., 1994; Miller, Lynam, Widiger, & Leukfield, 2001; Widiger & Costa, 2012). Although the early research supported a categorical or taxonic nature of PPD (Barry et al., 2008; Harris et al., 1994; Lee, 2006; Skilling, Harris, Rice, & Quinsey, 2002; Skilling, Quinsey, & Craig, 2001), several scholars since suggested that these findings only supported the taxonomic nature of the behavioural component of PPD and not the more personality-focused traits. Moreover, they critiqued the validity of the methodology and nature of data analysis used to produce these results for reasons including inappropriate samples (i.e. community or psychiatric samples with high rates of mentally disordered offenders) and file-only based ratings of psychopathy, which are less capable of insightfully assessing Factor 1 traits (Edens, Marcus, Lilienfeld, & Poythress, 2006; Lilienfeld, 1998; Marcus, John, & Edens, 2004; Vasey, Kotov, Frick, & Loney, 2005). Since then, methodologically stronger research clearly supported the dimensional nature of PPD among adults and psychopathic traits among youth samples, which is in line with other major structural models of personality and personality disorder (Blackburn et al 2005; De Clercq & De Fruyt, 2003; Edens et al., 2006; Guay et al., 2007; Livesley, 2001, 2007; Lynam & Widiger, 2001; Lynam & Derefinko, 2006; Marcus et al., 2004; Murrie, Marcus, Douglas, Lee, Salekin, & Vincent, 2007). Given this, although those meeting the diagnosis of PPD may seem to be a discrete class of humans, they are different from non-psychopaths only in that the particular degree and combination of certain maladaptive traits underlying the disorder have combined in such a way as to make their overt behaviours problematic for others to the extent that these traits become noticeable and measurable. In effect, they are quantitatively different rather than categorically different (e.g. Widiger, Sanderson, & Warner, 1986). Thus, personality disorders, such as psychopathy, are better measured in a dimensional sense and seen as an extreme variant of normal personality traits experienced in a particularly detrimental combination

resulting in dysfunctional expression, rather than viewed as a distinct category of personality disorder (e.g. Costa & McCrae, 1992; Livesley, 2001; Livesley et al., 1994).

General Personality Theories

A benefit of reconceptualising psychopathy from a personality-centred framework is that the construct can then be fit into more general theories of personality, such as presented by Costa and McCrae's (1992) widely accepted Five Factor Model (FFM) (Livesley, 2001). The FFM was created using a lexical approach, whereby the consensus is that traits of most interest or relevance to people will be present and described within the language. Thus, a study of the language should reveal key terms that are defined and discussed to a greater extent than others (Widiger & Costa, 2012). Through this approach, the five factor, or Big 5, structure of personality was determined to consist of Extraversion (sociability and agency, e.g. warm, assertive, positive emotions), Agreeableness or at the opposing end, Antagonism (interpersonal strategies, e.g. trust, altruism, tender mindedness), Conscientiousness (impulse control, ability to carry out plans/tasks and organize behaviour, e.g. dutifulness, self-discipline, order; essentially, self-control), Neuroticism (emotional instability and maladjustment, e.g. anxiety, angry-hostility, depression, impulsiveness), and Openness [to Experience] (interest in and willingness to try new things, intellectual curiosity, e.g. fantasy, feelings, values) (Costa & McCrae, 1992; Lynam & Derefinko, 2006; Lynam & Widiger, 2007; Widiger & Costa, 2012). Essentially, all humans can be described along these five domains as they "refer to observable differences in patterns of thought, feeling, and behavior" that appear to be consistent across culture and age (Costa & McCrae, 1992: 346) and they "have been found to recur in many different studies and appear to account for most of the variance in measures derived from a wide variety of personality theories" (Costa & McCrae, 1992: 344). Widiger and Costa (2012) observed that the first two domains, Agreeableness and Extraversion (which happen to be the largest domains extracted), both touch on interpersonal relatedness, while Conscientiousness focuses on constraint and regulation of behaviour, Neuroticism touches on emotional instability, and Openness is concerned with intellect and imagination. In effect, these five domains are, in order, what is considered most important to a society or culture, based on the frequency and variety with which terms related to it appear in the language (Widiger & Costa, 2012).

Whereas the DSM provides categorical distinctions between personality disorders, in support of the lack of qualitative or categorical distinction between normal and abnormal personality (e.g. O'Connor, 2002), research suggests that DSM personality disorders can be described with reference to at least four of these five higher-order traits, the exception being the smallest and last extracted factor, Openness to Experience (Livesley, 2001). For instance, Lynam and Widiger (2001) asked personality disorder experts to rate personality disorders using the FFM and found that virtually all (with the exception of schizotypal personality disorder) could be described by the thirty facets underlying the five-factor model. Importantly, this moves the discussion of personality disorders away from a categorical distinction that results in diagnostic overlap and the forcing of homogeneity upon heterogeneous disorders towards a dimensional approach where they can be considered in the context of the continuum of normal personality traits mixed together to form a coherent syndrome (Widiger & Costa, 2012). Such an approach would recognize that personality disorders, such as psychopathy, are composed of maladaptive variants of normal personality traits; thus, they exist within the perspective of normal personality rather than being set aside as qualitatively different (Widiger & Costa, 2012).

Previous studies specifically interpreted psychopathic personality disorder using the FFM framework, which enables the consideration of psychopathy in relation to other types of personality functioning and dysfunction and, importantly, opens up the underlying nature of the construct of psychopathy to more than just the operationalization suggested by Hare (Lynam & Derefinko, 2006; Miller et al., 2001). In a study exploring the FFM profile of the prototypical psychopath with 481 young adults, Miller and colleagues (2001) found that both Factor 1 and Factor 2 of the PCL-R were characterized by low levels of Agreeableness, while Factor 2 was additionally characterized by low levels of Conscientiousness (Miller et al., 2001). In a later meta-analysis, Lynam and Derefinko (2006) found that Agreeableness and Conscientiousness were similarly negatively related to both Factor 1 and 2 scores, though Conscientiousness exhibited a much weaker correlation with Factor 1, possibly explaining why this relationship was not found in the single-sample study by Miller et al. (2001). In contrast, in a study with 100 hospitalized male offenders with personality disorders, Pereira, Huband, and Duggan (2008), using a less specific measure of the FFM (the NEO-FFI), failed to identify a relationship with Conscientiousness but instead identified that Extraversion and Neuroticism were related to psychopathy. Specifically, they found that Factor 1 scores were negatively related to

Agreeableness and Neuroticism, while Factor 2 scores were negatively related to Agreeableness but positively related to Extraversion.

These studies suggested that the FFM dimensions most relevant to adult psychopathy appear to be Agreeableness, which is negatively related with both PCL-R factors, and Conscientiousness, which is specifically negatively related with Factor 2. These findings are theoretically intuitive, given that the low end of Agreeableness represents an individual who is Antagonistic whereas an individual low in Conscientiousness has difficulties with self-control. Of note, Miller and Lynam (2003) observed that biological findings of poor attention shifting and response modulation in individuals high in psychopathy are consistent with the expression of low Conscientiousness. On the other hand, some studies have suggested a relationship with Neuroticism, although the direction and nature of the relationship with Neuroticism is not clear as it is mixed with items that are theoretically and empirically related (anger-hostility, impulsiveness) and unrelated (anxiety, depression) to psychopathy.

These findings suggest that some personality traits, which are absent in the Hare scales of psychopathy, are in fact important to psychopathy, such as lack of anxiety and fearlessness, (Widiger & Costa, 2012). In fact, Lynam and Widiger (2007) argued that continually searching for the factor structure of the PCL scales would do little to elucidate the true nature of the underlying construct, as additional relevant items of psychopathy could not be identified using this approach. Thus, some authors advocated for reconceptualising psychopathy from the ground up and utilizing normal personality frameworks, such as the FFM, as a starting point. This was the process utilized by the authors of the Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996) as well as the Comprehensive Assessment of Psychopathic Personality Disorder (Cooke et al., 2005).

Importantly, these research findings also apply to adolescents. In fact, previous studies demonstrated that adolescents show a similar five-factor personality structure as adults (De Clercq & De Fruyt, 2003; De Clercq, De Fruyt, & Van Leeuwen, 2004; De Fruyt, Mervielde, Hoekstra, & Rolland, 2000). Of note, scores on Agreeableness, Conscientiousness, and Extraversion were quite stable from adolescence into adulthood, although both genders experienced increases in Openness to Experience as they entered adulthood, while females

also increased somewhat in their Neuroticism scores as they aged (McCrae, Costa, Terracciano, Parker, Mills, De Fruyt, & Mervielde, 2002).

Regarding the personality-based profile of *psychopathy* among youth, the patterns were again generally similar to that found with adults, although there were some slight developmental differences, mostly concerning neuroticism (Lynam, 2002; Lynam, Moffitt, Raine, Loeber, & Stouthamer-Loeber, 2005; Salekin, Leistico, Trobst, Schrum, & Lochman, 2005). One youth study using first a sample of 13 year olds assessed by their mothers and secondly a sample of 16 year olds assessed by their mothers and themselves on a two-factor measure of youth psychopathy identified that Agreeableness was more negatively related to Factor 1 (Interpersonal/Affective) than Factor 2 (Social Deviance), whereas Conscientiousness was more negatively related to Factor 2 than Factor 1 (Lynam et al., 2005). Interestingly, Neuroticism was positively related to both factors, although more strongly to Factor 2; this is likely due to its inclusion of traits related to impulsiveness and anger-hostility, but also fearlessness, shamelessness, and superficiality (Farrington, 2005). A study with children examining the prototypical "fledgling" psychopath likewise found that childhood psychopathy was primarily characterized by low Agreeableness and Conscientiousness, although in this case psychopathy scores were related to low Neuroticism (Lynam, 2002). Salekin and colleagues (2005) analyzed the relationship between the Big 5 (i.e. the FFM) and several different measures of psychopathy, although it is important to note that these measures were all based on the PCL-R (the PCL:YV, Forth et al., 2003; the Antisocial Process Screening Device, Frick & Hare, 2001; and the Child Psychopathy Scale, Lynam 1996). Again, this research suggested that neuroticism was positively related to adolescent psychopathy, leading the authors to conclude "that worry and anxiety may accompany psychopathic features in earlier developmental stages" (Salekin et al., 2005: 445).

Consistently then, research suggests that the affective/interpersonal traits indexed on the PCL-R are negatively related to Agreeableness, while the socially deviant traits are negatively related to Agreeableness and Conscientiousness and, importantly, these findings are consistent across differing developmental periods. However, the research findings are less consistent regarding the relationship between Neuroticism and psychopathy. Miller and colleagues' (2001) research with 481 young adults found different patterns of correlations between the two-factor PCL-R and this higher-order FFM dimension. Specifically, while Factor 1

(the interpersonal and affective traits) appeared to be represented by low levels of Neuroticism, Factor 2 (deviant lifestyle) was better represented by high levels of Neuroticism. Interestingly, Lynam and Derefinko's (2006) meta-analysis found that neuroticism was unrelated to Factor 1 but positively and moderately related to Factor 2 (Extraversion was also unrelated to Factor 1 but negatively, though weakly, related to Factor 2) while a study with 100 hospitalized offending men with personality disorders using a less specific measure of the FFM (the NEO-FFI) similarly found that Factor 1 scores were negatively related to Agreeableness and Neuroticism, while Factor 2 scores were negatively related to Agreeableness but positively related to Extraversion (Pereira, Huband, & Duggan, 2008).

There are at least two possible explanations for the inconsistent findings regarding Neuroticism and psychopathy. The first is that as mentioned, Neuroticism itself is composed of a variety of underlying traits, some of which are hypothesized to share a positive relationship with psychopathy (e.g. angry hostility, impulsiveness) and some of which are hypothesized to share a negative relationship (e.g. anxiety, depression, vulnerability to stress, and self-consciousness) (Miller & Lynam, 2003). However, this does not explain the differential findings between the two factors and Neuroticism. Instead, what may be at play here are different subtypes of psychopathy. While there are a variety of perspectives on the possible subtypes of psychopathy, some previous scholars suggested that primary psychopathy characterizes those whose psychopathic deficits are constitutional/genetic and who tend to score more highly on Factor 1 than Factor 2 while secondary psychopathy applies to those whose dysfunction is more adaptive in nature, and who tend to score more highly on Factor 2 than Factor 1 (Karpman, 1941; Levenson, Kiehl, & Fitzpatrick, 1995; Porter, 1996). Interestingly, additional research suggests that primary/Factor 1 psychopaths tend to show low levels of anxiety whereas secondary/Factor 2 psychopaths experience higher levels of anxiety (Karpman, 1941; Skeem, Johansson, Andershed, Kerr, & Eno Louden, 2007; Verona et al., 2001). This research signifies that assessing the degree of Neuroticism may be an important tool for distinguishing subtypes of psychopathy. Unfortunately, the PCL-R lacks any direct measure of neuroticism, such as a lack of anxiety or lack of vulnerability (i.e. fearlessness).

Regardless of the conflicting results involving Neuroticism, these studies helped move the construct of psychopathy back towards a more general personality framework: psychopathy can therefore be described by reference to normal personality and its underlying nature

explored in much greater detail than the limited content contained in the PCL scales. This is important for several reasons. Firstly, using personality frameworks to integrate research on personality disorders such as psychopathy allows research on normal personality functioning and other personality disorders to be integrated with research specifically conducted on psychopathic personality disorder, which should allow for better understanding of the developmental patterns and stability of this disorder and its comorbid relationship with other personality dysfunction, given that particular FFM dimensions will overlap in these various disorders (Farrington, 2005; Livesley, 2001; Lynam et al., 2005; Lynam & Widiger, 2001, 2007; Miller & Lynam, 2003).

Secondly, the application of frameworks of normal personality, such as the FFM, to the construct of psychopathy provides support to those who have critiqued that that the PCL scales lack reference to some apparently important dimensions of personality functioning, particularly lack of anxiety but also lack of fear, and result in inconsistent profiles, particularly of "successful" or primary psychopaths (e.g. Lykken, 1995; Lynam & Widiger, 2007; Miller & Lynam, 2003; Miller et al., 2001; Widiger & Costa, 2012). In one such paper, Lynam and Widiger (2007) argued that some of the key traits of psychopathy include high interpersonal antagonism and being oppositional and combative (i.e. hostile), neither of which are directly indexed on the PCL; likewise, Widiger and Costa (2012) observed that whereas neither the DSM nor PCL-R touch on absence of anxiety or fear, these traits are represented among the 30 facets of the FFM and in some cases, are associated with the psychopathy factors. Similarly, they noted that the FFM provided a clearer description of successful psychopaths, something that the DSM does not recognize and the PCL does not distinguish. For example, Mullins-Sweatt, Glover, Derefinko, Miller, and Widiger (2010) asked experts to provide an FFM rating of a successful psychopathic individual and found that a high level of Conscientiousness distinguished their personality profile from that of a more traditional criminal psychopath, as the presence of traits related to self-discipline, achievement-striving, competence, and order characterized the successful psychopath's ability to avoid conflict with the criminal justice system, something an unsuccessful psychopath has been unable to do.

In addition to providing support for the argument that the PCL scales underconceptualize PD, these personality-based studies also support the critiques that the antisocial facet of the PCL scales is not particularly useful as a distinguishing characteristic of psychopathic

personality. The consistent findings regarding the relationship of low Agreeableness and low Conscientiousness with psychopathy has very important implications for discussing the relationship between personality and antisocial behaviours. As discussed in the previous chapter, the PCL scales have been criticized for relying too heavily on indices of antisocial behaviours in their assessment of psychopathy, leading to strong predictive validity but impaired ability to understand and explain the causal relationship between personality and antisocial outcomes. The FFM, in contrast, contains no direct reference to antisocial outcomes, yet several studies have identified a relationship between low Agreeableness in particular, but also low Conscientiousness, with antisocial outcomes, including delinquency and crime, as well as the tendency to show conduct problems (e.g. Miller et al., 2001; Miller & Lynam, 2001, 2003; Miller, Lynam, & Leukefeld, 2003). This provides further non-tautological support for the purported relationship between psychopathic personality disorder and antisocial outcomes yet does so in a way that provides researchers with the ability to theorize more directly about the causal nature of this association. For instance, Miller and Lynam's (2001) meta-analysis of the relationship between four structural models of personality (the FFM, Eysenck's P-E-N model, Tellegen's three factor model, and Cloninger's seven factor temperament and character model) identified that across 59 studies, an antagonistic personality style (i.e. low Agreeableness) was primarily predictive of broadly defined antisocial outcomes, followed by impulsive cognitive and behavioural styles (i.e. low Conscientiousness). Of relevance to psychopathy, this means that the Factor 1 traits may play a more important role in explaining participation in antisocial behaviours than Factor 2 traits; however, given the heavy inclusion of antisocial behaviours on Factor 2, this relationship has been suppressed in past studies.

However, while the above research supports the need for a more personality-focused measure of psychopathy, the findings do not necessarily imply that an instrument built on and designed to measure a conceptualization of the normal personality framework should be used to assess maladaptive personality in the form of personality disorders, such as psychopathy. Several studies have documented that while the NEO-PI-R, the empirical assessment tool used to represent the FFM in research, provides useful information regarding the relationship to and divergence of personality disorders from the normal personality framework, it is less useful at suggesting avenues for treatment and predictions of future outcomes (Livesley, 2001, 2007). One reason for this is because the FFM is said to represent higher-order domains of personality functioning, rather than more specific forms of lower-order constructs. For instance, Neuroticism

is described by symptoms including angry hostility, anxiousness, and trait depression and it is at the level of these particular symptoms that clinicians obtain useful information about treatment strategies; in contrast, the other four dimensions are typically described by positive traits (e.g. warmth, tendermindedness, compliance, and straightforwardness) and thus are not direct measures of the maladaptive traits typically associated with psychopathy (e.g. unempathic, lacks emotional depth, self-centred, insincere). Similarly, although they correlate strongly with each other (given their collective representation on a single factor) these lower-order constructs may themselves have relationships with other variables, such as violent recidivism, that are differentially stronger or weaker than other constructs on the same factor and they may have distinct etiologies, such as differing genetic factors (e.g. Livesley, 2007). Finally, even general personality frameworks such as the FFM have been criticized for not containing reference to symptoms important to personality disorder. Livesley (2001) noted that these frameworks were not built with the specific purpose of identifying personality *dis*order and so traits that are often relevant to clinicians, such as cognitive dysregulation and insecure attachment, are not represented well by measures like the NEO-PI-R. Thus, assessment tools built specifically to measure a particular construct like psychopathy are likely to more comprehensively describe the full conceptualization of that particular disorder.

Again however, this is not a guarantee that a measure will fully represent the disorder it intends to assess, as this depends largely on the underlying theoretical orientation and operationalization of the theoretical construct (Heidt & Wheeldon, 2015).For instance, whereas the PCL was built using a top-down approach where traits relevant to the disorder were selected originally from a list provided in Cleckley's (1941, 1976) descriptive profile and which appeared relevant in the sample of incarcerated male offenders upon which the scale was validated, the PPI was built using a bottom-up approach, where traits relevant to the disorder were selected from a much larger list of all possible symptoms and reduced over time through empirical analysis (Livesley, 2007; Lilienfeld & Andrews, 1996). Thus, while the above research points to the need to develop personality-focused measures of psychopathic personality disorder using bottom-up approaches that are more likely to comprehensively represent the disorder in question, it also identifies that measures need to focus on the lower-order symptoms to increase the measure's utility for treatment and predictive purposes. One such model of psychopathy is the CAPP, which was built by Cooke and colleagues (2005) using a lexical (bottom-up) approach specifically to represent the construct of psychopathy using a personality-based

approach. Again, in this model PPD is theoretically represented by six interconnected yet individual domains of functioning – Attachment, Behaviour, Cognitive, Dominance, Emotional, and Self – each of which is represented by several symptoms for a total of 33 symptoms. These symptoms are measured on a seven-point scale, thus providing a dimensional representation of each of the six domains and a dimensional classification of psychopathy. It is important to note again that as this model was designed as a personality-focused conceptualization of psychopathy, antisocial behaviours do not constitute any of the domains or symptoms in this measure. Thus, the CAPP expands on the Hare conceptualization of psychopathy by bringing the focus back to clinically relevant personality indicators of psychopathy as identified by authors such as Cooke and Michie (2001), Lilienfeld and Andrews (1996), and Patrick (2010), adding additional indicators of each domain, and leaving out non-clinically relevant behaviours, such as criminal history and versatility, and juvenile delinquency/serious criminal behaviour.

Given its foundation as a personality-based model of psychopathy, the CAPP contains many similar symptoms as found on the FFM, but as a result of its purpose in measuring psychopathic personality disorder specifically, rather than personality functioning generally, it integrates additional symptoms thought to be relevant to psychopathy, including sense of self, attachments with others, and cognitive processes. Further, unlike the NEO-PI-R and PPI measures of personality and psychopathy, respectively, the 33 CAPP symptoms are measured on the basis of a file review and interview rather than a self-report assessment, which gives it greater utility in settings where individuals are motivated to lie and conceal, such as offending populations. Cooke et al. (2005) designed several measurement instruments utilizing the CAPP model of psychopathy, including the CAPP-IRS which was designed for use in institutional settings and which is the focus of the current study.

Current Study

As noted in the previous chapter, Pedersen et al. (2010) found strong internal consistency of CAPP-IRS domain scores in a sample of adults, while McCormick (2007) found support for interrater reliability and internal consistency of the CAPP-IRS total and domain scores. However, the analysis conducted in the previous chapter identified some potential issues with the CAPP-IRS structure. Firstly, the analysis identified some potential concerns regarding the internal reliability of some symptoms and domains for the female young offenders.

Secondly, in the previous chapter, the theoretical structure of the CAPP-IRS was tested in a sample of 147 incarcerated male serious and violent young offenders. Unfortunately, the results provided a lack of support for this structure. The domains were organized conceptually, as a way to arrange similar symptoms, but they are not necessarily arranged in an empirically meaningful way. Although an important limitation of factor analysis is that it is sample dependent, and the theoretical structure may therefore fit quite well in other youth or adult samples, it is also possible that the theoretical structure proposed by the authors is simply not valid. The current study continues the exploration of the CAPP internal structure by subjecting the data to an exploratory factor analysis to identify the most useful organization of psychopathy symptoms among a sample of incarcerated male serious and violent young offenders.

Methodology

Procedure

The procedure used to collect the data for this current study was described in detail in the previous chapter. Briefly, study data was collected from 186 male and female serious and violent young offenders remanded to either Burnaby or Victoria youth custody centres between 2005 and 2011. Given that the previous chapter's analysis identified some potential issues with the internal structure of the CAPP for female young offenders and that only 38 female youth have CAPP-IRS profiles available for analysis, this chapter will explore the factor structure of the CAPP-IRS only for the 147 male serious and violent incarcerated young offenders.

Measures

CAPP-IRS: The only measure analyzed in this chapter was the CAPP-IRS (Cooke et al., 2005). Again, each symptom on the CAPP-IRS is measured on a seven-point scale where the score reflects the persistence of symptomatic manifestation across time, situations, and relationships and the corresponding degree of dysfunction, impairment, and/or distress it causes to the self or others. While each symptom is divided further into three adjectival descriptors and behavioural indicators can be scored to help characterize the extent to which the symptom is present and maladaptive, this chapter focused only on domain and symptom scores which, in a previous study, were determined to have excellent overall interrater reliability (Intraclass Correlation Coefficient = .91) and good to excellent domain reliabilities (ICCs from .69 to .86;

McCormick, 2007), similar to research with the PCL (Dolan & Rennie, 2006; Gretton et al., 2004; Jones et al., 2006; Lynam et al., 2007; Salekin et al., 2006; Skeem & Cauffman, 2003; Vincent, 2002). These findings were particularly important, given that the CAPP-IRS symptom assessments utilize a much wider 7-point scale than the three-point PCL assessment, suggesting interrater reliability would be more difficult to consistently achieve.

Analytic Strategy

In the previous chapter, the theoretical six domain structure of the CAPP-IRS was tested using confirmatory factor analysis and the results indicated a poor fit for this model. The current analysis will take a bottom up approach to identify a more appropriate fit for the data in current sample. This will be achieved in three steps, each involving a form of factor analysis. First, a principal components analysis (PCA) will be conducted using the six domain total scores to assess the purported hierarchical structure of psychopathy proposed by the CAPP-IRS. Second, a PCA will be performed individually for each of the purported domains to identify whether the allocated symptoms converge into a single domain and, if not, where they split off and into how many individual factors. PCA is the selected method of analysis for the first two steps as it utilizes all the variance (variance that is unique to each variable, the variance that is common among all variables, and the error variance). In these two sets of analyses, given that there is only one component anticipated, the data will not be rotated. Component loadings will be interpreted as follows: .71 and above will be excellent, .63 through .70 will be very good, .55 through .62 will be good, between .45 and .54 will be fair, and under .45 will be poor and therefore considered as not loading on any particular component.

Third, using the results of the first two tests and the personality research and theories discussed above for guidance, an exploratory factor analysis (EFA) will be conducted with all 33 putative CAPP symptoms to identify the best fitting model for this sample generally, as well as by age group. EFA is a method of data reduction where numerous items on a measurement scale can be reduced into a smaller number or groupings. Specifically, EFA attempts to identify the number of factors present in a measurement scale, at least for that particular set of data. There are multiple analytical options when conducting an EFA, including the method of factor extraction and rotation of factors to make the solution more interpretable (Tabachnick & Fidell, 2001). The current study will employ maximum likelihood factor extraction, which is generally preferred as it allows for goodness of fit indices to be computed. A combination of the scree plot

and the “greater than one” eigenvalue method will be used to decide the number of factors to retain post-extraction (Tabachnick & Fidell, 2001). Again, symptoms reaching values of .45 or above will be interpreted as loading onto that factor. Prior to the analyses being conducted, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity will be checked to confirm that the data set is suitable for factor structure analysis.

Results

Hierarchical Nature of the CAPP-IRS Model of Psychopathy

In the first analysis, a PCA was conducted with the six domain scores to assess the hierarchical nature of the CAPP-IRS model of psychopathy. The authors suggested that psychopathy is a hierarchical construct represented by a varying array of symptom combinations. The first part of this hypothesis would be supported if the data revealed a large distance between the first component and any subsequent components, as it would essentially be identifying one big factor of psychopathic personality. The results supported this, as one large component with an eigenvalue of 3.95 accounting for 65.8% of the variance was extracted. Of the six individual domains, the largest communalities occurred for *Emotional* and *Dominance* (Table 17). While communalities were fairly close in size for five of the six domains, the *Cognitive* domain had a fairly low communality value, suggesting that only a little more than half of the variance in this domain was accounted for by the one hierarchical psychopathic component. Despite this, the unrotated component loading values indicated that all six domains loaded significantly and excellently onto the one component of psychopathy.

Table 17: Domain Loadings on the One-Component CAPP-IRS Model (n=147)

Domain	Communality	Unrotated Component Loading
Emotional	.708	.842
Dominance	.702	.838
Behaviour	.690	.831
Attachment	.681	.825
Self	.627	.792
Cognitive	.536	.732

Although the domain based analysis indicated that the CAPP-IRS was primarily defined by one large component upon which all six domains loaded, the analysis at the symptom level revealed a very different picture. As an initial step prior to examining the factor structure of the 33 symptoms in a rotated factor model, a test was run to assess the authors' supposition that the CAPP-IRS represents a unidimensional hierarchical model of psychopathy. If so, all 33 symptoms should load onto a single component. To this end, a PCA was run using the 33 symptoms and the unrotated loadings were examined. Both the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity supported the use of factor analysis with this sample, *KMO* = .857, Bartlett's x^2 (528) = 3378.374, p = .000. Further, virtually all communality values were at a satisfactory level (>0.50; see Table 18). Only *Garrulous* fell below 50%, meaning that the extracted components explained less than half of its variance.

Table 18: PCA Communality Values of the 33 CAPP-IRS Symptoms

Symptom	Communality
A1 Detached	.788
A2 Uncommitted	.684
A3 Unempathic	.775
A4 Uncaring	.709
B1 Lacks Perseverance	.735
B2 Unreliable	.775
B3 Reckless	.647
B4 Restless	.586
B5 Disruptive	.798
B6 Aggressive	.757
C1 Suspicious	.655
C2 Lacks Concentration	.712
C3 Intolerant	.559
C4 Inflexible	.703
C5 Lack Planfulness	.650
D1 Antagonistic	.793
D2 Domineering	.679
D3 Deceitful	.853
D4 Manipulative	.559
D5 Insincere	.774
D6 Garrulous	*.470*
E1 Lacks Anxiety	.766
E2 Lacks Pleasure	.680

Symptom	Communality
E3 Lacks Emotional Depth	.795
E4 Lacks Emotional Stability	.670
E5 Lacks Remorse	.810
S1 Self-Centred	.706
S2 Self-Aggrandizing	.814
S3 Sense of Uniqueness	.716
S4 Sense of Entitlement	.618
S5 Sense of Invulnerability	.769
S6 Self-Justifying	.785
S7 Unstable Self-Concept	.578

Overall, seven components were extracted in this analysis, accounting for a total 70.81% of the variance in PPD. In support of the hierarchical nature of PPD there was a large distance in the eigenvalues of the first (11.57) and subsequent (3.31 down to 1.13) components. However, an inspection of the unrotated component matrix indicated that only just over half (18 or 54.5%) of the 33 symptoms (*Detached, Uncommitted, Unempathic, Uncaring, Disruptive, Intolerant, Inflexible, Antagonistic, Domineering, Manipulative, Insincere, Lacks pleasure, Lacks emotional stability, Lacks remorse, Self-centred, Self-aggrandizing, Sense of entitlement,* and *Unstable self-concept)* loaded cleanly onto the first component which, alone, accounted for slightly more than a third (33.06%) of the variance in PPD (Table 19). In contrast, three symptoms (*Restless, Lacks concentration,* and *Lacks anxiety*), failed to load at all onto the first major component, suggesting that they are not strong defining features of PPD in this sample. Furthermore, nearly half of the symptoms (*Lacks perseverance, Unreliable, Reckless, Aggressive, Suspicious, Lacks planfulness, Deceitful, Garrulous, Lacks emotional depth, Sense of uniqueness,* and *Sense of Invulnerability* and *Self-justifying*) loaded onto the first major component but also loaded fairly strongly (>.450) onto at least one other component. Of these, four (*Suspicious*, *Lacks planfulness, Garrulous*, and *Sense of uniqueness*) actually loaded more strongly onto a different component than the first primary component, suggesting again that they may not be key symptoms underlying psychopathy, at least among this youth sample.

Table 19: Unrotated Component Matrix of the 33 CAPP-IRS Symptoms

Symptoms	Components						
	1	2	3	4	5	6	7
Detached	.675	-.188	-.433	-.192	.043	-.208	.168
Uncommitted	.610	.102	-.199	-.430	-.135	.041	.238
Unempathic	.709	-.270	-.308	.208	.204	.137	.030
Uncaring	.745	-.052	-.285	.091	.115	.045	.214
Lacks Perseverance	*.531*	*.509*	-.188	-.204	-.094	.324	.060
Unreliable	*.661*	*.455*	-.050	-.172	-.194	.209	.133
Reckless	*.552*	*.466*	.021	.149	.299	.093	.059
Restless	.253	*.462*	.288	.417	-.019	.198	.113
Disruptive	.686	-.021	-.119	.266	-.333	.216	-.291
Aggressive	*.656*	-.186	-.162	*.497*	-.036	-.053	-.119
Suspicious	*.499*	.270	.009	.060	.176	*-.538*	-.095
Lacks Concentration	.303	.698	.115	.092	-.042	.328	.041
Intolerant	.657	-.102	.061	.118	-.210	-.131	.195
Inflexible	.556	.358	.234	.221	-.187	-.335	.124
Lacks Planfulness	*.448*	*.582*	-.033	-.291	-.001	.150	-.055
Antagonistic	.726	.137	-.120	.420	-.180	-.140	-.062
Domineering	.682	-.275	.279	.201	-.083	-.084	-.076
Deceitful	*.647*	.005	.186	-.433	-.029	-.088	*-.450*
Manipulative	.654	-.099	.228	-.068	.054	-.066	-.242
Insincere	.618	-.131	.382	-.334	-.072	-.113	-.316
Garrulous	*.459*	.029	*.472*	-.111	-.047	-.038	-.143
Lacks Anxiety	.385	.265	.006	.067	.699	-.064	-.222
Lacks Pleasure	.534	-.066	-.440	-.143	-.042	-.366	.200
Lacks Emotional Depth	*.675*	-.206	*-.481*	-.179	.164	-.081	.003
Lacks Emotional Stability	.640	.295	-.115	.201	-.172	-.280	-.103
Lacks Remorse	.593	-.438	-.250	.141	.202	.347	-.154
Self-Centred	.648	-.207	.351	-.210	.130	.108	.218
Self-Aggrandizing	.604	-.437	.417	-.038	-.040	.008	.286
Sense of Uniqueness	*.480*	-.249	*.558*	-.055	.072	-.043	.319
Sense of Entitlement	.528	-.397	.256	.146	-.232	.193	.064
Sense of Invulnerability	*.581*	.097	.251	-.033	*.580*	.055	.133
Self-Justifying	*.588*	*-.477*	-.158	-.034	.009	.409	-.136
Unstable Self-Concept	.594	.096	-.160	-.302	-.310	.003	-.063

As a final step prior to conducting the EFA, the component regression scores were correlated to determine whether an oblique or orthogonal rotation would be appropriate. Despite a theoretical supposition that the underlying components of a hierarchical PPD construct would be somewhat related to each other, the bivariate correlations indicated a complete absence of correlation between the seven components. Thus, an orthogonal rotation – varimax – is required.

Testing the Univariate Nature of the CAPP-IRS Theoretical Domains

In the second step, each of the six theoretical domains was individually subjected to a PCA to assess their univariate nature. The *Attachment* domain purportedly consists of the four symptoms *Detached, Uncommitted, Unempathic*, and *Uncaring*. In the previous chapter, three of the four symptoms appeared to be coherent with only *Uncommitted* appearing problematic. In the current analysis, a univariate structure was identified with only one component with an eigenvalue of 2.75 being extracted. This one component accounted for 68.45% of the variance in attachment. All four symptoms had an excellent loading onto this component, although, consistent with the results in the previous chapter, *Uncommitted* was the weakest of the four (Table 20). Still, the results suggested that the four symptoms said to represent *Attachment* do in fact converge into a single domain.

Table 20: Symptom Loadings onto the Attachment Domain

Attachment Domain	Communality	Component 1 (Unrotated)
Detached	.728	.853
Uncommitted	.547	.740
Unempathic	.701	.837
Uncaring	.769	.877

The previous chapter's analyses suggested that the six symptoms on the *Behaviour* domain did not converge particularly well. Specifically, the symptom *Restless* did not appear to correlate well with the other five symptoms of *Lacks perseverance, Unreliable, Reckless, Disruptive,* and *Aggressive.* In the current analysis, *Restless* again performed inconsistently, achieving a very low communality of .286 (Table 21). The results identified two main components underlying the *Behaviour* domain. The first, with an eigenvalue of 2.92, accounted

for 48.71% of the variance, and was represented by good to excellent component loadings from all symptoms except *Restless*¸ which exhibited a fair loading on this first component. Interestingly, the second component, with an eigenvalue of 1.04 and 17.29% of the variance, appeared to be represented by two symptoms already loading onto the first component with *Aggressive* loading more strongly onto the second component than the first. In other words, two complex variables (*Disruptive* and *Aggressive*) were identified in this analysis while one fairly non-significant variable (*Restless*) was also identified. Given that PCA uses the unique, common, and error variance to produce component loadings, it is possible that the removal of *Restless* will help to better distinguish the structure of this domain.

Table 21: Symptom Loadings onto the Behaviour Domain

Behaviour Domain	Communality	Component 1 (Unrotated)	Component 2 (Unrotated)
Lacks Perseverence	.679	.759	-.321
Unreliable	.766	.821	-.304
Reckless	.594	.735	-.232
Restless	.286	.480	-.236
Disruptive	.777	*.740*	*.478*
Aggressive	.859	*.595*	*.710*

In the previous chapter, the *Cognitive* domain was also problematic in terms of low inter-item correlations between its five symptoms of *Suspicious, Lacks concentration, Intolerant, Inflexible* and *Lacks planfulness*. Again, two components were identified in the current analysis. The first component, with an eigenvalue of 2.36, accounted for 47.13% of the variance, while the second, with an eigenvalue of 1.02, accounted for an additional 20.39% of the variance. Overall then, these two components explained two-thirds (67.51%) of the variance of the *Cognitive* domain. All symptoms had good to excellent loadings on the first component (Table 22); however, *Intolerant* loaded equally strongly onto Component 2. *Lacks concentration* also had a substantial loading on Component 2; interstingly, this loading was negative. In effect, the *Cognitive* domain does not appear to be unidimensional in this sample.

Table 22: Symptom Loadings onto the Cognitive Domain

Cognitive Domain	Communality	Component 1 (Unrotated)	Component 2 (Unrotated)
Suspicious	.549	.674	.308
Lacks Concentration	.754	.624	*-.604*
Intolerant	.692	*.595*	*.581*
Inflexible	.686	.811	.167
Lack Planfulness	.695	.708	-.441

The *Dominance* domain performed better in the previous chapter than either *Behaviour* or *Attachment*, although it appeared that two symptoms (*Garrulous* and *Antagonistic*) were somewhat unrelated to the remaining symptoms of *Domineering, Deceitful, Manipulative,* and *Insincere*. In the current analysis, a single component was identified with an eigenvalue of 3.299 explaining 54.98% of the variance. Still, the aforementioned two symptoms had the lowest communalities (Table 23) with less than half of their variance accounted for by the one component. Further, although they both achieved a "good" loading onto the component, with *Garrulous* verging on a "very good" loading, they remained the weakest loadings on this component, compared to the other four symptoms. Still, the PCA supported that the *Dominance* domain was unidimensional in the current sample, though the overall amount of variance explained in this domain by its six symptoms was fairly low at just over half.

Table 23: Symptom Loadings onto the Dominance Domain

Dominance Domain	Communality	Component 1 (Unrotated)
Antagonistic	.366	.605
Domineering	.574	.757
Deceitful	.669	.818
Manipulative	.595	.771
Insincere	.687	.829
Garrulous	.408	.639

In the previous chapter, *Lacks anxiety* appeared particularly problematic on the *Emotional* domain, as it was seemingly unrelated or weakly related to the remaining symptoms of *Lacks pleasure, Lacks emotional depth, Lacks emotional stability,* and *Lacks remorse.* In the current analysis, while a single component was identified with an eigenvalue of 2.42, this

component explained less than half of the variance (48.39%). *Lacks anxiety* in particular had a low communality value, although the values for *Lacks emotional stability* and *Lacks remorse* were also fairly small (Table 24). However, these latter two symptoms achieved a very good loading on the single component whereas *Lacks anxiety* had a fairly strong loading. Still, this domain appears to be unidimensional with all symptoms loading onto it.

Table 24: Symptom Loadings onto the Emotional Domain

Emotional Domain	Communality	Component 1 (Unrotated)
Lacks Anxiety	.239	.488
Lacks Pleasure	.560	.748
Lacks Emotional Depth	.757	.870
Lacks Emotional Stability	.402	.634
Lacks Remorse	.462	.680

Generally, the *Self* domain appeared unproblematic in the previous analysis, with the only weakness coming from *Unstable Self-concept*. The remaining symptoms of *Self-centred, Self-aggrandizing, Sense of uniqueness, Sense of entitlement, Sense of invulnerability, and Self-justifying* appeared to relate well to each other. In the current analysis, a single component was identified with an eigenvalue of 3.52, accounting for half (50.34%) of the variance. However, *Unstable self-concept* was again problematic, with a very low communality and a weak, but still fairly strong, loading onto the component (Table 25). Interestingly, both *Sense of invulnerability* and *Self-justifying* also had low communalities and weaker, although still very good, loadings onto the component.

Table 25: Symptom Loadings onto the Self Domain

Self Domain	Communality	Component 1 (Unrotated)
Self-Centred	.656	.810
Self-Aggrandizing	.733	.856
Sense of Uniqueness	.563	.750
Sense of Entitlement	.512	.716
Sense of Invulnerability	.398	.631
Self-Justifying	.440	.663
Unstable Self-Concept	.222	.471

Overall, the results of this second stage of analysis indicated that many of the domains did appear to be unidimensional but that each had somewhat poorly performing symptoms. In addition, two of the domains (*Behaviour* and *Cognitive*) were bidimensional with some complex symptoms that cross-loaded onto both components. Furthermore, although the majority of the domains did appear to be unidimensional in this sample, the single components identified in the *Dominance, Emotional,* and *Self* domains accounted for only half of the variance in the domain, leaving a substantial proportion unexplained by the currently assigned symptoms. Considering these results, as well as the findings in the previous chapter of significant and strong inter-domain correlations, it appears some re-organization of the 33 CAPP-IRS symptoms may be possible. Thus, the next step is to conduct a factor analysis with all 33 symptoms to identify the structure of the CAPP-IRS in the sample of male serious and violent incarcerated young offenders.

Exploratory Factor Analysis with the 33 CAPP-IRS Symptoms

The EFA was conducted using maximum likelihood extraction and varimax rotation. Similar to the previous analysis, seven factors were identified by the Kaiser rule (Eigenvalues > 1), accounting for 70.81% of the variance. As PCA uses all the variance (unique, common, and error) whereas EFA uses only the common variance, the resulting communalities and factor loadings differed. Table 26 shows the communalities for the 33 symptoms resulting from the EFA. In this analysis, five of the CAPP-IRS symptoms (*Restless, Suspicious, Intolerant, Garrulous*, and *Unstable self-concept*) had communality values below .500, indicating that the extracted factors accounted for less than half of their variance. Thus, these symptoms are unlikely to load cleanly onto any of the identified factors and may be candidates for deletion from the CAPP-IRS model. In contrast, some communalities were especially high, particularly for *Deceitful* (.999), *Self-aggrandizing* (.821), *Detached* (.814), and *Lacks remorse* (.814).

Table 26: EFA Communality Values of the 33 CAPP-IRS Symptoms

Symptom	Communality
A1 Detached	.814
A2 Uncommitted	.585
A3 Unempathic	.720
A4 Uncaring	.648
B1 Lacks Perseverance	.680
B2 Unreliable	.755
B3 Reckless	.593
B4 Restless	*.378*
B5 Disruptive	.680
B6 Aggressive	.697
C1 Suspicious	*.453*
C2 Lacks Concentration	.591
C3 Intolerant	*.496*
C4 Inflexible	.598
C5 Lack Planfulness	.545
D1 Antagonistic	.789
D2 Domineering	.642
D3 Deceitful	.999
D4 Manipulative	.536
D5 Insincere	.613
D6 Garrulous	*.318*
E1 Lacks Anxiety	.617
E2 Lacks Pleasure	.570
E3 Lacks Emotional Depth	.780
E4 Lacks Emotional Stability	.565
E5 Lacks Remorse	.814
S1 Self-Centred	.633
S2 Self-Aggrandizing	.821
S3 Sense of Uniqueness	.590
S4 Sense of Entitlement	.506
S5 Sense of Invulnerability	.729
S6 Self-Justifying	.777
S7 Unstable Self-Concept	*.433*

Using the guideline of .45 to interpret a symptom as "loaded" onto a factor, a fairly clear structure to the data emerged (Table 27). Five symptoms (*Reckless, Aggressive, Disruptive, Insincere,* and *Sense of invulnerability*) cross-loaded onto two factors and were assigned to the

factor they correlated most strongly with. Consistent with their low communality, indicating a poor relationship with the hierarchical construct of PPD, the symptoms *Restless, Suspicious, Intolerant, Garrulous*, and *Unstable Self-Concept* did not load.

Table 27: 7-Factor Rotated Factor Matrix of the 33 CAPP-IRS Symptoms (n=147)

	Factors						
Symptoms	**1**	**2**	**3**	**4**	**5**	**6**	**7**
S2 Self-Aggrandizing	**.856**	-.030	.162	.100	.214	.067	-.006
S3 Sense of Uniqueness	**.745**	.008	.034	.088	.026	.084	.139
S1 Self-Centred	**.688**	.184	.196	.001	.212	.120	.168
D2 Domineering	**.568**	.002	.124	.420	.295	.192	.056
S4 Sense of Entitlement	**.545**	.011	.072	.238	.349	.090	-.135
B1 Lacks Perseverence	.018	**.760**	.265	.089	.117	.083	.052
B2 Unreliable	.201	**.756**	.281	.191	.084	.143	.011
C2 Lacks Concentration	-.023	**.715**	-.137	.192	-.033	-.009	.150
C5 Lacks Planfulness	.024	**.672**	.140	.056	-.013	.200	.177
B3 Reckless	.121	***.522***	.071	.293	.083	.013	*.456*
A1 Detached	.160	.066	**.827**	.159	.239	.094	.097
E3 Lacks Emotional Depth	.084	.076	**.722**	.101	.416	.163	.192
E2 Lacks Pleasure	.068	.055	**.703**	.230	.089	.067	.043
A2 Uncommitted	.226	.416	**.565**	.029	.079	.185	-.024
A4 Uncaring	.226	.248	**.505**	.306	.379	-.031	.205
D1 Antagonistic	.141	.245	.236	**.757**	.249	.084	.103
B6 Aggressive	.195	.007	.218	***.617***	*.468*	-.010	.104
E4 Lacks Emotional Stability	.096	.313	.263	**.575**	.071	.188	.129
C4 Inflexible	.313	.314	.138	**.567**	-.194	.085	.129
B5 Disruptive	.156	.303	.145	***.515***	*.471*	.206	-.114
E5 Lacks Remorse	.196	-.012	.226	.083	**.829**	.057	.167
S6 Self-Justifying	.314	.061	.209	-.013	**.778**	.156	-.042
A3 Unempathic	.198	.058	.428	.277	**.604**	.019	.230
D3 Deceitful	.289	.227	.216	.072	.128	**.883**	.126
D5 Insincere	*.507*	.119	.148	.135	.091	***.536***	.080
D4 Manipulative	.370	.117	.169	.258	.194	**.464**	.195
E1 Lacks Anxiety	-.001	.157	.081	.116	.104	.153	**.734**
S5 Sense of Invulnerability	*.446*	.242	.127	.037	.134	.011	***.661***
B4 Restless	.110	.388	-.207	.346	-.040	-.131	.185
C1 Suspicious	.115	.140	.287	.398	-.126	.191	.356
C3 Intolerant	.438	.168	.289	.390	.194	.047	-.027
D6 Garrulous	.433	.171	.005	.152	.014	.256	.110
S7 Unstable Self-Concept	.171	.370	.383	.156	.185	.233	-.088

* Items loading on factors denoted in bold and underlined. Cross-loaded items denoted by italics and underlined.

The five symptoms that failed to load were removed and the analysis was repeated. The seven factors were retained but the amount of variance explained increased to 75.15%. Although *Aggressive* and *Disruptive* now loaded onto only one factor, *Reckless, Insincere,* and *Sense of Invulnerability* continued to cross-load. *Unempathic* and *Domineering* also began cross-loading in the new model (albeit, at relatively low levels). Still, considering where the strongest loadings occurred, the factor structure remained the same overall (Table 28).

Table 28: 7-Factor Rotated Factor Matrix of 28 CAPP-IRS Symptoms

	Factors						
Symptoms	**1**	**2**	**3**	**4**	**5**	**6**	**7**
S2 Self-Aggrandizing	**.846**	-.016	.155	.122	.199	.106	.002
S3 Sense of Uniqueness	**.739**	.012	.031	.099	.008	.117	.144
S1 Self-Centred	**.678**	.194	.192	.021	.208	.152	.163
D2 Domineering	***.559***	.010	.132	*.454*	.251	.209	.049
S4 Sense of Entitlement	**.559**	.014	.078	.279	.310	.101	-.127
B1 Lacks Perseverance	.017	**.786**	.247	.103	.111	.070	.038
B2 Unreliable	.183	**.758**	.260	.200	.073	.145	.016
C2 Lacks Concentration	-.036	**.704**	-.134	.178	-.035	-.021	.135
C5 Lacks Planfulness	.008	**.678**	.108	.059	-.007	.195	.183
B3 Reckless	.123	***.529***	.061	.303	.049	.008	*.465*
A1 Detached	.163	.087	**.840**	.173	.207	.108	.072
E3 Lacks Emotional Depth	.079	.093	**.722**	.164	.393	.174	.185
E2 Lacks Pleasure	.064	.075	**.694**	.230	.065	.078	.026
A2 Uncommitted	.219	.422	**.558**	.050	.058	.197	-.020
A4 Uncaring	.234	.257	**.518**	.344	.333	-.026	.191
D1 Antagonistic	.132	.245	.235	**.780**	.174	.078	.117
B6 Aggressive	.198	.017	.231	**.654**	.403	-.013	.104
E4 Lacks Emotional Stability	.080	.312	.244	**.579**	.025	.188	.142
C4 Inflexible	.302	.320	.127	**.541**	-.241	.093	.128
B5 Disruptive	.413	.297	.149	**.560**	.414	.197	-.087
E5 Lacks Remorse	.196	-.019	.240	.154	**.821**	.062	.176
S6 Self-Justifying	.316	.064	.205	.066	**.770**	.163	-.026
A3 Unempathic	.200	.063	*.456*	.325	***.565***	.025	.213
D3 Deceitful	.249	.244	.199	.098	.126	**.894**	.117
D5 Insincere	*.478*	.131	.138	.153	.081	***.557***	.075
D4 Manipulative	.364	.129	.174	.286	.158	**.472**	.178
E1 Lacks Anxiety	-.023	.157	.104	.119	.083	.158	**.738**
S5 Sense of Invulnerability	*.447*	.239	.136	.044	.112	.032	***.685***

The seven extracted factors clearly mapped onto some important constructs both historically and clinically associated to psychopathy. Factor 1 included symptoms signifying a dysfunction in relating to others: *Self-aggrandizing, Sense of uniqueness, Self-centred, Domineering, and Sense of entitlement*. Given the focus of this factor on self-importance, this factor was named Grandiose. Factor 2, with the symptoms of *Lacks perseverance, Unreliable, Lacks concentration, Lacks planfulness,* and *Reckless* signified an inability to commit to and persist with a plan. This factor was therefore labelled Impulsive. Factor 3 included the symptoms of *Detached, Lacks emotional depth, Lacks pleasure, Uncommitted, and Uncaring*. In effect, this factor was composed of symptoms concerning one's emotional ability to connect with others and was therefore named Emotionless. Factor 4 included symptoms reminiscent of acting in an antisocial or unfriendly way in one's interpersonal relationships. Specifically it was defined by the symptoms of *Antagonistic, Aggressive, Lacks emotional stability, Inflexible,* and *Disruptive.* Thus, it indicated a person who is Hostile towards others. The three symptoms on Factor 5 – *Lacks remorse, Self-justifying*, and *Unempathic* suggested a person who is Callous towards others. Factor 6 included symptoms similar to Factor 1, though while Factor 1 concerned ones relationship with the self, these symptoms (*Deceitful, Insincere,* and *Manipulative*) were focused more on a dysfunction in relating to others. Thus, this factor was labelled Superficial.[3] Although Factor 7 was only composed of two symptoms – *Lacks anxiety* and *Sense of Invulnerability* - these two symptoms clearly indicated a person who was Fearless.[4] Importantly, *Reckless* also loaded onto this factor, although in the current sample it had a slightly stronger relationship with Impulsive.

Internal Structural Reliability of the 28-Symptom 7-Factor Model

The next step in the analysis was to analyse the internal structural reliability of the empirically identified seven-factor 28-symptom model using Cronbach's alpha as well as values

[3] Of note, if the analysis is replicated with the criteria that 6 factors are identified, Superficial combines with Grandiose into a single factor while the remaining factors are unchanged.

[4] When *Lacks anxiety* (the weaker symptom) is removed from the analysis, *Sense of invulnerability* instead loads onto Factor 1, *Grandiosity.* The subsequent internal reliability statistics identified that Cronbach's alpha for F1 does not change; however, the mean IIC drops to .493. Overall, the internal structural reliability statistics do not differ dramatically with a 6-factor 27 item model. Given that fearlessness is clinically and empirically relevant to psychopathy, the analysis proceeded using the 7-factor 28 item model.

for the squared multiple correlations, corrected item-total correlations, and mean inter-item correlation. As discussed in the previous chapter, the values of the squared multiple correlations indicate how much of a variable is explained by the remaining variables in that sub-scale (with no minimum cut-off required), corrected item-total correlations indicate to what degree a particular variable correlates with the overall sub-scale score (variables with a value less than 0.300 do not correlate well with the overall scale score and are possible candidates for removal), while the mean inter-item correlation indicates the overall strength of the relationship between variables purported to contribute to that sub-scale (of note, a mean IIC exceeding 0.8 may indicate that the sub-scale variables are too closely related, resulting in multicollinearity).

As shown in Table 29, the internal structural reliability results of the 28-symptom 7-factor model of CAPP-IRS psychopathy were promising. No factors had a symptom with a corrected item-total below 0.528, and the mean inter-item correlations (MIC) ranged from .537 (Impulsive) to .686 (Callous). The Cronbach's alpha values were also quite strong, ranging from .729 (Fearless) to .875 (Emotionless).

Table 29: Internal Structural Reliability of the 28-item 7 Factor CAPP-IRS (n=147)

Scale	Cronbach's Alpha (α)	Mean ICC	Symptoms	Scale α if deleted	SMC	CIC
F1 Grandiose	.851	.542	Self-Aggrandizing	.775	.684	.825
			Sense of Uniqueness	.825	.475	.653
			Self-Centred	.825	.469	.661
			Domineering	.828	.447	.640
			Sense of Entitlement	.842	.358	.577
F2 Impulsive	.848	.537	Lacks Perseverence	.797	.574	.737
			Unreliable	.800	.563	.732
			Lacks Concentration	.831	.394	.613
			Lacks Planfulness	.820	.437	.649
			Reckless	.836	.357	.583
F3 Emotionless	.875	.580	Detached	.816	.699	.825
			Lacks Emotional Depth	.833	.628	.761
			Lacks Pleasure	.855	.477	.675
			Uncommitted	.871	.382	.601
			Uncaring	.857	.452	.667
F4 Hostile	.850	.531	Antagonistic	.780	.656	.806
			Aggressive	.817	.532	.668
			Lacks Emotional Stability	.817	.472	.669
			Inflexible	.851	.383	.528
			Disruptive	.824	.473	.639
F5 Callous	.866	.686	Lacks Remorse	.727	.701	.833
			Self-Justifying	.832	.592	.729
			Unempathic	.860	.512	.693
F6 Superficial	.829	.620	Deceitful	.668	.618	.784
			Insincere	.786	.507	.665
			Manipulative	.830	.423	.619
F7 Fearless	.729	.587	Lacks Anxiety	-	.345	.587
			Sense of Invulnerability	-	.345	.587

ICC = Inter-Item Correlation; SMC = Squared Multiple Correlation; CIC = Corrected Item Total Correlation

The CAPP-IRS factor level internal reliability statistics are actually better than previous studies using other measures of psychopathy, where scale MICs were identified from .41 to .58 for the three-factor YPI and from .25 to .34 for the three-factor PCL:YV (Andershed, Hodgins, & Tengström, 2007), from .31 to .54 for the four-factor B-Scan (Mathieu, Hare, Jones, Babiak, & Neumann, 2013), and .14 for the total APSD score (Lee et al., 2003). Similarly, the current

results identified factor alpha levels running from .729 (Fearless) to .875 (Emotionless). These findings are again stronger than previous studies with alternative models of psychopathy, including the PPI, where Kruh, Whittemore, Arnaut, Manley, Gage, and Gagliardi (2005) found scale alphas ranging from .55 to .85, and Sandoval, Hancock, Poythress, Edens, and Lilienfeld (2000) found scale alphas ranging from .63 to .89, although Lynam, Gaughan, Miller, Miller, Mullins-Sweatt, and Widiger (2011) reported higher alphas ranging from .82 to .88 on the PPI. With regards to the YPI, Andershed and colleagues (2007) identified scale alphas ranging from .68 to .82, while Skeem and Cauffman (2003) reported stronger alphas, between .77 and .90. Both Lynam, Whiteside, and Jones (1999) Brinkley, Schmitt, Smith, and Newman (2001) analysed the Self-Report Psychopathy Scale and found similar factor alphas of .84/.83 for Factor 1 and .68/.69 for Factor 2, while Lynam and colleagues (2011) found slightly higher alphas for Factor 1 (.87), but not Factor 2 (.70). Dong, Wu, and Waldman (2014) reported alphas for the APSD conducted with both clinic and community samples and found similar results, ranging from .62 to .83 with the clinic sample and .61 to .84 with the community sample, which were consistent with Frick et al.'s (2000) clinic (.64 to .85) and community (.74 to .83) sample results. Vitacco et al. (2003) found less satisfactory scores, ranging from .53 to .74; these results were consistent with Lee et al. (2003), who reported alphas ranging from .48 to .66 on the APSD. Salekin, Ziegler, Larrea, Lee Anthony, and Bennett (2003) analysed a 16-item version of the Millon Adolescent Clinical Inventory Psychopathy Content Scale and identified three factors with alphas ranging from .56 to .62. The only instrument that appeared to have comparable levels of factor level internal reliability was the adult screening version of the Psychopathy Checklist where Kruh and colleagues (2005) reported alphas of .84 and .78 on the two-factor PCL:SV. In contrast, using the youth version, Skeem and Cauffman (2003) reported exceptionally weak PCL:YV factor alphas, ranging from .22 to .57 on the three-factor model, while Andershed and colleagues (2007) found comparatively low alpha values also using the three-factor PCL:YV, ranging from .58 to .79. In other words, compared to virtually all the studies mentioned above, the 28-symptom CAPP-IRS empirically identified 7-factor structure appear to exhibit a considerable degree of internal reliability.

EFA by Age Group

Given the discussion in Chapter 3 regarding brain development, which might have some important influences over expression of psychopathic symptoms at different points during

adolescence, the exploratory factor analyses using all 33 symptoms were conducted again separately by age group, with one group consisting of 12 to 15 year olds (early adolescents, n = 40) and the other consisting of 16 to 18 year olds (late adolescents, n = 107). Immediately, some distinct age group differences were observed in the communalities for several CAPP-IRS symptoms (Table 30). Notably, the early group had one only one CAPP-IRS symptom with a communality under .500 (C4 *Inflexible*), whereas the late group had four (B4 *Restless*, C1 *Suspicious*, D6 *Garrulous*, S7 *Unstable Self-Concept*), as well as two that were very close to this value (A2 *Uncommitted*, C3 *Intolerant*).

Table 30: CAPP-IRS Symptom Communalities in the Age-Based EFA

Symptom	Communalities	
	12 – 15 Year Olds (n = 40)	16 – 18 Year Olds (n = 107)
A1 Detached	.852	.843
A2 Uncommitted	.813	*.501*
A3 Unempathic	.843	.701
A4 Uncaring	.850	.592
B1 Lacks Perseverance	.616	.683
B2 Unreliable	.851	.710
B3 Reckless	.990	.583
B4 Restless	.727	*.391*
B5 Disruptive	.958	.713
B6 Aggressive	.779	.663
C1 Suspicious	.668	*.494*
C2 Lacks Concentration	.718	.616
C3 Intolerant	*1.00*	*.528*
C4 Inflexible	*.468*	.655
C5 Lack Planfulness	.576	.590
D1 Antagonistic	.709	.757
D2 Domineering	.768	.611
D3 Deceitful	.899	.999
D4 Manipulative	.729	.565
D5 Insincere	.831	.615
D6 Garrulous	.656	*.269*
E1 Lacks Anxiety	.638	.554
E2 Lacks Pleasure	.579	.546
E3 Lacks Emotional Depth	.913	.732
E4 Lacks Emotional Stability	.572	.613
E5 Lacks Remorse	.651	.846
S1 Self-Centred	.775	.637
S2 Self-Aggrandizing	.909	.789
S3 Sense of Uniqueness	.774	.585
S4 Sense of Entitlement	.619	.622
S5 Sense of Invulnerability	.595	.677
S6 Self-Justifying	.705	.783
S7 Unstable Self-Concept	.830	*.337*

The resulting factor solutions identified eight factors explaining 75% of the variance in CAPP-IRS scores among 12-15 year old male youth, and seven factors explaining 63% of the variance in CAPP-IRS scores among 16-18 year old male youth. As seen in Table 31, two symptoms (C1 *Suspicious* and C4 *Inflexible*) failed to load onto a factor for 12-15 year old youth, whereas three symptoms (B4 *Restless*, D6 *Garrulous*, and S7 *Unstable Self-Concept*) failed to load for 16-18 year old youth. Each age group also had its own unique set of symptoms that cross-loaded at .45 or higher onto another factor. For 12-15 year olds these were: A1 *Detached*, B5 *Disruptive*; D3 *Deceitful*, D4 *Manipulative*, E3 *Lacks Emotional Depth*, S1 *Self-Centred,* and S5 *Sense of Invulnerability* whereas for 16-18 year old youth these were A2 *Uncommitted*, D2 *Domineering*, and D5 *Insincere*. These symptoms may require redefining to ensure clarity from other similar symptoms.

Table 31: Comparison of Factor Loadings between Early and Late Adolescents

Symptoms	12-15 Year Olds (n=40)	16-18 Year Olds (n=107)
A1 Detached	Cross-loaded F1 and F2	F5
A2 Uncommitted	F2	Cross-loaded F5 and F2
A3 Unempathic	F1	F4
A4 Uncaring	F1	F5
B1 Lacks Perseverance	F2	F2
B2 Unreliable	F2	F2
B3 Reckless	F5	F2
B4 Restless	F6	Failed to load
B5 Disruptive	Cross-loaded F7 and F1	F3
B6 Aggressive	F1	F3
C1 Suspicious	Failed to load	F3
C2 Lacks Concentration	F6	F2
C3 Intolerant	F8	F1
C4 Inflexible	Fails to load	F3
C5 Lack Planfulness	F2	F2
D1 Antagonistic	F1	F3
D2 Domineering	F1	Cross-loaded F1 and F3
D3 Deceitful	Cross-loaded F4 and F2	F6
D4 Manipulative	Cross-loaded F1 and F4	F6
D5 Insincere	F4	Cross-loaded F6 and F1
D6 Garrulous	F4	Fails to load
E1 Lacks Anxiety	F5	F7
E2 Lacks Pleasure	F2	F5
E3 Lacks Emotional Depth	Cross-loaded F1 and F2	F5
E4 Lacks Emotional Stability	F2	F3
E5 Lacks Remorse	F1	F4
S1 Self-Centred	Cross-loaded F3 and F1	F1
S2 Self-Aggrandizing	F3	F1
S3 Sense of Uniqueness	F3	F1
S4 Sense of Entitlement	F7	F1
S5 Sense of Invulnerability	Cross-loaded F5 and F3	F7
S6 Self-Justifying	F1	F4
S7 Unstable Self-Concept	F2	Fails to load

*Cross-loads are interpreted as factor loads exceeding .45 on more than one factor

An additional factor identified among the early adolescent sample was composed of only one symptom, *Intolerant*, which for late adolescents loaded fairly weakly onto the first factor. The analysis was replicated for early adolescents forcing a 7-factor model; in this case, Intolerant failed to load on any of the seven factors, while the remaining factors remained the same. Thus, both early and late adolescents were interpreted as having a 7-factor structure. The first factor extracted for each sample varied both in terms of item content and in terms of variance explained. Factor 1 explained a larger proportion of variance for the early adolescent males (20.9%) than in the later adolescent males (12.1%), likely because 10 of the 33 symptoms loaded onto this factor among 12-15 year olds. Thus, this factor was quite a complex one. Of note, the eigenvalues of the first factors for both early and late adolescents (13.7 and 10.8, respectively) was much larger than the second (3.4 and 3.5, respectively) or subsequent factors.

The factor loads were somewhat muddled for the early adolescents (Table 32). Factor 1 seemed to contain a mix of constructs which together, seem to represent a tendency towards being Callous/Unemotional, as they touched on the unemotional (*Unempathic, Lacks Remorse, Uncaring, Lacks Emotional Depth, Detached*) and behavioural tendencies (*Aggressive, Self-Justifying, Antagonistic, Domineering, Manipulative*) associated with a callous personality style. Factor 2 similarly suggested a complexity of symptoms that seemed to relate to being Undependable, both towards the self (*Unstable Self-Concept, Lacks Planfulness, Lack of Emotional Stability*) and to others (*Unreliable, Uncommitted, Lack of Perseverance*). This may reflect a youth who is entering a mode of identity crisis where they are unsure of who they really are and engage in identity testing, or trying on different personalities. Following the complexity of the first two factors, Factor 3 seemed to clearly converge on Grandiosity (*Sense of Uniqueness, Self-Aggrandizing, and Self-Centred)*, while Factor 4 touched on aspects of Superficiality (*Insincere, Deceitful, and Garrulous*). Factor 5 contained three symptoms suggestive of being Fearless (*Reckless, Lacks Anxiety, Sense of Invulnerability*). Another interesting finding was that rather than describe an adolescent who is impulsive (which was more evident among the older youth), the two symptoms contained in Factor 6 (*Restless, Lacks Concentration*) were more suggestive of a Hyperactive profile. The two symptoms on Factor 7 (*Disruptive, Sense of Entitlement*) suggested an adolescent who is Demanding. Lastly, as previously noted Factor 8 contained only one symptom – Intolerant – and therefore should not be considered a reliable or interpretable factor.

Table 32: Rotated Factor Structure for 12-15 Year Olds

Factor 1 Callous/ Unemotional	Factor 2 Undependable	Factor 3 Grandiose	Factor 4 Superficial	Factor 5 Fearless	Factor 6 Hyperactive	Factor 7 Demanding	Factor 8 n/a
A3 Unempathic (.843)	S7 Unstable Self-Concept (.724)	S3 Sense of Uniquenes s (.776)	D5 Insincere (.724)	B3 Reckless (.820)	B4 Restless (.773)	B5 Disruptive (.718)*	C3 Intolerant (.872)
B6 Aggressive (.786)	B2 Unreliable (.700)	S2 Self-Aggrandizi ng (.753)	D3 Deceitful (.684)*	E1 Lacks Anxiety (.736)	C2 Lacks Concentration (.759)	S4 Sense of Entitlement (.576)	
E5 Lacks Remorse (.760)	A2 Uncommitted (.699)	S1 Self-Centred (.520)*	D6 Garrulous (.547)	S5 Sense of Invulnerability (.512)*			
A4 Uncaring (.744)	C5 Lacks Planfulness (.699)			C1 Suspicious (.436)			
S6 Self-Justifying (.719)	B1 Lacks Perseverance (.617)						
D1 Antagonistic (.673)	E4 Lacks Emotional Stability (.561)						
E3 Lacks Emotional Depth (.689)*	E1 Lacks Pleasure (.510)						
D2 Domineering (.658)							
A1 Detached (.626)*							
D4 Manipulative (.588)*							

*Cross-loaded symptom. Cross-loadings are as follows: E3 Unempathic F1 (.689) and F2 (.599); A1 Detached F1 (.626) and F2 (.566); D4 Manipulative F1 (.588) and F4 (.529); S1 Self-Centred F3 (.520) and F1 (.501); D3 Deceitful F4 (.684) and F2 (.482); S5 Sense of Invulnerability F5 (.512) and F3 (.465); and B5 Disruptive F7 (.718) and F1 (.550).

Symptoms that failed to load at .450 or above: C1 Suspicious and C4 Inflexible

Next, a correlational analysis was performed between the factors. This analysis revealed that most of the factors were moderately to strongly correlated with each other (Table 33). The strongest correlations occurred between Factor 1 Callous/Unemotional and Factor 3 Grandiose (r = .708), Factor 3 Grandiose and Factor 4 Superficial (r = .703), Factor 2 Undependable and Factor 4 Superficial (r = .653); and Factor 1 Callous/Unemotional and Factor 7 Demanding (r = .628). Interestingly, Factor 6 Hyperactive was unrelated to all factors except Fearless.

Table 33: Correlations between the 7-Factors in Early Adolescents (n=40)

	F1	F2	F3	F4	F5	F6	F7
F1 Callous/Unemotional	-						
F2 Undependable	.580**	-					
F3 Grandiose	.708**	.481*	-				
F4 Superficial	.583**	.653**	.703**	-			
F5 Fearless	.373*	.573**	.ns	.338*	-		
F6 Hyperactive	ns	ns	ns	ns	.361*	-	
F7 Demanding	.628**	.428*	.405*	.469*	ns	ns	-

** p < .001; * p < .05

An exploratory factor analysis at the factor level was then conducted to check whether any of these lower-order factors were related sufficiently to each other and distinctly enough from others to coalesce into higher-order dimensions. Two dimensions quite reminiscent of the two-factor PCL-R were identified. The first dimension had an eigenvalue of 3.566 and accounted for nearly half of the variance (45.28%). Five of the factors loaded cleanly onto this first dimension, whereas Factor 5 Fearless cross-loaded, more strongly onto the second (.593) than first (.471) dimension (Table 34). The second dimension had an eigenvalue of 1.344 and accounted for only 12.30% of the variance. This dimension involved the Fearless as well as the Hyperactive factor.

Table 34: EFA with the 7-Factor Structure for Early Adolescents (n=40)

Dimension 1 – Affective/Interpersonal	**Dimension 2 - Behavioural**
Factor 3 Grandiose (.854)	Factor 5 Fearless (.593)
Factor 1 Callous/Unemotional (.812)	Factor 6 Hyperactive (.579)
Factor 4 Superficial (.809)	
Factor 2 Undependable (.734)	
Factor 7 Demanding (.576)	

Next, the analysis moved to late adolescents where overall, the factors appeared much clearer in terms of their symptom loads (Table 35). Factor 1 was clearly touching on Grandiosity, while Factor 2 suggested a tendency to be Impulsive, and Factor 3 contained symptoms of Hostility. Interestingly, Factors 4 and 5 appeared to divide the constructs of Callous (Factor 4) and Unemotional (Factor 5), suggesting that for older youth, these constructs

may need unique attention. Factor 6 referenced elements of Superficiality, while Factor 7 touched on elements of Fearless.

Table 35: Rotated Factor Structure for 16-18 Year Olds

Factor 1 Grandiose	Factor 2 Impulsive	Factor 3 Hostile	Factor 4 Callous	Factor 5 Unemotional	Factor 6 Superficial	Factor 7 Fearless
S2 Self-Aggrandizing (.839)	B1 Lacks Perseverance (.778)	D1 Antagonistic (.745)	E5 Lacks Remorse (.850)	A1 Detached (.856)	D3 Deceitful (.909)	E1 Lacks Anxiety (.662)
S3 Sense of Uniqueness (.739)	B2 Unreliable (.771)	E4 Lacks Emotional Stability (.685)	S6 Self-Justifying (.793)	E3 Lacks Emotional Depth (.679)	D5 Insincere (.535)*	S5 Sense of Invulnerability (.602)*
S1 Self-Centred (.699)	C2 Lacks Concentration (.715)	C4 Inflexible (.620)	A3 Unempathic (.623)	E2 Lacks Pleasure (.670)	D4 Manipulative (.471)	
S4 Sense of Entitlement (.619)	C5 Lacks Planfulness (.707)	B6 Aggressive (.610)		A2 Uncommitted (.484)*		
D2 Domineering (.553)*	B3 Reckless (.549)	C1 Suspicious (.524)		A4 Uncaring (.443)		
C3 Intolerant (.460)		B5 Disruptive (.495)				

*Cross-loaded symptom. Cross-loadings are as follows: D2 Domineering F1 (.553) and F3 (.446); A2 Uncommitted F5 (.484) and F2 (.449); D5 Insincere F6 (.535) and F1 (.514); S5 Sense of Invulnerability F7 (.602) and F1 (.440). Symptoms that failed to load at .450 or above: B4 Restless, D6 Garrulous, and S7 Unstable Self-Concept.

Again, correlations were conducted between the 7-factors identified in late adolescence. The factor correlations were much weaker, although still significant (Table 36). Two pair-wise correlations were moderately strong, these were Factor 4 Callous with Factor 5 Unemotional (r = .620) and Factor 1 Grandiose with Factor 2 Superficial (r = .600). Only one pair-wise correlation was considered non-significant, between Factor 2 Impulsive and Factor 4 Callous; however, it was just barely non-significant, at 0.05.

Table 36: Correlations between the 7-factors in Late Adolescents (n=107)

	F1	F2	F3	F4	F5	F6	F7
F1 Grandiose	-						
F2 Impulsive	.229*	-					
F3 Hostile	.535**	.512**	-				
F4 Callous	.512**	ns	.416**	-			
F5 Unemotional	.397**	.349**	.519**	.620**	-		
F6 Superficial	.600**	.392**	.508**	.398**	.423**	-	
F7 Fearless	.382**	.426**	.367**	.332**	.426**	.416**	-

Again, an exploratory factor analysis was conducted with the seven factors. In this case, all seven factors loaded cleanly onto a single dimension (Table 37). This dimension had an eigenvalue of 3.578, and it explained 43.25% of the variance. Factor 3 Hostile had the strongest loading, while Factor 2 Impulsive was the weakest.

Table 37: EFA with the 7-Factor Structure for Late Adolescents (n=107)

Dimension 1 – Psychopathy
Factor 3 Hostile (.736)
Factor 6 Superficial (.706)
Factor 1 Grandiose (.704)
Factor 5 Unemotional (.694)
Factor 4 Callous (.646)
Factor 7 Fearless (.570)
Factor 2 Impulsive (.517)

Discussion

Given that the previous chapter's results indicated a poor fit for the theoretical CAPP-IRS structure in a sample of serious and violent incarcerated adolescent males, the analyses in the current chapter were conducted in search of an empirically suggested structural model. In the first stage of the analysis, a PCA with the six theoretical domains was conducted, where one large component identifying 66% of the variance was extracted. While all six domains loaded onto this component, the communality for the *Cognitive* domain was comparatively lower in value, suggesting that the items on this domain (*Suspicious, Lacks concentration, Intolerant,* and *Lack planfulness*) were less strongly related to the hierarchical construct of psychopathy. Still, all six domains did load onto a single component that explained two-thirds of the variance in PPD, suggesting the CAPP-IRS may in fact present a hierarchical unitary construct of psychopathy.

A PCA was then performed at the symptom level. While seven components were identified overall, the distance between the first and subsequent components was fairly substantial, suggesting that the bulk of symptoms form a unitary construct. However, the symptoms *Restless, Lacks concentration*, and *Lacks anxiety* did not load onto this first component. Of note, two previous studies (Hoff et al., 2012; Kreis et al., 2012) similarly

identified issues with these – as well as several other (namely, *Unstable self concept*) – particular CAPP-IRS symptoms, meaning they may not be particularly representative of the construct of psychopathy. It was interesting that two of the three symptoms failing to load onto this first major component were together descriptive of an Impulsive personality style, whereas the third was a symptom associated with psychopathy in many classic profiles but which shows an inconsistent relationship (positive, negative, and sometimes nonexistent) with psychopathy. Of note, Dawson et al., (2012) presented two case studies in which they demonstrated the potential for the CAPP-IRS to distinguish between primary and secondary subtypes of psychopathy. Given that adult research demonstrates that a major distinction between these two subtypes is the primary's cognitive control and behavioural inhibition of their impulses versus the secondary's more impulsive and anxious nature, perhaps the issues with these symptoms resulted from the mixed presence of youth in the sample who were exhibiting primary versus secondary psychopathic traits.

While *Suspicious, Lacks planfulness, Garrulous,* and *Sense of uniqueness* did load onto the first component, they yielded stronger loadings onto one of the other six identified components. Overall, a slight minority of symptoms did not load cleanly onto this first major component, in that they exhibited considerable loadings on at least one other component. In the current sample then, at a symptom level, while the bulk of the CAPP-IRS symptoms loaded onto a single dimension, there was also evidence for multidimensionality. Similar findings were previously obtained with the PPI and PPI-R. Both Benning and colleagues (2003) and Edens and McDermott (2010) identified two, possibly three, underlying dimensions that appeared to be mostly orthogonal (unrelated). Self-Centred Impulsivity/Impulsive Antisociality was composed of the content scales Machiavellian Egocentricity, Carefree Nonplanfulness, Impulsive Nonconformity, and Blame Externalization, while Fearless Dominance was composed of Social Potency, Fearlessness, and Stress Immunity. A final content scale – Coldheartedness – remained on its own factor.

Although some scholars expressed importance in finding a unitary structure to PPD (e.g. Johnstone & Cooke, 2004), others have suggested that non-unitary findings suggest the presence of two distinct dispositions that together represent PPD (e.g. Blonigen et al., 2006). From a theoretical perspective, accepting that psychopathy may be a multidimensional construct would allow for an integration of distinct etiologial theories, such as those based on a

lack of reactivity to emotional stimuli (e.g. Blair, 1999; Lykken, 1995) and deficient inhibitory control (Newman, MacCoon, Vaughn, & Sadeh, 2005). However, the age-based analyses conducted in the current study suggested that PPD may perhaps develop into a unitary construct over time, as whereas the factors identified among early adolescents loaded onto two somewhat distinct dimensions (with one factor cross-loading on both), the factors identified among late adolescents all loaded onto a single dimension, providing support for the hierarchical unitary nature of PPD.

Age Based Findings

The factor analyses conducted with the two age groups suggested some interesting possible developmental differences in the expression of psychopathic symptoms among early (12-15 year old) and late (16-18 year old) male adolescents. Overall, many symptoms loaded differently for the early versus late adolescent males. An immediately apparent difference in the factor structures was the relevance played by the symptoms previously located on the Self domain for the late adolescents, as opposed to the early adolescents. Specifically, the key defining symptoms of the first and most important factor identified for late adolescents were symptoms concerning self-perception, namely: Self-Aggrandizing, Sense of Uniqueness, Self-Centredness, and Sense of Entitlement. In contrast, these symptoms were split between several factors (two on Factor 3, one on Factor 7, and one cross-loading onto Factors 3 and 1) for the early adolescents. Instead, the symptoms weighing in most heavily on the first factor extracted from the analysis of early adolescents were from a mix of originating domains, namely, the former Attachment (*Unempathic* and *Uncaring*), Behaviour (*Aggressive*), Emotional (*Lacks Remorse*), and Self (*Self-Justifying*) domains. Thus, whereas the first factor for late adolescents was more clearly focused upon symptoms related to Self-Centredness, the first factor for early adolescents was much more complex, touching on the varying aspects of antisociality, aggression, and unemotionality.

Analyses of both groups similarly yielded factors touching on grandiosity, superficiality, undependability/impulsiveness, and fearlessness. The content of these factors was very similar, although not identical in terms of either symptom loading weights or symptom location. The Grandiosity factor shared the symptoms of *Sense of Uniqueness, Self-Aggrandizing*, and *Self-Centred* across the two age groups, although the order of the symptom loadings differed.

Among 16-18 year old youths, this factor was additionally defined by three symptoms – *Sense of Entitlement, Domineering,* and *Intolerant* – which were instead located on the Demanding (Factor 7), Callous (Factor 1), and Intolerant (Factor 8) factors, respectively, among early adolescents. Another important difference based on age was that the Grandiosity factor was the largest factor extracted in the analysis with late adolescents, whereas it was the third largest factor among early adolescents (following behind the factors of Callous/Unemotional and Undependable). These differences may reflect the tendency to become very self-focused during the mid-point of adolescent development as peers exert the greatest amount of influence at this stage (Brown, 1990).

The symptoms underlying the shared factor of Superficiality were generally consistent at each age point (*Insincere* and *Deceitful*), although the order that they loaded onto the factors differed. However, the third symptom on this factor differed by age – for younger youth, Superficiality was additionally defined by *Garrulous* whereas this symptom did not load onto any factor for older youth. Instead, Superficiality among late adolescents was additionally defined by the symptom *Manipulative*. Interestingly, while *Manipulative* loaded most strongly (.588) onto the first Factor of Callous/Unemotional for early adolescents, it also cross-loaded nearly equally in strength (.529) onto the Superficiality factor.

Being Fearless was the third factor in common to both age groups, which was a particularly interesting finding given that measures related to fearlessness have demonstrated an association with PPD in adult samples and psychopathic traits – particularly callous/unemotional ones – in child samples (Barry, Frick, DeShazo, McCoy, Ellis, & Loney, 2000; Frick et al., 1994; Frick et al., 1999) yet, fearlessness is not clearly represented on the psychopathy checklists, other than through a proxy measure of stimulation seeking behaviours (Glenn et al., 2007). Importantly, low fearfulness is associated with behavioural inhibition problems which, as discussed in Chapter 2, are common among adolescents due to ongoing maturation of neurological structures responsible for moderating responses to stimuli. Specifically, fearlessness appears to be a physiological response – or lack thereof in this instance – to aversive stimuli, such as impending punishment. Research findings associated low levels of fear conditioning (fearlessness) with reduced skin conductance responses to aversive stimuli with higher psychopathy scores in both incarcerated and community samples (Benning, Patrick, & Iacono, 2005; Levenston et al., 2000; López, Poy, Patrick, & Moltó, 2013; Patrick,

1994; Patrick et al., 1993; Syngelaki, Fairchild, Moore, Savage, & van Goozen, 2013). Critically, a longitudinal study by Glenn and colleagues (2007) supported the importance of early expressions of fearlessness to adult psychopathy: adults with higher scores on the Self-Report Psychopathy scale (SRP-II) at 28 years old were significantly less fearful and inhibited as three year olds. Of note, one of two empirically established dimensions of PPI is Fearless Dominance (Benning et al., 2003; Edens & McDermott, 2010). Interestingly, studies suggested that one of its underlying scales – Fearless – could actually be divided into two content scales relating to 1) thrill and adventure seeking, and 2) boredom proneness, which relate differently to the two major dimensions of Fearless Dominance (positive relationship with thrill and adventure seeking) and Self-Centred Impulsivity (positive relationship with boredom proneness) (Benning et al., 2003). In the current study, Fearless was more similar to thrill and adventure seeking than to boredom proneness (i.e. *Lacks anxiety* and *Sense of invulnerability* in both age groups, as well as *Reckless* among early adolescents) whereas a separate factor for late adolescents (Factor 2 Impulsive) contained symptoms more relevant to boredom proneness (i.e. *Lacks perseverance, Unreliable, Lacks concentration, Lacks planfulness,* and *Reckless*), thus supporting the distinction in these content scales found in other studies using different measures (the PPI).

Lacks Anxiety was located on the Fearless factor for both ages, but while both are associated with low behavioural inhibition, it is important to distinguish this symptom from fearlessness. Fearlessness tends to be discussed in relation to anticipated punishment, in that individuals with low fear do not physiologically anticipate punishment; furthermore, as noted above it is often associated with thrill and adventure seeking (Barry et al., 2000; Kotler & McMahon, 2005; Kubak & Salekin, 2009). Trait anxiety in contrast involves negative affect, such as a Generalized Anxiety Disorder (Kubak & Salekin, 2009). Importantly however, both low anxiety and fearlessness have been associated with psychopathy. Interestingly, two studies found that low levels of anxiety were associated with the presence of callous/unemotional traits among children with conduct problems, whereas children with conduct problems but no callous/unemotional traits tend to show higher levels of trait anxiety, which is consistent with the primary versus secondary conceptualizations of psychopathy discussed previously (Frick et al., 1994, 1999).

Another interesting finding here was the differential location of the symptom *Reckless* for early (Fearless) and late (Impulsive) adolescents. The tendency to be reckless, or more specifically, risk-taking, undergoes substantial developmental change during adolescence as a result of neurological changes in the frontal lobe and in particular, the prefrontal cortex. Engagement in risk-taking behaviours increases between childhood and adolescence with the onset of puberty and increased reward-seeking (which explains the location of *Reckless* on the Fearless factor for younger, but not older adolescents) and then decreases again between adolescence and adulthood as adolescents begin to develop more cognitive controls and self-regulation (which explains why *Reckless* is correlated with other impulsive-like behaviours among late, but not early, adolescents) (Rosso, Young, Femia, & Yurgelun-Todd, 2004; Spear, 2000; Steinberg, 2008). Thus, the underlying expression of *Reckless* changes over the period of adolescent development, resulting in unique correlations with other psychopathic symptoms and age-based placement on factors of psychopathy.

One factor emerged that was somewhat similar in content between age groups, although distinct enough that they received unique names: Undependable in early adolescents and Impulsive in late adolescents. Among early adolescents this factor was composed of the symptoms *Unstable Self-Concept, Unreliable, Uncommitted, Lacks Planfulness, Lacks Perseverance, Lacks Emotional Stability,* and *Lacks Pleasure,* which together describe a youth who is undependable to others as well as to themselves – essentially, an individual who is uncommitted to their ideas and plans. An Impulsive factor was identified among the late adolescents. Although it contained similar symptoms as the Undependable factor in the younger youth, namely, *Lacks perseverance, Unreliable*, and *Lacks planfulness,* it also contained symptoms suggestive of impulsiveness, specifically*, Lacks concentration* and *Reckless.* Thus, whereas younger youth are undependable in that they are uncommitted to their ideas and plans, older youth are impulsively undependable both in terms of their commitment to others, as well as by acting without thinking. Regardless of how they look across adolescence, these factors are both similar in content to the Big 5 dimension of Conscientiousness, which touches on self-control and which Shiner and Caspi (2003) describe as containing, among others, the traits of irresponsibility, unreliability, carelessness, a tendency to quit easily, and distractability. Shiner and Caspi (2003) explained that this superfactor contains at least three lower-order traits, the description of which are very similar to the undependable factors found in the current study. The first is attention, which involves the ability to focus and shift attention, and persist in focusing

attention despite other ongoing distractions. This lower-order trait then is similar to the CAPP-IRS symptom of *Lacks Concentration*. The second is inhibitory control, which describes an individual who – at the low end – is behaviourally impulsive and undercontrolled, careless, and engages in incautious behaviours, similar to the CAPP-IRS symptoms of *Unreliable, Lacks planfulness* (Shiner & Caspi, 2003). The third lower-order factor is achievement motivation, which involves – at the high end – setting and following high standards, working hard, and persisting in the completion of activities (Shiner & Caspi, 2003); in other words, the CAPP-IRS symptoms of *Lacks Perseverance, Lacks Planfulness*. Thus from a FFM perspective, the CAPP-IRS has essentially identified that the lower-order traits of attention and achievement motivation describe younger youth, whereas the lower-order traits of attention, inhibitory control, and achievement motivation describe older youth. Still, there are other symptoms unique to these CAPP-IRS factors in adolescents that are not described by the Conscientiousness super-factor, such as *Lacks Pleasure, Lacks Emotional Stability,* and *Unstable Self-Concept*. Whether these represent symptoms specifically important to adolescent psychopathy as opposed to the structure of normal personality or whether they will load onto other factors in other studies is something that needs to be addressed in future research.

Whereas the late adolescents' Undependable structure referenced inhibitory control, the early adolescents' did not, which is consistent with neurological research showing that development of inhibitory control comes with age, some of which develops between early and late adoelscence (Rosso et al., 2004; Tamm et al., 2002). Thus, its relevance among older youth may reflect that this trait is somewhat less common in older adolescents and when present, suggestive of possible psychological dysfunction.

As noted, impulsivity did not emerge as a salient factor for early adolescents. However, a factor more akin to hyperactivity was identified. The Hyperactive factor (Factor 6) in 12-15 year olds was defined by two symptoms, *Restless* and *Lacks Concentration* which together describe a youth who has difficulty sitting still and focusing. It is possible that hyperactivity reflects an issue with behavioural control whereas impulsivity reflects an issue with intellectual control. Subsequently, the variance in factors may be the result of ongoing neurological development over the course of adolescence, specifically in the frontal lobe. Cognitive controls develop over adolescence and into adulthood, resulting in less risk taking and recklessness but also improved capacity for self-control and self-regulation (Steinberg, 2008). Essentially, with

increased development of the prefrontal cortex comes better executive functioning, meaning skills such as abstract reasoning and shifting attention are developed in later adolescence and into adulthood (Rosso et al., 2004). This developmental process plays an important role in the ability to sit still and focus, and may therefore explain why hyperactivity is an observed CAPP-IRS factor in 12-15 year old male youth but not in 16-18 year olds, but impulsivity is an observed CAPP-IRS factor in 16-18 year olds but not 12-15 year olds. Of note, Lynam (1996) suggested that "fledgling" or child psychopathy is likely associated to the combination of hyperactivity-impulsive-attention problems and conduct problems. Further, going forward it would be interesting to follow up the behavioral outcomes of young adolescents high on the Hyperactivity factor as well as the Callous factor, as previous research found that among children with both Attention Deficit Hyperactivity Disorder and Conduct Disorder/Oppositional Disorder, only those who also exhibited callous/unemotional traits demonstrated other characteristics similar to adult psychopathy, namely, high scores on a thrill and adventure seeking scale and a reward-dominance task (Barry et al., 2000).

In fact, a significant amount of research suggests that the early presence of callous/unemotional traits (especially when combined with conduct problems) is suggestive of a distinct etiological pathway towards the future expression of more severe conduct problems and other antisocial behaviours (Kotler & McMahon, 2005). In particular, the research by Frick and colleagues has demonstrated that children with callous/unemotional traits together with conduct problems (CP/CU+) are distinguished from children with conduct problems but not callous/unemotional traits (CP/CU-) in both severity of future delinquency and other antisocial behaviours (Caputo et al., 1999; Christian et al., 1997; Frick et al., 2005). In addition, children with callous/unemotional traits, regardless of their level of conduct problems, exhibited a reward-dominant response style in which they attended less to cues of punishment and focused more on obtaining the reward, similar to research among adult psychopaths (Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003; O'Brien & Frick, 1996; Pardini et al., 2003). Not surprisingly then, research suggests that antisocial children who also possess callous/unemotional traits have an amygdala dysfunction, similar to adult psychopaths (Jones & Viding, 2007).

Given the consistent finding among studies with children that the emergence of callous/unemotional traits when combined with conduct problems results in poorer future outcomes, including higher rates of aggression and delinquency (Frick, 2009; Kotler &

McMahon, 2005), it was important to observe that callous and unemotional traits were observed coalescing into factors in the general and age-based analysis; however, it was not expected that they would present as separate among late adolescents and, alarmingly, while an unemotional factor was observed for late adolescents, a solitary unemotional factor did not emerge for early adolescents. Instead, the callous factor appeared to contain the unemotional symptoms.

Thus, in the age-based analysis a factor related to callousness was identified in each group; however, the underlying symptoms at each age suggest that this construct is actually quite distinct at different points in adolescence. For early adolescents, the Callous/Unemotional factor (which was the first and therefore largest factor extracted) consisted of a mix of negative affective, or unemotional symptoms (*Unempathic, Lacks Remorse, Uncaring, Lacks Emotional Depth, Detached*), negative behavioural (*Aggressive, Self-Justifying, Antagonistic)* and negative interpersonal (*Domineering, Manipulative*) traits. This construct is similar to the traits describing the Big 5 superfactor of Agreeableness which, at the low end, describes an antagonistic and disagreeable person who is "selfish, aggressive, rude, spiteful, teases others, stubborn, and manipulative" (Shiner & Caspi, 2003: 8). Of note, Barry and colleagues (2000) found that of children with conduct problems and impulsivity, only those with high levels of callous/unemotional traits also showed other psychopathic traits, such as fearlessness and a reward-dominant response. This speaks to the significance of callous/unemotional traits in the development of possible psychopathic disorder, and may explain why this factor was the largest extracted among the younger adolescents.

Unexpectedly, Callous and Unemotional were clearly divided into two unique factors (Factors 4 and 5, respectively) among the late adolescents. The Callous factor was composed of the symptoms *Lacks Remorse, Self-Justifying*, and *Unempathic* whereas the Unemotional factor was defined by the symptoms *Detached, Lacks Emotional Depth, Lacks Pleasure, Uncommitted,* and *Uncaring*. Interestingly, empathy, which is essentially the polar opposite of callousness, is known to have both affective (vicariously emotionally experiencing the other's problem) and cognitive (actively grappling with and trying to understand the other's problem) components (Knafo, Zahn-Waxler, Davidov, Van Hulle, Robinson, & Rhee, 2009). These are associated with specific brain regions which research has shown mature at different times, with the affective components (limbic and paralimbic) regions developing sooner than the cognitive components (prefrontal and temporal cortices) (Knafo et al., 2009). This might explain why

callousness was divided into affective (Unemotional) and more cognitive (Callous) factors among late adolescents but not early ones.

Another developmental difference involved the Antisocial factor (Factor 3) found among late adolescents but not the early ones. This factor was composed of the symptoms *Antagonistic, Lacks Emotional Stability, Inflexible, Aggressive, Suspicious*, and *Disruptive* and is suggestive of an individual who is inconsiderate of others and determined to get what they want. While the younger youth did not have a clearly Antisocial factor, they did have a Demanding one (Factor 7), which was composed of one symptom found on the older youths' Antisocial factor – *Disruptive* – as well as one unique symptom – *Sense of Entitlement* – which was instead located on the older youths Grandiosity factor. Early adolescents may have a misperception about the importance of their needs that result in their being demanding and which may develop over time into a more Antisocial way of functioning, where they begin acting aggressively and antagonistically when pursuing their perceived needs. Interestingly, the symptoms *Aggressive* and *Antagonistic* are both located on the Callous/Unemotional factor for early adolescents. This may reflect that being aggressive and antagonistic when younger (between 12 and 15) is more unusual than when in the higher end of the adolescent years (between 16 and 18) and is therefore associated with other symptoms suggestive of emotional dysfunction (i.e. *Unempathic, Lacks Remorse, Uncaring, Lacks Emotional Depth, Detached*) that together increase the ability to be Callous and to engage in emotionally and physically harmful behaviours towards others.

The CAPP-IRS Factor Profiles versus the FFM Profile of Psychopathy

Broadly speaking, research suggests that both Factor 1 (Interpersonal/Affective) and Factor 2 (Social Deviance) scores are negatively associated with Agreeableness, while Factor 2 scores are additionally negatively associated with Conscientiousness (Lynam, 2002; Lynam & Derefinko, 2006; Lynam et al., 2005; Miller et a., 2001; Pereira et al., 2008). Although not empirically tested here, it seems likely that similar findings would occur in the current study. For instance, Conscientiousness contains traits related to: 1) self-discipline; 2) competence; 3) deliberation, and 4) dutifulness, order, and achievement striving. These four are in turn related (negatively) to the CAPP-IRS symptoms of 1) *Lacks perseverance,* 2) *Unreliable*, 3) *Reckless*, and 4) *Lacks planfulness*, all of which are found on the same factor among late adolescents (Impulsive). In other words, traits related to Conscientiousness are only found on a single factor

in late adolescents and Conscientiousness would therefore be negatively associated with the Impulsive factor (similar to Factor 2 of the PCLYV) but is unlikely to be associated with the other six factors. Similarly, three of these four (with the exception of *Reckless*, which was located on the Fearless factor) are found on the Undependable factor for early adolescents, which would again present in a negative, though likely weaker, association with Conscientiousness.

In contrast, Agreeableness contains traits including: 1) tendermindedness; 2) modesty; 3) altruism; 4) trust; 5) compliance; and 6) straightforwardness. These traits match up, again negatively, with the following CAPP-IRS symptoms – 1) *Uncommitted and Lacks Remorse;* 2) *Unempathic;* 3) *Uncaring;* 4) *Suspicious;* 5) *Inflexible; and* 6) *Insincere* – which are located on several factors – primarily Callous/Unemotional, but also Undependable, and Superficial for early adolescents, and Unemotional, Callous, Hostile, and Superficial for late adolescents. Thus, consistent with the overlap between Agreeableness and the two-factor model of psychopathy, several CAPP-IRS factors also appear to contain traits related to Agreeableness.

At times, a negative relationship with Neuroticism has also been previously identified although the direction has been inconsistent. Miller et al. (2001) and Pereira et al. (2008) both found that Neuroticism was negatively related to Factor 1 but positively related to Factor 2 scores, whereas Lynam and colleagues (2005) and Salekin et al. (2005) found that Neuroticism was positively related to both factors. A key distinction between these studies was that the first two involved adults while the latter involved adolescents. The symptoms related to Neuroticism include: 1) impulsiveness; 2) hostility; 3) anxiety; 4) depression; 5) vulnerability; and 6) self-consciousness, which in turn relate to the CAPP-IRS symptoms of: 1) *Lacks concentration*; 2) *Intolerant*; 3) *Lacks Anxiety* (negatively)*;* 4) *Lacks pleasure;* 5) *Lacks emotional stability;* and 6) *Unstable self-concept.* These symptoms are primarily found on the Undependable factor for early adolescents, as well as the Hyperactive and Fearless factors. Given that three symptoms are located on the Undependable factor, a positive association may be expected with Neuroticism. In contrast, for late adolescents, symptoms of Neuroticism are found across the Grandiose, Impulsive, Unemotional, Antisocial, and Fearless factors where they would primarily be expected to demonstrate weakly positive associations. In other words, Neuroticism would likely be unrelated or weakly related at a factor level to the CAPP-IRS for older adolescents as its symptoms are widely spread out across factors. This may explain why studies with adolescents at times have found positive associations with Neuroticism whereas studies with

adults find negative or no relationship. In other words, the tendency of individuals with psychopathic traits to express symptoms of Neuroticism changes over the course of development, similar to the way one of its main traits – anxiety – changes its relationship with psychopathy factors over time.

CAPP-IRS Factor Variance across Adolescence

The finding that the CAPP-IRS factor structure was somewhat different in early versus late adolescence may cause some concern. Johnstone and Cooke (2004) suggested that a necessary finding to allow for the extension of adult psychopathy to adolescents would be factor invariance, i.e. that the same factor structure identified in adult samples is also identified in adolescent samples. This was not the case in this study, even when focusing on what may crudely be considered the same developmental period. Developmentally however, it makes sense that the expression of psychopathic traits would vary between adolescence and adulthood, as the brain research discussed in Chapter 2 explained the varying expression of psychopathic traits even across the more restricted period of adolescence. Because research on the CAPP-IRS factor structure has not yet been published with an adult sample, it is unknown whether the different empirical factor structures identified in this study are truly different from the theoretical structure suggested by Cooke et al. (2005), or whether the results may be due to developmental or, possibly even, measurement issues in the current study. As adolescents in late teenage years are more developmentally/neurologically similar to adults (though not yet identical given ongoing maturation of neurological structures) it is likely that research with adults will identify a CAPP-IRS factor structure similar to the one found among older adolescents. However, given that the CAPP-IRS was constructed for use with adults, it is also possible that the theoretical factor structure *will* be validated among adults, and that the differing factor structures identified in this study are instead a result of inappropriate symptom measurement during this developmental period. In other words, some or all of the 33 CAPP-IRS symptoms may be relevant to adolescents but measured in ways that are developmentally inappropriate, or may be developmentally irrelevant to the expression of psychopathic traits at this age (Kotler & McMahon, 2005). However, it should be noted that previous research using other measures of psychopathy have also found differential factor loadings for adult versus child samples; for instance, Frick and colleagues (1994) observed that although a similar two-factor structure was found in their sample of 95 clinic-referred six to 13 year olds using the

Psychopathy Screening Device [later known as the Antisocial Process Screening Device], some items typically found on the Affective/Interpersonal Factor 1 (grandiosity, failure to accept responsibility, boredom susceptibility) in adults were instead associated with the Impulsive/Conduct Problems factor of the APSD, one explanation for which they suggested was developmental. Further, the personality research discussed earlier in this chapter suggests that the CAPP-IRS structure may in fact be very different empirically than what was theoretically anticipated, and that the overall pattern of results in this chapter may similarly apply to adults.

Conclusion

The current study confirmed that the underlying structure of the CAPP-IRS was inconsistent with the theoretical domain model presented by the instrument's authors. Further, consistent with the discussion provided in Chapter 3 regarding neurological development, an age-based analysis revealed some potentially distinct developmental trends in the expression of psychopathic personality disorder. However, an important caveat regarding these findings is that the results of factor analysis are sample dependent, meaning that in other samples, more empirical support may be provided for the theoretical domain model. Future studies should replicate these analyses both in other samples of incarcerated male adolescents, but also in samples for which the CAPP-IRS was ultimately designed: institutionalized adults.

Chapter 6.

Convergent and Divergent Validity of the CAPP-IRS

Introduction

In the previous chapters the structural validity of the CAPP-IRS was explored through factor analyses. The purpose of this final set of analyses is to explore the construct validity of the theoretical structure of the CAPP-IRS through a criterion-related approach in which scores on the CAPP-IRS are correlated with other measures of psychopathy (PCL-YV and the MACI-PCS), as well as with clinical (MACI) and self-report (MAYSI-2) measures of other psychological constructs that theoretically should be related (e.g. egotism, impulsivity, delinquency) and unrelated (e.g. inhibited, doleful, depressed) to the construct of psychopathy.

Construct Validity

Construct validity concerns the accuracy of a measurement tool in assessing the phenomenon of interest. It represents "the degree to which the operational definition of a variable actually reflects the true theoretical meaning of the variable" (Cozby & Rawn, 2012: 99). A substantial amount of theoretical speculation has been directed towards the underlying nature of the concept of psychopathy. As a personality disorder, the construct of psychopathy is abstract and its structure must be inferred from indicators designed to tap into its content. These indicators are essentially the operationalized form of abstract symptoms, such as being "impulsive" or "lacking in empathy" that are speculated to compose part of this construct. Thus, there are two broad types of hypotheses that must be tested to determine the overall validity of a construct: hypotheses regarding the symptoms that compose a construct in question (content validity) and hypotheses regarding the best way to measure the underlying symptoms or the larger construct itself (construct validity).

Construct validity is therefore assessed using two broadly distinctive approaches. First, construct validity can be qualitatively assessed by examining the face and content validity of an operationalization of a construct. These forms of validity concern whether the items composing the measure appear to reflect the theorized model. Face validity simply assesses whether the measure in question appears to reflect the theorized construct. In other words, does the measure appear to focus on elements related to psychopathy or is it representative of another abstract construct (e.g. intelligence). Content validity is concerned with the items composing the measure and whether the measure assesses all of the theorized content but nothing unrelated to the construct (Cozby & Rawn, 2012). While the Psychopathy Checklist has face validity, in that it is clearly an operationalization of the psychopathy construct, some authors have criticized its content validity, given that it lacks reference to traits originally part of the clinical description by Cleckley (e.g. “lack of anxiety”) while it contains content not historically deemed an essential part of the theory (e.g. criminal behaviours) (Cleckley, 1941; Cooke & Michie, 2001; Cooke et al., 2006; Cooke et al., 2004; Cooke et al., 2007; Hall & Benning, 2006; Hall et al., 2004; Karpman, 1941; Lilienfeld, 1994; Lilienfeld & Andrews, 1996; Lynam & Derefinko, 2006; McCord & McCord, 1964; Patrick, 2010; Skeem & Cooke, 2010; Verona et al., 2001). Of note, Kreis et al. (2012) recently found support for the content validity of the Comprehensive Assessment of Psychopathic Personality (CAPP) using a prototypical analysis with a sample of 132 mental health professionals, although some of the 33 symptoms performed less well than others.

Secondly, construct validity can be examined by comparing the proposed measure to pre-established measures of similar (convergent) and dissimilar (divergent) constructs, as well as measures of future (predictive) and co-occurring (concurrent) behaviours (Campbell & Fiske, 1959; Cozby & Rawn, 2012). In these approaches, construct validity is quantitatively assessed by statistically comparing the operationalization of a construct to some other well-established measure of a criterion. While the CAPP has not yet been subjected to such analyses, the Psychopathy Checklists have been and their construct validity has been demonstrated. As such, the Psychopathy Checklists are frequently used in establishing the construct validity of more recent alternate measures of psychopathic personality disorder. A review of the research findings pertaining to the construct validity of the PCL, as well as several other measures of psychopathic personality disorder, is presented in the following section.

Convergent Validity of Psychopathy Measures

One form of construct validity is supported if a new measure of psychopathy exhibits strong bivariate correlations with a pre-existing measure of psychopathy or other related constructs, such as Antisocial Personality Disorder (Das, de Ruiter, Doreleijers, & Hillege, 2009). The “gold standard” level of measurement of psychopathy among both child/youth and adult samples has been the Psychopathy Checklists created by Dr. Hare. As the PCL was the initial instrument created to systematically measure psychopathy, the ability to establish construct validity through comparisons to measures of similar constructs was limited; however, the PCL did correlate with the global ratings made using Cleckley’s criteria (Harpur et al., 1988) and produced significant, though relatively weak, correlations with the Psychopathic Deviate scale on the Minnesota Multiphasic Personality Inventory (Hare, 1985). Further, the PCL correlated positively with measures of Antisocial Personality Disorder, a very similar construct albeit one that is more behaviourally focused, while the PCL:YV correlated moderately-strongly with conduct disorder (essentially a childhood version of Antisocial Personality Disorder), which some propose may be an early onset form of psychopathy (Brandt et al., 1997; Forth, Brown, Hart, & Hare, 1996; Hart & Hare, 1989). Yet the PCL associations with other existing measures, such as the Psychopathic Deviate scale on the Minnesota Multiphasic Personality Inventory, although significant, were relatively low (e.g. Hare, 1985).

Although some studies have found moderate associations between differing psychopathy measures, the total score correlations between the PCL and some of the more recently developed psychopathy measures, such as the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), the Childhood Psychopathy Scale (CPS; Lynam, 1997), the Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002), the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), the Self Report Psychopathy Scale (SRPS; Levenson et al., 1995), and the Psychopathy Content Scale (PCS; Murrie & Cornell, 2000) have at times been weaker than would be expected (Forth et al., 1996; Kruh, Whittemore, Arnaut, Manley, Gage, & Gagliardi, 2005; Lee et al., 2003; Malterer, Lilienfeld, Neumann, & Newman, 2010; Murrie & Cornell, 2000, 2002; Poythress, Edens, & Lilienfeld, 1998; Salekin et al., 2005; Skeem & Cauffman, 2003; Vitacco et al., 2003).

Stronger associations would be expected between measures of psychopathy built using a similar underlying conceptualization of the construct, such as the PCL:YV and the YPI, APSD, and the SRPS. Yet these outcomes have not always occurred. While the YPI was built on the three-factor model of the PCL (Andershed et al., 2007), total score correlations between it and the PCL:YV have varied from somewhat weak (r = .29, Dolan & Rennie, 2007; r = .30, Skeem & Cauffman, 2003; r = .35, Cauffman et al., 2009) to moderate (r = .47, Andershed et al., 2007) in strength. One possible reason for the variation of results involves the sample demographics. For instance, Skeem and Cauffman's (2003) study involved incarcerated 14 to 17 year old males, a large proportion (36%) of whom scored 30 or higher on the PCL:YV, whereas Andershed and colleagues' (2007) study involved 12 to 20 year old male and female youth clinically referred for substance misuse, a very low proportion (3%) of whom scored 30 or higher on the PCL:YV scores. Still, generally speaking, the studies more consistently found weak than moderately strong correlations.

Another possible explanation of the weaker than expected relationship is that the YPI was intended for use as a self-report scale with non-incarcerated adolescents. While the authors included the ten "core" psychopathic traits included on the PCL, they removed the seven problematic items identified by Cooke and Michie (2001), such as the items indexing antisocial behaviours, as well as an additional three that they felt might result *from* psychopathy (Skeem & Cauffman, 2003). The weakened relationship may therefore be the result of limited item overlap between the YPI and the original PCL:YV. Notably, Skeem and Cauffman (2003) identified a weaker correlation between the YPI and the traditional two-factor PCL:YV (r = .24) compared to the modified three-factor PCL:YV (r = .30) which also removed these problematic items. Moreover, the YPI is a self-report measure, and others have speculated that self-report measures have more difficulty assessing the interpersonal and affective traits of psychopathy than they do the behaviourally-oriented ones, i.e. those focusing on impulsive and antisocial characteristics (Edens, Hart, Johnson, Johnson, & Olver, 2000; Harpur et al., 1989).

Another measure built on the PCL model of psychopathy is the APSD, which consists of self-report, parent-rating, and teacher-rating versions (Frick & Hare, 2001). Several studies identified that its underlying structure is composed of either two or three intercorrelated dimensions – Callous/Unemotional, Impulsivity (at times referred to as Impulsivity/Conduct Problems), and Narcissism, with the presence of the latter dimension under debate: (Dong et

al., 2014; Frick et al., 2000; Vitacco et al., 2003). Regardless of the factor structure, total score correlations with the PCL:YV have been weak to moderately strong (r = .40, Lee et al., 2003; r = .30, Murrie & Cornell, 2002), although one study found a moderately strong correlation of r = .62 (Vitacco et al., 2003). Further, ROC analyses identified a relatively small AUC of .69, indicating only a slightly better than chance probability that a randomly selected youth scoring 25 or higher on the PCL:YV would also have a higher score on the APSD than would a randomly selected youth scoring less than 25 on the PCL:YV (Lee et al., 2003).

While the APSD appears to tap into the behavioural aspects of psychopathy, its ability to validly assess the affective and interpersonal traits appears limited, at least compared to the ability of the PCL:YV to assess these important traits (Lee et al., 2003). Moreover, in the study by Lee and colleagues, only two of 19 parallel item pairs between the two measures had a significant association: PCL:YV Callous or Lacking Empathy was associated with both APSD Item 11 (You tease or make fun of other people) and Item 18 (You are concerned about the feelings of others). Still, one study (Vitacco et al., 2003) *did* find a moderately strong correlation between the APSD and PCL:YV. It is unclear why the association between these instruments would be weaker in other similar (incarcerated adolescent) samples, although as previously suggested, a possible reason concerns the proportion of youth considered psychopathic by the PCL:YV. Unfortunately, although Lee et al. (2003) reported the average psychopathy score in their sample (20.44), they did not report the proportion of youth scoring 30 or above on the PCL:YV, so this hypothesis could not be explored further.

Another self-report measure based on the PCL-R model of psychopathy is Levenson's Self-Report Psychopathy Scale (SRPS; Levenson et al., 1995). This measure presents two scales designed to measure primary (selfish, uncaring, manipulative personality) and secondary (impulsive and self-defeating lifestyle) psychopathy in community samples. Brinkley et al. (2001) examined the construct validity of the SRPS among a sample of adult male incarcerated offenders and found, consistent with many of the aforementioned studies of self-report measures, only a moderately weak correlation with the PCL-R (r = .35). Brinkley et al. (2001) also used the kappa coefficient to examine diagnostic concordance and found that there was little instrument overlap in identifying psychopathic participants. In effect, the SRPS seemed to be mostly successful at identifying those at the extremes of the psychopathy continuum. However, it should be noted that this instrument was designed for use in community (e.g.

college) samples, and the success of using self-report to measure psychopathic traits amongst individuals who may be motivated to hide those traits (i.e. inmates) is notoriously poor (e.g. Lilienfeld & Fowler, 2007). Thus, a consistent reason for the general tendency to observe weaker than expected total score correlations between these psychopathy measures may be the variance in administration methods. In fact, previous research *has* detected a measurement effect, meaning that even instruments built on the same original conceptualization of psychopathy inconsistently measure psychopathy as a result of the differing mode of measurement (e.g. the self-report APSD versus clinician-rated PCL:YV; Lee et al., 2003). Of note, while Malterer et al. (2010) observed that correlations in the range of .4 would be expected between instruments that propose to measure the same construct using different methods, the majority of the correlations reported above fell below this level, thus indicating that there is more than just a method effect responsible for the weaker correlations.

At other times, the weaker than expected correlations between psychopathy instruments may be due to differing conceptualizations and operationalizations of the originating construct, such as between the Psychopathy Content Scale (PCS) or Psychopathic Personality Inventory (PPI) and the PCL:YV. Murrie and Cornell (2000, 2002) created the PCS using 20 items found on the Millon Adolescent Clinical Inventory (Millon, Millon, Davis, & Grossman, 1993). Their original content included a mix of items tapping callousness, egocentricity, and antisociality. Of note, five of these latter items directly reference substance abuse, which is likely the result of Murrie and Cornell's (2000) observation that the MACI Substance Abuse Proneness scale was the most strongly correlated with PCL-R total scores (r = 0.47) in their sample, and because the Substance Abuse Proneness scale correctly identified 79% of low versus high-scorers on the PCL-R. Still, given that substance abuse is not viewed as a defining feature of psychopathy (e.g. Forth et al., 1993; Hare, 1991; Lilienfeld & Andrews, 1996), the heavy reliance upon substance use indicators on the MACI PCS creates concerns regarding the face validity of this scale as an appropriate conceptualization of psychopathy.

However, despite the heavy emphasis on substance use, the MACI-PCS achieved a moderately strong correlation with the PCL-R scores (r = 0.60) and in a discriminant function analysis it was able to reliably (83%) distinguish high and low scoring youth on the PCL-R (Murrie & Cornell, 2000). Yet given the concerns of face validity, and in line with the research findings of Cooke and Michie (2001) and Frick and colleagues (Barry et al., 2000; Frick et al.,

2000), Salekin et al. (2003) revised the MACI-PCS by replacing 12 of the items (including the five substance abuse statements) with eight other MACI statements they considered more representative of psychopathy. Their theoretically revised PCS, labelled the P16, consisted of three scales: Egocentric (MACI items 5, 7, 103, 146, 135, 52, and 155, alpha = .61), Callousness (MACI items 5, 21, 60, 61, 139, alpha = .62), and Antisociality (MACI items 15, 23, 45, 111, and 150, alpha = .56). All three scales successfully predicted violent recidivism two years following the original assessment (Salekin et al., 2003). Unfortunately, some of the items they removed tapped important constructs related to more recent conceptualizations of psychopathy (Cooke et al., 2005), including dominance (e.g. Item 28 "I sometimes scare other kids to get them to do what I want", Item 128 "I don't mind pushing people around to show my power"), callousness (Item 117 "I do what I want without worrying about its effects on others"), and irresponsibility (Item 92 "I am very good at making excuses to get out of trouble"). Thus, it seems that both MACI-based measures of psychopathy appear, on the face of it, to present inadequate operationalizations of psychopathy.

In contrast to the development of the PCS and P16, the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) conceptualized psychopathy using a bottom-up approach. Unlike the majority of the instruments previously discussed, the underlying model of psychopathy was therefore not based on the PCLs conceptualization. Initial factor analysis with a university sample identified eight subscales: Machiavellian Egocentricity (30 items indexing narcissistic and ruthless attitudes in interpersonal functioning), Social Potency (24 items indexing a perceived ability to influence and manipulate others), Coldheartedness (21 items indexing a propensity toward callousness, guiltlessness, and unsentimentality), Carefree Nonplanfulness (20 items indexing an attitude of indifference in planning one's actions), Fearlessness (19 items indexing an absence of anticipatory anxiety concerning harm and a willingness to participate in risky activities), Blame Externalization (18 items indexing a tendency to blame others for one's problems and to rationalize one's misbheaviour), Impulsive Noncomformity (17 items indexing a reckless lack of concern regarding social mores), and Stress Immunity (11 items indexing an absence of marked reactions to anxiety-provoking situations) (Lilienfeld & Andrews, 1996). Two subsequent studies identified that seven of these eight scales loaded onto two orthogonal (uncorrelated) dimensions that somewhat paralleled the two-factor PCL model: Fearless Dominance (Social Potency, Fearlessness, and Stress Immunity) and Impulsive Antisociality or Self-Centred Impulsivity (Machiavellian Egocentricity,

Carefree Nonplanfulness, Impulsive Nonconformity, and Blame Externalization; Benning et al., 2003; Edens & McDermott, 2010). Coldheartedness failed to load onto either scale. Interestingly, in two studies (Benning, Patrick, Salekin, & Leistico, 2005; Edens & McDermott, 2010), the Fearlessness scale actually related to both dimensions, and a subsequent factor analysis of this sub-scale revealed that it appeared to be composed of at least two distinct forms of fearlessness that relate differently to the PPI (and PPI-R) factors: thrill and adventure seeking, and boredom proneness. The first relates positively with the Factor 1 Fearless Dominance dimension, while the latter relates to the Factor 2 Impulsive Antisociality/Self-Centred Impulsivity dimension.

Despite its differing conceptualization and different method of assessment, the PPI initially demonstrated a moderate association with the PCL-R (r = .54), albeit in a small sample of around 50 participants (Poythress et al., 1998). Interestingly, this was a much stronger correlation than found between the YPI and PCL in a separate study (r = .30, Skeem & Cauffman, 2003), even though both the YPI and the PPI are self-report measures, and despite the fact that the YPI used the three-factor PCL model of psychopathy as the basis for its conceptualization, including 10 of the 13 "core" traits (Andershed et al., 2007). The PPI demonstrated an even stronger correlation with another psychopathy instrument built using the PCL-R as a framework: Hare's Self-Report Psychopathy scale – Revised (SRP-R; Hare, 1985), with which it was correlated at .91. However, the excessively high correlation in this study may have been due to a combination of similar measurement style (self-report) as well as the intense focus of the SRP-R on the PCLs Factor 1 traits, which is primarily what the PPI is designed to tap into. However, despite the initially high correlation, a later study found a much weaker relationship (r = .17) between the PCL-R and a revised version of the PPI (Edens & McDermott, 2010).

Overall, correlations between the PCL and other measures of psychopathy have ranged from weak to moderately strong. These correlations were all performed at the total score level, which prevents an understanding of how well each respective measure taps into the specific dimensions of psychopathic characteristics and where specifically the instruments overlap in item content. As discussed in a previous chapter, the PCL-R and PCL:YV have been empirically divided into between two and four intercorrelated factors. Correlations at the factor level may therefore provide some insights into the varying relationships between the PCL-based

measures and alternative operationalizations of psychopathy. Furthermore, as discussed in the subsequent section, it is likely that each factor of psychopathy will have distinctive relationships not only with the factors contained in other psychopathy instruments, but also with other criminological and psychological constructs of interest.

Factor Level Convergent Validity between Psychopathy Instruments

Correlations between psychopathy instruments at the factor level generally supported the convergent validity of psychopathy measures although, for the most part, they have also highlighted the challenges faced by alternative psychopathy instruments in adequately assessing affective and interpersonal traits, even by instruments purported to focus on these traits, such as the PPI.

Despite their differential approach to conceptualizing psychopathy, previous studies have identified moderate correlations between the PPI and PCL factor scores. In a small sample of around 50 participants, Poythress et al. (1998) found that the PPI total score correlated to a moderate degree with the total PCL-R score (r = .54) but primarily, this relationship appeared due to the overlap between the PPI and Factor 1 of the two-factor model of PCL, which exhibited a stronger relationship (r = .54) than the PPI and Factor 2 (r = .40). In fact, the relationship between PCL-R Factor 2 and PPI total scores became non-significant after partialling out the effects of the PCL-R Factor 1, whereas the relationship between the PCL-R Factor 1 and the PPI total score remained statistically significant and moderate in strength (r = .40) after partialling out the effects of PCL-R Factor 2. Further, while only one PPI subscale (Machiavellian Egocentricity) correlated with the PCL-R Factor 2 (r = .44), four scales correlated significantly and moderately in strength (rs .31-.56) with the PCL-R Factor 1.

These findings were not unexpected, given that Factor 1 of the two-factor PCL combines the more personality-focused factors of psychopathy (i.e. Deficient Affective Experience as well as Arrogant and Deceitful Interpersonal Style), consistent with the PPIs focus on the personality aspects of psychopathy, whereas Factor 2 (i.e. Social Deviance) focuses more on the behavioural elements. Unexpectedly, in a later study Skeem and Lilienfeld (2004) found the opposite pattern of relationships, with the PPI total score correlating more strongly with Factor 2 (r = .48) than Factor 1 (r = .30). Similarly, in a sample of patients institutionalized for mental

health concerns, Kruh and colleagues (2005) also found that the PCL:SV Factor 2 scores were primarily responsible for explaining the unique variance in PPI total scores, and that partial correlations between PCL:SV Factor 1 and PPI total scores became non-significant after controlling for PCL:SV Factor 2 whereas after controlling for PCL:SV Factor 1 scores, the relationship between PCL:SV Factor2 and PPI total scores remained. Likewise, using both community and offender samples, Malterer and colleagues (2010) found that while the PCL-R/PCL:SV and PPI total scores correlated moderately, as did the PCL Factor 2 scores with PPI Factor 2 scores, the PCL Factor 1 scores correlated less strongly with the PPI Factor 1 scores. Thus, as concluded by Malterer et al. (2010), the majority of these studies suggest that the PPI is not as successful as originally thought at tapping into the core interpersonal and affective traits and that its relationship with the PCL-R appears more attributable to the role of antisocial and socially deviant traits represented by Factor 2 of the two-factor PCL-R structure.

Despite its purported focus on the interpersonal/affective traits, other measures of psychopathy have shown stronger convergent validity at the factor level with the interpersonal and affective factors. Using Levenson's SRP Scale among 270 Caucasian and 279 African-American prisoners, Brinkley and colleagues (2001) recorded small to moderate correlations between the SRPS primary and secondary scales and both PCL-R Factors 1 and 2. They interpreted these results as implying that the SRP Scale was able to assess both the personality and antisocial traits of psychopathy.

Skeem and Cauffman (2003) compared the YPI with the PCL:YV in a sample of 160 serious young male offenders and found that the correlations between similar factors (*r*s = .20 to .35) were stronger than those between non-similar factors (*r*s = .11 to .17). However, a ROC analysis suggested that there was only a 68% chance that a youth identified by the PCL:YV as psychopathic would score more highly on the YPI than a randomly chosen youth who was not considered psychopathic by the PCL:YV; thus, the overlap between measures was – as suggested by the moderately weak factor-pair correlations – somewhat weak. Furthermore, when they cluster analysed YPI scores to create high versus low scoring YPI youth there were no significant differences on the PCL:YV scores. Interestingly, they observed that the YPI was more focused on the core interpersonal and affective traits than the PCL:YV, which may partly explain why they found only limited support for the factor-level construct validity.

Convergent and Divergent Validity – Relationships of Psychopathy Measures with Similar and Dissimilar Constructs

Another method to establish construct validity is to compare the new instrument to measures of theoretically related (convergent) and unrelated (divergent, or discriminant) constructs. Theory would suggest that psychopathy, as an externalizing disorder, would generally correlate positively with measures of other externalizing disorders, such as childhood conduct disorder/adulthood antisocial personality disorder and substance abuse/dependence, and would have a negative or non-significant relationship with internalizing disorders, such as depression and anxiety (Huchzermeier, Geiger, Bruβ, Godt, Köhler, Hinrichs, & Aldenhoff, 2007; Krueger, Hicks, Patrick, Carlson, Iacono, & McGue, 2002). In support of its construct validity, PCL scores have positively correlated with Diagnostic and Statistical Manual (DSM-IV) Cluster B diagnoses of externalizing personality disorders (antisocial, narcissistic, histrionic, borderline, and paranoid) and measures of externalizing constructs and behaviours (e.g. anger, conduct problems, school problems, substance use and abuse problems, criminal behaviours, impulsivity, dominant and hostile interpersonal styles), and have generally either correlated negatively or negligibly with internalizing issues, such as depression, anxiety, submissiveness, and social introversion, as well as with diagnoses of DSM-IV Cluster C internalizing personality disorders (schizoid, schizotypal, avoidant, dependent, and obsessive-compulsive) in criminal, clinical, and community samples with both adults (Edens et al., 2000; Forth et al., 1996; Hall et al., 2004; Hart & Hare, 1989; Harpur et al., 1989; Huchzermeier et al., 2007; Kosson et al., 1990; Lynam & Derefinko, 2006; Vitale et al., 2002; Salekin et al., 2001) and adolescents (Brandt et al., 1997; Campbell et al., 2004; Das et al., 2009; Forth et al.,1990; Kosson et al., 2002; Murrie & Cornell, 2000; Salekin et al., 2005; Salekin, Neumann, Leistico, DiCicco, & Duros, 2004; Schmidt et al., 2006; Sevecke, Lehmkuhl, & Krischer, 2008). Notably, studies with children (Frick et al., 2000) and youth (Lynam, 1997) using alternative instruments based on the PCL (the Psychopathy Screening Device and the Childhood Psychopathy Scale, respectively) have shown similar patterns of results as those mentioned above.

In a study conducted several decades ago to explore whether psychopathy could be considered a distinct clinical syndrome, Hart and Hare (1989) found that psychopathy diagnoses made with the PCL were significantly related to antisocial and histrionic personality disorders, while PCL scores were significantly positively related to prototypicality ratings of antisocial,

histrionic, and narcissistic personality disorders, while significantly negatively related to prototypicality ratings of avoidant personality disorder. In a study with 98 male youth in a juvenile justice treatment institution, Das and colleagues (2009) found that PCL:YV scores were significantly related with antisocial and externalizing MMPI-A scales, with the exception of the scale measuring school problems. The total score was also significantly positively associated with denial of social anxiety, while significantly negative associated with scales representing social introversion. Both the PCL and PCL:YV thus appear to demonstrate some degree of convergent and divergent validity in adult and youth samples.

However, some of these findings have been mixed. Vitale and colleagues (2002) found support for dimensional, but not categorical, PCL-R scores with measures of psychoticism (which taps into callousness, impulsiveness, and sensation seeking) and constraint. In addition, their discriminant validity analyses yielded some unexpected findings, including significant positive relationships between dimensional PCL-R psychopathy scores and measures of anxiety and negative affectivity. A possible reason for this is that their sample was composed of females, as several studies have suggested that alternative structural models of psychopathy may be more appropriate for women (see Forouzan & Cooke, 2005). Another possible reason is that despite their tendency to be intercorrelated, divergent relationships between the different factors of psychopathy and these constructs of interest were concealed by using total score analyses. Importantly, factor level correlations have identified some unique relationships between the two-, three-, and four-factor PCL structures and both externalizing and internalizing constructs of interest to psychopathy (Benning et al., 2003; Harpur et al., 2002; Hall et al., 2004; Huchzermeier et al., 2007). a general pattern of findings are as follows: the interpersonal traits (Factor 1 in the two, three, or four factor model) are positively associated with narcissism, cognitive functioning, and sociability; the affective traits (Factor 1 in the two-factor model and Factor 2 in the 3 or 4 factor model) are positively related to social detachment and low affiliation and negatively associated with fearfulness, anxiety, and stress; while the behavioural factors of the PCL measures (Factor 2 in the two-factor model, and Factor 3 in the 3 or 4 factor models) are positively associated with antisocial personality, impulsivity, anger, substance abuse, suicide risk, and anxiety, as well as negatively associated with measures of internal control and constraint (Hall et al., 2004; Hare, 1991; Harpur et al., 1989; Harpur et al., 2002; Hart & Hare, 1989; Huchzermeier et al., 2007; Patrick, 1994; Patrick, Bradley, & Lang, 1993; Smith & Newman, 1990; Verona et al., 2001).

Similar findings have been obtained with alternate measures of psychopathy and externalizing/internalizing personality measures. For instance, Sandoval et al. (2000) found that the PPI was significantly positively related to measures of aggression and borderline personality, and negatively related to measures of empathy. Similarly, in a sample of 326 male and female university students, Salekin and colleagues (2001) found that total scores on both the revised Self-Report Psychopathy Scale (SRP-II; Hare, 1991) and the PPI were related to – in particular – symptoms of Borderline and Antisocial Personality Disorders, as well as with other Cluster B personality disorder symptoms, such as Narcissistic personality. Benning et al. (2003) examined the construct validity of the factor structure of the PPI and found evidence for divergent relationships using measures of other externalizing constructs. While the PPI-I was associated with interview-assessed symptoms of Antisocial Personality Disorder, PPI-II was significantly positively associated with both interview-assessed and self-report child and adult symptoms of Antisocial Personality Disorder, antisocial behaviour both before and after 18 years of age, alcohol abuse/dependence, and negatively with age at first alcohol consumption. Later, Benning, Patrick, Salekin and Leistico (2005) found divergent results at the factor level by correlating the PPI, SRP-II, and APSD factors with personality symptoms assessed by the Personality Disorder Questionnaire-4+ (Morey, 1991). As expected, the factors alleging to assess the more 'personality' focused aspects of psychopathy, i.e., PPI Fearless Dominance and the SRP-II Factor 1 were negatively related to the anxious-fearful Cluster C personality disorders (i.e. avoidant, dependent, obsessive-compulsive), whereas the more 'behaviourally' focused PPI Impulsive Antisociality, SRP-II Factor 2, and APSD Impulsive-Conduct Problems scales were all positively related to symptoms of the externalizing (dramatic, emotional, and erratic) Cluster B personality disorders (i.e. borderline, narcissistic, histrionic, and antisocial).

Using the PPI-R, Edens and McDermott (2010) also found a different pattern of relationships at the factor level. Whereas Fearless Dominance was significantly negatively related to anger (and non-significantly negatively related to impulsivity), Impulsive Antisociality (or SCI) was strongly positively related to both, while Coldheartedness was unrelated to either. In addition, Fearless Dominance and Coldheartedness were related (negatively) to anxiety and depression, whereas Impulsive Antisociality was uniquely related to hostility and number of psychiatric symptoms. While Fearless Dominance was moderately associated with an alcohol abuse/dependence diagnosis, Impulsive Antisociality was weakly associated with a drug abuse/dependence diagnosis.

Using a modified version of the adult PCL-R, Murrie and Cornell (2000) split their sample of 90 male and female clinically-referred youth into high- (total score of 22 and over) and low-scorers (total score of 10 and less) and then assessed which of the MACI scales distinguished between the groups. Of the 31 MACI scales, including the Psychopathy Content and those on the Modifying Indexes, Personality Patterns, Expressed Concerned, and Clinical Syndrome scales, high-scoring youth exhibited significantly higher scores (convergent validity) than low-scoring youth on the MACI subscales of Disclosure, Unruly, Forceful, Oppositional, Identity Diffusion, Social Insensitivity, Substance Abuse Propensity, Delinquent Predisposition, Impulsive Propensity, and Psychopathy Content, whereas they scored significantly lower than low-scoring PCL-R youth on the Submissive, Conforming, Sexual Discomfort, and Anxious MACI subscales. While the largest effect sizes were observed for the Substance Abuse, Submissive, Conforming, Forceful, and Anxious scales, a discriminant function analysis indicated that the most accurate classification into high- and low-psychopathy groups occurred using the Substance Abuse Proneness (79% accurate), Unruly (74% accurate), and Delinquent (65% accurate) scales.

Murrie and Cornell (2000) also anticipated that nine of the MACI scales would relate either positively or negatively with the PCL-R total scores given their similar or dissimilar characteristics. Six of the anticipated relationships were observed: the PCL-R total scores were significantly positively correlated with Substance Abuse Proneness (r = 0.47), Unruly (r = 0.43), Delinquent Predisposition (r = 0.41), Forceful (r = 0.38), Impulsive Propensity (r = 0.34), and Social Insensitivity (r = 0.29). Although they had anticipated that the PCL-R scores would be positively correlated with the Egotistic and Borderline scales, and negatively correlated with the Self-Demeaning scale, they failed to find any significant associations with these. Of note, although not predicted, they also observed a significant negative correlation with the Submissive scale (r = -0.42). Importantly, their data was taken from a sample of hospitalized youth with mental disorders, which may lead to differing results from samples of incarcerated serious and violent youth.

While the above studies examined the construct validity of the PCL:YV using the MACI subscales, Lexcen, Vincent, and Grisso (2004) examined the construct validity of the MACI-based Psychopathy Content Scale by comparing those scores to other instruments. Using the PCS with 481 justice-involved youth, they found that both PCS factors were positively related

with the Massachusetts Adolescent Youth Screening Inventory-2 (Grisso & Barnum, 2001) scales representing alcohol/drug problems, anger/irritability, depression/anxiety, somatic complaints, suicide ideation, thought disturbance, and traumatic experiences, which implies that these scales have little discriminant validity with other measures of psychological constructs.

Interestingly, some of the other discriminant validity findings with adolescent samples have been inconsistent. In a sample of 98 male youth in a juvenile justice treatment institution, Das and colleagues (2009) unexpectedly found that all four PCL:YV factors were related to social introversion, not just Factor 1 as they had anticipated. Moreover, while the PCL:YV total score was unrelated to anxiety, neither was the PCL:YV Factor 2, with which they expected to see a unique inverse relationship.

In fact, several studies found positive associations between the PCL:YV and measures of internalizing behaviours, such as anxiety (Kosson et al., 2002; Salekin et al., 2005; Schmidt et al., 2006;), while some found negative associations with anxiety (Murrie & Cornell, 2000; Sevecke et al., 2008), others failed to identify a relationship (Brandt et al., 1997; Skeem & Cauffman, 2003). For instance, in Brandt et als. (1997) file-based study applying a modified version of the PCL:R to 130 incarcerated male adolescents, no association was identified between modified PCL-R scores and the Child Behaviour Checklist (Achenbach & Edelbrock, 1983) measure of anxiety. Similarly, in Skeem and Cauffman's (2003) interview-based study with incarcerated male young offenders, neither the two-factor nor three-factor version of the PCL:YV correlated significantly with a measure of anxiety (although, the self report based Youth Psychopathic Traits Inventory also utilized in this study demonstrated a negative relationship with anxiety, r = -0.24, mostly due to the Impulsive/Irresponsible factor, partial r = -0.24). Yet in contrast, Kosson and colleagues (2002) observed a statistically significant positive relationship (r = .25, $p < .01$) between PCL:YV scores and scores on the Welsh Anxiety Inventory among 115 adolescent male offenders on probation, whereas Murrie and Cornell (2000), in a clinical sample characterized by two-thirds female youth, found that the MACI Clinical Syndrome of Anxiety significantly distinguished between high- and low-scoring youth on a modified PCL-R, with high-scoring youth appearing, on average, to be significantly less anxious. Sevecke and colleagues (2008), in a sample of over 200 male and female 14 to 19 year old detainees, found that the PCL:YV total score and Factor 2 had a negative relationship with anxiety, but only for the male participants.

It is possible that these conflicting results were a measurement effect, as Brandt's study only used file data, which typically limits the resulting assessment of psychopathy, in particular, of the interpersonal and affective domains, and the sample sources differed for each study with Brandt et al.'s (1997) and Sevecke et al.'s (2008) data coming from incarcerated adolescents, Kosson et al.'s (2002) study using youth on probation, and Murrie and Cornell (2000) using a clinical sample. Yet it is also possible that these results indicate that the construct of psychopathy, as measured by the PCL, may look slightly different in adolescence, when several items characterizing the PCL:YV are more regularly manifested and/or when youth may be more likely to express other psychopathology (Schmidt et al., 2006).

Still another explanation, although it would also apply to research with adult samples, is that conflicting findings between measures of psychopathy and some theoretically relevant constructs results from the tendency to utilize total scores rather than factor scores in correlation analyses. For instance, in an important study that revealed some insight into the variations in findings regarding anxiety, Frick et al., (1999) found that whereas conduct problems (similar to the behavioural factor of the PCL) were positively correlated with measures of trait anxiety, callous and unemotional traits (similar to the affective factor of the PCL) were negatively related. Similarly, during the early validation studies with the PCL, Harpur and colleagues (1989) found that the two factors of psychopathy correlated differently with external measures. Specifically, Factor 1 – characterizing the "core" affective and interpersonal traits of psychopathy – yielded positive correlations with measures of interpersonal dominance and negative correlations with anxiety, whereas Factor 2 was more strongly related to antisocial and criminal behaviour measures, as well as other self-report personality scales and family background issues.

Predictive Validity

While this dissertation will not encompass predictive validity, a brief discussion on this research is relevant here as it speaks to future research recommendations with the CAPP-IRS. Predictive validity concerns the ability of an instrument to estimate the likelihood that a future outcome of interest will occur. In the criminal justice system, predictive validity often concerns recidivism following release from custody (e.g. Corrado et al., 2004; Edens et al., 2006; Gretton et al., 2004; Gretton et al., 2001; Harris et al.; Hart et al., 1988; Porter et al.; Salekin, 2008; Schmidt et al., 2006; Vaughn & DeLisi, 2008; Vincent et al., , 2008; Vincent et al., 2003; Walsh

& Kosson, 2007; Walters et al., 2008) or behaviours while in an institution (e.g. Buffington-Vollum et al., 2002; Das, de Ruiter, Lodewijks, & Doreleijers, 2007; Dolan and Blackburn, 2006; Dolan and Rennie, 2006; Douglas et al., 1999; Douglas et al., 2005; Doyle et al., 2002; Edens et al., 2002; Edens & Campbell, 2007; Gray et al., 2003; Guy et al., 2005; Heilbrun et al., 1998; Hildebrand et al., 2004; Hill et al., 1996; Murrie et al., 2004; Nicholls et al., 2004; Spain et al., 2004; Stafford & Cornell, 2003; Young et al., 2004).

Overall, the PCL scales have shown remarkable ability to predict such important outcomes with adults and adolescents, both with respect to the criminal and clinical population, though less well with female samples (e.g. Odgers, Reppuci, & Moretti, 2005; Schmidt et al., 2006; Vincent et al., 2008). As noted in previous chapters, the successful predictive validity of the PCL scales is the likely result of the inclusion of antisocial behaviours in the PCL, as past behaviour is known to be one of the best, if not the best, predictors of future behaviour.

Current Study

The construct validity of the CAPP still remains to be established (Vincent, 2012; Dawson et al., 2012). According to Dawson and colleagues (2012) the CAPP does appear to provide more information than the PCL:YV; however, whether the information is relevant to psychopathy has not been demonstrated. In other words, some items currently measured by the CAPP may not actually meaningfully represent the construct of psychopathy.

This chapter explores the convergent and divergent validity of the CAPP-IRS by examining correlations with theoretically relevant and unrelated constructs assessed with other well-established measures. The first stage in establishing the construct validity of the CAPP-IRS will involve correlating the total and domain CAPP-IRS scores with total and factor scores of other psychopathy instruments. The second stage (convergent and discriminant validity) will explore the construct validity of the CAPP-IRS by examining its relationships with measures of internalizing and externalizing disorders.

Sample

The procedure used to recruit participants for this study was described in the previous chapters. The current set of analysis was conducted only for the male young offenders; however, the total number of participants varied for each set of analysis depending on how many scales they had completed of the four measures (CAPP-IRS, PCL:YV, MACI, and MAYSI-2) being analyzed.

Measures

The construct validity of the CAPP-IRS will be explored using three supplementary instruments: the PCL:YV (Forth et al., 2003), the Millon Adolescent Clinical Inventory (MACI; Millon et al., 1993), and the Massachusetts Youth Screening Instrument (MAYSI-2: Grisso & Barnum, 2001). Unfortunately, given the time constraints in the custody centre and restrictions on accessing youth during their class times, as well as the short-term stays and cyclical pattern of incarceration typical of this sample, the four key measures of interest were not all administered at the same point in time. In the vast majority of cases, the structured Time 1 interview containing the MAYSI-2 was the focus of the initial contact with the youth, while the MACI and CAPP-IRS interviews were conducted in different sessions at later points with the youth. On average, the MACI was administered 178 days (SD = 211.060, range of 0 to 1,214 days later, after the Time 1 Interview and 144 days after the CAPP-IRS Interview, whereas the Time 1 and CAPP-IRS interviews were conducted an average of 80 days apart (range of 1 to 588 days). Given the presence of some extreme outliers, the 5% trimmed mean is also reported: Time 1 – MACI 165.75 days on average between assessments, MACI – CAPP-IRS 122.73 days on average between assessments; and Time 1 – CAPP-IRS 62.39 days on average between assessments. This is an important caveat for this study, since some research has questioned the stability of the psychopathy construct over time, even during adolescence. Thus, the different points in time may weaken some or all of the findings. That said, a substantial proportion of interviewers were conducted with the same youth within 31 days: over a third (37.9%) of Time 1 and MACI assessments were conducted within a month of each other, while essentially half of the MACI and CAPP (48.3%), and Time 1 and CAPP (51.8%) interviewers were conducted within a month of each other.

Given that the instruments were administered over the course of several different interviews, the sample size for each instrument varies. Slightly less than half (41.5%) the youth completed all four instruments of interest, while a third (33.3%) completed three instruments and a quarter (24.5%) completed only two. The number of scales completed did not vary significantly based on the youth's ethnicity, F (1.645, 89.015) = 0.510, $p > .05$; however, there was a significant negative relationship with age, r (144) = -0.298, $p = .000$ indicating that younger youth completed more scales. Given that in some cases youth completed the four scales across different periods of incarceration, this result likely reflects that some youth aged out of the youth system before they could complete all the research instruments whereas younger youth had more exposure to the youth custody system. Still, these results suggest that the subsequent analyses will need to consider the potential effect of age.

CAPP-IRS

The CAPP-IRS (Cooke et al., 2005) is administered through the combination of a semi-structured interview and file assessment. Interviewers are provided with a list of guiding questions for each symptom; should a dysfunction appear present, interviewers follow up with questions addressing the severity and persistence of this symptom over the youth's life. Thus, the CAPP-IRS in the current study involves lifetime ratings; however, other research with the CAPP-IRS may use shorter time-periods, such as a six month or one year timeframe. Following completion of the interview, the interview and file data together are used to inform CAPP-IRS ratings. Ratings are made on 33 symptoms arranged across six theoretical domains. As noted in Chapter 3, interrater reliability was excellent for total scores, and good to excellent for domain scores. CAPP-IRS lifetime rating interviews were completed for 147 male incarcerated youth; however, given that one male had only completed the CAPP-IRS and could therefore not contribute to the construct validity analyses, the sample was reduced to 146. The internal consistency of the total scale based on the 33 symptoms was excellent (Cronbach's alpha = 0.938), and the domain score ranged from acceptable to very good (Attachment $\alpha = 0.843$, Behaviour $\alpha = 0.773$, Cognitive $\alpha = 0.711$, Dominance $\alpha = 0.833$, Emotional $\alpha = 0.711$, and Self $\alpha = 0.825$). It is important to note that a cut-off score for "possible psychopathy" using the CAPP-IRS has not been set, although a possible cut-score will be discussed later in the analysis.

PCL:YV

The PCL:YV (Forth et al., 2003) is a 20-item representation of psychopathy that can be divided into four correlated yet unique factors: Interpersonal (F1), Affective (F2), Lifestyle (F3), and Antisocial (F4). Similar to the CAPP-IRS assessment, the PCL:YV is administered through a semi-structured interview, along with a review of file information, and ratings are also conducted using a lifetime timeframe. As the PCL:YV manual provides suggested questions but not a standard interview, the same semi-structured interview was used to generate information for both sets of ratings. Prorated total scores ranged from 5 to 34, with an average score of 20.6. This average is quite high compared to several other studies with incarcerated youth (e.g. Cauffman et al., 2009 x = 16; Andershed et al., x = 15.5; though see Lee et al., 2003 for an exception), but it is important to remember that Canadian youth justice legislation makes it difficult to be held in custody without being considered a serious and/or violent offender. Although the established cut-off for a diagnosis for psychopathy among adults is 30/40, with youth a cut-off for possible psychopathy is typically either 25 or 27. In the current sample, slightly more than one-tenth (11.9%) of the youth met the adult criteria for psychopathy, while one-fifth (20.2%) had a score of 27 or above, and one-third (34.5%) had a score of 25 or above. Unlike the average dimensional score, these categorical scores were generally consistent with previous research (see Edens et al., 2007 for a summation), although in one exception, Campbell et al. (2004) found that only 9.4% of incarcerated youth scored 25 and over.

Only 42 youth had data on all 20 items used to calculate the total score. The internal consistency as measured by Cronbach's alpha was good for the total score and Factor 2, nearly acceptable for Factors 1 and 3, but unacceptable for Factor 4 (PCL:YV Total α = 0.807, Factor 1 α = 0.684, Factor 2 α = 0.833, Factor 3 α = 0.651, Factor 4 α = 0.485). A closer look at this latter scale suggested that four of the five items were problematic, in that they generated low corrected item-total correlations: Early Behavioral Problems (r = .171), Poor Anger Control (r = .208), Revocation of Conditional Release (r = .246), and Criminal Versatility (r = .307). Although potentially problematic, similarly low psychometric properties have also been found in other studies both the PCL:YV (e.g. Andershed et al., 2007; Lee et al., 2003; Skeem & Cauffman, 2003) and other psychopathy measures (e.g. Lee et al., 2003; Kruh et al., 2005; Salekin et al., 2003; Skeem & Cauffman, 2003; Vitacco et al., 2003).

MACI

The MACI (Millon et al., 1993) is a 160 item scale that measures clinical and personality issues among adolescents using a true/false answer scheme. The MACI consists of 31 underlying scales, including Clinical Syndromes, Personality Patterns, and Expressed Concerns. The Clinical Syndromes scales cover seven major mental illnesses, three of which (Substance Abuse Proneness, Delinquency Predisposition, and Impulsive Propensity) are similar to behaviour problems expected from youth high in psychopathic traits, as the impulsive, irresponsible, stimulation-seeking style of youth is likely to result in their engaging in alcohol and/or drug use, breaking the rules, and engaging in reckless behaviour. Four other scales (Eating Dysfunction, Anxious Feelings, Depressive Affect, and Suicidal Tendency) conflict with psychopathic traits, as these scales reflect internalizing issues, whereas psychopathic individuals tend to be higher on externalizing symptoms.

The next set of scales represent 12 Personality Patterns or styles. Five of these scales are consistent with psychopathic individuals; specifically, being dramatizing, egotistic, unruly, forceful, oppositional, and borderline are all generally characteristic of the psychopathic personality, as they are representative of externalizing issues, as noted above. In contrast, being introverted, inhibited, doleful, submissive, conforming, and self-demeaning is inconsistent with psychopathy as these scales are more reflective of disorganized mental functioning and internalizing issues.

The last set of scales, Expressed Concerns covers eight issue areas, described in Table 7. Some of these scales, including sexual discomfort, family discord, and childhood abuse likely do not relate to psychopathy. However, identity diffusion and social insensitivity generally appear consistent with the psychopathic personality, whereas self-devaluation, body disapproval, and peer insecurity all seem inconsistent. These scales will not be the focus of the current study.

An additional scale was created by Murrie and Cornell (2000). The MACI: Psychopathy Content Scale (PCS) consists of 20 items taken from the larger MACI items (Table 38). Its purpose is to screen for young offenders displaying highly psychopathic traits for whom more detailed assessments, such as the PCL:YV, should be used. Early research with the PCS found that it exhibited a similar two-factor structure to the two-factor PCL:YV measure (i.e.

Interpersonal/Affective = Factor 1; Social Deviance = Factor 2) and similar to the PCL:YV, the PCS demonstrated some predictive validity with violent, general, and total number offences in a small sample of young offenders (Salekin et al., 2003). Salekin and colleagues (2003) were concerned about the heavy weighting of the PCS towards substance abuse, as five of the 20 items on the scale directly referenced use of substances. They created an alternate psychopathy subscale using 16 MACI items (the P16), some of which overlapped with the PCS items. Their new scale, shown in Table x below, presents a profile of psychopathy more in line with personality-based conceptualizations put forth by Cooke and Michie (2001) and Frick and colleagues (2001). However, some items with apparent face validity (e.g. item 9 (reverse scored) “I always try to do what’s proper”, item 28 “I sometimes scare other kids to get them to do what I want”, item 92 “I am very good at making excuses to get out of trouble”, item 117 “I do what I want without worrying about its effects on others”, and item 128 “I don’t mind pushing people around to show my power”) are not part of the P16 scale. Possibly these items were included in the original 25 item scale but removed as a result of their low psychometric values. Still, the resulting model appears to be missing some relevant items and, unlike the CAPP-IRS, themes related to dominance are absent from this operationalization of psychopathy.

Table 38: MACI Psychopathy Content Scale and P16 Item Content and Factor Structures

Item	PCS (Murrie & Cornell, 2000)	P16 (Salekin et al., 2003)
5. I do my very best not to hurt people's feelings*	Factor 1	Factor 2
21. Punishment never stopped me from doing whatever I wanted	Factor 1	Factor 2
28. I sometimes scare other kids to get them to do what I want	Factor 1	-
52. I don't see anything wrong with using others to get what I want	Factor 1	Factor 1
92. I'm very good at making excuses to get out of trouble	Factor 1	-
117. I do what I want without worrying about its effects on others	Factor 1	-
128. I don't mind pushing people around to show my power	Factor 1	-
135. I can charm people into giving me almost anything I want	Factor 1	Factor 1
60. To see someone suffering doesn't bother me	-	Factor 2
61. I don't seem to have much feeling for others	-	Factor 2
139. I will make fun of someone in a group just to put them down	-	Factor 2
9. I always try to do what is proper*	Factor 2	-
23. I like to follow instructions and do what others expect of me*	Factor 2	Factor 3
45. I've never been called a juvenile delinquent*	Factor 2	Factor 3
111. I've had a few run-ins with the law	Factor 2	Factor 3
150. I often have fun doing certain unlawful things	Factor 2	Factor 3
15. I've never done anything for which I could have been arrested	-	Factor 3
7. Some people think of me as being a bit conceited	-	Factor 1
103. I like being the center of attention	-	Factor 1
146. In many ways I feel very superior to most people	-	Factor 1
155.Telling lies is a pretty normal thing to do	-	Factor 1
8. I would never use drugs, no matter what*	n/a**	-
40. I used to get so stoned that I did not know what I was doing	n/a	-
42. I see myself as falling far short of what I'd like to be	n/a	-
62. I enjoy thinking about sex	n/a	-
75. I've gone through periods where I've smoked pot several times a week	n/a	-
120. There have been times when I could not get through the day without some pot	n/a	-
152. When we're having a good time, my friends and I can get pretty drunk	n/a	-

Note: (R) indicates the item is reverse scored. "n/a" indicates the items are unrelated to the PCL content and not assigned to a factor. "-" indicates the item is not on the scale in question. PCS Factor 1 = Egocentricity, Factor 2 = Antisocial Behaviors (Salekin et al., 2003). P16 Factor 1 = Egocentricty, Factor 2= Callousness, Factor 3 = Antisociality

The MACI also contains several validity scales (disclosure, debasement, and desirability) and a reliability scale. The scales that will be used in the current study include the

seven Clinical Syndromes and the 12 Personality Pattern scales, as well as the Psychopathy Content Scale created by Murrie and Cornell (2000). It should be noted that items do overlap across some of these scales; however, items are weighted differently for each factor that they load on and therefore assume differential importance on each scale (McCann, 2006).

MACI scores were originally available for 99 of the 147 male youth (67%); however, five youth were missing information regarding age and their tests could not be scored, while another four youth were immediately excluded according to their low Reliability score.[5] All other youth had a reliability score of 4. After transforming raw scores into baserates based on gender and age, two more youth were excluded due to a high score on the Disclosure scale.[6] No youth were excluded after the final scale changes were made according to the Disclosure, Anxiety/Depression, Desirability/Debasement, and Denial/Complaint adjustments.[7] MACI analyses were performed with the remaining 88 male youth.

The total Psychopathy Content Scale can range from 0 to 20; in the current sample, it ranged from 6 to 20 with an average score of approximately 12. This average was considerably higher than the 8.8 obtained by Murrie and Cornell (2002) in their incarcerated youth population, and may be reflective of the more serious and violent nature of the current sample.

MAYSI-2

The MAYSI-2 (Grisso & Barnum, 2001) is a 52 item self-report no/yes based assessment of the recent (past few months) thoughts, behaviours, and feelings of incarcerated youth. It is intended to be used as a screening tool for potential mental health issues, so that youth who appear to be at risk may be sent for more in-depth mental health assessments. Given this purpose, the MAYSI-2 does not provide diagnosis, but only identifies youth with

[5] The MACI manual states that a raw score of 2 on the Reliability scale (meaning they endorsed both of two highly improbable items: Item 114 *I have not seen a car in the last 10 years;* and Item 126 *I flew across the Atlantic 30 times last year*) suggests that the youth in question was either paying insufficient attention to the item content or had trouble understand the items, and that their test should therefore be considered invalid (Millon, Millon, Davis, & Grossman, 1993).

[6] The MACI manual states that raw Disclosure scores at 200 or below, or at 590 and above should render the whole test invalid (Millon et al., 1993).

[7] The MACI manual states that if "[n]one of the [baserate] scores on the Personality Patterns scales (1 through 8B) are above 59...no clear personality pattern emerges from the test data and therefore no interpretation should be attempted" (Millon et al., 1993: 53).

significant symptoms, and those with non-remarkable symptoms. Still, it does provide insight into seven main issue areas identified through factor analysis (Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001): Alcohol/Drug Use; Anger-Irritableness; Depression-Anxiousness; Somatic Complaints; Suicide Ideation; Thought Disturbance (for males only); and Traumatic Experiences (with one item differing for males and for females). Although there are 52 items on the total scale, some items did not load appropriately onto any factors, while others were removed due to low alpha coefficients and item-total correlations (Grisso et al., 2001).[8]

Grisso and Barnum (2006) reported the internal consistency coefficients in the MAYSI-2 manual. Generally, the alpha coefficients for the sample of young males were acceptable (Alcohol-Drug Use $\alpha = 0.85$; Angry-Irritable $\alpha = 0.80$; Depressed-Anxious $\alpha = 0.72$; Somatic Complaints $\alpha = 0.75$; Suicide Ideation $\alpha = 0.80$). However, the Thought Disturbance and Traumatic Experiences alphas were in the questionable range ($\alpha = 0.61$ and 0.63, respectively). The current study sample produced fairly consistent results (Alcohol-Drug use $\alpha = 0.895$; Angry-Irritable $\alpha = 0.793$; Depressed-Anxious $\alpha = 0.698$; Somatic Complaints $\alpha = 0.746$; Suicide Ideation $\alpha = 0.895$; Thought Disturbance $\alpha = 0.594$; Traumatic Experiences $\alpha = 0.613$).

Hypotheses

Overall, the extent that the CAPP-IRS correlates positively with assessments of similar constructs, and negatively with assessments of dissimilar constructs, the more confidence researchers will have in the CAPP-IRS as an accurate measure of psychopathic personality. This study will explore the overall construct validity of the CAPP-IRS with convergent, concurrent, and divergent validity analyses using the CAPP-IRS, PCL:YV, MACI Scales, MAYSI-2 Scales, and measures of key behaviours.

It is anticipated that the CAPP-IRS total score will correlate positively and moderately with the PCL:YV, the PCS, and the P16 total scores as all these instruments are presumed to measure the construct of psychopathy, albeit based on differing conceptualizations and operationalizations of the construct (e.g. PCL:YVs emphasis on antisocial behaviours, PCS's

[8] While most items are accurately represented in this table, revisions have been made to the MAYSI since our original purchase of the instrument. The MAYSI-2 Manual provides a breakdown of the items for each factor and will be used as a guide for the analysis for this chapter.

emphasis on substance abuse). Sub-scale level analyses are expected to reveal a more distinct pattern of relationship between certain CAPP-IRS domains, and PCL:YV and PCS factors. Specifically, it is anticipated that the following sub-scales will exhibit stronger correlations: CAPP-IRS Dominance and Self Domains with the PCL:YV Factor 1; CAPP-IRS Attachment and Emotion Domains with the PCL:YV Factor 2; and CAPP-IRS Behaviour and Cognitive Domains with the PCL:YV Factor 3.

Although Factor 1 of the PCS was labelled Egocentric by Salekin et al. (2003), a review of its content suggests it is a multidimensional factor with items touching upon fearlessness (e.g. item 21 “Punishment never stopped me from doing whatever I wanted”), callousness (e.g. item 117 “I do what I want without worrying about its effects on others”), dominance (e.g. item 128 “I don’t mind pushing people around to show my power”), manipulation (e.g. item 52 “I don’t see anything wrong with using others to get what I want”), irresponsibility (e.g. item 92 “I’m very good at making excuses to get out of trouble”), and impression management (e.g. item 135 “I can charm people into giving me almost anything I want”). When comparing these themes with the CAPP domain content, two domains in particular appear to be tapped: Attachment (callousness) and Dominance (dominance, manipulation, impression management), and to a lesser extent, Emotion (fearlessness) and Behaviour (irresponsibility). Given this, the PCS Factor 1 would primarily be expected to share a relationship with the CAPP-IRS Attachment and Dominance domains, and potentially with the CAPP-IRS Behaviour and Emotion domains, whereas it would be expected to relate primarily to Factors 1 and 2 of the PCL:YV.

In contrast, the PCS Factor 2 seems to be more clearly focused on Antisocial items (e.g. item 111” I’ve had a few run-ins with the law”), with the exception of two items that seem to tap aspects of irresponsibility (i.e. item 9 “I always try to do what is proper” and item 23 “I like to follow instructions and do what others expect of me”) and thus relationships would primarily be expected with the CAPP Behaviour domain and PCL:YV Factors 3 and 4. In contrast, the item content of the P16 appears to be more clearly aligned with the factor labels and lines up well with the PCL:YV factors. Thus, similar correlations as expected between the CAPP-IRS domains and PCL:YV factors would be anticipated.

Although the personality traits underlying the construct of psychopathy are expected to increase the risk for a wide range of antisocial behaviours, neither the CAPP-IRS, P16, or two-

factor PCS directly measure antisocial behaviours. As such, only weak or non-significant correlations with the PCL:YV Factor 4 are expected. However, consistent with previous research (e.g. Loper, Hoffschmidt, & Ash, 2001), positive correlations are expected between the CAPP-IRS total score and following scales: MACI Substance Abuse Proneness, Delinquency Predisposition, and Impulsive Propensity Clinical Syndromes, MACI Dramatizing, Egotistic, Unruly, Forceful, Oppositional, and Borderline Tendency Personality Patterns, as well as the MAYSI-2 subscales of Alcohol/Drug Use, Angry Irritable, and Traumatic Experiences. The clinical syndrome correlations are anticipated as these are examples of externalizing issues, while the personality pattern correlations are expected as research with the DSM demonstrates that psychopathy is often positively correlated with the histrionic, narcissistic, antisocial, borderline, and sadistic personality disorders, and the traits of the oppositional scale also seem similar to the psychopathic personality. The MAYSI-2 correlations are expected as the Alcohol/Drug use scale reflects some items of impulsive/irresponsible substance use, the Angry Irritable scale represents poor anger control and hostility, and the Traumatic Experiences scale consists of items involving exposure to violence or dangerous situations, which is characteristic of the stimulation-seeking, impulsive, irresponsible, callous/lacking empathy style of youth high in psychopathic traits. However, as some of these items are inconsistent with psychopathy (e.g. Doing things you wish you hadn't when drunk or high, Using alcohol or drugs to feel better on the Alcohol/Drug use scale; Staying mad for a long time on the Angry Irritable scale; and being terrified of an event on the Traumatic Experiences scale), the correlations are expected to be only weak-moderate in strength.

Likewise, and consistent with previous research findings (e.g. Loper et al., 2001), negative or non-significant correlations are expected between the CAPP-IRS and the following scales: MACI Eating Dysfunction, Anxious Feelings, Depressive Affect, and Suicidal Tendency Clinical Syndromes, MACI Introversive, Inhibited, Doleful, Submissive, Conforming, and Self-Demeaning Personality Patterns, and MAYSI-2 subscales of Depressed-Anxious, Somatic Complaints, Suicide Ideation, and Thought Disturbance. These correlations are expected as such traits (i.e. feeling nervous/anxious, feeling unworthy, experiencing symptoms of psychosis, and experiencing symptoms of internalizing personality disorders) are all inconsistent with the construct of psychopathy.

Data Analysis

Analyses of the CAPP-IRS domain scores was based on the theoretical model proposed in the original CAPP-IRS manual (Cooke et al., 2005). The PCL:YV factor scores were calculated for the four-factor model, and, consistent with the guidelines for analysis presented in the manual scores, were pro-rated when necessary (Forth et al., 1994). The analyses primarily involved zero-order correlations at a significance level of 0.05. Analyses were conducted for the total sample of males, with some additional analyses also conducted by age group (12-15 year olds, n=33; 16-18 year olds; n=55). ROC analyses were also conducted with the CAPP-IRS total score.

Results

All psychopathy instruments were tested for univariate and multivariate outliers. Univariate outliers were screened by transforming individual item scores into z-scores, where a score of plus/minus 3 would indicate that a youth should be considered an outlier. For multivariate outliers, Mahalanobis distance (D^2) scores and their corresponding probabilities were computed. In this case, any D^2 probabilities below 0.001 would be considered a multivariate outlier.

Five of the 33 CAPP-IRS symptoms had at least one univariate outlier: C3 Intolerant (z-score = 4.079), D5 Insincere (z-score = 3.489), E2 Lacks Pleasure (z-score = 3.404), S3 Sense of Uniqueness (z-score = 3.248), and S4 Sense of Entitlement (z-score = 3.840). Whereas the average scores of the sample were very low for C3 Intolerant (X = 1.10), D5 Insincere (X = 1.39), and E2 Lacks Pleasure (X = 1.10), the outlying youth had received scores of 6. Similarly, the average sample scores for S3 Sense of Uniqueness and S4 Sense of Entitlement were very low (Xs = 0.67 and 0.80, respectively), the outlying youth had received scores of 4 and 5, respectively. Of note, each outlying value belonged to a different youth. Similarly, the D^2 probabilities did not identify any multivariate outliers. Thus, the data from these youth were left in the dataset. The PCL:YV analysis also did not reveal any multivariate outliers; however, one item – Parasitic Orientation – had an outlier with a z-score of 4.22. This was the result of a single youth receiving the maximum score on this item (2), whereas the average sample score was 0.18.

On both the MACI psychopathy scales one variable – item 115 “I have never done anything for which I could be arrested” – had three outlying values, because only three of the 88 youth replied “false”. While the PCS Factor 1 and Factor 2 scales did not yield any multivariate outliers (all D2 probabilities were above .001), two youth were identified as multivariate outliers on the PCS. Notably, these two youth were also two of the three who responded “false” to item 115, and one of them was the outlying youth on the PCL item parasitic orientation. In case these outlying values were affecting the results of the subsequent analyses, the analyses were conducted with and without the two multivariate outliers. The results were virtually unchanged (slightly weaker values) when these youth were removed. Thus, the analyses were performed with their data included.

Descriptive statistics for three of the four instruments used are produced below in Table x, while the results for the MACI scales are found in Table 39. It is interesting to note that whereas no youth achieved a maximum score on any CAPP-IRS domain, youth did reach the maximum score on three of the four PCL:YV factors (the exception being the Lifestyle factor). This is likely due to the compressed scale used by the PCL:YV, and it suggests that the CAPP-IRS may potentially provide a more discriminating assessment of possible psychopathy given that its larger range of points makes it more difficult to achieve maximum scores.

Table 39: CAPP-IRS, PCL-YV, and MAYSI-2 Descriptives

Item (possible range)	Min.	Max.	Average	Std. Dev.	Skewness	Kurtosis
CAPP-IRS (n=146)						
Attachment (0-24)	0	20	6.63	4.956	0.576	-0.441
Behavioural (0-42)	0	34	14.04	6.348	0.215	-0.205
Cognitive (0-30)	0	21	9.65	5.114	0.130	-0.802
Dominance (0-42)	0	29	9.47	6.697	0.686	-0.091
Emotional (0-30)	0	25	9.10	5.543	0.620	-0.071
Self (0-42)	0	30	9.16	6.442	0.805	0.258
Total (0-210)	0	147	58.08	28.470	0.314	-0.205
PCL:YV (n=84)						
Factor 1 (0-8)	0	8	3.06	2.125	0.106	-1.015
Factor 2 (0-8)	0	8	4.16	2.476	-0.118	-1.066
Factor 3 (0-10)	0	9	4.82	2.019	0.133	-0.424
Factor 4 (0-10)	3	10	7.23	1.935	-0.492	-0.516
Total	5	34	20.63	7.137	-0.141	-0.825
MAYSI-2 (n=125)						
Alcohol/Drug (0-8)	0	8	5.37	2.111	-1.001	0.052
Suicide Ideation (0-5)	0	5	0.93	1.626	1.599	1.055
Angry-Irritable (0-9)	0	9	4.64	2.709	0.005	-1.038
Somatic Complaints (0-6)	0	6	2.73	1.968	0.187	-1.233
Depressed-Anxious (0-9)	0	8	2.31	2.068	0.721	-0.278
Thought Disturbance (0-5)	0	4	0.71	1.036	1.547	1.790
Traumatic Experiences (0-5)	0	5	2.62	1.491	-0.042	-1.216

The MAYSI-2 manual provides caution and warning cut-points for all scales except Traumatic Experiences (Grisso & Barnum, 2006). For most scales, around 30% of youth typically meet the cut-off for the Caution while 10% meet the cut-off for the Warning. As shown in Table 40, the male youth in this current sample could be considered very troubled, particularly with respect to alcohol and drug use where eight in ten youth met or exceeded the Caution cut-off , suggesting serious levels of substance abuse. Over half the male youth also met or exceeded the Caution cut-off on the Angry-Irritable scale, while nearly half met or exceeded the Caution cut-off for the Somatic Complaints scale. These results indicate that the typical incarcerated male serious and violent young offender has a complex and multi-faceted problem profile.

Table 40: Percentage of Incarcerated Male Serious and Violent Offenders Meeting MAYSI-2 Caution and Warning Cut-Offs (n=135)

Scale	Caution	Warning
Alcohol/Drug Use	81.0%	61.9%
Angry-Irritable	51.9%	18.5%
Depressed-Anxious	41.5%	7.4%
Somatic Complaints	48.1%	10.4%
Suicide Ideation	20.7%	17.8%
Thought Disturbance	42.2%	17.8%

The descriptive statistics according to the adjusted baserates for each of the modifying indexes, personality patterns, expressed concerns, and clinical syndromes on the MACI are presented in Table 41. Of note, a baserate score over 75 indicates that the characteristic is clinically present, whereas a score of over 85 indicates that the characteristic is clinically prominent (Murrie & Cornell, 2000). The data was generally distributed normally with the exceptions of body disapproval, eating dysfunction, and suicidal tendency. A substantial proportion of youth exhibited clinically concerning patterns (Unruly), concerns (Social Insensitivity, Family Discord), and syndromes (Substance Abuse, Delinquent, Impulsive). This is likely a reflection of the sample composition, as the incarcerated young males were primarily serious and/or violent offenders. In fact, the current scores on these scales indicated a particularly troubled sample of male youth, particularly when compared to previous studies using the MACI. For instance, both Murrie and Cornell (2000) and Loper et al. (2001) provided descriptive statistics for their sample data. Murrie and Cornell provided average scores for their high psychopathy group (defined by a score of 22 or higher on the PCL-R) and low psychopathy group (PCL-R score of 10 or lower) of clinically referred youth, while Loper and colleagues presented data individually for violent incarcerated male and female youth, as well as combined statistics. Compared to these samples, the youth in the current study exhibited significantly more severe externalizing problems and significantly less severe internalizing problems. Specifically, youth in the current sample had substantially higher scores on six subscales: Unruly, Forceful, Impulsive Propensity, Family Discord, Substance Abuse Proneness, and Delinquency Predisposition. In contrast, youth in the current study scored much lower than youth in Murrie and Cornell (2000) and Loper et al.'s (2001) samples on the Doleful, Submissive, Anxious Feelings, and Suicidal Tendency scales. In other words, compared to two previous studies of at-risk youth, the current sample was composed of youth who appeared to,

on average, be more antisocial (Unruly), dominating and controlling towards others (Forceful), more risk-taking (Impulsive Propensity), and have more severe experiences with family conflict (Family Discord), whereas they were less likely, on average, to be depressed or pessimistic (Doleful), dependent upon others (Submissive), worried or fearful (Anxious Feelings), or think about self-harm (Suicidal Tendency).

Table 41: MACI Scale Descriptives among Incarcerated Male Serious and Violent Young Offenders (n=88)

Scale	Min	Max	Mean	SD	Skew	Kurtosis	% > 75	% > 85
Modifying Indexes								
Disclosure	22	93	57.01	16.43	.240	-.715	17.0	5.7%
Desirability	17	95	62.43	16.50	-.658	.257	20.5	1.1%
Debasement	35	95	50.92	14.42	.765	-.014	6.8	1.1%
Personality Patterns								
Introversive	6	91	37.55	19.16	.626	-.036	5.7	1.1%
Inhibited	1	88	31.33	18.36	.801	.382	2.3	1.1%
Doleful	6	90	47.76	23.72	.188	-1.249	14.8	6.8%
Submissive	3	73	42.49	12.33	.079	.616	0	0%
Dramatizing	24	111	66.85	16.39	.083	.050	22.7	11.4%
Egotistic	13	83	56.46	12.81	-.743	1.276	4.5	0%
Unruly	48	113	82.65	13.69	-.251	.311	68.2	44.3%
Forceful	17	112	59.64	22.24	.341	-.795	28.4	13.6%
Conforming	11	91	45.24	14.43	.699	1.57	3.4	2.3%
Oppositional	27	88	64.77	13.96	-.685	-.073	25.0	2.3%
Self-Demeaning	9	89	43.10	20.60	.412	-.993	8.0	2.3%
Borderline	7	97	45.32	21.10	.596	-.105	11.4	6.8%
Expressed Concerns								
Identity Diffusion	10	110	50.19	21.4	.373	-.370	12.5	5.7%
Self-Devaluation	7	109	39.80	22.51	.936	.580	10.2	4.5%
Body Disapproval	1	83	17.47	15.47	1.61	3.10	1.1	0%
Sexual Discomfort	9	81	39.99	13.76	.098	-.012	1.1	0%
Peer Insecurity	6	90	33.51	21.28	.912	-.101	6.8	1.1%
Social Insensitivity	49	115	79.55	15.83	.161	-.765	54.5	40.9%
Family Discord	36	110	80.36	14.70	-.556	.588	68.2	36.4%
Childhood Abuse	5	98	36.66	23.25	.789	-.365	9.1	2.3%
Clinical Syndromes								
Eating Dysfunction	2	70	13.97	11.44	2.084	6.244	0	0%
Substance Abuse	37	115	92.69	21.28	-.472	-.830	75.0	54.5%
Delinquent	57	115	86.52	13.54	-.256	-.388	77.3	51.1%
Impulsive	24	110	75.60	19.38	-.456	-.357	55.7	28.4%
Anxious	7	69	35.86	13.77	.124	-.296	0	0%
Depressive	4	106	46.98	25.44	.223	-1.082	19.3	4.5%
Suicidal Tendency	1	113	24.81	19.09	2.074	5.845	3.4	2.3%
Psychopathy Content	6	20	12.45	3.30	-.139	-.558	n/a	n/a

Validity results

Psychopathy Instrument Total Scores

Zero-order correlations were computed between the total scores of the four psychopathy instruments. All the instruments were significantly related to each other. In particular, the CAPP-IRS and PCL:YV exhibited a strong relationship for the total sample (Table 42). This relationship was stronger than expected, given the additional domains referenced by the CAPP and its lack of reference to antisocial behaviours. Of note, the correlation was consistently strong in both the younger [$r(23) = .739$, $p = .000$] and older [$r(33) = .690$, $p = .000$] groups of male youth. For the whole sample, there was an equally strong correlation between the PCS and P16, which was not surprising, as they directly overlap in content. For the total sample, the CAPP-IRS was also significantly positively related to both the MACI based psychopathy scales, though to a much weaker extent than with the PCL:YV. However, while the PCS and P16 were related to the 16 to 18 year old males [$r(52) = .326$, $p = .016$; $r(53) = .357$, $p = .008$, respectively), the association was non-significant for the 12 to 15 year old males ($r = .219$, $r = .254$, respectively). Both zero-order and partial correlations controlling for the influence of the other factors between the CAPP-IRS total score and each of the PCS and P16 factors failed to identify any unique relationships between the CAPP-IRS and factor scores for the 12 to 15 year olds. The association between CAPP-IRS and PCS was the result of both PCS factors for the 16 to 18 year olds, as the zero-order correlations revealed weak relationships with PCS Factor 1 ($r = .295$) and Factor 2 ($r = .293$), both of which became non-significant when the contribution of the other factor was statistically controlled. In contrast, the relationship between CAPP-IRS scores and the P16 among 16 to 18 year olds was mostly due to its relationship with the PCS Factor 2. While zero-order correlations indicated weak relationships between the CAPP-IRS and P16 Factor 2 ($r = .328$) and Factor 3 ($r = .286$), partial correlations rendered the relationship with Factor 3 non-significant, whereas the relationship with Factor 2 remained weak and significant (partial $r = .292$).

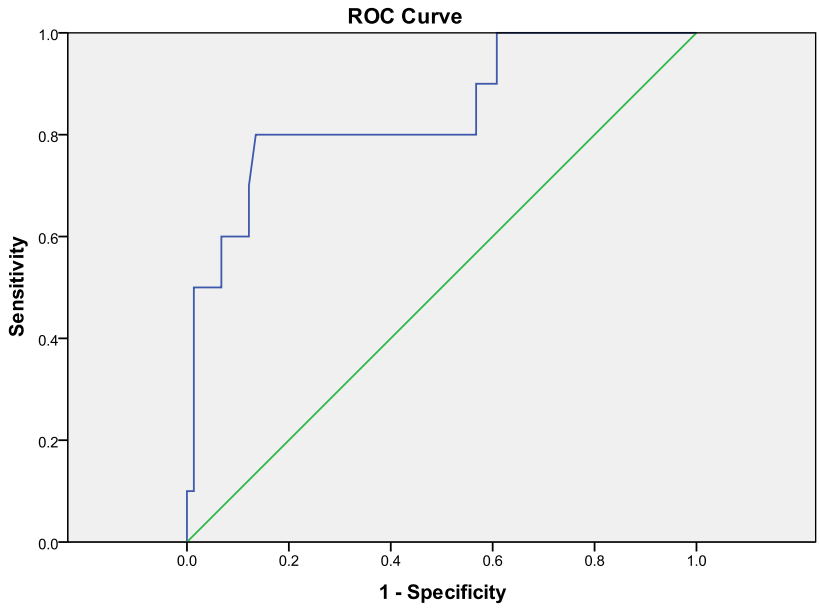
Table 42: Inter-correlations between the CAPP-IRS, PCL:YV, PCS, and P16 total scores

	CAPP-IRS	PCL:YV	PCS	P16
CAPP-IRS	-			
PCL:YV	.733**	-		
PCS	.326*	.380*	-	
P16	.348*	.368*	.772**	-

* p < .005; ** p < .001

An alternative way to check the validity of the CAPP-IRS is to assess its ability to predict which youth would exhibit high levels of psychopathic traits as measured by a pre-established instrument. To check the specificity and sensitivity of the CAPP-IRS total score in predicting youth identified as psychopathic according to the PCL:YV, two ROC analyses were performed using the traditional 30 point cut-off utilized with adult samples, as well as the 27 point cut-off frequently used in adolescent samples. At a PCL:YV cut-off of 30, the area under the curve (AUC) was quite high (Figure 3), AUC = .845 (SE = 0.073; 95% CI = .702-.988), indicating that there is an 84.5% chance that a youth identified as psychopathic according to the traditional PCL:YV cut-off would score more highly on the CAPP-IRS than a youth who fell below the PCL:YV cut-off of 30.

Figure 3: ROC Curve at PCL:YV Cut-Off of 30



Diagonal segments are produced by ties.

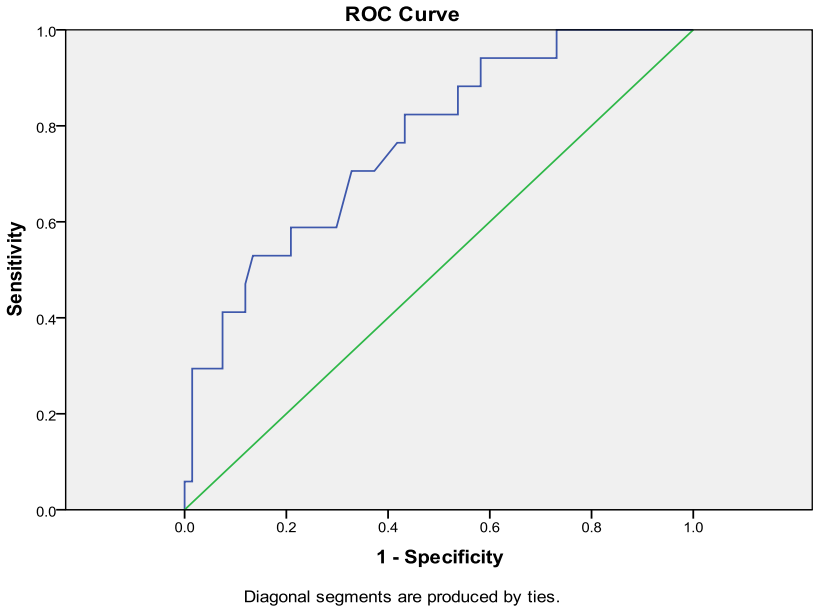
Cut-off scores on the CAPP-IRS total were also examined, with a focus on increasing specificity relative to sensitivity. Specificity of a test refers to the proportion of people without the condition who in fact test negative (true negatives) or in this case, who score below the 30 point PCL:YV cut-off for psychopathy. In contrast, sensitivity of a test refers to the proportion of people with a condition who do in fact test positive (true positives) or again, in this case, who score above the cut-off for psychopathy. Given the potential detrimental implications of falsely labelling a youth as psychopathic (false positives) the goal should be to identify a CAPP-IRS score that captures a large proportion of youth who would meet the PCL:YV criteria for psychopathy while risking that a few youth who should meet the criteria go unidentified by the CAPP-IRS (false negative). With this intent in mind, the results suggested that appropriate CAPP-IRS scores to consider establishing as cut-points for psychopathy, at least in regards to the PCL:YVs ability to identify psychopathic youth, would range in the area of 85 to 86.5 (Table 43). At these values, the CAPP-IRS would correctly identify 80% of youth who would receive a score of 30 or higher on the PCL:YV, and between 85% and 86.5% of youth who would receive a score under 30 on the PCL:YV.

Table 43: CAPP-IRS Cut-Off Values to Identify Youth Meeting the 30-Point PCL:YV Cut-Off

CAPP-IRS Score	Sensitivity	1 - Specificity
83	.800	.162
85.00	.800	.149
86.5	.800	.135
87.5	.700	.122

The AUC for the lower PCL:YV cut-off of 27 was weaker, though still acceptable, at AUC = .766 (SE = 0.062, 95% CI = .644-.888; Figure 4).

Figure 4: ROC Curve at PCL:YV Cut-Off of 27



Cut-off scores were examined for the 27-point cut-off on the PCL:YV, again with the intent of maximizing specificity at the expense of sensitivity. In this case, a CAPP-IRS total score of 81 would be ideal to reduce the risk of falsely identifying a youth as meeting the PCL:YV 27-point criteria for psychopathy while correctly identifying a large proportion of those who do meet the PCL:YV 27-point criteria for psychopathy. As seen in Table 44, compared to the PCL:YV cut-off of 30, there is a much larger trade-off between sensitivity and specificity levels on the CAPP-IRS. To reach specificity levels of 80% or higher, the sensitivity of the CAPP-IRS must drop to around 50%. To reach sensitivity levels of 80% or higher, specificity would drop to 56.7% or lower. In other words, the CAPP-IRS appears to be much more useful at identifying youth meeting higher levels of psychopathy. However, it is also possible that this result is simply a consequence of the nature of the current sample and that in samples of less problematic male youth, it would be much easier to distinguish those who meet the lower level criteria for psychopathy.

Table 44: CAPP-IRS Cut-Off Values to Identify Youth Meeting the 27-Point PCL:YV Cut-Off

CAPP-IRS Score	Sensitivity	1 - Specificity
78.00	.588	.209
79.50	.529	.209
81.00	.529	.179
83.00	.529	.164

CAPP-IRS Domain Level Construct Validity with Psychopathy Instruments

The CAPP-IRS domains expand upon the multi-dimensional nature of the PCL:YV factors. For instance, PCL:YV Factor 1 contains reference to both internal (i.e. grandiosity) and interpersonal (i.e. impression management, pathological lying, manipulation) relationships. The CAPP-IRS divides these relationships into two distinct domains: Dominance and Self. It would then be anticipated that the Dominance and Self domains would be intercorrelated to a greater degree than they would with the remaining CAPP-IRS domains. Similar expectations apply to the Attachment and Emotional domains (which break up and expand upon PCL:YV Factor 2), and the Behaviour and Cognitive domains (which break up and expand upon PCL:YV Factor 3).

As shown in the top half of Table 45, the expected pattern of relationships between CAPP Domains emerged. In other words, Attachment and Emotion correlated more strongly together (r = .817) than with any other domain (rs = .413-.624), Behaviour and Cognition correlated more strongly together (r = .663) than with any other domain (rs = .484-.624), and Dominance and Self correlated more strongly together (r = .671) than with any other domain (rs = .346-.618).

However, these results differed between the 12 to 15 year old group (n = 33) and the 16 to 18 year old group (n = 55). While Attachment and Emotion correlated more strongly for the older youth (r = .819) than with any other paired domain (rs = .323-.605), younger youth exhibited a slightly stronger relationship between Attachment and Dominance (r = .833) than between Attachment and Emotion (r = .798). The Emotion domain was, as expected, more strongly correlated with Attachment than with any other domain (rs = .457-.698). Similarly, although Behaviour and Cognition correlated most strongly for the whole sample and the older male youth (r = .704, remaining rs = .323-.605), this was not true of the younger male youth, as Behaviour correlated more strongly with Attachment (r = .628), Emotion (r = .610), and Dominance (r = .606), than with Cognitive (r = .533), although the strongest correlation for the

Cognitive domain was Behaviour (remaining *r*s = .355-.496). Similarly, for the younger youth, Dominance was more strongly correlated with Attachment (*r* = .833) than was the anticipated Self (*r* = .805) domain, although the strongest pairwise correlation for Self was the anticipated Dominance domain (remaining *r*s = .355-.712). For the older youth, Self was correlated equally strongly with Dominance (*r* = .564) as it was with Attachment (*r* = .565), while Dominance was only slightly more strongly correlated with Self, as expected, than it was with Behaviour (*r* = .558).

Returning to the whole sample, many of the anticipated relationships between CAPP Domains and the other scale factors were found. In particular, strong correlations were found between the CAPP-IRS Attachment domain and PCL:YV Factor 2 (*r* = .752), between the CAPP-IRS Dominance domain and PCL:YV Factor 1 (*r* = .747), between the CAPP-IRS Emotional domain and PCL:YV Factor 2 (*r* = .762), and between the CAPP-IRS Self domain and PCL:YV Factor 1 (*r* = .664). These results were consistent when run separately for the young (n=25) versus older (n=34) groups of males. Although to a much weaker degree, the expected correlations were generally also found between the CAPP-IRS and the PCS and P16 scales. Again, given the multidimensional appearance of Factor 1 of the PCS correlations were expected with virtually all the CAPP Domains. However, only three significant weak correlations were observed: Attachment (*r* = .328), Dominance (*r* = .268), and Emotion (*r* = .271).

However, some of the anticipated correlations either were weaker than expected or non-existent, and some non-anticipated relationships were apparent. For instance, although the relationship was statistically significant, PCL:YV Factor 3 was only weakly related to both the CAPP-IRS Behaviour (*r* = .340) and CAPP-IRS Cognitive (*r* = .221) domains. Instead, the CAPP-IRS Behaviour was more strongly related to both Factor 2 (*r* = .461) and Factor 1 (*r* = .434), while the CAPP-IRS Cognitive was more strongly related to Factor 1 (*r* =.409). When split by age, the expected relationships for the Behaviour and Cognitive domains with Factor 3 were non-significant for both age groups. Instead, in the young sample, Behaviour was only related to Factor 2 (*r* = .574) while Cognitive was unrelated to all four factors, while for the older sample Behaviour was most strongly related to Factors 1 (*r* = .402) and 4 (*r* = .401), as well as slightly less strongly with Factor 3 (*r* = .343). In contrast, for the older youth, the Cognitive domain was only related to Factor 1 (*r* = .401).

Despite the fact that the CAPP-IRS does not directly index any antisocial behaviours, PCL:YV Factor 4 was significantly related to five of the six CAPP domains; Attachment *r* = .478, Behaviour *r* = .338, Dominance *r* = .404, Emotion *r* = .492, Self *r* = .351. Only Cognitive was unrelated to the Antisocial Behaviours indexed by the PCL:YV, *r* = .192. When split by age, amongst the younger youth Factor 4 was significantly related to only three domains: Dominance (*r* = .451), Emotion (*r* = .445), and Attachment (*r* = .418), whereas for older youth, Factor 4 was related to Emotion (*r* = .558), Attachment (*r* = .539), Behaviour (*r* = .401), and Dominance (*r* = .373). These relationships may be due to the inherent association between psychopathic personality factors and ability to act delinquently towards others. What was particularly interesting about these relationships was that they were stronger than the expected relationships between the PCL:YV and Factor 3 of the P16 (*r* = .262) and Factor 2 of the PCS, which was non-existent.

Generally, the expected relationships between the PCS Factor 1 and the CAPP domains of Attachment (*r* = .328), Dominance (*r* = .268), and Emotion (*r* = .271) were found. Only the Behaviour domain failed to reach significance with the PCS Factor 1 (*r* = .199). However, while the PCS Factor 1 was expected to be related to the PCL:YV Factor 1 and Factor 2, while a relationship was found with Factor 2 (*r* = .357) it was unrelated to Factor 1 (*r* = .155). Unexpectedly, the PCS Factor 1 was significantly related to both the PCL:YV Factor 3 (*r* = .326) and Factor 4 (*r* = .371). PCS Factor 2 also yielded several unanticipated relationships. Again, the Antisocial Behaviours factor on the PCS was expected to relate to the CAPP Behaviour domain and the PCL-YV Factor 3 and 4. While the relationship was found with the CAPP Behaviour domain (*r* = .286), the correlations with the PCL:YV Factors 3 and 4 were weak and failed to reach statistical significance (*r*s = .221 and .197, respectively). Albeit weak, unexpected relationships were also found between the PCS Factor 2 and the CAPP Attachment (*r* = .228), Cognitive (*r* = .300), Dominance (*r* = .255) and Emotion (*r* = .237) domains. Not surprisingly, given the absence of a total score relationship for younger youth with the PCS, only one factor level relationship was found, and this relationship – between Factor 2 of the PCS and the Behaviour domain – barely reached significance (*r* = .345, p = .049). Despite a relationship with the PCS total score among older youth, only three pairwise relationships were found for the older sample: PCS Factor 1 as significantly associated with Attachment (*r* = .276) and Dominance (*r* = .345), while PCS Factor 2 was significantly associated with Dominance (*r* = .346).

Perhaps the most surprising results emerged from the P16 analyses. Factor 1 of the P16 taps items related to egocentricity and grandiosity; thus, it was expected to yield significant correlations with the CAPP Dominance and Self domains, as well as the PCL:YV Factor 1. In fact, none of these relationships were significant (*r*s = .173, .131, and .205, respectively). Instead, the P16 Factor 1 was only related to the PCS scales, with a particularly strong relationship with the PCS Factor 1 (*r* = .672). The results for the P16 Factor 2 were more consistent with expectations, although some unexpected relationships also emerged. The PCS Factor 2 did in fact achieve its strongest correlations with the expected domains of the CAPP: Attachment (*r* = .458) and Emotion (*r* = .408). However, it was unrelated to the PCL:YV Factor 2 (*r* = .248). Instead, P16 Factor 2 was significantly related to both PCS Factors, as well as Factor 1 of the P16 (*r*s = .574, .236, and .293, respectively). A similar pattern of results occurred with Factor 3 of the P16. The anticipated relationships with the CAPP Behaviour and Cognitive domains were found (*r*s = .281 and .301, respectively), as well as the relationship with PCL:YV Factor 4 (*r* = .262); however, Factor 3 of the P16 was unrelated to the PCL:YV Factor 3 (*r* = .190), while it was weakly related to three additional CAPP domains: Attachment (*r* = .235), Dominance (*r* = .313), and Emotion (*r* = .228). When split by age, only one barely significant relationship was found at the factor level for the younger youth, between Factor 3 and Behaviour (*r* = .354, p = .043) whereas several factor-level relationships were found for the older youth for the P16 Factor 2 (Attachment, *r* = .528; Behaviour, *r* = .268; and Emotion, *r* = .439) and Factor 3 (Cognitive, *r* = .268, Dominance, *r* = .389).

Table 45: Domain and Factor Level Correlations among 4 Measures of Psychopathy

	CAPP-IRS						PCL:YV				PCS		P16		
Psychopathy Factor/Domain	A	B	C	D	E	S	1	2	3	4	1	2	1	2	3
CAPP-IRS															
Attachment	-														
Behaviour	.610**	-													
Cognitive	.413**	***.663***	-												
Dominance	.567**	.577**	.491**	-											
Emotion	***.817***	.624**	.457**	.524**	-										
Self	.618**	.484**	.346*	***.671***	.571**	-									
PCL:YV															
Factor 1 Interpersonal	.426*	.434*	.409*	***.747***	.336*	***.664***	-								
Factor 2 Affective	***.752***	.461*	.152	.366*	***.762***	.500**	.334*	-							
Factor 3 Lifestyle	.457**	***.340****	***.221****	.135	.492**	.295*	.280*	.581**	-						
Factor 4 Antisocial	.478**	.338*	.192	.404*	.492**	.351*	.348*	.526**	.535**	-					
PCS															
Factor 1 Egocentricity	***.328****	***.199***	.139	***.268****	***.271****	.154	***.155***	***.357****	.326*	.371*	-				
Factor 2 Antisocial Behaviours	.228*	***.286****	.300*	.255*	.237*	.101	.083	.226	***.221***	***.197***	.342*	-			
P16															
Factor 1 Egocentricity	.120	.097	.018	***.173***	.106	***.131***	***.205***	.206	.238	.114	.672**	.234*	-		
Factor 2 Callousness	***.458*****	.242*	.151	.213*	***.408*****	.171	.053	***.248***	.094	.199	.574**	.236*	.293*	-	
Factor 3 Antisociality	.235*	***.281****	***.301****	.313*	.228*	.181	.160	.243	***.190***	***.262****	.343*	.927**	.265*	.195	-

* p < .05, ** p < .001. Hypothesized relationships are bolded and italicized

CAPP-IRS Convergent Validity with Related Constructs

The next set of analyses focused on the positive relationships that were expected to occur between the CAPP-IRS scores and select MACI and MAYSI-2 syndromes. These results were explored both categorically and dimensionally. Firstly, as previously discussed, using a higher cut-off to detect the possible presence of psychopathy in this sample of serious and violent incarcerated male youth seems warranted. Youth were subsequently split into a “high psychopathy” versus “no or low psychopathy” group at the CAPP-IRS total score cut-off of 85 or higher, and then compared on the outcome variables of interest as measured by the MACI and

MAYSI-2 instruments (Table 46). 72 youth fell below the cut-off, whereas 16 of the youth with MACI data met the psychopathy cut-off as did 15 youth with MAYSI-2 data. Although youth scoring in the high range of psychopathy on the CAPP-IRS generally produced higher average scores on the MACI and MAYSI-2 scales, with the exception of Dramatizing, Egotistic, and Alcohol/Drug Use, they differed significantly from low scoring youth in only one area: being Forceful towards others.

Table 46: CAPP-IRS Categorical Relationships with MACI and MAYSI-2 Related Constructs

Syndrome	No or Low Psychopathy (CAPP-IRS < 85)	High Psychopathy (CAPP-IRS 85 and over)	Statistical Result
MACI Clinical Syndromes			
Substance Abuse Proneness	90.65	101.81	ns
Delinquency Predisposition	85.61	90.63	ns
Impulsive Propensity	73.74	84.00	ns
MACI Personality Patterns			
Dramatizing	67.92	62.06	ns
Egotistic	56.71	55.31	ns
Unruly	81.92	85.94	ns
Forceful	57.33	70.00	t (86) = -2.1, p = .039
Oppositional	63.56	70.25	ns
Borderline Tendency	43.76	52.31	ns
MAYSI-2			
Alcohol/Drug Use	5.44	5.15	ns
Angry-Irritable	4.64	5.07	ns
Traumatic Experiences	2.57	2.87	ns

An unexpected pattern of relationships was also observed at the dimensional level (Table 47). Only one of the MACI Clinical Syndromes (Substance Abuse Proneness) was significantly related to the CAPP-IRS total score, whereas two (Substance Abuse Proneness and Impulsive Propensity) were significantly, although weakly, related to the PCL:YV. None of these scales were significantly related to the CAPP-IRS score for either age group (though the correlation only slightly exceeded significance for the older youth, r = .261, p = .054). In

contrast, the MACI based psychopathy scales had moderate to strong significant correlations with the MACI Clinical Syndromes (*r*s ranging .400-.781), likely due to their item overlap.

The unexpected pattern of relationships continued on in the analysis of the MACI Personality Patterns (Table 47). Dramatizing was actually *negatively* related to the CAPP-IRS total score (of note, the direction of the relationship with the other three psychopathy instruments was also negative, although not significant), although it was unrelated to either age group when conducted separately for each group. Likewise, the Egotistic scale was not significantly related to any psychopathy instrument, nor to the CAPP-IRS total scores for either age group, and while not significant, three of the four correlations were in the opposite direction than would be expected (Table 47). Although in the anticipated direction, the Unruly and Borderline scales were also unrelated to the CAPP-IRS total score for the whole sample as well as individually by age group; however, these scales were only weakly related to the PCL:YV (r = .267 and .383, respectively) whereas they were moderately related to the PCS and P16 total scores (*r*s ranging .487-.618). While positive significant associations were observed between the CAPP-IRS and the Forceful and Oppositional scales, the strength of both relationships were quite weak (r = .259 and r = .252, respectively). The unexpected results with the MACI syndrome scales might lead one to question the construct validity of the CAPP-IRS total score, although the PCL:YVs performance was for the most part only slightly better. In fact, these results are possibly suggestive of method effect, as the MACI scales are based on self-report whereas the CAPP-IRS and PCL:YV are both “clinician” rated. However, with the exception of the Angry-Irritable scale which produced weak correlations with the PCL:YV (r = .264), PCS (r = .303), and P16 (r = .259), no significant relationships were found with the MAYSI-2 and any instrument measuring psychopathy, despite the fact that the MAYSI-2 scales are also based on self-report. Thus, the moderately strong correlations observed between the MACI syndrome scales and the MACI-based psychopathy scales are most likely the result of overlapping item content.

Table 47: CAPP-IRS Total Score Convergent Validity with Related Constructs

Syndrome	CAPP-IRS Total	PCL:YV Total	PCS Total	P16 Total
MACI Clinical Syndromes				
Substance Abuse Proneness	.272*	.364*	.781**	.592**
Delinquency Predisposition	.062	.180	.493**	.400**
Impulsive Propensity	.182	.369*	.568**	.537**
MACI Personality Patterns				
Dramatizing	-.249*	-.086	-.088	-.054
Egotistic	-.173	-.146	-.130	.003
Unruly	.116	.267*	.618**	.528**
Forceful	.259*	.320*	.748**	.771**
Oppositional	.252*	.368*	.641**	.572**
Borderline Tendency	.206	.383*	.541**	.487**
MAYSI-2				
Alcohol/Drug Use	.009	-.029	.186	.100
Angry-Irritable	.137	.264*	.303*	.259*
Traumatic Experiences	.183	.083	.190	.187

* $p < .05$, ** $p < .001$

It is possible that the failure to observe the anticipated relationships is the result of treating psychopathy as a unidimensional construct by utilizing the total scores. Therefore these analyses were replicated using the factor/domain scores for each instrument (Table 48). When examining the pattern of relationships for the whole sample, the results were generally consistent. Only the CAPP-IRS Attachment domain was consistently related to the MACI Personality Pattern scores, with the exception of Unruly, but not all of these relationships were in the expected direction. Attachment issues were negatively related to Dramatizing and Egotistic scores on the MACI Personality Patterns scale. In contrast, Attachment scores were positively and weakly related to the Forceful, Oppositional, and Borderline personality patterns (*r*s = .301-.345). Attachment was also related to the Substance Abuse Proneness clinical syndrome scale, but was unrelated to the other two clinical syndromes as well as all three MAYSI-2 scales. The CAPP-IRS Emotional domain had a similar pattern of relationships; however, this domain was also positively associated with the Impulsive Propensity clinical syndrome while it was unrelated to the Egotistic personality pattern. Considering the PCL:YV, Factor 1 was unrelated to any of the MACI or MAYSI-2 scales. On the other hand, Factors 2

and 3 exhibited several correlations: weak-moderate positive relationships with Substance Abuse Proneness and Impulsive Propensity on the MACI clinical syndrome scales (*r*s range .330-.415), while Factor 3 was also related to Delinquency Predisposition (*r* = .299). These factors were also positively related to the Unruly, Forceful, Oppositional, and Borderline personality patterns (*r*s range .298-.438), but not the Dramatizing or Egotistic patterns. Interestingly, given what it focuses on, PCL:YV Factor 4 was unrelated to the Delinquency Predisposition clinical syndrome, although it had weak relationships with Substance Abuse Proneness (*r* = .352) and Impulsive Propensity (*r* = .260) scales. In addition, Factor 4 was only related to two of the six personality patterns: Forceful (*r* = .307) and Oppositional (*r* = .347). Overall, the only moderately strong relationships observed were with the MACI psychopathy scales and the MACI clinical syndromes and personality patterns. The MAYSI-2 Alcohol/Drug, Angry-Irritable, and Traumatic Experiences scales were generally unrelated to any psychopathy instrument.

The absence of significant correlations between the MAYSI-2 and CAPP-IRS domains was consistent regardless of age; however, some interesting variations on the above noted relationships were observed when the convergent validity of the CAPP-IRS domains with related MACI subscales was examined. The MACI Substance Abuse Proneness scale was differentially related to CAPP-IRS domains depending on age group. For younger youth, positive associations emerged with the Attachment (*r* = .356) and Emotion (*r* = .368) domains, whereas for the older youth, Substance Abuse Proneness was positively associated with the Behaviour domain (*r* = .355). The relationship with Cognitive disappeared when conducted by age group. In contrast, whereas for the entire sample Impulsive Propensity was only related to Emotion, the age group analyses revealed that it was significantly related to both Emotion (*r* = .340) and Behaviour (*r* = .275) for the older youth, whereas there was no statistically significant relationship between Impulsive Propensity and CAPP-IRS domain for younger youth. In fact, the younger youth only exhibited a handful of significant *negative* correlations with related MACI subscales, whereas the older youth more consistently exhibited the expected correlations. Interestingly, whereas older youth were unrelated to the Dramatizing scale, a negative association with the Attachment domain was present for younger youth (*r* = -.346). Furthermore, the Unruly scale was negatively associated with the Dominance (*r* = -.370) and Self (*r* = -.346) domains for the younger group. These domains were unrelated to Unruly for older youth; instead, positive associations were observed between Unruly and the Behaviour (*r* = .287),

Cognitive (*r* = .273), and Emotion (*r* = .307) domains for older youth. Although unrelated to CAPP-IRS domain scores among younger youth, the Forceful scale was positively related to several CAPP-IRS domains among older youth: Attachment (*r* = .380), Behaviour (*r* = .330), and Emotion (*r* = .350). Similarly, the Attachment and Emotion domains were both positively associated with the Oppositional scale among older youth (*r*s = .277 and .334, respectively) but non-significantly for the younger group. One domain – Emotion – was positively related to the Borderline Tendencies scale, among older youth only (*r* = .298). Unexpectedly, the Egotistic scale was negatively related to two CAPP domains among older youth: Attachment (*r* = -.290) and Emotion (*r* = -.320).

Table 48: CAPP-IRS Domain Level Convergent Validity with Related Constructs

	CAPP-IRS						PCL:YV				PCS		P16		
	A	B	C	D	E	S	1	2	3	4	1	2	1	2	3
MACI Clinical Syndrome															
Substance Abuse Proneness	.307*	.270*	.282*	.100	.325*	.055	.092	.330*	.415*	.352*	.653**	.433**	.459**	.382**	.419**
Delinquency Predisposition	.088	.116	.051	-.017	.149	-.076	-.097	.197	.299*	.193	.469**	.411**	.315*	.140	.413**
Impulsive Propensity	.206	.158	.143	.001	.304*	.072	.046	.403*	.406*	.260*	.576**	.362*	.478**	.274*	.369**
MACI Personality Patterns															
Dramatizing	-.319*	-.217*	-.230*	-.107	-.241*	-.108	.027	-.111	-.043	-.147	-.028	-.070	.204	-.332*	-.081
Egotistic	-.282*	-.148	-.186	-.008	-.189	-.053	.046	-.210	-.057	-.204	-.029	-.098	.267*	-.293*	-.073
Unruly	.094	.156	.198	.018	.198	-.085	-.001	.298*	.358*	.208	.535**	.486**	.509**	.109	.485**
Forceful	.345*	.260*	.127	.113	.355*	.059	-.083	.416*	.326*	.307*	.792**	.466**	.581**	.616**	.437**
Oppositional	.317*	.140	.193	.107	.330*	.145	.050	.400*	.347*	.347*	.565**	.365**	.430**	.411**	.380**
Borderline Tendency	.301*	.139	.190	-.014	.317*	.090	.042	.435*	.438*	.230	.497**	.369**	.342*	.365**	.343*
MAYSI-2															
Alcohol/Drug Use	-.052	.015	.061	.036	-.003	-.019	-.050	-.141	-.059	.190	.080	.111	-.007	.151	.106
Angry-Irritable	.168	.200	.151	.047	.131	-.022	.082	.139	.283*	.367*	.276*	.182	.152	.212*	.205
Traumatic Experiences	.139	.147	.214*	.195	.110	.081	.068	-.062	-.043	.313*	.131	.120	.044	.249*	.141

* $p < .05$, ** $p < .001$

Divergent Validity

The final set of analyses explored the construct validity of the CAPP-IRS through comparison with dissimilar constructs. Psychopathy, as an externalizing disorder, should be unrelated to internalizing constructs, such as anxiety and depression, and has historically also been unrelated to thought disturbances. Thus negative or negligible relationships would be expected between any of the measures of psychopathy and MACI and MASYI-2 measures of internalizing problems. Analyses were first run categorically, and then for the total and the domain/factor levels. The categorical analyses indicated that youth high in CAPP-IRS

psychopathic traits had significantly higher scores on the MACI Eating Dysfunctions, Introverted, and MAYSI-2 Suicidal Ideation scales (Table 49). As it was unexpected that there would be a relationship detected between these three scales and psychopathy, each of the scales was checked for univariate outliers. One youth in the high psychopathy group was considered a univariate outlier on the Eating Dysfunction scale (z = 3.109). This youth had multiple clinically prominent MACI scales, including Unruly, Self-Demeaning, Self-Devaluing, Substance Abuse, Impulsive Propensity, and Depressive. The analyses were re-run after removing this youth and Eating Disorder was no longer significantly related to the categorical CAPP-IRS score. However, youth high in CAPP-IRS psychopathy continued to score significantly higher than low-scoring youth on the MACI Introverted and MAYSI-2 Suicidal Ideation scales, and no univariate outliers were detected for the high psychopathy group.

Table 49: CAPP-IRS Categorical Relationships with MACI and MAYSI-2 Unrelated Constructs

Syndrome	No or Low Psychopathy (CAPP-IRS < 85)	High Psychopathy (CAPP-IRS 85 and over)	Statistical Result
MACI Clinical Syndromes			
Eating Dysfunctions	12.57	20.25	t (86) = -2.501, p = .014
Anxious Feelings	37.42	28.89	t (86) = 2.30, p = .024
Depressive Affect	46.22	50.38	ns
Suicidal Tendency	22.94	33.19	ns
MACI Personality Patterns			
Introverted	35.39	47.25	t (86) = -2.29, p = .024
Inhibited	30.24	36.25	ns
Doleful	46.75	52.31	ns
Submissive	43.68	37.13	ns
Conforming	46.82	38.13	t (86) = 2.23, p = .028
Self-Demeaning	41.64	49.69	ns
MAYSI-2			
Depressed/Anxious	2.15	3.00	ns
Somatic Complaints	2.89	2.20	ns
Suicidal Ideation	0.79	2.27	t (16.51) = -3.18, p = .028
Thought Disturbance	0.67	0.87	ns

Total score analyses were generally in conflict with the expected results. Unfortunately, inconsistent results were found for the two measures of anxiety. As expected, the CAPP-IRS total scores were significantly negatively related to the MACI measures of Anxious feelings; however, CAPP-IRS total scores were significantly positively related to the MASYI-2 measure of Depressed/Anxious. This result was possibly due to the MASYI-2s combining of the Depressed and Anxious constructs into a single item. Interestingly, although neither the CAPP-IRS nor PCL:YV total scores were related to the MACI Depressive Affect construct, both the MACI-based assessments of psychopathy were significantly and positively related to this measure of depression (PCS r = .251, P16 r = .221). Positive relationships were also found between the CAPP-IRS total score and the MACI Introverted and Inhibited scales. This was a surprising finding, given that individuals high in psychopathy traits are typically more overt and aggressive.

Of note, the PCL:YV total score was also significantly and positively related to the MACI Introverted scale, although not the Inhibited scale. Another unexpected finding was that the psychopathy instruments were consistently positively related to measures of suicidal feelings, with correlations ranging from .223 to .363 in strength.

Some clarity on these unexpected associations was provided when the analyses were replicated by age group (Table 50). The CAPP-IRS total score was moderately and negatively related to Anxious Feelings for the older youth (r = -.479) whereas it was unrelated for the younger group. In contrast, the Suicidal Tendency, Introverted, and Inhibited scales were all significantly and positively related to CAPP-IRS total scores for the young group (rs = .365-.399) while unrelated for the older group. In addition, the Eating Dysfunctions, Depressive Affect, Doleful, Submissive, Conforming, and Self-Demeaning scales were all unrelated to CAPP-IRS total scores among the younger group, whereas Eating Dysfunctions, Depressive Affect, Doleful, and Self-Demeaning scales were unrelated to CAPP-IRS total scores for older youth, and both Submissive and Conforming were significantly negatively related to CAPP-IRS total scores for the older group (rs = -.505 and -.340, respectively). The MAYSI-2 scores also showed divergent relationships by age, as they were unrelated to CAPP-IRS total scores for the older youth, while Depressed/Anxious and Suicidal Ideation both yielded positive correlations with the younger youth (rs = .422 and .559, respectively).

Table 50: Divergent Validity of CAPP-IRS Total Scores

Syndrome	CAPP-IRS Total	PCL:YV Total	PCS Total	P16 Total
MACI Clinical Syndromes				
Eating Dysfunctions	.138	.294*	.076	.131
Anxious Feelings	-.344*	-.239	-.633**	-.584**
Depressive Affect	.122	.247	.251*	.221*
Suicidal Tendency	.277*	.360*	.223*	.190
MACI Personality Patterns				
Introverted	.305*	.326*	.223*	.243*
Inhibited	.250*	.237	.035	-.018
Doleful	.175	.333*	.397**	.315*
Submissive	-.384**	-.340*	-.716*	-.727**
Conforming	-.305*	-.448**	-.707**	-.633**
Self-Demeaning	.138	.246	.466**	.414**
MAYSI-2				
Depressed/Anxious	.246*	.276*	.273*	.278*
Somatic Complaints	-.004	-.084	.095	.108
Suicidal Ideation	.363*	.329*	.277*	.276*
Thought Disturbance	.132	.146	.039	.030

* $p < .05$, ** $p < .001$

Age continued to play an important role when examining these relationships at the domain level (Table 51). The CAPP domains, and PCS and P16 factors were consistently negatively related to the MACI Anxious Feelings scale, while the PCL:YV factors were unrelated. This relationship was driven by the inverse relationship between Anxiety and psychopathy symptoms amongst older youth, as five of the six CAPP-IRS domains were significantly negatively related to Anxious Feelings for older youth (Behaviour, r = -.433; Emotion, r = -.433; Cognitive, r = -.403; Attachment, r = -.383; Dominance, r = -.369) whereas none of the CAPP-IRS domains shared a significant relationship with Anxious Feelings among younger youth.

On the other hand, four of the six CAPP-IRS domains (Attachment, Dominance, Emotion, and Self), three of the four PCL:YV factors (Factors 2, 3, and 4), Factor 1 of the 2-factor PCS, and Factor 2 of the three-factor P16 were all significantly positively associated with the MACI Suicidal Tendency scale. In addition, the MAYSI-2s measure of Suicidal Ideation was

also positively related to several psychopathy domains/factors, particularly those found on the CAPP-IRS. Five of the six CAPP domains, with the exception of Behaviour, were related to Suicidal Ideation, as were Factors 1 and 4 of the PCL:YV, Factor 1 of the PCS and Factor 2 of the P16. Thus, suicidal tendency was fairly consistently related to the emotional side of psychopathy as well as the interpersonal dimensions as measured by the CAPP-IRS and the PCS, and the behavioural aspect of psychopathy measured by the PCL:YV. Again, however, this relationship was affected by age. Suicidal Tendency was only associated with CAPP-IRS domains for the younger youth, specifically with the Attachment (r = .489), Dominance (r = .386), and Emotional (r = .386) domains. Likewise, the MAYSI-2 Suicidal Ideation scale was positively associated with several CAPP-IRS domain scores for younger youth (Attachment, r = .641; Dominance, r = .576; Emotion, r = .433; Self, r = .588) but not significantly related to any CAPP-IRS domain among the older youth.

Similarly, a range of different psychopathy characteristics were weakly and positively associated with the MAYSI-2 measure of Depressed/Anxious. Specifically, the CAPP-IRS domains of Attachment and Cognition, antisocial behaviours on the PCL:YV (Factor 4), egocentricity on the PCS (Factor 1), and egocentricity and callousness on the P16 (Factors 1 and 2) shared correlations with Depressed/Anxious ranging from .213 to .328. In addition, the MACI Depressive Affect scale was positively associated with the CAPP-IRS Attachment (r = .224) and PCL:YV Factor 2 (r = .258). Yet when conducted by age, the relationship between the CAPP-IRS Attachment domain and the MACI Depressive Affect and MAYSI-2 Depressed/Anxious scales disappeared for older youth, but remained for younger youth (rs = .410 and .519, respectively). Interestingly, although previously unrelated to MAYSI-2 Depressed/Anxious scores when examining the whole sample, the CAPP-IRS Dominance (r = .379), Emotion (r = .398), and Self (r = .413) domains became stronger and significant among the younger youth whereas they remained insignificant for older youth.

The aforementioned total score correlation with the MACI Inhibited scale disappeared at the factor level, with the exception of a weak positive relationship with the Attachment domain. This relationship appeared only for the younger group and within this age group actually emerged for the Cognitive (r = .349) and Dominance (r = .445) domains, as well as with Attachment (r = .377). Like the Inhibited scale, there were unexpected positive relationships between several CAPP-IRS domains (Attachment, Behaviour, Cognitive, and Emotion), the

PCL:YV Factors 2 and 3, and the P16 Factor 2 with the MACI Introverted scale. For the CAPP-IRS domains, Attachment was positively and equally related to Introverted for both the younger (r = .362) and older (r = .377) groups; however, Introverted was also positively related to the Behaviour domain for the younger youth (r = .383) while unrelated for the older youth, whereas it was positively related to Emotion for the older youth (r = .325) but unrelated for the younger youth.

As expected, the MACI constructs of Submissive and Conforming were negatively related to several psychopathy factors and domains, more consistently for Submissive than Conforming. However, this pattern was primarily the result of the association between these personality patterns and psychopathy traits among older youth. Both personality patterns were unrelated to all CAPP-IRS domains for younger youth, whereas each CAPP-IRS domain was significantly negatively related to Submissive (Dominance, r = -.478; Attachment, r = -.429; Behaviour, r = -.407; Emotion, r = -.390; Cognitive, r = -.339; Self, r = -.305). In addition, the Attachment and Emotion domains were significantly negatively related to CAPP-IRS scores among older youth (rs = -.416 and -.505, respectively).

While the CAPP-IRS domains and PCL:YV factors were, as expected, unrelated to the MACI Self-Demeaning scale, this scale was significantly and positively related to both the PCS and P16 factors. Of note, when examining correlations for the younger versus older youth, the Self-Demeaning scale demonstrated a significant positive association with Attachment (r = .358) for the younger sample, whereas all associations for the older sample were non-significant. Interestingly, when examining the sample as a whole, the MACI Doleful scale was unexpectedly positively related to several aspects of psychopathy: the CAPP Attachment and Emotional domains, the PCL:YV and P16 emotional and behavioural factors, and the PCS' egocentric and behavioural factors. However, when separated into younger versus older samples of youth, no significant relationships with Doleful were detected. The MAYSI-2 measures of Somatic Complaints and Thought Disturbance were also unrelated to any measure of psychopathy, both at the whole sample level as well as when conducted by age group.

Table 51: CAPP-IRS Divergent Correlations at the Domain Level

Psychopathy Factor / Domain	CAPP-IRS						PCL:YV				PCS		P16		
Syndrome	A	B	C	D	E	S	1	2	3	4	1	2	1	2	3
MACI Clinical Syndromes															
Eating Dysfunctions	.219*	.059	.075	.102	.033	.179	.301*	.225	.187	.079	.126	-.123	.201	.079	-.055
Anxious Feelings	-.302*	-.309*	-.337*	-.255*	-.334*	-.130	-.052	-.248	-.192	-.233	-.559**	-.539**	-.402**	-.377**	-.493**
Depressive Affect	.224*	.020	.010	.084	.165	.094	.121	.258*	.172	.131	.204	.051	.134	.286*	.049
Suicidal Tendency	.362*	.065	.162	.238*	.283*	.234*	.245	.305*	.337*	.260*	.243*	.006	.144	.262*	-.018
MACI Personality Patterns															
Introverted	.416**	.232*	.253*	.111	.343*	.148	.126	.342*	.269*	.243	.189	.157	-.004	.425**	.163
Inhibited	.300*	.176	.187	.202	.140	.203	.218	.192	.103	.133	-.041	.025	-.185	.169	.046
Doleful	.261*	.073	.018	.139	.218*	.139	.141	.328*	.264*	.212	.292*	.298*	.145	.276*	.295*
Submissive	-.383**	-.293*	-.264*	-.335*	-.343*	-.228*	-.170	-.284*	-.255	-.347*	-.687**	-.570**	-.513**	-.541**	-.512**
Conforming	-.404**	-.193	-.210*	-.128	-.423**	-.133	-.037	-.518**	-.463**	-.341*	-.613**	-.521**	-.395**	-.515**	-.475**
Self-Demeaning	.176	.001	.118	.158	.101	.118	.210	.153	.110	.218	.401**	.272*	.296*	.269*	.330*
MAYSI-2															
Depressed / Anxious	.229*	.205	.213*	.207	.170	.158	.215	.122	.221	.328*	.228*	.187	.141	.263*	.213*
Somatic Complaints	-.023	.071	.165	-.089	-.040	-.084	-.020	-.159	.058	-.050	.070	.100	.011	.114	.138
Suicidal Ideation	.423**	.142	.217*	.385**	.308*	.283*	.288*	.152	.218	.370**	.216*	.193	.086	.346*	.200
Thought Disturbance	.151	.078	.148	.121	.081	.068	.205	.023	.208	.153	-.012	.115	-.041	.061	.073

* $p < .05$, ** $p < .001$

Discussion

This chapter explored the construct validity of the CAPP-IRS through reference to other measures of psychopathy, related constructs, and unrelated constructs. Prior to comparing the CAPP-IRS with other measures, intercorrelations between the six domains were first conducted,

with the expectation that the six domains would exhibit three sets of particularly strong pairwise correlations between theoretically related domains. Among the full sample of male youth the results were consistent with the expected pattern of results (Attachment with Emotion, Behaviour with Cognition, Dominance with Self) However, there were some unexpected pairwise domain correlations when examined by age group. In the younger age group, rather than correlate most strongly with Emotion, the Attachment domain exhibited a slightly stronger relationship with Dominance, while the Dominance domain was more strongly correlated with Attachment than with its more theoretically related domain, the Self. For older youth, the Dominance domain was equally related to the Self domain as it was to the Attachment domain. Younger youth also generated the inconsistent correlations between Behaviour and Cognition. In this sub-sample, Behaviour was more strongly related to Attachment, Emotion, and Dominance than it was to Cognition. Thus, it appears that the unexpected results between Behaviour and Cognition are attributed to the younger youth, and the problem appears to be driven by the Behaviour domain. Of note, the internal structural reliability analyses previously conducted identified that the *Restless* symptom was problematic in regards to its relationship with the remaining items on this theoretical domain, while the exploratory factor analysis located *Restless* on a different factor for young versus older youth. An Item Response Theory analysis would be a useful next step to assess the relative importance of each CAPP-IRS symptom to the manifestation of psychopathy across different ages.

The results of the comparisons with other measures provided some additional support for the construct validity of the CAPP-IRS, more so at the total score level than the domain level. The fact that the total score construct validity analyses were more consistent with the hypothesized relationships than were the domain score analyses may be the result of utilizing the theoretical CAPP domains as opposed to the empirically derived factors identified in the previous chapter. However, as factor analysis is sample-dependent, it is important that other studies identify a similar factor structure before proceeding to undertake construct validity analyses with the empirically identified factors. It should also be noted that while the results observed with the theoretical CAPP structure were often unexpected, the PCL:YV also showed divergent relationships as compared to past research findings (e.g. Murrie & Cornell, 2000), for instance, with respect to the total score failing to relate to Delinquency Predisposition, while showing unexpected positive relationships with the MACI Eating Dysfunctions, Suicidal Tendency, Introverted, Doleful, and Self-Demeaning scales. Thus, the unexpected patterns

identified in the current study may have more to do with the intensely serious and violent nature of the young male participants, as the analysis of the MACI and MAYSI-2 clinical syndromes revealed many characteristics that were present at substantially greater levels than in past studies (e.g. Loper et al., 2001).

The high rates of complex psychological problems may also explain why some of the expected relationships, such as between CAPP-IRS and PCL:YV measures of psychopathy and the MACI Clinical Syndromes of Delinquent Predisposition and Impulsive Propensity, turned out to be negligible. The MACI base rate calculations enable clinicians to consider the relative prevalence of syndromes within the population of interest. For instance, syndromes like Depression are typically more common in general and clinical populations than a tendency to be sadistic (i.e. Forceful) (Meagher, Grossman, & Millon, 2001). However, given that the current sample is composed of seriously challenged young males whose clinical profiles on average far exceeded the level of problems identified in previous studies (e.g. Loper et al.), the base rate transformations may not have been appropriate in the current study. As an example, although the high psychopathy youth did not differ significantly from lower scoring psychopathy youth on the Substance Abuse Proneness, Delinquency Predisposition, and Unruly scales, their *average* scores exceeded the cut-off for clinical prominence, while the Impulsive scale just missed the cut-off of 85 at X= 84.00, while the lower scoring youth also produced average scores for the Substance Abuse Proneness and Delinquency Predisposition scales that exceeded the cut-off for clinical prominence. Thus, the current sample is substantially more clinically challenged than many of the previous samples used to explore relationships between psychopathic traits and psychopathological concerns.

On the other hand, the expected relationships between the CAPP-IRS and the PCL:YV were generally observed, which provides some initial support for the CAPP-IRS as a valid measure of psychopathic traits. At a total score level, the correlation was particularly strong (r = .73). This was higher than the correlation found between the PCL:YV and several other psychopathy measures, including the PCS both in the current (r = .38) and previous studies (r = .60, Murrie & Cornell, 2000; r = .49, Murrie & Cornell, 2002), the PPI (r = .54, Poythress et al., 1998), the APSD Self-Report version (r = .30, Murrie & Cornell, 2000), and the SRP (r = .35, Hare, 1985) suggesting that overall, the CAPP-IRS is more successful at accessing the PCL-

based psychopathic construct than are other pre-existing measures of psychopathy, although not necessarily when examined at a domain/factor level.

An interesting caveat here is that while the CAPP-IRS scores were significantly and equally associated to PCL:YV total scores for both younger (12-15 year olds) and older (16-18 year olds) youth, the PCS and P16 total scores were only significantly associated with CAPP-IRS scores for older youth. Whereas the CAPP-IRS scores were virtually equally related to both factors of the PCS, the association with P16 scores for 16 to 18 year old youth was primarily due to the Callous traits tapped by Factor 2, while the Antisociality correlation appeared driven by the relationship with Callousness. Of note, this finding is consistent with Forceful (i.e. a sadistic personality pattern) being positively associated with three CAPP-IRS domains (Attachment, Emotion, and Behaviour) only for the older youth whereas there was a complete lack of association between the Forceful scale and younger youths' CAPP-IRS scores. One explanation for this finding is the divergent location of the *Unempathic* symptom on the age-based factor models identified in the previous chapter. For older youth, a clear Callous-themed factor emerged that consisted of one Attachment (*Unempathic*) and one Emotional (*Lacks Remorse*) symptom, as well as one symptom from the Self (*Self-Justifying*) domain, whereas for younger youth, *Unempathic* was located on a mixed-trait factor alongside other symptoms from the Attachment, Behaviour, Dominant, Emotion, and Self domains. Thus in the current study, callousness appeared to be a clearer psychopathic symptom for older than younger youth. Further research should employ the use of alternative measures of callous-unemotional traits to explore why callous-unemotional traits – suggested by several authors as the core traits of psychopathy – were not meaningfully tapped by the self-report measures of psychopathy among the younger incarcerated male adolescents and why their measurement using interview-based tools did not exhibit meaningful correlations with theoretically related constructs.

Among the full sample of male youth as well as when conducted by age, four of the six anticipated inter-correlations between the CAPP-IRS domains and PCL:YV 4-factor model were observed: Attachment and Emotion correlated most strongly with the Affective Factor 2, while Dominance and Self correlated most strongly with the Interpersonal Factor 1. However, divergent findings occurred with the Behaviour and Cognitive domain, which were expected to correlate most strongly with the PCL:YV Factor 3. Among the full sample of males, the Behaviour domain was most strongly related to Factor 2 whereas the Cognitive domain was

most strongly related to Factor 1. At a sub-sample level, Behaviour correlated moderately with Factor 2 for the younger males, and weakly-moderately with Factors 1, 2, and 4 for older males. On the other hand, Cognition did not correlate at all with the PCL:YV factors for young males, and moderately with Factor 1 for older males. Interestingly, three of the five Cognitive symptoms did not load on the seven factor model for young males identified in the previous chapter; thus there appear to be some challenges in meaningfully relating cognitive dysfunction to other traits of psychopathy among younger adolescents.

However, the expected correlations did occur between the Behaviour/Cognitive domains and the behavioural factors of the PCS (Factor 2 Antisocial Behaviours) and P16 (Factor 3 Antisociality). Thus, it appears that the issue lay with the behavioural measurements (Factor 3 and Factor 4) obtained for the PCL:YV. Given that the internal reliability statistics were quite poor for Factor 4, this unexpected result should be viewed with some caution, as it is clear there were some issues with the manner in which antisocial behaviours were consistently assessed.

While the CAPP domains and PCL:YV factors did exhibit the anticipated relationships with the PCS and P16 measures of psychopathy, these results should also be viewed with some caution, given previous research findings with the MACI-based psychopathy assessments that have led other authors to question their construct validity. Specifically, Lexcen and colleagues (2004) examined the construct validity of the MACI PCS using the MAYSI-2 and Child Behaviour Checklist – Youth Self-Report (YSR). While they found that the PCS best fit a two-factor model, consistent with Murrie and Cornell's (2000) original factor analysis, they needed to drop five of the items to achieve this structure. Further, they questioned the item content, noting that symptoms touching on the antisocial lifestyle, such as irresponsibility, were absent from the scale. In addition, while many of their anticipated relationships were found (e.g. positive correlations with alcohol/drug use, angry/irritable tendencies) they also observed some unanticipated relationships, such as between the PCS and thought disorders (which is not typically found in adult research; Hare, 2003), somatic complaints, and ethnicity. Given this, they concluded that there was limited support for the convergent and divergent validity of the PCS (Lexcen et al., 2004). Of note, in the current study for the most part, the PCS, as well as the P16, showed the expected positive (i.e. Substance Abuse Proneness, Delinquency Predisposition, Impulsive Propensity, Unruly, Forceful, Opositional, Borderline Tendency) and negative (i.e. Anxious Feelings, Submissive, Conforming) correlations; however, some

unanticipated relationships were also identified (i.e. positive relationships with Depressive Affect, Introverted, Doleful, Self-Demeaning, and Suicidal Ideation).

In terms of the relationship between psychopathy and related constructs, only some of the anticipated patterns were found. Overall, the MACI measures of Substance Abuse Proneness, Forceful, and Oppositional were all positively related to the CAPP-IRS. However, some of the domain patterns of relationships were unexpected. For instance, while it was expected that individuals high in psychopathy would also have a tendency to abuse substances, it was somewhat surprising to observe that the strongest correlation with Substance Abuse Proneness was the Emotional, followed by Attachment domain, while the Cognitive and Behavioural domains were less strongly related. Given the life circumstances of the current sample however, a likely explanation for this result is that youth with emotional dysfunctions may use alcohol/drugs to cope or, alternatively, that their heavy use of substances has led to high scores on some Emotional symptoms of psychopathy, such as *Lacks Pleasure, Lacks Emotional Depth,* and *Emotional Stability.*

While the CAPP-IRS total score was weakly positively associated with the MACI Oppositional scale, at the domain level the correlations appeared due to overlap with the Attachment and Emotional domain. Yet an oppositional personality is one that is stubborn, angry, hostile, defiant and overall negativistic (Millon et al., 1993), thus correlations would be more likely expected with the Cognitive (C4 *Inflexible*) and Dominance (D1 *Antagonistic*) domains. In the current study however, the Attachment domain was most consistently related with other constructs, which could suggest either that this domain is too mixed in content, resulting in a lack of discriminant validity with regards to other constructs, or that the CAPP-IRS taps into a detached personality more successfully than any other domain, followed somewhat closely by the emotional dysfunction, which also fairly consistently demonstrated relationships with many other constructs.

To engage in sadistic behaviours, one needs to be particularly callous in their feelings towards other humans. Not surprisingly then, although Forceful was related to three of the four PCL:YV factors, the strongest association was with Factor 2 (r = .416). Similarly, although to a weaker extent, although Forceful was related to three of the six CAPP domains, its strongest associations were with the Emotional (r = .355) and Attachment (r = .345) domains. Given that

the CAPP-IRS is purported to focus more on the core personality traits whereas the PCL:YV is heavily indexed by aspects of antisocial behaviours, one would expect that the CAPP-IRS domains would be more strongly related to the Forceful scale. However, in contrast to the empirically identified CAPP structure, in the theoretical model "callousness" does not particularly stand out; rather, it is indexed as a single symptom (Unempathic) that is part of a larger pattern of detached relationships towards other individuals, and its relationship with Forceful is possibly being weakened by one or more of the other symptoms, such as being Uncommitted, which was identified in a previous chapter as a problematic symptom somewhat unrelated to the remaining symptom content on its scale.

While some of the anticipated relationships between the CAPP-IRS and measures of theoretically related constructs were found, others were not. It was anticipated that the MACI measure of histrionic traits (i.e. Dramatizing) would be positively associated with the CAPP-IRS, given its attention-seeking nature and defining traits of egocentricity, manipulativeness, and gregariousness (Millon et al., 1993). However, the CAPP-IRS total score actually showed a negative relationship with Dramatizing, as did four of the six CAPP-IRS domains (Attachment, Behaviour, Cognition, Dominance). Interestingly, when split by age, Dramatizing was unrelated to the CAPP-IRS total scores for both groups; however, at a domain level, it was significantly negatively related only to Attachment among the younger males. One immediate explanation for the lack of the anticipated positive relationship is that histrionic tendencies are much more commonly observed among females, while the current sample involved only males. Another plausible reason is that the driving force behind these behaviours is an actual need for acceptance by others, which is at odds with the true nature of psychopathy, thus resulting in a negative association.

A more surprising and somewhat concerning finding as the failure of the Egotistic scale to positively correlate with any of the CAPP-IRS total or domain scores. An egocentric viewpoint is a defining historical trait of psychopathy and is consistent across instruments purporting to measure this construct. Yet in the current study, it was negatively, though non-significantly, correlated with the CAPP-IRS total score, non-significantly associated with five of the six CAPP-IRS domains, and significantly negatively correlated with the Attachment domain. In explaining this finding, it is important to acknowledge that likewise, neither the PCL:YV total nor factor scores were associated with the Egotistic scale. This is true both of the current and a previous

study (Murrie and Cornell, 2000), which suggests that the MACI may be assessing Egotistic traits in a very different way than either the CAPP-IRS or PCL:YV. Of note, in Murrie and Cornell's previous study (2000), the youth in the non-psychopathic group actually yielded higher scores than youth in the psychopathic group on the Egotistic scale (50.1 versus 45.3, respectively). Furthermore, the Egotistic scale is composed of three underlying factors – Admirable Self-Image, Cognitively Expansive, and Interpersonally Exploitive (Millon et al., 1993). It is possible that some of these factors map onto the psychopathy measure of egotistic while others do not, thus weakening or changing the direction of the correlation.

Alternatively, it is possible that egocentricity is not a particularly defining trait of psychopathy during adolescence. Developmentally, a tendency to be self-centred and self-serving is a common characteristic among adolescents; thus, its use as a key indicator of psychopathy among this age group may be limited (e.g. Seagrave & Grisso, 2003).Of note, while the Egotistic scale was unrelated to any of the CAPP-IRS domains for young males, it was negatively related to both Attachment and Emotion among older males. Both the direction and the pattern of the association was unexpected as theoretically, an Egotistic personality pattern should correlate positively with the Self domain.

A disappointing finding was that the CAPP-IRS failed to correlate at either a total score or, for the most part (with the exception of Emotion), domain level, with the MACI's Impulsive Propensity scale. Impulsivity is an important construct underlying delinquency and criminal behaviour and, particularly, psychopathy. However, research studies have begun to distinguish between different subtypes of psychopathy. The profile of the "primary" psychopath is one of a more intellectual and self-controlled being – in other words, thoughtful and non-impulsive. In contrast, the "secondary" psychopath is described as more hot-headed and angry – in other words, reactive and impulsive (e.g. Benning et al., 2003; Karpman, 1941; Poythress, Edens, Skeem et al., 2010). While the CAPP-IRS may very well be able to distinguish between these types of individuals, symptom combinations that would describe the prototypical primary versus secondary psychopathic personality have not been explored. It is possible that by examining psychopathy scores either as a total or individually by domain, the subtle differences between primary and secondary psychopaths were covered up, thus resulting in a generally non-existent relationship with impulsive propensity.

Another reason for the failed association may be due to the use of theoretical rather than empirical domains. In the previous chapter, CAPP-IRS symptoms from across the Behaviour (*Lacks perseverance*, *Unreliable, Reckless*) and Cognitive (*Lacks Concentration, Lacks Planfulness*) domains coalesced to form a factor that was clearly touching on impulsive characteristics. The more diluted focus on impulsivity in the theoretical model may be one reason for the absent theoretically relevant domain association with Impulsive Propensity for the sample of male youth. On the other hand, age also appeared to be influencing these results. Among younger males, Impulsive Propensity was unrelated to any theoretical domain; however, among older males, weak but significant positive associations were observed between this scale and both the Behavioural and Emotional domains.

Another unexpected finding was the failure to document a positive relationship between the MACI Delinquency Predisposition scale and the CAPP-IRS at the total score and domain level, both for the whole sample and by age subsample. One possible explanation for this is that the CAPP-IRS – with its absence of direct measurement of antisocial behaviours – is a poor measure of criminal and delinquent tendencies. Yet, in the current sample the PCL:YV total score and three of the four factor scores (with the exception of Factor 3) *also* failed to correlate significantly with this scale. Thus, a more likely explanation has to do with the nature of the sample. Again, the current sample involved serious and violent young male offenders, and the descriptive statistics indicated a very high rate of delinquency predisposition regardless of psychopathy score. In other words, there was likely insufficient variation among this variable to detect any real relationship with psychopathic features. That said, nearly all the CAPP-IRS domains correlated positively and moderately with PCL:YV Factor 4, a measure of antisocial behaviours. This strength of relationship was not anticipated, given that the CAPP-IRS does not specifically measure items like criminal versatility or violations of conditional release. Thus, there may be some utility of the CAPP-IRS in explaining and predicting involvement in antisocial behaviours. However, this will need to be explored in further research examining the predictive validity of the CAPP-IRS.

Despite the absence of some anticipated relationships, there were some interesting patterns uncovered in the current chapter that may actually support the CAPP-IRS as a more sensitive measure of the complex phenomenon of psychopathy. For instance, consistent with Skeem and Cauffman (2003), while the PCL:YV was unrelated to measures of anxiety, the

CAPP-IRS total and domain scores generated negative relationships with the MACI Anxious Feelings, and positive relationships with the MAYSI-2 Depressed/Anxious scale. The latter result seems to be the result of a positive association between depression and the Attachment domain of the CAPP-IRS: the MACI Depressive scale was positively associated with Attachment, as was the MAYSI-2 Depressed/Anxious scale. However, Attachment was negatively related to the MACI measure of Anxious Feelings, as were four of the other CAPP-IRS domains (Behaviour, Cognitive, Dominance, and Emotion). Thus, consistent with Skeem and Cauffman's (2003) interpretation of the YPI versus PCL:YV, these results suggest that the CAPP-IRS is better positioned to tap into the key affective features of psychopathy, which is particularly important for criminologists, given the relative importance of affective traits in predicting general and violent recidivism (Barry et al., 2000; Hall et al., 2004; Salekin et al., 2003; Skeem, Mulvey, & Grisso, 2003; Vitacco, Neumann, Robertson, & Durant, 2002). Of note, a study exploring child and adolescent psychopathy from a personality framework by Salekin and colleagues (2005) found a positive relationship between Neuroticism (which includes anxiety) and both the CPS and the APSD; however, the PCL:YV was unrelated to Neuroticism. Again, this implies that the PCL:YV is ill positioned to access a symptom that studies suggest is developmentally important for psychopathy. Specifically, Salekin and colleagues (2005) suggested that anxiety is present during adolescence but that over time, with repeated exposures to anxiety-producing situations, such as repeated contact with the criminal justice system, they become desensitized to anxiety, resulting in anxiety being unrelated or even negatively related to psychopathy. Interestingly, in a later study, Kubak and Salekin (2009) found evidence of a developmental trend between psychopathic traits and trait anxiety, whereby initially positive associations were found between trait anxiety and psychopathy scores in children aged 9 to 13 (average correlation of .36), but these associations became weaker by mid-adolescence (aged 14 to 15; average correlation of .14) and disappeared by late adolescence (aged 16 to 18; average correlation of -.05). Unfortunately, in the current study, the PCL:YV appeared unable to capture this developmental change.

In contrast, compared to the CAPP-IRS domains, the PCL:YV factors were slightly more strongly related to the Forceful, Oppositional, and Borderline scales, and tapped into the MACI Unruly scale and MAYSI-2 Angry/Irritable scale while the CAPP-IRS did not. These results suggest that the PCL:YV may be slightly better positioned to assess the antisocial aspects of psychopathy, as these scales tend to describe someone who is sadistic (Forceful), engages in

explosive anger and stubbornness while also feeling intense levels of guilt and shame (Oppositional), has an unstable mood (Borderline), and is antisocial (Unruly) and hostile (Angry/Irritable).

An important finding – and consistent with Salekin et al.'s (2005) supposition that anxiety is developmentally related to psychopathy – is that the negative relationship between CAPP-IRS psychopathy and MACI Anxious Feelings was only observed for older male youth. Further, this relationship occurred both with the total score and for all CAPP-IRS domains except Self, with the strongest correlations occurring for the Behavioural and Emotional domains. In contrast, the positive association between measures of Depression (MAYSI Depressed/Anxious and MACI Depressive Affect scales) were only found at the domain level for young male youth where the MAYSI Depressed/Anxious scale was positively associated with Attachment, Self, Emotion, and Dominance domains and the MACI Depressed Affect scale was positively associated with Attachment.

Similar patterns emerged with other aspects of internalizing personality. For instance, an unexpected result involved the positive correlation between the CAPP-IRS total score and the MACI Introverted Scale. Further analysis revealed that this relationship was primarily driven by the Attachment domain of the CAPP-IRS (r = .416) followed by the Emotional domain (r = .343). Interestingly, this pattern may actually be further evidence of the CAPP-IRS' ability to tap into the emotional and attachment aspects of the psychopathy construct. Millon et al. (1993) identified that the Introversive scale was composed of three underlying facets, representing Expressively Impassive, Temperamentally Apathetic, and Interpersonally Unengaged. These youth are described as being unable to feel real pleasure and pain and have few emotions and a minimal need for affection, thus remaining passively attached or detached to others. This description corresponds with the intended focus of both the CAPP-IRS domains, as Attachment concerns the ability to form quality emotional relationships with others while Emotion focuses on the ability to experience different emotional states. In contrast, studies using the PCL:YV have failed to find a relationship between the total or factor levels of the PCL:YV and the MACI Introversive scale (e.g. Murrie & Cornell, 2000; Loper et al., 2001), suggesting that the PCL does not sufficiently tap into emotional detachment from others. However, in the current study, age was an important factor. At the domain level, while Introversive was related to Attachment

among both young and older adolescents, it was uniquely related to the Behavioural domain for younger adolescents and the Emotional domain for older adolescents.

Another unexpected finding was in regards to the significant positive correlations between psychopathy measures and the two measures of suicidal tendency/ideation. Interestingly, Murrie and Cornell (2000) also found that the psychopathic group had higher average scores on the Suicidal Tendency scale than did non-psychopathic youth; however, in their case, the difference was not statistically significant. In addition, Sevecke et al. (2008), in a study with slightly over 200 male and female adolescent detainees, also identified a positive relationship between the PCL:YV total and Factor 2, 3, and 4 scores and suicidal behaviour, but only among the female youth. This is consistent with Gretton and colleagues (2004) who also found a positive relationship between PCL:YV scores and a history of self-injury among female youth. Still, the direction of this relationship is unanticipated according to historical conceptualizations, as Cleckley's research described the prototypical psychopath as someone who would threaten suicide as an attention-seeking gesture, but rarely carry it out (1941). However, Lexcen and colleagues (2004) found a positive relationship between the MAYSI-2 Suicidal Ideation scale and Factor 2 of the MACI PCS, while Verona and colleagues (2001) found a positive relationship between Factor 2 of the two-factor PCL-R and a history of suicide attempts; although, partial correlations with MPQ personality scales revealed that the effect of Factor 2 was rendered negligible when Negative Emotionality and Constraint were included, meaning that suicidal attempts were actually associated with a tendency towards anxiousness/neuroticism, alienation, and hostility (high Negative Emotionality) and impulsivity, sensation seeking, poor socialization, and psychoticism (low Constraint). In effect, they suggested that impulsive antisociality and suicidality were expressions of the same underlying temperamental disposition. Notably however, in the current study the MAYSI-2 Suicidal Ideation was instead associated with Factor 1 of the PCS, as well as Factor 2 of the P16, Factors 1 and 4 of the PCL:YV, and the Attachment, Behaviour, Cognitive, Dominance, Emotional, and Self domains on the CAPP-IRS. In other words, in the current study a tendency towards suicidal ideation/tendency was consistently related to the core affective and interpersonal style traits. This may reflect a developmental trend, similar to the sometimes documented positive association between anxiety and psychopathic traits in adolescent samples. In fact, analyses at the subsample level revealed a lack of association between measures of suicidal

ideation/tendency and psychopathy in older male adolescents but a positive association among younger male adolescents.

An important difference between youth in the current study and those in previous studies utilizing the MACI is that whereas Murrie and Cornell (2000) found that high-scoring PCL-R youth scored significantly lower than other youth on the MACI Disclosure scale, which signifies that youth are more likely to reveal their true feelings or behaviours (Millon et al., 1993:), in the current study, youth who scored 25 and over on the PCL:YV scored significantly higher on the Disclosure scale (X = 62.2, SD = 16.7) than youth scoring under 25 on the PCL:YV (X = 52.4, SD = 16.8; t [57] = -1.068, p = .043). When youth present with particularly low or high raw scores on this scale, adjustments are made to the Personality Patterns scales as the youth may have held back relevant information that subsequently contributed to an inaccurate clinical profile. In the case of high Disclosure scores, the Personality Pattern scores are reduced, which might then weaken the strength of the relationships between constructs of interest. However, in this sample, 29 youth had their scores adjusted downwards as a result of a Disclosure score over 400; eight of these youth scored 25 or above on the PCL:YV (9 did not complete the PCL:YV) whereas 11 of the 29 scored 85 or above on the CAPP-IRS. The adjustments made to these scales may have weakened the strength of the findings.

Overall, the results provided some degree of support for the construct validity of the CAPP-IRS total score and more limited support for the CAPP-IRS theoretical structural model. There are two plausible explanations for the unexpected pattern of associations identified between the CAPP-IRS theoretical structural model and measures of related constructs. The first is that the theoretical model simply does not reflect an accurate organization of psychopathic characteristics. In fact, there is some support for this assertion based on the previously discussed confirmatory factor analysis results. The second explanation concerns age and the stability of psychopathic features over both short- and long-term periods of time. The analyses conducted both in the current and previous chapter suggest that some different symptoms of psychopathy are more or less relevant at different stages of adolescence, and that their interaction with other psychopathic characteristics also varies by developmental stage.

Considering the theoretical model as a way of organizing psychopathic traits, the results of the current chapter identified different profiles of psychopathy for younger versus older male

youth. Among young male serious and violent incarcerated offenders, high psychopathy scores unexpectedly appeared to be positively associated with internalizing issues, such as scales indexing suicidal ideation and depression. This may reflect an underlying issue with self-esteem and being uncertain. Interestingly, the exploratory factor analysis in the previous chapter identified a factor that indexed many of these traits in the form of being *Detached* from others, *Uncommitted* to others, being *Unreliable*, having an *Unstable Self-Concept* and *Lacking in Perseverance, Planfulness*, *Pleasure,* and *Emotional Stability.* Importantly, the correlation between high psychopathy scores and high internalizing issues may yield opportunities for intervention and the prospect of shifting developing young psychopaths off of this negative trajectory. Further, the negative correlation between measures of antisociality (Unruly) and psychopathy among younger youth suggest that younger youth with elevated traits of psychopathy are actually less likely to reflect an antisocial personality. Alternatively, the fact that the CAPP-IRS profile of psychopathy for 12 to 15 year old male offenders was more clearly associated with internalizing issues than the externalizing profile typically associated with adult psychopathy may mean that the CAPP-IRS does not validly assess psychopathy among very young adolescents.

On the other hand, by ages 16 to 18, the presentation of psychopathic personality appears much more consistent with what would be expected of adult psychopaths. In this study, higher psychopathy scores were significantly associated with higher scores on measures of impulsivity (Impulsive Propensity), antisociality (Unruly), hostility (Oppositional), and unstable moods (Borderline Tendency). Interestingly, higher psychopathy scores among this age group were significantly negatively associated with Egotism, which may suggest that this is a feature of psychopathy that is more defining later in life.

Although there was only limited support for the overall construct validity of this measure, a tentative cut-score based on the 33 symptom theoretical model was identified through comparisons to the PCL:YV cut-off of 30. Using a CAPP-IRS total score of either 85 or 86.5 would yield sensitivity *and* specificity levels in the 80% range. In contrast, the trade-off between sensitivity and specificity became much more substantial when using the PCL:YV cut-off of 27 as a guide. This is likely due to the severe multi-problematic nature of the sample under study. It would likely be more difficult to detect psychopathy when the cut-point is dropped because the range of youth now included in the group of potential psychopaths would have so many other

ongoing problems that the clarity of the construct would become muddled. That said, in other samples involving a more typical adolescent offender population lower cut-points may be more appropriate, as there may be lower levels of psychopathy or other problems. The variations in potential cut-points should also be assessed in future research; however, to do this, it is also necessary to finalize the symptom content of the CAPP-IRS, as the previous chapters identified some problematic symptoms that may be good candidates for removal. Similarly, it may also be necessary in the future to assign different weighting to the symptoms of psychopathy. Unlike the items composing the different MACI scales, measures of psychopathy currently treat the different domains or factors as equally important, despite assertions from some researchers that the affective personality traits reflect the "core" features of this disorder (e.g. Cooke & Michie, 2001; Vincent, 2002). This limitation may be especially relevant for the CAPP-IRS as it has a wider range of individual symptom domains, and future research may identify different combinations of these domains as relevant to different types of psychopathy (e.g. primary versus secondary at a very basic distinction). In addition, the results of this and previous chapters also suggest that the cut-scores may need to vary with age, as the profile of CAPP-IRS psychopathy appears quite different for 12 to 15 year old male youth than it does for 16 to 18 year old male youth.

Another important caveat regarding the CAPP cut-off score identified in this study is that it was based on a presumption that the PCL:YV was successful in identifying psychopathic youth. There are two potential major concerns here. The first is developmental, in that the PCL:YV may be falsely identifying a group of youth as high in psychopathy (false positive) due to the tendency for certain adult psychopathic-like traits to occur in abundance during adolescence (e.g. risk-taking, egocentric viewpoint). Unfortunately, the CAPP-IRS may also falsely identify some youth as at high risk for psychopathy based on its inclusion of similar traits in its operationalization of psychopathy. The second major concern in using PCL:YV-identified psychopathic youth to create a similar cut-score on the CAPP-IRS is the PCL's heavy reliance upon criminal and other antisocial behaviours to measure psychopathy. It is possible that some of the youth identified as psychopathic on a measure that conflates personality traits with behavioural indicators would not be considered truly psychopathic according to the purely personality based measure. In other words, the inclusion of antisocial behaviours on the PCL:YV – which may be the result of other psychopathic traits rather than defining traits of

psychopathy – may inflate the proportion of youth who are considered psychopathic. Thus, a higher cut-score may actually be needed for the CAPP-IRS.

Conclusion

The current study explored the first two layers of the nomological network of CAPP-IRS psychopathy, the first being convergent validity of psychopathy measures with each other, and the second being convergent validity of psychopathy measures with related construct and divergent validity of psychopathy measures with unrelated constructs (Das et al., 2009). However, the third layer, where psychopathy measures are compared to normal-range personality dimensions, such as described by the Five Factor Model, was not explored in this study (Das et al., 2009). As discussed in the previous chapter, research with the PCL:YV suggests that psychopathy is described by the Big Five factors/domains of low Agreeableness, low Conscientiousness, and high Neuroticism (Lynam et al. , 2005; Salekin et al., 2005); however, as the current study did not employ measures of normal-range personality, whether the CAPP-IRS maps onto normal range personality in either the same or other meaningful ways could not be explored.

This chapter examined the construct validity of the CAPP-IRS by conducting total and domain score correlation analyses with measures of the same (PCL:YV, PCS, P16), similar (e.g. Impulsive Propensity, Unruly, Forceful, Opposition) and dissimilar (e.g. Anxiety, Submissive, Conforming, Self-Demeaning) constructs. The CAPP-IRS showed excellent convergent validity with a strong positive correlation with the PCL:YV total score, and generally moderately strong positive correlations at the domain/factor level. However, there was limited support for the concurrent and divergent validity of the CAPP-IRS as some anticipated relationships were not observed (e.g. a positive correlation with Impulsive Propensity and Egotistic) while unexpected correlations also occurred (e.g. a positive relationship with Suicidal Tendency and Inhibited). Age appeared to be an important factor in these unexpected correlations, suggesting that the CAPP-IRS may have better validity among older (16 to 18 year olds) than younger (12 to 15 year olds) adolescents. Still, there were many results that do provide some initial support for the CAPP-IRS as a useful measure of psychopathy and which warrant its further exploration in future research.

The current study explored the construct validity of the theoretical CAPP-IRS structure. Given the generally unsupportive findings regarding this structure in the previous chapters, it is important that future research first seek to replicate the empirical structure identified in Chapter 4, and then examine the construct validity of that model. It is possible that some of the unexpected relationships could be due to the misspecified model under study, and/or the inclusion of weak symptoms that produce low internal reliability statistics relative to the rest of their scale.

This study utilized the well-known "gold standard" of psychopathy – the PCL:YV – to assess the convergent validity of the CAPP-IRS. However, the PCL:YV has been criticized for being too heavily reliant upon antisocial behaviours whereas reference to historically and clinically important traits – such as a lack of anxiety – have been absent from the PCL scales. More recently, several psychopathy measures have been created from a personality-focused framework, notably the PPI-R but also the more recently developed Elemental Psychopathy Assessment (Lynam, Gaughan, Miller, Miller, Mullins-Sweatt, & Widiger, 2011) which is a self-report psychopathy assessment built using the Five Factor Model as a guiding framework. While the CAPP-IRS was strongly related to the PCL:YV total score and generally related to the factor scores in meaningful ways, it would be interesting to compare both the CAPP-IRS and the PCL:YV to these more personality-focused measures of psychopathy.

Future research should also explore the predictive validity of the CAPP-IRS. The results of this study showed conflicting results with respect to the CAPP-IRS' relationship with measures of antisocial behaviours. Whereas nearly all CAPP-IRS domains correlated positively and moderately with the PCL:YV Factor 4, none of the domains were significantly related to the MACI measure of Delinquency Predisposition. Further, the internal reliability of Factor 4 in the current study was very poor, suggesting any results involving this factor are questionable. For the CAPP-IRS to demonstrate its utility to the fields of criminology and criminal justice, it is important that it establish its ability to predict relevant criminal justice outcomes, such as general and violent recidivism, and institutional misbehaviours.

Chapter 7.

Discussion

This dissertation included three analytical chapters, each of which contained their own unique discussion regarding that chapter's findings. This final chapter consists of a more generic level of discussion regarding the importance of PPD to criminologists, particularly as it relates to the CAPP. In addition, some limitations inherent to all the analyses are identified.

The Importance of PPD to Criminologists

This dissertation began with a discussion of the absence of PPD in criminological theory in favour of the more simplified and therefore parsimonious general theory of crime. While the general theory has accumulated substantial empirical support, it remains a limited theory on crime. As previously discussed, research has unquestionably established that LSC is a substantial risk factor for offending. However, beyond providing a link between LSC and offending, the theory does little to predict what forms of offending an individual is likely to participate in or elucidate the other risk or protective factors that may be aggravating or mitigating this risk, such as, respectively, a combination with CU traits or the ability to feel remorse. In this way, LSC is quite similar to a diagnosis of Antisocial Personality Disorder (APD), a behaviorally-based personality disorder in the Diagnostic and Statistical Manual that may apply to between half and three-quarters of the general prison population which, consequently, offers little in the way of informative information to those working with the criminal population (Correctional Service of Canada, 1990, 2013; Hodgins & Cote, 1990).

Moreover, the theory does little beyond identify quantify this risk. Gottfredson and Hirschi (1990) proposed that their theory was a general one, in that it explains all crime and analogous behaviour; further, they posited that it was not necessary to predict beyond this. Essentially, they took the perspective that all crime shared certain characteristics (those associated with

their definition of LSC) and thus, there was no need to examine the differing role LSC played with respect to different forms of offending. However, this *is* an important question for criminologists, as recent studies have made it clear that offenders are not all generalists. For instance, while many offenders do engage in analogous behaviours, such as traffic violations (Chenery, Henshaw, & Pease, 1999; Cohen, McCormick, & Haarhoff, 2014; Rose, 2000), not all offenders are equally likely to engage in property, sexual, and violent forms of offending. Unlike LSC, psychopathy does appear to play an important role in distinguishing between these trajectories. A recent study by Cale, Lussier, McCuish, and Corrado (2015) distinguished antisocial juvenile sex offenders from serious and violent juvenile non sex offenders, while in a separate study using the same sample of incarcerated serious and violent young offenders, McCuish, Corrado, Hart, and DeLisi (2015) identified multiple trajectories towards violent and non-violent offending, one of which – chronic violent offending with lower levels of non-violent offending – was strongly predicted by PPD.

Still, the PCL has been critiqued as to whether it truly represents the full syndrome of psychopathy, as it has been criticized both for underconceptualizing (e.g. missing reference to lack of anxiety, hostile attribution bias, suspicious cognition) and overconceptualizing (e.g. over-emphasis on the criminal behavior element) the disorder. The CAPP avoids these concerns by approaching the conceptualization of PPD from a ground-up approach that initially sought to overextend the construct's conceptualization before empirically reducing them to key indicators, and by excluding reference to antisocial behaviours in its assessment of this personality construct. In effect, the CAPP is based on a comprehensive model of personality dysfunction that should allow for a wide variety of symptom combinations to be developed. This may result in subtypes of psychopathy being identified (e.g. Dawson et al., 2012), which may help in determining etiology and trajectories towards the development of PPD as well as a deeper understanding of the relationship between PPD and various forms of offending participation, including both the quantity and quality of the offending trajectory. Further, it provides an opportunity to further explore the relationship between personality trait dysfunction and forms of offending behaviours. This information is essential for criminologists, as it has implications for appropriate methods of criminal justice response as well as prevention of offending and for the treatment of offenders to reduce recidivism.

Psychopathy and Development and Life-Course Criminological Theorizing

There are two general ways in which PPD and DLC can be integrated. The first is by integrating PPD into DLC theorizing, while the second concerns the application of DLC to understanding the development of PPD.

Integrating PPD into DLC Theories

While Chapter 2 of this dissertation discussed the lack of integration of PPD into criminological theorizing, PPD can and should be integrated into the DLC perspective. Fox et al. (2015) recently described the presence of psychopathic traits in many of the existing DLC theories and offered strategies to more explicitly include this construct as a central explanatory variable. There are several reasons why the CAPPs conceptualization of psychopathy makes integration into DLC theories more feasible than the PCLs. A longstanding challenge to this integration has been the tautological measurement of PPD offered by Hare's PCL scales. Farrington (2005) observed that while Hare's two-facet four-factor operationalization of PPD provided substantial predictive validity, it limited the ability to understand the composition of the disorder, its etiology, and the true causes of higher rates of antisocial behaviours. In essence, the PCL's predictive ability is based on the notion that the best predictor of future behaviour is past behaviour. The current strategy to avoid this tautology has been to drop Factor 4 (e.g. DeLisi, 2009) in analyses; however, as Cooke noted, the remaining factors of psychopathy are still heavily indexed by reference to antisocial behaviour. Thus, not only might the overt behaviours be the result of the core latent personality traits, such as lack of remorse, impulsivity, and callousness, rather than represent true underlying personality symptoms indicative of psychopathy, but they are also used to assess the presence of these core latent personality traits. In contrast, when assessing CAPP symptoms, antisocial indicators are avoided. The CAPP therefore avoids this tautology of measurement and presents a cleaner version of PPD, which should offer greater utility in explicating the reasons for the association with offending and how these reasons may vary according to stage of life.

In contrast to propensity theorists' stance that age is irrelevant, psychopathic features appear to exert a stronger influence over future involvement in crime and deviance the earlier in

life they appear. In effect, PPD is likely most informative when signs consistent with it appear early in life, as it sets apart a subgroup of children most likely to initiate offending at an earlier age and persist with it for a longer duration. In contrast, symptoms of PPD that emerge later, typically in adolescence, are less informative, as many such traits (e.g. impulsivity, irresponsibility, stimulation seeking, grandiosity) are common to this developmental period (Edens et al., 2001; Hart et al., 2002; Seagrave & Grisso, 2002; Skeem & Cauffman, 2003). Integrating PPD into DLC theorizing may therefore reveal that different personality trait dysfunctions are relevant to offending at different stages of the life course. While it is likely that CU traits – which appear to be highly heritable and consequently fairly stable – exert a consistent influence over antisocial behaviours across these early developmental periods (childhood through adolescence), it is possible that other symptoms of psychopathy have different relevance at different stages. For instance, stimulation seeking or grandiosity at age 7 may be indicative of a more antisocial trajectory than if these same symptoms emerged at age 13.

A second major reason why the CAPPs conceptualization of PPD should be more easily integrated into DLC criminological theories than the PCLs conceptualization is the CAPPs underlying assumption that personality traits can and do change over time, thereby increasing or decreasing the risk level for criminal behavior over time. In contrast, the PCL provides for a more static assessment of psychopathic traits, whereby previous participation in a variety of activities prevents the scoring of that particular item from decreasing over time. This critique is particularly applicable to the traits directly measuring criminal behaviours. The items of serious criminal behaviour, criminal versatility, and revocation of conditional release can only ever increase in scoring, but can never decrease, given that they are scored based on the number of times a certain behaviour has been participated in. Furthermore, the assessment of the remaining personality traits is conducted over the life-course of the individual, where previous participation in a certain form of behaviour may be sufficient to score a trait as a 1, or somewhat present (Lee, 2006). In contrast, the CAPPs measurement of psychopathy permits change. The CAPP specifically offers a lifetime rating version as well as a version focused on the past six months. Thus, it can assess for and reflect change in symptom presence/severity over time. This makes it consistent with DLC theories which recognize that risk factors for offending vary according to life stage, and that these risk factors hold different sway over offending depending on when they occur. For instance, as observed in Moffitt's (1993) developmental taxonomy,

conduct problems that emerge early in life are of significantly greater concern than those emerging in adolescence. Similarly, psychopathic-like traits that are present early in life (e.g. impulsivity in childhood) likely hold different relevance than the same traits expressed later in life (e.g. in adolescence) for the development of psychopathy.

A third major reason why the CAPP should be a more palatable model of PPD to integrate into DLC theories is that it approaches PPD strictly from a personality perspective, meaning it can apply to all individuals, whether they are non-offenders, minor/moderate offenders, or chronic offenders. In other words, the CAPP does not treat PPD as a criminal propensity. Instead, it has the potential to utilize a variety of different dysfunctional personality symptom combinations that may reveal unique patterns of association with offending and non-offending trajectories. Using CAPP to assess the development of psychopathic traits could allow for identification of different traits at different points of life and how they may differentially relate to offending or non-offending patterns. In contrast, the PCLs overreliance on antisocial behaviours limits its application to the non-offending trajectories, even though research using other measures has established that there are non-criminal psychopaths (e.g. Mahmut, Homewood, & Stevenson, 2007; Mullins-Sweatt, Glover, Derefinko, Miller, & Widiger, 2010).

Using the DLC Perspective to Explain PPD

DLC also has potential utility as a theoretical perspective with which to explain the development of PPD. As a categorical construct, PPD may be considered, similarly to LSC, as a criminal propensity, or an underlying condition that no matter what development stage, exerts the same influence on the individual. From a propensity perspective, the reason a child is aggressive towards siblings is the same reason that individual is aggressive to his peers in adolescence (Lynam & Gudonis, 2005). Propensity theories on crime propose an underlying genetic or other biological risk factor for criminal involvement; as such, they adopt a “nature” explanation for criminal behavior. However, propensity theories also allow for “nurture” to play a role as they acknowledge that underlying biological conditions may need to be “turned on” by particular environmental conditions. For instance, the MAOA gene only appears to be a propensity towards aggression in the context of abuse and/or neglect during childhood. Without these environmental conditions, the underlying biological risk factor is not triggered and the propensity towards crime is not activated. Similarly, Gottfredson and Hirchi (1990) described

that LSC relies upon poor parenting to turn on. Whereas Gottfredson and Hirschi (1990) explicitly denied that LSC was a biological or psychological construct, recent findings discussed earlier in this dissertation suggest that it is. As discussed in Chapter 3, psychopathy also appears to be a biological construct. From a broad perspective it could be considered a criminal propensity, as its categorical presence, no matter at what age, increases the risk that an individual will engage in some form of conduct problem/antisocial behaviour.

Dimensionally however, PPD could be considered a developmental factor for at least two main reasons. Firstly, a substantial amount of empirical research suggests there are multiple pathways to psychopathy, as the accumulating evidence indicates that different psychopathic traits have different underlying causes. Chapter 3 provided an overview of the neurological underpinnings of some psychopathic traits, while other research suggests there are physiological and genetic causes to other traits, including fearlessness and CU traits (e.g. Glenn et al., 2007; Jones & Viding, 2007; Levenston et al., 2000; Patrick et al., 1993; & Osumi et al., 2007). Secondly, psychopathic traits may have different relevance to the definition of PPD depending on the age at which they emerge, and in conjunction with particular other elements of psychopathy. For instance, as previously discussed, the research on anxiety suggests that whereas adult psychopaths may demonstrate a lack of anxiety, youth high in psychopathic traits actually appear more anxious. Thus, a lack of anxiety may be a psychopathic trait that is developed over time, for instance, through repeated exposures to stimulation seeking events. In addition, a finding in this dissertation that supports this conclusion was the factor invariance between 12 to 15 year olds and 16 to 18 year olds. In particular, grandiosity appeared more relevant to older youth whereas CU traits stood out for the 12 to 15 year olds. Moreover, CU traits were combined for younger adolescents whereas they were divided into separate factors for older youth, perhaps reflecting that these traits separated and became more refined over time. Thus, a DLC approach would be beneficial to understanding the relevance of psychopathic traits to the overall manifestation of this disorder over time.

Using a DLC approach to explain the development of PPD is particularly relevant when PPD is defined by the CAPP model, as it presents a wider conceptualization of the disorder and therefore more fully explicates the underlying nature of the disorder (Dawson et al., 2012). Rather than stipulating a cut-score for PPD, the CAPP model treats PPD as a hierarchical disorder with multiple symptomatology. Consistent with different types of offenders, there are

likely different types of psychopaths, each of which may have a different developmental pathway and differing patterns of offending. At the most basic level of separation, researchers have speculated the existence of two main types of psychopaths (primary/secondary). Yet given the comprehensive inclusion of traits indicative of PPD presented by the CAPP model, subtypes of PPD that follow different trajectories of offending may also be identified.

Using the CAPP Rather than other Personality-based PPD Assessments

The CAPP is not the only personality-based PPD assessment that has been developed. For instance, the PPI is a self-report version of psychopathy that was likewise conceptualized with a personality focus, therefore avoiding reference to criminal behaviours (Lilienfeld & Andrews, 1996). A major limitation of the CAPP is the length of time taken to accumulate required evidence to make the assessment of the 33 symptoms. In this regard, instruments like the PPI are more efficient as they rely on a self-report assessment of personality traits associated with psychopathy. Despite concerns regarding the ability to self-assess and accurately reflect on personality traits such as grandiosity/egocentricity, research has supported the validity of the PPI. However, the PPI was developed for use with the general community population and not within a prison environment where individuals often face legitimate motivations to lie.

While the CAPP profile of PPD is not based on a normal personality model, unlike the FFM for instance, its use was developed for a population where personality dysfunction is more likely to exist. Still, given that the CAPP is purely personality-focused and removes emphasis on criminal behaviours it has utility outside of the criminal justice system where it can be used to assess for PPD among clinical samples, for instance. The CAPP has potential for use in clinical settings because of the insight it would offer into the specific nature of treatment needed. However, its use with offenders is also ideal, as its comprehensive assessment should contribute more understanding towards the variety of sympomatology underlying forms of psychopathy, and provide more explanation for the relationship between psychopathy and crime. It may have a particular usefulness with serious and violent young offenders who likely show a wide variety of personality dysfunction related to the onset, frequency, variety, and duration of offending. Thus, the CAPP has potential to further describe the multiple trajectories

that appear to relate to the development of multiple forms and persistence of antisocial behaviours. Still, the results of this dissertation suggest that while the CAPP appears to have validity as a measure of psychopathy, its application in a young offender population can be enhanced.

Limitations

There were several major limitations of this study. First, although the internal structural reliability analysis was conducted with both genders, many further analyses could not be conducted for female youth due to their low sample size. Consequently, this dissertation was unable to demonstrate whether PPD, as measured by the CAPP-IRS, is similar for both genders. The results of the internal structural reliability suggested that female and male serious and violent adolescent youth differed in some significant ways in terms of the relative strength of certain CAPP-IRS symptoms. Consistent with what these results implied, previous research has both speculated on and empirically supported that females show a slightly different profile of PPD than males, for instance with more emphasis on the interpersonal and less emphasis on the behavioural traits. It is important that future research conduct item response theory analyses to assess for the relative importance of CAPP domains as they relate to serious and violent adolescent male and female offenders. Similarly, the analyses were not conducted separately by ethnic group. There were two major ethnicities represented in the sample: Caucasian and Aboriginal, and future analysis should attempt to separate the results by these two main groups to determine whether there are differences either in the way symptom dysfunction is expressed or in the relative importance of these symptoms to a potential diagnosis of PPD.

Second, although Chapter 3 discussed neurological development and its relevance to the development of PPD, this study did not include any neuropsychological measures. Thus, this discussion was only to provide contextual understanding of the development ongoing in adolescents during that developmental period and how it might influence the presence or expression of psychopathic traits. Additional research that explores the relationship of the 33 symptoms to various forms of neuropsychological functioning is recommended, particularly as such research may further elucidate the etilogical underpinnings of these traits and may suggest a different theoretical structural organization. Consistent with this, another limitation of this study is that genetic traits were not discussed or factored into the analysis, despite the fact that

research supports the heritability of some psychopathic traits. Again, conducting research with the CAPP that also includes heritability estimates would be beneficial for understanding the etiology of these symptoms.

Third, it must be acknowledged that the CAPP-IRS model and interview schedule used in this study were intentionally developed for use with adults. This may have resulted in some irrelevant or less relevant symptoms of psychopathy being included in the model applied to adolescents. Further, the nature of assessing the symptoms was not always ideal. For instance, the measurement of CU traits can be improved for children. As an example, the APSD (Frick & Hare, 2001) measures CU traits through six items, the first five of which are reverse scored: is concerned about the feelings of others; feels bad or guilty; is concerned about schoolwork; keeps promises; does not show emotions; keeps the same friends. Somewhat similarly, the CAPP measures a lack of empathy through items indicative of: being indifferent or unconcerned about the suffering of others; treating others cruelly or callously; ability to describe extreme violence without any real emotion; and ability to sustain threatening or intimidating behaviour towards another person (Cooke et al., 2005). The questions used to get at this symptom include whether “anyone has complained that you were insensitive to their feelings or unkind to them”, whether they “can put yourself in another person’s shoes and understand things from their point of view”, and how they respond when someone annoys them. These questions may be too complex to assess the presence of CU traits among adolescents. Instead, questions that are more direct and get at the adolescents perceptions of and treatment towards others who are suffering might provide more light on their callous tendencies, whereas questions that provide situational examples about times when they may have been able to share another person’s emotional experiences (e.g. how do you feel when your best friend is sad, what do you do when they are sad?) might be more developmentally appropriate.

Fourth, the sample size used for these analyses was fairly small, particularly given the number of symptoms being evaluated. Not only might this limit the ability to detect significance, it also limits the utility of an age-based analysis. For instance, rather than divide adolescents into the more typical three-pronged developmental stages over adolescence (early, mid, and late) the current analyses had to combine these groups into the more generic 12 to 15 year olds and 16 to 18 year olds, which may have prevented the detection of some important age-related

differences. The 12 to 15 year old sample was particularly small (n = 39); thus, the factor analytic results may be unreliable.

Fifth, the current study examined the construct validity of the CAPP-IRS but did not examine its predictive validity. This is an important form of validity to test, especially as a major critique of the PCL is that its ability to predict criminal behaviours appears to primarily be generated by its inclusion of antisocial behavioural items. Should the CAPP-IRS demonstrate predictive validity towards criminal behaviours it will allow researchers to move away from this inherent tautology and develop an improved understanding of the relationship between PPD and crime.

Conclusion

Despite the aforementioned limitations, this dissertation presented the first application of the CAPP-IRS to a sample of incarcerated youth, and demonstrated that although there were some weaknesses in assessing psychopathic symptoms among adolescents, the CAPP-IRS did appear to have a degree of validity. Future research should replicate these analyses in additional samples of incarcerated youth to determine whether the results were sample dependent. In addition, the collection of additional research data in adult samples would allow for item response theory analysis to be conducted to determine the developmental sensitivity of these symptoms of psychopathy. This research must be conducted before any of the symptoms identified as problematic in this dissertation are removed from the model.

Currently, there is a movement towards greater inclusion of PPD into criminological theorizing, as PPD offers criminologists important information with which to distinguish between different antisocial behaviour trajectories. The CAPP has the potential to add to this trajectory modeling given that it provides a more complete description of PPD. This dissertation provided an important first step towards greater adoption of the CAPP-IRS in criminal justice settings.

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