IDENTIFYING CALLOUS-UNEMOTIONAL SUBTYPES AMONG JUSTICE-

INVOLVED YOUTH

A Dissertation

by

MELISSA SUE MAGYAR

Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Chair of Committee,	John Edens
Committee Members,	Sherecce Fields
	Holly Foster
	Leslie Morey
Head of Department,	Douglas Woods

August 2014

Major Subject: Psychology

ABSTRACT

Considerable evidence suggests that the presence of a callous and unemotional interpersonal style identifies an important subgroup of antisocial and aggressive youth. Relative to other children with conduct problems, youth high on callous-unemotional (CU) traits are distinguished by the absence of empathy, lack of guilt, callous and uncaring behaviors, and poverty in emotional expression. Despite the recognized heterogeneity of high CU youth as well as importance of the presence of CU traits, no study to date has attempted to disaggregate these youth into meaningful subgroups. Therefore, the current study sought to address this void in the literature by investigating whether justice-involved male youths could be disaggregated into distinct CU trait variants, consistent with theoretical and empirical conceptualizations of primary and secondary variants of psychopathy.

The study involved a multi-ethinic, community corrections sample comprised of 151 male juvenile offenders. The entire spectrum of criminal offenses and levels of supervision were represented in this sample. The initial set of model-based cluster analyses failed to yield conceptually coherent primary and secondary variants, despite the inclusion of additional theoretically relevant variables. The failure of the ICU dimensions to identify meaningful clusters among the current juvenile offender sample raised concerns about the psychometric properties of the ICU, along with its factor structure.

To address these concerns, additional model-based cluster analyses with various permutations of revised, unidimensional ICU subscale(s) and theoretically relevant variables were conducted. Additionally, an alternative subtyping/classification approach using scales from the Personality Assessment Inventory-Adolescent Version (PAI-A; Morey, 2007b) was applied to the sample in an effort to identify meaningful subgroups. However, both sets of supplementary analyses still failed to yield meaningful, homogeneous psychopathic variants consistent with the theoretical and empirical literature.

Contrary to expectations, the current study findings offer little support for the utility of callous-unemotional traits to disaggregate justice-involved youth into meaningful homogenous subgroups. Thus, the present study's contribution to the growing subtyping literature appears to further complicate our understanding of juvenile psychopathic variants. In order to more concisely parse out the heterogeneity of juvenile psychopathic traits, future research of the distinct developmental pathways of callous-unemotional traits among juvenile samples is needed.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my profound thanks and praise to my Lord and Holy Savior, Jesus Christ, for providing me with the strength, wisdom, and guidance to successfully navigate this journey. My steadfast faith and belief in His vision helped me through some of my most difficult moments.

I would like to express my appreciation for my mentor, Dr, John Edens, for sharing his wealth of knowledge with me and ensuring that I developed into a thoughtful, competent researcher and scholar. Thank you to my committee members, Dr. Fields, Dr. Foster, and Dr. Morey, for their insightful feedback throughout the course of this research project. Dr. Ackerman, one of my original committee members, who served a pivotal role in the study design phase and so graciously introduced me to the administration of Brazos County Juvenile Services, is also deserving of considerable praise. I also want to extend my gratitude to colleagues, department faculty, and a number of external faculty members who provided support and consultation during various stages of my research.

I am incredibly grateful for my friends, family, and various other people who the Lord brought into my life at different points throughout this journey. Each of you in your own unique way provided me with an inspirational, positive message and/or words of encouragement that will always remain in my heart. To one of the most important, special people in my life, my mother, words cannot express how incredibly blessed and thankful I am for your unconditional love, selflessness, and patience. You always

remained right by my side, through the highs and lows, and taught me to remain hopeful, no matter how impossible a situation or obstacle may seem. This journey could have never been completed without you.

I would like to express my gratitude to the various administration and staff members of the Brazos County Juvenile Services who supported me and so graciously helped to facilitate my research. I am exceptionally thankful for Dr. Douglas Vance, Executive Director of Brazos County Juvenile Services, for granting me the opportunity to pursue my research, and always believing in me. Your powerful words of inspiration and unrelenting support left a considerable impact on my life. Thank you for allowing my passion and dreams to become a reality.

Finally, thank you to all of the parents and guardians who permitted your adolescents to participate in my project. And to the young men who were willing to devote at least two hours of their time to meeting with me, completing my study protocol, and sharing some of their life stories, I am endlessly grateful. Your strength and resilience are simply remarkable and inspire me each and every day. Because of each of you as well as other youth who have undergone similar journeys, I dedicate my life to this line of research and career. Thank you!

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Modern conceptualizations of psychopathy date to the work of Cleckley (1941/1982), who provided one of the most influential early formulations of this syndrome. His well-known criteria reflect mainly a personality-based approach (Lilienfeld, 1994) in which prominent interpersonal (e.g., superficial charm; deceitfulness; unresponsiveness in interpersonal relations) and affective (e.g., absence of nervousness or other neurotic manifestations; lack of remorse or shame; lack of empathy) features define the core of the disorder. In addition to the core affective and interpersonal features, most contemporary measures of psychopathy also include behavioral criteria, which are characterized by an irresponsible and impulsive lifestyle.

Over three decades of research with offenders has been based primarily on assessments using original and revised versions of Hare's Psychopathy Checklist (PCL/PCL-R; Hare, 1980, 1991, 2003). The original dominant model of the PCL-R literature consisted of two factors (Harpur, Hakstian, & Hare, 1988; Harpur, Hare, & Hakstian, 1989) that corresponds to affective and interpersonal characteristics of psychopathy (Factor 1) and impulsive/antisocial behaviors (Factor 2). More contemporary research revealed that a three-factor model (Cooke & Michie, 2001) capturing the core Arrogant and Deceitful Interpersonal Style (Facet 1), Deficient Affective Experience (Facet 2), and Impulsive and Irresponsible Behavioral Style (Facet 3) provided a more meaningful, robust factor structure. Recently, researchers have further parsed the structural model of the PCL-R into four facets (Hare, 2003; Hare, &

Neumann, 2006). The first three facets are identical to the three factors in Cooke and Michie's (2001) model, namely Interpersonal (Facet 1), Affective (Facet 2), and Behavioral (Facet 3). However, Hare's (2003) four-factor model also includes an Antisocial (Facet 4) comprised mainly of explicitly criminological items (e.g., juvenile delinquency; criminal versatility). Given Facet 4's focus on criminality, numerous researchers have questioned whether Facet 4 assesses simply antisociality, rather than psychopathy, per se. Notably, there remains considerable debate regarding how many factors best capture the construct of psychopathy.

The relationship between psychopathic traits and various adverse outcomes such as community violence and criminal recidivism has been demonstrated in several large-scale studies and meta-analytic reviews (Gendreau, Goggin, & Smith, 2002; Kennealy, Skeem, Walters, & Camp, 2010; Singh, Grann, & Fazel, in press; Yang, Wong, & Coid, 2010). Although psychopathy traditionally has been studied in adult criminal offenders, given the serious risk psychopathic individuals pose to society, a strong argument can be made for the importance of identifying developmental precursors of this disorder in childhood and adolescence (for overviews, see Forth, Kosson, & Hare, 2003; Petrila & Skeem, 2003; Salekin & Frick, 2005).

Considerable debate surrounds the validity of directly extending the construct of psychopathy to juveniles (Seagrave & Grisso, 2002; Skeem & Cauffman, 2003). Critics have argued that 'juvenile psychopathy' may be inappropriate because several features of adult psychopathy (e.g., impulsiveness, irresponsibility, sensation seeking) are normative characteristics of adolescent development (Edens, Skeem, Cruise, &

2

Cauffman, 2001; Seagrave & Grisso, 2002). As stated by Seagrave and Grisso (2002), "there is reason to be concerned about potential developmental sources of false positives when measuring psychopathic traits in juvenile offenders" (p. 219). Along these same lines, evidence supporting the temporal stability of juvenile psychopathic traits extending into adulthood would argue against such traits being simply transient features of developmental processes. Such empirical evidence provides further support for the notion that personality disorders remain at least relatively stable over time. Even though the stability of psychopathic traits in youth continues to be an ongoing concern, globally, CU traits are evidenced to be relatively stable across development. Research focusing on the stability of CU traits will be reviewed in more detail in a later section of this proposal.

Another concern raised regarding the appropriateness of extending psychopathy to children and adolescents is whether the external correlates (i.e., nomological net) associated with adult psychopathy are similar to the emotional, behavioral, and personality correlates surrounding 'juvenile psychopathy.' Presently, an accumulated body of research demonstrates that numerous correlates associated with child and adolescent psychopathy parallel the correlates found in adult psychopathic samples. For example, similar to adult psychopaths, research has shown that children and adolescents with psychopathic traits show a reward dominance style (Barry et al., 2000; O'Brien & Frick, 1996), exhibit a preference for thrill and adventure seeking (Frick, O'Brien, Wootton, & McBurnett, 1994), and reduced levels of anxiety (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999).

3

Globally, there are a lot of concerns about the science behind the downward extension of psychopathy to juveniles. However, the available research suggests that there is something meaningful going on here and that researchers are continuing to investigate these characteristics. Through their continued empirical work focused on identifying developmental precursors of psychopathy in juveniles, researchers have constructed various developmental models of psychopathy (see Frick. 1995, 2006; Lynam, 1996).

Developmental Models of Psychopathy

As noted by Frick and White (2008), a substantial portion of research attempting to extend the construct of psychopathy to youth has used measures that combine the affective, interpersonal, and behavioral dimensions of psychopathy (see Frick & Dickens, 2006, for a review) based on the assumption that the combination of these dimensions are best represented by a higher order construct. However, researchers such as Lynam (1996) have proposed conceptualizations that focus on the importance of particular dimensions of psychopathy, rather than the higher order factor. Lynam's conceptualization builds upon Loeber, Brinthaupt, & Green's, (1990) syndrome of hyperactivity (i.e., hyperactivity, impulsivity, and attention deficits), which is referred to as hyperactivity-impulsivity-attention (HIA).

Lynam (1996) argued that the impulsive and irresponsible dimension was the most critical dimension of psychopathy, noting that HIA combined with conduct problems (CP) is evidenced in children who engage in early antisocial behavior that is more frequent and severe in nature than children with conduct problems only. Lynam

(1998) asserted that children with HIA–CP were remarkably similar to adults with psychopathy, particularly in terms of neuropsychological deficits and deficient response modulation. Lynam labeled these youth as ''fledgling psychopaths'' (p. 573).

Another line of research attempting to extend the construct of psychopathy to youth by identifying developmental precursors involves the work conducted by Frick and colleagues (Frick, Barry, & Bodin, 2000). In contrast to Lynam's (1996) conceptualization that emphasizes the importance of the impulsive and irresponsible dimension of psychopathy in subtyping youth with conduct problems, Frick's developmental model of psychopathy specifically focuses on the affective factor of psychopathy, or the "callous-unemotional dimension," which is conceptually analogous to the Deficient Affective Experience in the three-factor structural model of the PCL-R (Cooke & Michie, 2001). Youth high on callous-unemotional traits are distinguished by the absence of empathy and remorse, lack of guilt, callous and uncaring behaviors, and poverty in emotional expression (see e.g., Frick, 2006; Frick & Marsee, 2006; Frick & White, 2008). Researchers such as Porter and Woodworth (2006) have argued that CU traits map closely onto adult psychopathic traits (especially Factor 1 features on the PCL-R). As noted by Frick and White (2008), callous-unemotional (CU) traits are prominent in most conceptualizations of psychopathy in adults (Cleckley, 1976; Hare, 1993).

Research has suggested that youth with and without CU traits have differing causal processes underlying their conduct problems (Frick & Dantagnan, 2005). Extant research suggests that youth with CU traits may have a distinct temperament

5

characterized by low fearfulness, reward dominance, and lack of emotional responsivity to negative emotional stimuli which impacts their early moral development (Frick & Morris, 2004). Also of theoretical importance, adults high on the interpersonal and affective dimensions demonstrate similar deficits in performance on laboratory tasks (Patrick, Zempolich, & Levenston, 1997).

Considerable research evidence exists designating the presence of a callous and unemotional interpersonal style that characterizes an important subgroup of antisocial and aggressive youth. In particular, CU traits identify a more severe, aggressive, and stable pattern of antisocial behavior in juvenile forensic facilities (Kruh, Frick, & Clements, 2005), outpatient mental health clinics (Christian, Frick, Hill, Tyler, & Frazer, 1997), and school-based samples (Frick, Cornell, Barry, Bodin, & Dane, 2003). Callous-unemotional traits predict a variety of theoretically and empirically important external criteria independent of general measures of conduct problems and antisocial behavior. For example, the presence of CU traits predicts future aggressive and violent behavior in both adjudicated (e.g., Vincent, Vitacco, Grisso, & Corrado, 2003) and nonadjudicated (e.g., Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005) adolescents.

Along with examining the predictive utility of CU traits, as noted earlier, the downward extension of the construct of psychopathy to juveniles requires consideration of the stability of CU traits across various developmental periods to adulthood (Edens et al., 2001; Seagrave & Grisso, 2002). Therefore, as suggested by Frick and White (2008), it is important to determine whether the behaviors that define CU traits are stable enough to be considered 'traits,' which implies some level of stability across development to

adulthood. Several research studies have demonstrated that CU traits are relatively stable from childhood to early adolescence (e.g., Munoz & Frick, 2007; Frick, Kimonis, Dandreaux, & Farrell, 2003) both via self-report and parent report, respectively. More importantly, with respect to the prediction of adult psychopathy, Blonigen, Hicks, Krueger, Patrick, and Iacono (2006) demonstrated that the CU dimension was relatively stable (r = .60) from late adolescence (age 17 years) into early adulthood (age 24). Relatedly, Burke, Loeber, and Lahey (2007) reported that teacher ratings of interpersonal callousness in clinic-referred boys (ages 7 to 12) predicted these youths'-scores on adult measures of psychopathy (PCL-R Factor 1: β = .041, p < .001; Factor 2: β = .052, p < .001 at ages 18 to 19), even after controlling for childhood conduct problems. Notably, parent ratings of interpersonal callousness were no longer significant predictors of PCL-R Factor 1 or 2 after controlling for conduct disorder symptoms.

In terms of the previously described nomological net, results of a large body of research suggest that antisocial youth with CU traits demonstrate distinct personality, emotional, and behavioral characteristics. In contrast to general measures of antisocial behavior and conduct problems, CU traits consistently tend to be positively associated with sensation-seeking and fearless behaviors (Essau, Sasagawa, & Frick, 2006; Frick et al., 1999; Pardini, 2006) and negatively correlated with trait anxiety or neuroticism (Andershed, Gustafson, Kerr, & Stattin, 2002a; Frick et al., 1999; Lynam, Caspi, Moffitt, Raine, Loeber, & Stouthamer-Loeber, 2005). The negative relationship between measures of trait anxiety/neuroticism and CU traits evidenced in both Frick et al. (1999) and Lynam et al. (2005) typically only existed when the level of conduct problems was

controlled. In other words, youth with CU traits experience lower levels of anxiety relative to other youth demonstrating similar levels of conduct problems.

There is also evidence to suggest that CU traits are differentially related to proactive and reactive forms of aggression. Specifically, youth with CU traits not only show a more severe and pervasive pattern of aggressive behavior, but they also tend to show aggression that is both reactive and proactive in nature (Enebrink, Anderson, & Langstrom, 2005; Frick et al., 2003; Kruh et al., 2005). Conversely, antisocial youth with low CU traits tend to exhibit lower levels of aggression relative to high CU youth. Additionally, aggressive behavior demonstrated by low CU youth is typically reactive in nature (Frick et al., 2003; Kruh et al., 2005).

Consistent with Cleckley (1976) and Lykken's (1995) assertions, previous research suggests that deficits in emotional processing seem to be specifically associated with affective and interpersonal dimensions of psychopathy (i.e., callous-unemotional interpersonal style) in both adult (Patrick, 1994) and juvenile (Barry et al., 2000) samples. According to a research review conducted by Frick and White (2008), 10 published studies documented abnormalities in how antisocial youth with CU traits process emotional stimuli including emotional words (Loney, Frick, Clements, Ellis, & Kerlin, 2003), emotional pictures (Kimonis, Frick, Fazekas, & Loney, 2006), emotional facial expressions (Blair, Colledge, Murray, & Mitchell, 2001), and emotional vocal tones (Blair, Budhani, Colledge, & Scott, 2005).

Studies comparing how youth with CU traits process various types of emotional stimuli have consistently demonstrated that these youth do not exhibit deficits in the

processing of emotional stimuli with positive content. Rather, these juveniles display deficits in the processing of negatively charged emotional stimuli (Kimonis et al., 2006; Loney et al., 2003), particularly distress in others (Kimonis et al., 2006) and illustrations of fear (Blair & Coles, 2000). Notably, more recent research conducted by Kimonis, Frick, Munoz, and Aucoin (2008a), demonstrated that CU traits predict deficient emotional processing of distressing stimuli via a dot-probe task in youth high in aggression *and* exposure to community violence, relative to high CU youth low on exposure to violence. Conversely, youth high on CU traits, more extensive histories of abuse, and less exposure to community violence, demonstrated enhanced orienting to distressing stimuli. Their sample ($n = 88$) consisted predominantly of African Americans (68%), whereas past studies investigating the association between emotional processing and psychopathic traits have used primarily Caucasian samples (Blair et al., 2005; Hiatt, Lorenz, & Newman, 2002; Kimonis, et al., 2006; Patrick, Bradley, & Lang, 1993).

Although some research, such as Kimonis et al. (2008a), has not borne out the link between CU traits and deficient emotional processing as would be expected, considerable research evidence demonstrates an association between these two constructs. Thus, the majority of empirical findings regarding CU traits and affective processing supports the theoretical formulations of Cleckley (1976) and Lykken (1995) suggesting the general lack of emotionality or lack of fearful inhibitions, respectively, in individuals with psychopathic traits.

Measurement of Callous-Unemotional Traits

In terms of the assessment of CU traits, the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) was specifically developed to address the psychometric limitations of other instruments that measure these traits in children and adolescents (e.g., Antisocial Processing Device- Callous-Unemotional Scale = 6 items) and to also provide a valid, reliable, and efficient assessment of CU traits. Results of factor analyses across various studies, including both American juvenile offenders and non-referred German adolescents (Essau et al., 2006; Kimonis et al., 2008b, respectively), have demonstrated a hierarchical three-factor model (i.e., Callousness, Unemotional, Uncaring) for this measure. In addition to loading on one of three subfactors, all items also load onto a fourth, general "callous–unemotional" factor.

The Callousness factor was related to indices of problematic and antisocial behavior across both studies. More specifically, Essau and colleagues demonstrated that Callousness was positively related to conduct disorder symptoms, broadband externalizing and internalizing behavior dimensions, and also significantly predicted problematic behavior. Similarly, an association between Callousness and aggression was demonstrated in Kimonis et al. (2008b).

Findings for the Unemotional factor were somewhat convergent across studies. In Essau et al. (2006), the Unemotional dimension was positively related to externalizing behaviors, while negatively related to emotional instability. However, Kimonis et al.'s (2008b) findings demonstrated that this dimension was not related to aggression or delinquency measures, but rather was inversely related to empathy and positive affect.

Compared to the Callousness and Unemotional dimensions, the aggregated pattern of associations between the Uncaring factor and various theoretically relevant constructs is arguably inconsistent with both the primary and secondary psychopathy conceptualizations. Similar to Essau et al.'s (2006) findings that Uncaring was positively related to externalizing behaviors and predicted problematic behaviors, Kimonis and colleagues (2008b) demonstrated that relative to the other two ICU factors, Uncaring was most strongly and consistently related to delinquency measures. These combined findings seem to suggest that elevated scores on the Uncaring dimension would be more characteristic of the secondary variant. However, Uncaring was the only ICU subscale associated with skin conductance reactivity to high provocation (Kimonis et al., 2008b). More specifically, these measures were negatively related to one another. Relatedly, the Uncaring dimension was also inversely related to empathy and positive affect (Kimonis et al., 2008b). The negative association between Uncaring and emotional functioning appears to be more consistent with the typical primary variant profile. In summary, the implications of the differential relationships between the ICU factors and various theoretically important correlates in the development of the specific hypotheses for the current study will be discussed in greater detail later in this proposal.

Is There More than One Type of Psychopath? Investigating Variants of Psychopathy

The possible existence of psychopathy subtypes has been the focus of theory for decades (Karpman, 1941; McCord & McCord, 1959/1964). For example, Karpman (1948) theorized that primary and secondary psychopaths could be distinguished from

one another by the etiology of their psychopathic features. He argued that primary psychopathy is underpinned by a constitutional (heritable) affective deficit, specifically a defect in temperament characterized by a greater degree of fearlessness and lower susceptibility to punishment. Conversely, secondary psychopathy reflects an environmentally acquired emotional disturbance. More specifically, he theorized that secondary psychopathy results from "unresolved emotional conflict," predominantly hostility, produced by exposure to harsh punishment, parental rejection, overindulgence, or abuse. This hostility disrupts the functioning of an otherwise "intact conscience," giving the appearance of a "psychopathic facade'' (Karpman, 1948, p. 523). Karpman also identified the presence of neurosis or anxiety as the key marker for this particular subtype. Similarly, Lykken (1995) argued that secondaries are more vulnerable to anxiety and other negative emotions, whereas primary psychopaths possess an innately fearless temperament and exhibit relatively few signs of anxiety.

Providing another theoretical conceptualization of psychopathy variants, Porter (1996) hypothesized that a secondary subtype would emerge as a consequence of being severely traumatized during childhood, citing more generalized trauma relative to Karpman's focus on the role of parents. Additionally, Porter asserted that as a consequence of previously endured trauma, secondary psychopaths are hypothesized to experience a "dissociation of affect and cognition" (Porter, 1996, p. 184). These dissociative symptoms result in secondary psychopaths "turning off" their capacity for emotional responding which leads to a limited concern for the consequences to others of one's actions.

In terms of research studies focusing on the etiology of primary and secondary subtypes, twin studies provide support for the view that deficits evidenced in primaries are constitutional in nature. Using self-report measures of psychopathy, significantly higher concordance rates were found in monozygotic than in dizygotic twins (Jang, Livesley, & Vernon, 1996). Also, recent studies utilizing model-based cluster analysis have indicated that relative to the primary subgroup, secondary psychopaths exhibit greater levels of previous childhood traumatic experiences (adults, Poythress et al., 2010; juveniles, Kimonis, Tatar, & Cauffman, 2012; Tatar, Cauffman, Kimonis, & Skeem, 2012).

Along with etiological distinctions in the development of psychopathic traits, theoretical and clinical literature posits that primary and secondary psychopaths differ in the expression of psychopathic features. Theoretically, according to Blackburn (1975, 1987), the primary psychopath is extraverted, confident, dominant, and low to average in anxiety, whereas the secondary psychopath is more socially withdrawn, inhibited, low in self-confidence, submissive, moody, and emotionally disturbed. According to Karpman (1948), secondary psychopaths are more "hot headed," impulsive, and are more reactively aggressive relative to their primary counterparts.

Recent empirical investigations utilizing male prisoner samples (Hicks, Markon, Patrick, Krueger, & Newman, 2004; Skeem, Johansson, Andershed, Kerr, & Louden, 2007) and male jail inmates (Swogger & Kosson, 2007; Vassileva, Kosson, Abramowitz, & Conrod, 2005) yield substantial evidence in support of psychopathic subtypes broadly consistent with the primary and secondary theoretical conceptualizations. For example,

13

Skeem et al. (2007) selected a high psychopathic subsample of violent inmates ($n = 123$) to identify subtypes within a relatively homogeneous subgroup. Model-based cluster analysis results demonstrated support for the existence of two clusters, consistent with the primary and secondary subtypes. The cluster labeled secondary ($n = 49$) demonstrated greater anxiety and lower levels of psychopathic traits (Facets 1, 2, and 3) compared to the cluster labeled primary ($n = 74$). The two groups did not differ from one another in their levels of antisocial behavior (Facet 4). Relative to primary psychopaths, secondary psychopaths manifested significantly more borderline traits, irritability, social withdrawal, lack of assertiveness, major mental illness, and significantly poorer clinical functioning. However, in contrast to extant theories, secondary psychopaths were neither more impulsive nor less narcissistic than primary psychopaths.

Similarly, results of model-based cluster analysis conducted by Hicks et al. (2004) using primary trait scales from the brief form of the Multidimensional Personality Questionnaire (MPQ–BF; Patrick, Curtin, & Tellegen, 2002), yielded two clusters: Cluster 1: Emotionally stable psychopaths (traits similar to those associated with primary psychopathy) were more fearless, less anxious, and less reactive to stress and Cluster 2: Aggressive psychopaths (traits similar to those associated with secondary psychopathy) displayed greater aggression, reactive hostility, and impulsiveness than primary variants. Additionally, aggressive psychopaths reported engaging in more fights and had more extensive histories of criminality.

More recently, Poythress et al., (2010) used model-based clustering to investigate the utility of psychopathy and psychopathy-related constructs for identifying

homogeneous subgroups (consistent with primary and secondary variants) among a large

sample of offenders who met criteria for Antisocial Personality Disorder (ASPD).

Therefore, the following constructs/measures were used as clustering variables: the PCL-

R affective, interpersonal, and impulsive lifestyle features, anxiety, abuse history,

sensitivity to reward stimuli, and MPQ Harm Avoidance scale (HA) as a reversed index

of fearless temperament (i.e., meaning high scores indicate a preference for avoiding

potentially harmful situations, whereas low scores suggest a more fearless temperament).

Three of the four subtypes identified via model-based clustering adhered to

distinctions between primary ($n = 141$), secondary ($n = 153$), and non-psychopathic

ASPD offenders ($n = 195$), with a fourth unanticipated group ($n = 190$) being identified

that appeared psychopathic but with a "fearful temperament." The primary psychopathy

profile included somewhat higher scores on core interpersonal and affective features

rather than on the behavioral dimension of psychopathy as well as the lowest score on

both Harm Avoidance and anxiety. Conversely, the secondary psychopathy profile

exhibited significantly elevated levels of abuse/trauma history relative to the other

subtypes and demonstrated the highest level of anxiety. Again, consistent with theory,

the secondary group obtained slightly higher scores on the impulsive lifestyle feature of

psychopathy relative to the affective and interpersonal features. The non-psychopathic

ASPD group obtained low scores on all three of the PCL-R facets.

Theoretically informative differences were demonstrated between primary and

secondary groups in multiple domains, including self-report measures, passive avoidance

learning, clinical ratings, and official records. For example, significantly higher scores

were observed in the secondary psychopaths for self-reported impulsivity, alcohol

problems, and aggression, relative to the primary psychopathic group. Higher mean

scores were also observed in the secondary group for borderline features. In regards to

institutional infractions, the results suggested that secondary psychopaths would be more

prone than primary psychopaths to engage in aggressive misconduct while incarcerated

and were cited for more general infractions.

In summary, the empirical findings of the above described subtyping studies

using adult samples suggest that relative to primaries secondary psychopaths are

generally characterized by more social withdrawal, irritability, lack of assertiveness,

reactive hostility, and symptoms of major mental disorder (e.g., Poythress et al., 2010;

Skeem et al., 2007). More specifically, high-anxious secondary variants of psychopathy

and low-anxious primary variants show distinct correlates and outcomes.

Methodological and Statistical Issues in Subtyping Research

Prior to discussing the various subtyping studies conducted among juvenile

samples, it is necessary to highlight several important issues to consider in this literature.

First, instrument choice in the measurement of psychopathy varies across studies (i.e,

Youth Psychopathic Inventory [YPI; Andershed, Kerr, Stattin, & Levander, 2002b];

Antisocial Process Screening Device [APSD; Frick & Hare, 2001]; the Psychopathy

Checklist: Youth Version [PCL: YV]; Forth, Kosson, & Hare, 2003). The selected

instrument and its potential impact on resulting subtypes is relevant given that

psychopathy measures do not correlate highly with one another. For example, findings

from Cauffman, Kimonis, Dmitrieva, and Monahan (2009) indicated only a modest

overlap between the PCL: YV and YPI (*r*s .26 -.36); additionally, youths were often

identified as psychopathic by one measure but not by the other. Similarly, the YPI

moderately correlated with the three-factor PCL: YV (*r* = .30) in a study conducted by

Skeem and Cauffman (2003). Additionally, results of several studies reported in Forth et

al. (2003) comparing the APSD and PCL: YV yield only moderate correlations (*r*s .30 -

.48) between the total scores of these measures.

The statistical method used to derive subtypes/clusters varies across studies. For

example, initial attempts to identify subtypes of children and adolescents used traditional

cluster analytic methods (Christian et al., 1997; Frick, Bodin, & Barry, 2000; Vincent et

al., 2003), whereas a select number of studies have used latent class factor analyses

(Wareham, Dembo, Poythress, Childs, & Schmeidler, 2009), latent class analyses (Veen,

Andershed, Stevens, Doreleijers, & Vollebergh, 2011) or finite mixture modeling

(Vaughn, Edens, Howard, & Smith, 2009). Similar to the adult literature, more recent

studies investigating psychopathy variants use model-based cluster analysis (MBC) in an

effort to address the shortcomings of the previously mentioned statistical approaches

(Andershed, Kohler, Louden, & Hinrichs, 2008; Kimonis, Skeem, Cauffman, &

Dmitrieva, 2011; Kimonis et al, 2012; Lee, Salekin, & Iselin, 2010; Tatar et al., 2012).

According to Fraley and Raftery (2003), model-based cluster analysis reduces

some of the uncertainties inherent in traditional clustering methods by testing the relative

fit of a specific number of models that vary in their assumptions about the structure of

the data. Additionally, contrary to common cluster analytic approaches, model-based

cluster analysis will not automatically yield multiple clusters if the data do not provide evidence for them.

Relatedly, some researchers cluster analyze the entire sample, whereas others only perform cluster analysis on a subsample of youth who received high psychopathy scores. As previously noted, given only moderate associations between measures assessing juvenile psychopathic traits, along with inconsistent psychopathy conceptualizations, it is rather difficult to rule out whether these supposed "homogenous" subsamples of youth identified as high on psychopathic traits are not just arbitrarily homogeneous. Therefore, cluster analyzing the entire sample, instead of only those youth who are deemed psychopathic due to meeting a particular cut score, would permit the model-based cluster analysis to yield meaningful homogeneous subgroups that co-occur with one another rather than potentially deriving subgroups based upon chance associations.

Sample recruitment is a potential issue to consider when conducting subtyping research as well. Types of samples investigated among juveniles have included: community, clinic-referred as well as first-time and incarcerated offenders. Relatedly, gender and ethnicity distribution as well as age range have varied across studies. For example, several studies included both males and females, whereas other samples consisted of males only. According to Cale and Lilienfeld (2002), psychopathy may be differentially expressed across males and females, thus the inclusion of female participants may have create a potential confound in the derivation of more clear cut variants.

In terms of ethnicity, the majority of subtyping studies consist primarily of Caucasians. Given concerns raised by researchers such as Skeem, Edens, Camp, and Colwell (2004) regarding traits used to define psychopathy or its method of assessment possibly making the construct less valid in ethnically diverse samples, it is understandable that subtyping studies inclusive of primarily Caucasian participants, relative to ethnic minorities, may yield differing results. Lastly, variations in participants' age range in the various subtyping studies warrants attention as well. Given numerous developmental differences between elementary school aged-children and adolescents, studies investigating the presence of psychopathy variants among children (ages 6 to 13; e.g., Christian et al., 1997) compared to adolescents (ages 12 to 19; e.g., Vincent et al., 2003) seem likely to yield different cluster analytic findings.

Notably, initial empirical investigations attempting to subtype youth into meaningful groups (e.g.'s, Christian et al., 1997; Frick, Bodin, et al., 2000) were not theory-driven. Rather, such studies sought to identify subtypes of children and adolescents based solely on levels of psychopathic traits. More recent research considers both theoretical (e.g., Karpman, 1941; Lykken, 1995) and empirical conceptualizations of primary and secondary variants in their investigations. For example, following Karpman's (1948) assertions that trait anxiety is central to distinguishing between primary and secondary variants of psychopathy, an increasing number of subtyping studies continue to provide growing empirical evidence that anxiety is a key construct in distinguishing between primaries and secondaries.

Finally, choice of criterion measures to validate clusters differs substantially across studies. More recent investigations use an array of theoretically and practically relevant external criterion variables, relative to the more limited selection of criterion measures included in earlier research. For example, Vaughn and colleagues (2009) demonstrated that primaries and secondaries differed from one another in a theoretically meaningful manner across a variety of correlates, namely rates of personal victimization, past year drug use, violent offending, and total self-reported delinquency, whereas Andershed et al., (2008), for example, used substance use and number of conduct disorder symptoms as external criterion variables.

Psychopathy Variants among Juvenile Samples

Even though the majority of research has treated psychopathy as a unitary construct, over the past decade, this traditional conceptualization of psychopathy has been challenged by the findings of several empirical studies using adult samples (as described above). The ability to disaggregate psychopathic individuals into distinct subgroups consistent with the theoretical conceptualizations of primary and secondary psychopathy provides evidence of measurable heterogeneity among individuals classified as 'psychopaths' (see Skeem et al., 2003).

Prior to examining whether primary and secondary variants were visible among juvenile samples, initial cluster analytic work sought to identify subtypes of children and adolescents based solely on levels of psychopathic traits. The earliest known cluster analytic study, Christian et al. (1997), involved a cluster analysis on both parent and teacher ratings of the Callous/Unemotional (CU) and the Impulsivity/Conduct Problems

(I/CP) factors of the Psychopathy Screening Device as well as a number of oppositional defiant/conduct disorder (ODD/CDD) symptoms (reported by both parents and teachers) in a sample of 120 clinic-referred children (ages 6 to 13). A four cluster solution was identified: clinic control ($n = 39$), callous/unemotional ($n = 41$), impulsive conduct ($n = 29$), and psychopathic conduct ($n = 11$). Two of the subgroups, i.e., the impulsive and psychopathic conduct clusters, demonstrated high rates of CD and ODD symptoms relative to the other clusters. However, the psychopathic conduct subgroup demonstrated significantly higher levels of CU traits as well as more oppositional, aggressive, and covert property-destructive symptoms than the impulsive conduct cluster.

Similarly, Frick, Bodin, et al. (2000) conducted a cluster analysis on the Narcissism, Callous-unemotional, and Impulsivity factors of the APSD in a large non-referred community sample of elementary school age children ($n = 1136$). The five clusters identified varied in the severity of the three measured factors, namely: Low psychopathy, mild callousness, pure narcissism, pure impulsivity, and high psychopathy. The largest cluster ($n = 288$), the low psychopathy group, obtained relatively low scores across all three APSD factors. Three of the clusters (ns = 121 to 157) obtained at least one elevated factor score. The high psychopathy cluster ($n = 114$; approximately 10% of the sample) obtained high scores across all three APSD subscales and demonstrated the highest rates of ADHD, CD, and ODD diagnoses and symptoms relative to the other clusters. Notably, the mild callousness cluster demonstrated moderately high scores on the Callous-Unemotional subscale. With the exception of the low psychopathy cluster,

the mild callousness cluster demonstrated lower rates of externalizing psychopathology relative to the other clusters.

Extending upon the work of Christian et al. (1997) and Frick, Bodin, et al. (2000), Vincent et al. (2003) conducted a cluster analysis of the affective, interpersonal, and behavioral factors of the PCL: YV in a sample of 259 incarcerated male adolescent offenders (ages 12 to 19). Four clusters were identified that varied in their mean scores across the three factors: Low psychopathic ($n = 74$), callous-deceitful ($n = 63$), impulsive ($n = 75$), and high psychopathic ($n = 47$). The high psychopathic cluster was the only group to obtain elevated mean scores across all three factors. Concurrent and prospective comparisons of external correlates across the four clusters indicated that the high psychopathic group initiated criminality and conduct problems significantly earlier and demonstrated a significantly higher base rate for violent recidivism relative to the other clusters. Those youth within the high psychopathic group who committed violent crimes post-release, on average, recidivated after a four-month time period, which was substantially earlier than the other groups.

More recently, Andershed et al. (2008) applied model-based cluster analysis (MBC; Banfield & Raftery, 1993) to the three factors of the Hare Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995), (i.e., Arrogant and Deceitful Interpersonal Style, Deficient Affective Experience, Impulsive and Irresponsible Behavioral Style) in a sample of 148 incarcerated German male offenders (ages 15 to 25). Results of this analysis yielded three clusters: Low psychopathic ($n = 52$), Unemotional/Impulsive-Irresponsible ($n = 53$), and Psychopathic ($n = 43$). The

Unemotional/Impulsive-Irresponsible group only obtained elevated scores on the

affective and behavioral dimensions of psychopathy, whereas the low psychopathic

group obtained relatively low levels on all three factors. Youth in the psychopathic

cluster were characterized by elevated scores on all three psychopathy factors,

significantly more conduct disorder symptoms, and a higher frequency of conduct

disorder diagnosis compared to the other clusters. With the exception of alcohol and

marijuana use, youth in the psychopathic cluster exhibited a significantly higher

frequency of substance use problems relative to the other clusters. The low psychopathic

and the Unemotional/Impulsive-Irresponsible clusters did not differ significantly from

one another in regards to substance use problems.

Unlike previous empirical attempts to identify meaningful psychopathy

subgroups among juvenile samples, Wareham et al. (2009) was the first theory-driven

investigation to my knowledge that sought to identify primary and secondary variants of

psychopathy among justice-involved youth. Their sample consisted of both male and

female first-time offenders ($N = 165$) enrolled in a diversion program. To ensure that

subtypes with distinct profiles were identified rather than just psychopathic trait level

differences, indicators of anxiety (internalizing problems) and externalizing problems,

along with the three YPI factors (i.e., Callous–Unemotional, Grandiose–Manipulative,

and Impulsive–Irresponsible) were included in the latent class factor analyses (LCFA).

Similar to previous subtyping studies (e.g., Christian et al., 1997; Swogger &

Kosson, 2007; Vassileva et al., 2005; Vincent et al., 2003) four classes were identified,

namely: Nonpsychopathic ($n = 103$), impulsive ($n = 21$), impulsive-anxious ($n = 30$), and

psychopath-like ($n = 11$). The nonpsychopathic group was characterized by obtaining below average levels of psychopathy, internalizing and externalizing problems. Relative to the impulsive and psychopath-like groups, the impulsive-anxious group obtained slightly elevated interpersonal psychopathic features and the highest levels of anxiety. The psychopath-like group demonstrated the highest levels of affective, interpersonal, and behavioral factors of psychopathy as well as externalizing problems, but below average anxiety levels, similar in magnitude to those of the non-psychopathic group.

Relationships between the subgroups and various theoretically relevant historical (e.g., prior delinquent behavior and substance use) and prospective outcome measures (e.g., recidivism) were also assessed. The non-psychopathic group demonstrated significantly lower levels of prior and subsequent substance use, prior family problems, as well as prior and subsequent offending relative to the psychopath-like group. Level of prior offending (both total and violent) was the highest for the psychopath-like group. The two impulsive groups were characterized as having the highest levels of family problems, which was a proxy indicator of socialization difficulties.

The impulsive-anxious subtype was characterized by elevated levels of anxiety and externalizing behavior problems, which is consistent with theoretical conceptualizations of the secondary variant (e.g., Lykken, 1995). However, these youth failed to obtain elevated scores on the psychopathy factors. Youth in the psychopath-like group demonstrated elevated psychopathy scores, low levels of anxiety, high levels of impulsive/risk-taking problems, and involvement in prior offending, which appear generally consistent with the primary variant of psychopathy (Karpman, 1941). As

described above, Wareham and colleagues' cluster analytic findings produced a somewhat theoretically coherent primary variant of psychopathy. However, they failed to identify a comparable subgroup that was consistent with both theoretical and empirical conceptualizations of a secondary variant. The inclusion of female participants may have created a potential confound (see Cale & Lilienfeld, 2002) that may have adversely affected the capacity of their cluster analytic technique to yield a more clear cut secondary variant. Overall, the results of their investigation were rather mixed relative to other prior subtyping studies such as Vincent et al. (2003).

Further extending previous subtyping studies conducted with both adult and juvenile samples, Vaughn et al. (2009) used a sample of 267 incarcerated juvenile offenders (male and female) to distinguish psychopathy variants. In the initial steps of their study, Vaughn and colleagues used the APSD as a screening device to identify a "high" psychopathic subgroup, which ultimately consisted of youth scoring one and a half standard deviations above the mean (APSD score of 24 or above).Within this high psychopathic group ($n = 132$), a finite mixture modeling approach was applied to a number of indicators of psychological distress to identify latent primary and secondary variants, namely: the MAYSI-2 subscales of traumatic experience and suicidal ideation, several subscales of the Brief Symptom Inventory (BSI; Derogatis, 1993) (anxiety, depression phobic anxiety, somatization, interpersonal sensitivity, obsessive-compulsive, and paranoia), ADHD diagnosis, and prescribed antidepressant medication.

Results of this analytic approach yielded support for both primary ($n = 64$) and secondary ($n = 68$) subgroups. The secondary subgroup exhibited more psychiatric

symptoms as indicated on the various BSI subscales, suicidal ideation, ADHD diagnoses, and antidepressant use compared to the primary subgroup. Secondaries were also more likely to have a history of trauma relative to the primaries, whereas youth in the primary subgroup obtained comparable scores to the nonpsychopathic group ($n =$ 135) on the indicators of psychological distress. Consistent with the constellation of theoretically relevant external correlates associated with primary and secondary subtypes evidenced among adult samples, youth in the secondary subgroup reported greater personal victimization, past year drug use, violent offending, property offending, and total self-reported delinquency relative to the primary subgroup.

Consistent with Vaughn et al. (2009), Lee et al. (2010), considered both theoretical and empirical conceptualizations of primary and secondary variants in their investigation. Lee and colleagues conducted two separate model-based cluster analyses on the APSD and PCL: YV in 94 male adolescent offenders (ages 12 to 18 years; 53 % African American). Along with the respective psychopathy factors, trait anxiety was also included in each analysis. Analyses for both the PCL-YV and APSD, respectively, yielded a three-cluster solution that designated groups with low ($n = 36$; $n = 40$), moderate ($n = 43$; $n = 44$), and high ($n = 14$; $n = 10$) levels of psychopathic traits and varying levels of trait anxiety. For example, the high psychopathic cluster demonstrated elevated levels across all three psychopathy factors as well as high trait anxiety, whereas youth in the moderate cluster obtained moderate levels on one or more of the psychopathy factors and low to high levels of trait anxiety.

In terms of group differences on several external criterion variables, (i.e., personality traits, risk and treatment amenability, and official violent recidivism), the low psychopathic group demonstrated more "positive" personality traits such as greater extraversion, conscientiousness, and agreeableness as well as lower scores on a scale assessing risk for dangerousness, whereas the high psychopathic cluster exhibited more "negative" personality traits (i.e., lower levels of the personality correlates noted above) and higher risk for dangerousness. The moderate psychopathic trait group was heterogeneous in nature, consisting of individuals who demonstrated both high and low levels of personality traits and risk for dangerousness. Notably, the three clusters did not significantly differ from one another on rates of violent recidivism.

As noted by Lee and colleagues (2010), the findings of this study provided limited support for the existence of primary and secondary variants of psychopathy in male youth. The subtypes that were identified appeared to be different from the adult subtypes and juvenile variants revealed in previous empirical research (e.g., adults, Hicks et al., 2004; Skeem et al., 2007; youth, Vaughn et al., 2009). Several aspects of this study, such as modest sample size and use of a rationally constructed measure of trait anxiety that overlapped with neuroticism, likely contributed to their failure to identify primary and secondary variants of psychopathy among male youth.

Veen et al. (2011) were interested in identifying psychopathy subtypes among a Dutch juvenile offender population as well as exploring the relationship of the subtypes with various mental health problems. Latent class analyses (LCA) were conducted on the Affective, Interpersonal, and Lifestyle factors of the YPI in a sample of 299 incarcerated

male juvenile offenders (ages 12 to 18) to identify psychopathic youth. Results of these analyses indicated that youth could be classified into either a low psychopathic group (n = 209) characterized by lower than average scores on the three YPI factors or a high psychopathic group (n = 90) characterized by higher than average scores on the various YPI factors.

In an effort to identify subtypes within the high psychopathy subgroup, Veen and colleagues conducted a second LCA on the three psychopathy factors and the Anxious/Depressed syndrome scale of the Youth Self-Report (YSR; Achenbach, 1991). Two psychopathic subgroups were identified within the high psychopathic subsample: low anxious/depressed (n = 77) and high anxious/depressed (n = 13) psychopathic subgroups. Compared to their low anxious/depressed counterparts, youth in the high anxious/depressed psychopathic subgroup obtained lower scores on the affective traits of psychopathy and reported higher levels of externalizing problems and substance use. Youth in the high anxious/depressed psychopathic group also reported a greater number of mental health problems relative to the non-psychopathic and low anxious/depressed psychopathic group. The characteristics of these two subtypes are generally in line with former descriptions of low anxious and high anxious psychopathic variants.

More recently, Kimonis et al. (2011) investigated potential variants of psychopathy among youth using an initial sample of 200 incarcerated male offenders (ages 14 to 17 years). These researchers were also interested in examining differences in the temporal stability of psychopathic traits and rates of violence between the two predicted variants over a two-year follow-up time period. Youth with high scores on the

PCL: YV (PCL: YV scores of 27 or higher) were identified as the clustering subsample (see similar cluster analytic approaches for adults, Hicks et al., 2004; Skeem et al., 2007 and juveniles, Vaughn et al., 2009). Because anxiety has been theoretically and empirically tied to subtypes, model-based cluster analysis was performed within the high psychopathic subsample ($n = 116$) on the four facets of the PCL: YV and the Physiological, Worry/Oversensitivity, and Social Concerns/Concentration subscales of the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Rickmond, 1985).

This analytic approach yielded a two cluster solution: one subgroup labeled "secondary" ($n = 39$) was characterized by significantly higher anxiety scores as well as higher scores on the PCL: YV interpersonal facet relative to the low-anxious labeled "primary" subgroup ($n = 74$). These identified subgroups did not significantly differ from one another on any of the other PCL: YV facets. In terms of group differences on theoretically relevant external criterion variables, secondary variants scored significantly higher than primaries on abuse history, hostility, depression, and global psychological distress at each assessed time point (i.e., baseline, one year, two years). Youth in the secondary group also exhibited greater psychosocial immaturity compared to individuals in the primary group.

Regarding subsequent behavioral problems, secondaries engaged in significantly more overall institutional violence over a two-year time period relative to primaries as well as a greater number of reactive violent incidents. No significant difference was evident between the variants in instrumental violence. In regards to stability of PCL: YV

29

scores and violent offending over a two-year time period, secondary variants showed similar stability in PCL: YV scores as primary variants, although secondaries demonstrated great instability in institutional violence. Overall, results of Kimonis and colleagues' cluster analytic study demonstrated that juveniles with high scores on a measure of psychopathy can be disaggregated into subgroups that look like primary and secondary variants identified in adult samples.

Kimonis et al. (2012) also conducted a more recent investigation of psychopathy variants in a male juvenile offender sample ($n = 373$), which particularly focused on group differences in substance use prior to and during incarceration. Unlike other empirical studies that examined psychopathy variants among juvenile samples, Kimonis and colleagues' sample predominantly consisted of ethnic minorities (53% Hispanic, 29% African American, and 12% other [bi- or multi-racial]), rather than primarily Caucasian participants. Consistent with methodology employed in prior empirical studies of psychopathy variants (e.g., youth, Kimonis et al., 2011; Vaughn et al., 2009; adults, Skeem et al., 2007), Kimonis and colleagues performed model-based cluster analyses on a subsample of youth ($n = 165$) who obtained elevated scores on the YPI (total score > 122) to derive clusters consistent with primary and secondary variants. Youth with YPI total scores of 121.5 and below were used as a non-psychopathic comparison group ($n= 208$).

The best-fitting model produced by the cluster analysis was a two-cluster solution. The cluster ($n = 43$) labeled 'secondary' was characterized by significantly higher levels of anxiety, total YPI and Impulsive-Irresponsible lifestyle factor scores, but

30

not Callous-Unemotional or Grandiose-Manipulative scores, compared with the other cluster ($n = 122$) that was labeled 'primary.' Relative to the psychopathy variants, the non-psychopathic comparison group was significantly less anxious than secondary variants, but slightly more anxious than primary variants.

Secondary variants reported significantly greater psychological distress, dysphoria, anger as well as greater rates of maltreatment compared to primary variants. The secondary variants reported, on average, a significantly higher frequency of pre-incarceration substance use (particularly alcohol use), followed by the primary variants, then the non-psychopathic comparison group. Youth in the secondary variant were two times more likely to abuse substances while incarcerated compared to the primaries, and were over four times more likely than both youth in the primary variant and comparison group to have met diagnostic criteria for a DSM-IV substance-related disorder in the past. Findings from Kimonis and colleagues' study provide further empirical support for and bolster theoretical conceptualizations of the primary/secondary distinction among youth samples.

Using the same sample of incarcerated adolescent male offenders that was described in the research of Kimonis et al. (2012), Tatar et al. (2012) reported results for additional variables not included in the earlier study. More specifically, they sought to determine whether secondary variants reported greater histories of trauma and victimization and more PTSD symptoms and dissociation than primary variants. Secondary variants reported a significantly higher rate of lifetime trauma exposure and greater likelihood of past PTSD symptoms compared to primary and non-psychopathic

youth. However, no significant differences were indicated between any of the groups on past or current PTSD diagnoses. Secondary and primary variants did not significantly differ from one another on reported past dissociative experiences, although secondaries were nearly two and a half times more likely to report previous dissociative experiences than non-psychopathic youth. As noted by the authors, the primary and secondary variants differential rates of trauma history is consistent with prevailing theoretical perspectives on psychopathy subtypes (Karpman, 1955; Porter, 1996). However, Porter's (1996) assertion regarding the prevalence of dissociative symptoms as a result of early traumatic experiences among secondaries was not supported.

In summary, particularly in the last five years, several studies have examined variants of psychopathy among youth. Despite the limitations of and differences in their methodological approaches, findings from the majority of these empirical investigations provide some support for the existence of primary and secondary variants in juvenile samples. Interestingly, as previously mentioned, despite the evidence supporting the importance of CU traits and youth high on CU traits being a heterogeneous group, no study to date as cluster analyzed these juveniles.

Exposure to Community Violence

As previously discussed, adverse environmental events and trauma history have been consistently linked to a hypothesized etiological pathway in the development of psychopathic traits referred to as the secondary variant. Unfortunately, research focused on the disaggregation of psychopathy into variants or subtypes has traditionally used a global indicator of abuse history or total summary score on a generic negative lifetime

32

events survey. Such limited methodology results in the failure to take into account a more detailed assessment of as well as the effects of other potentially traumatic events, such as exposure to community violence.

Empirical studies of exposure to community and neighborhood violence have indicated that it has an adverse impact on various domains of development as well as emotional and behavioral functioning in youth (e.g., Fitzpatrick & Bodizar, 1993; Jenkins & Bell, 1994). For example, youth faced with chronic exposure frequently experience distress, anxiety, depression, and posttraumatic stress symptoms (Fitzpatrick, 1993; Osofsky, Werers, Hann, & Fick, 1993). Along with internalizing symptoms, other research has demonstrated that exposure to community violence predicted antisocial behavior and aggression (Gorman-Smith & Tolan, 1998; Miller, Wasserman, Neugebauer, Gorman-Smith, & Kamboukos, 1999). The differential emotional impact that results from exposure to community violence is consistent with the maltreatment literature, which suggests that there may be heterogeneous affective outcomes resulting from maltreatment (Pollak, Cicchetti, Hornung, & Reed, 2000).

In terms of the association between callous-unemotional traits and community violence, Kimonis et al. (2008a) was the first study to provide empirical evidence for the significant association between CU traits and exposure to community violence. As previously discussed, there was an interaction between CU traits and exposure to violence in predicting responses to distress images, Kimonis et al. (2008a) suggested that this finding potentially provides evidence for a second environmentally influenced pathway to the development of CU traits, whereas prior empirical work predominantly

33

focused on the environmentally influenced developmental pathway (i.e., secondary variant) being attributed to maltreatment history, particularly abusive experiences. Additionally, Kimonis and colleagues suggested that exposure to community violence results in a reduced sensitivity to emotional stimuli via a desensitization process (Cooley, Boyd, Frantz, & Walsh, 2001), which could then lead to the development of CU traits in youth.

Given the numerous adverse consequences of exposure to community violence as well as empirical findings of Kimonis et al. (2008a), failure to investigate exposure to community violence as a potential pathway to the development of CU traits among youth results in a major void in the literature. Therefore, a secondary aim of the current study is to explore whether multiple pathways exist within the secondary variant as a function of maltreatment experiences and exposure to community violence (both direct and indirect).

Present Study

As previously noted, despite the importance of CU traits and youth high on CU traits being a heterogeneous group, no study to date has cluster analyzed data from these juveniles. Therefore, the purpose of the current study was to address this gap in the literature as well as various methodological limitations of prior subtyping studies. The first aim involves assessing whether two or more high CU trait subgroups with distinctive personality and emotional profiles can be identified via model-based cluster analysis among justice-involved youth. Second, it will be determined whether the constellation of theoretically and practically relevant correlates associated with the

34

subgroups resemble primary and secondary variants of psychopathy. Third, a more exploratory aim involves examining whether multiple pathways exist within the secondary variant as a function of childhood maltreatment and exposure to community violence by performing a second model-based cluster analysis on individuals in the identified secondary variant. If multiple secondary clusters can be identified, external validation analyses will be conducted on these empirically-derived groups to determine whether they differ from one another in theoretically and practically meaningful ways.

Aims and Hypotheses

Aim One: To Investigate whether Two or More CU Trait Subgroups with Distinctive Personality and Emotional Profiles can be Identified among Justice-Involved Youth

The presence of two subgroups could potentially provide evidence of differential developmental pathways to the development of CU traits that are consistent with the theoretical and empirical variants of primary and secondary psychopathy. Similar to the methodological approaches employed in more recent subtyping studies (adults, Poythress et al., 2010; youth, Kimonis et al, 2011; Kimonis et al, 2012; Tatar et al., 2012), model-based cluster analysis (Fraley & Raftery, 2003) will be used to investigate the utility of CU traits and theoretically relevant constructs for identifying low-anxious primary and high-anxious secondary variants.

I predict the emergence of two subgroups, each of which will be distinguished by a distinct pattern of elevated scores on the three subscales (i.e., Callousness, Unemotional, and Uncaring) of the ICU consistent with the profiles of previous empirically-derived primary and secondary variants. Additionally, consistent with other

subtyping studies, I also hypothesize that a non-psychopathic group will emerge characterized by below average scores on each of the three ICU factors. The anticipated patterns of elevated ICU factors for both the primary and secondary variants are informed by the findings of two studies that investigated the factor structure of the ICU in juvenile samples (Essau et al., 2006; Kimonis et al., 2008b). As previously discussed, both studies demonstrated differential relationships between the ICU factors and various theoretically important correlates.

 The combined findings from Essau et al. (2006) and Kimonis et al. (2008b) suggest that Callousness is an important factor for identifying problematic behavior. Given that prior studies have demonstrated stronger associations with total self-reported delinquency (Vaughn et al, 2009) as well as significantly more overall institutional violence for secondaries relative to primaries (Kimonis et al., 2011), I hypothesize that the secondary variant's profile will be characterized by above average levels on the Callousness factor compared to the primary variant.

In terms of the Unemotional factor, despite the equivocal consistency in findings across the two studies, I hypothesize that primaries will likely obtain higher average levels on the Unemotional factor relative to the secondaries, particularly given this factor's demonstrated relationship with emotional functioning and lack of association with antisocial behaviors.

As previously discussed, compared to the Callousness and Unemotional dimensions, the aggregated pattern of associations between the Uncaring factor and various theoretically relevant constructs is arguably inconsistent with both the primary

36

and secondary psychopathy conceptualizations. Given the nature of the previously described findings, it could be argued that either the primary or secondary variant would obtain elevated average scores on the Uncaring factor. Therefore, no specific directional hypothesis will be proposed for this factor.

Based upon both theory and previous research, I considered anxiety a key construct to distinguish between primary and secondary variants. Thus, I anticipate that the potential secondary variant will be characterized by elevated anxiety levels, whereas the primaries will obtain below average anxiety scores. I predict that the non-psychopathic subgroup will obtain slightly higher anxiety scores relative to the primaries, but substantially lower scores compared to the secondaries.

Aim Two: To Determine whether the Constellation of Correlates associated with the

Subgroups Resemble Primary and Secondary Variants of Psychopathy

Predicting that the hypothesized psychopathy variants might emerge from the cluster analysis, I developed a series of hypotheses regarding how the primary and secondary variants will differ from one another on several theoretically and practically relevant criterion measures. Because my primary interest was on theoretical subtypes, my analyses will focus mainly on specific comparisons among selected groups.

Internalizing Psychopathology

Two broad symptom dimensions underlie an array of diagnoses of psychopathology (Krueger & Markon, 2006). The internalizing dimension is related to anxiety and other negative emotions (Vollebergh, Iedema, Bijl, de Graaf, Smit, & Ormel, 2001). As previously discussed, Karpman characterized the secondary

psychopath as "… pervaded with states of anxiety, depression and guilt" (Karpman, 1948, p. 526). Likewise, Lykken (1995) described secondaries as "…stress-reactive, worried, irritable" (Lykken, 1995, p. 37). Conversely, primary psychopaths are considered to be rather resistant to negative emotions (Cleckley, 1941/1982; Karpman, 1948; Lykken, 1995). Empirically, secondary subtypes have demonstrated elevated levels of internalizing psychopathology, relative to primaries in both adult (e.g., Poythress et al., 2010; Skeem et al., 2007) and juvenile samples (e.g., Kimonis et al., 2011; Vaughn et al., 2009; Veen et al., 2011). Thus, I predict higher average scores for secondary variants than for primaries on a broadband indicator of internalizing problems.

Externalizing Psychopathology

The externalizing dimension encompasses various behaviors and personality traits such as aggression, impulsivity, antisocial behaviors, and substance use (Krueger, Hicks, Patrick, Carlson, Iacono, & McGue, 2002; Krueger, Markon, Patrick, Benning, & Kramer, 2007). Empirical findings have consistently demonstrated stronger relationships between externalizing symptoms and secondary subtypes than for primaries (adults, e.g., Poythress et al., 2010; youth, Vaughn et al., 2009). Thus, I predict higher mean scores on the broadband measure of externalizing problems for secondary than for primary psychopathic subtypes.

Other Personality Traits

I am also interested in primary and secondary group differences on interpersonal dominance. The role of interpersonal style in distinguishing between primary and

secondary subtypes was initially asserted by Blackburn (1987). According to Blackburn, the primary psychopath displays an extroverted, confident, and dominant style, whereas secondary psychopaths are more socially withdrawn and inhibited. Although no prior subtyping studies among juvenile samples have examined the relationship between interpersonal dominance and psychopathy subtypes, primary psychopaths showed greater levels of dominance relative to secondaries in an adult offender sample (Poythress et al., 2010). Thus, I predict elevated scores on an indicator of interpersonal dominance for primaries, relative to secondaries.

Aggression

Given that secondary psychopaths seem to demonstrate a greater susceptibility to negative emotions than primaries, theorists have proposed that individuals with secondary psychopathy may be more aggressive and violent (Blackburn, 1987; Mealey, 1995). For example, Karpman (1948) described secondary psychopaths as hot-headed, whereas primary psychopaths appeared more cool and deliberate. Skeem et al. (2003) theorized that secondary variants are more prone to reactive violence (i.e., angry response to perceived provocation), whereas primary variants are more likely to engage in instrumental aggression (i.e., to achieve a secondary goal, like obtaining power). This distinction in aggression type between psychopathy variants, particularly regarding secondaries engaging in more reactive aggression/violence relative to primaries, has been evidenced in several empirical investigations (adults, Hicks et al., 2004; youth, Falkenbach, Poythress, Creevy, 2008; Kimonis et al., 2011; Vaughn et al., 2009). Thus, I

predict that secondaries will demonstrate higher levels of reactive aggression relative to primaries, whereas primary variants will engage in more instrumental aggression.

Substance Abuse

Theoretically, Lykken (1995, p.142) hypothesized that primary psychopaths would be less prone to the use of alcohol and other sedating drugs than would secondary psychopaths. Empirically, there is increasing evidence for greater substance abuse in adult secondary variants of psychopathy (Skeem et al., 2007; Swogger & Kosson, 2007; Vassileva et al., 2005). Similarly, among juvenile samples, higher rates of substance use were evidenced in secondary variants relative to primaries (Kimonis et al., 2012; Vaughn et al., 2009). Therefore, I hypothesize that secondary variants will report elevated levels of substance use relative to primary variants.

Self-reported Delinquency, Prior Arrests, and Supervision/Probation Violations

As previously mentioned, individuals described as secondary variants of psychopathy are likely to be more susceptible to negative emotions and impulsivity. The empirical literature suggests that total self-reported delinquency as well as nonviolent and violent offending would be higher in emergent secondary psychopathic groups than in primary psychopaths (Kimonis et al., 2011; Vaughn et al., 2009). Thus, I predict that individuals in the identified secondary subtype will engage in a higher frequency of total self-reported delinquency as well as nonviolent and violent offending compared to primaries. Also, given the more reactive, impulsive nature of secondaries relative to primaries, I predict that secondary variants will incur a greater number of

supervision/probation violations compared to primary variants and will also have a more extensive arrest history.

Aim Three: To Explore whether Multiple Subgroups Exist within the Secondary Variant as a Function of Traumatic Experiences

As previously discussed, adverse environmental events and trauma history have been consistently linked to a distinct etiological pathway in the development of psychopathic traits referred to as the secondary variant. Given the high rates of childhood adversity among justice-involved juvenile populations, the suggestion that trauma and abuse provide the necessary conditions for the development of secondary psychopathy is particularly relevant (Cauffman, Feldman, Waterman & Steiner, 1998; Weeks & Widom, 1998). Several empirical investigations demonstrate associations between reports of childhood abuse and neglect with elevated scores on psychopathy measures (Campbell, Porter, & Santor, 2004; Forth & Burke, 1998; Krischer, & Sevecke, 2008; Weiler & Widom, 1996).

As previously discussed, prior subtyping studies in both adult and juvenile samples have typically used a global indicator of abuse history or total summary score on a generic negative lifetime events survey. Such restricted methodology results in the failure to assess other potentially traumatic events, such as exposure to community violence. Given the numerous adverse consequences of exposure to community violence as well as its potential utility in further disaggregating the secondary variant, I decided to explore whether multiple pathways exist within the secondary variant as a function of maltreatment experiences and exposure to community violence.

41

I will approach this more exploratory aim of my study via a second set of model-based cluster analyses using an indicator of abuse/neglect history as well as an index of exposure to community violence as clustering variables for only those individuals who were previously identified as secondaries. I anticipate that within the secondary variant at least two subgroups will be identified: One subgroup will be characterized by elevated levels of exposure to community violence and lower levels of previously endured abuse/neglect, whereas the second subgroup will demonstrate predominantly higher levels of abuse/neglect and lesser levels of exposure to community violence.

If these predicted multiple pathways can be identified, I will assess whether these empirically-derived groups are meaningful by examining whether they differ from one another in theoretically and practically meaningful ways. Only correlates thought to be critical in the distinction between multiple secondary pathways will be examined. Therefore, only a select number of external criterion measures used in the initial set of cluster analyses to distinguish primary and secondary variants will be used in these supplementary analyses.

Aggression and Violence

Childhood abuse and neglect are associated with aggressive behaviors and an increased likelihood of delinquency (Turner, Finkelhor, & Ormrod, 2006; Widom, Schuck, & White, 2006). Relatedly, witnessing or being directly victimized by community violence increases the likelihood for engaging in future aggression (Cooley et al., 2001). In terms of specific types of aggression, a link exists between reactive aggression and abuse, particularly physical abuse (Ford, Fraleigh, & Connor, 2010).

However, no such association between abuse and proactive aggression has been demonstrated. Although the reactive and proactive/instrumental aggression distinction has not been specifically examined in the community violence literature, youth exposed to high levels of community violence engage in aggressive and violent acts that represent both reactive and instrumental aggression/violence (Flannery, Singer, & Wester, 2001). Thus, I predict that individuals in the secondary pathway characterized by elevated levels of abuse/neglect will report higher reactive aggressive scores relative to the community violence pathway, whereas the pathway characterized by high levels of exposure to community violence will report higher levels of instrumental aggression and combined aggression scores relative to the abuse/neglect pathway. Relatedly, I predict that individuals in the elevated exposure to violence group will engage in more violent offending relative to the group characterized by a more severe abuse history. I do not have reason to believe that these two pathways will differ in total self-reported delinquency.

Internalizing and Externalizing Psychopathology

Although both childhood maltreatment as well as exposure to violence have been linked to the increased likelihood of developing internalizing problems, this relationship has not been consistently demonstrated in the community violence literature. Therefore, I hypothesize that the secondary pathway characterized by elevated levels of abuse/neglect will report higher levels of internalizing problems, relative to the pathway characterized by community violence. Conversely, since considerable empirical evidence exists regarding the association of externalizing problems and adolescent

43

substance abuse with both childhood maltreatment and exposure to community violence, no specific directional hypotheses will be developed for these criterion measures.

Other Personality Traits

Given that the overall predicted pattern of correlates associated with the secondary pathway characterized by elevated levels of exposure to violence is generally consistent with the constellation of external criterion measures related to the primary variant, I hypothesize that these individuals will demonstrate a more dominant interpersonal style relative to the more severe abuse history pathway.

METHOD

Participants

Participants were 151 male juvenile offenders, ranging in age from 12 to 18 years ($M = 15.26$, $SD = 1.27$). The majority of participants ($n = 102$; 67.60%) were serving probation terms under the supervision of the court and Brazos County Juvenile Services (10.60 % of these adjudicated youth were categorized as receiving intensive supervision). The level of supervision/legal status for the remainder of the sample is as followed: Deferred prosecution (17.20%), conditional release (11.90%), and parole (3.30%). Based on self-identified ethnic background, the sample was composed primarily of ethnic minorities: Hispanics (45.00%), African Americans (37.70%), followed by Caucasians (11.90%), and mixed race (5.30%).

Participants' instant offenses listed in the official institutional records fell into the following categories: Drug offenses (27.80%), property offenses (27.20%), violent offenses against another person (excluding sexual offenses; 20.50%), offenses against public administration (e.g., evading arrest and detention; 12.60%), status offenses (7.30%), and sexual offenses (4.60%). Approximately half of the sample was diagnosed with a mental illness ($n = 76$) with the majority of these youth receiving the diagnosis of Attention-Deficit/Hyperactivity Disorder ($n = 66$) as a co-morbid condition or sole diagnosis. All English-speaking male youths between the ages of 12 and 19 years being supervised by the court and/or Brazos County Juvenile Services were eligible to enroll in the study.

Measures

Demographic Information

Participants provided via self-report the following demographic variables: age, ethnicity, current grade level, name of the crime associated with current juvenile justice involvement, dates of current supervision term, current medication prescription for mental or nervous problems, current mental health diagnoses, previous placement in foster care or group homes, current gang involvement, and whether they had previously experienced a head injury. All of the above demographic variables also were examined via standardized review of each participant's institutional file. Measures described below are categorized into clustering measures used in MBC to identify clusters and measures used to examine the external validity of the resultant clusters based on theoretical and empirical conceptualizations of psychopathy variants.

Clustering Variables

Callous-Unemotional Traits

The Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) is a self-report instrument designed to assess callous-unemotional (CU) traits in children and adolescents. This measure includes 24 items (e.g., "I do not care if I get into trouble") that are rated on a four-point Likert-type scale from 0 (Not at all true) to 3 (Definitely true). As previously discussed, the ICU was specifically developed to address the psychometric limitations of other instruments that measure these traits in children and adolescents (e.g., Callous-Unemotional subscale of the Antisocial Processing Device = 6 items) and to also provide a valid, reliable, and efficient assessment of CU traits. Results

of factor analyses across various studies, including both American juvenile offenders (Kimonis et al., 2008b) and non-referred German adolescents (Essau et al., 2006) have demonstrated a hierarchical three-factor model for this measure. In addition to loading on one of three subfactors, all items also load onto a higher order general "callous–unemotional" factor. The three factors identified in prior analyses were: Uncaring (8-items; e.g., "I feel bad or guilty when I do something wrong"; reverse coded), Callousness (11 items; e.g., "I do not care who I hurt to get what I want"), Unemotional (5 items; e.g., "I hide my feelings from others").

As previously discussed, differential associations between the three ICU factors and relevant external correlates (e.g., aggression, delinquent behavior, past offending, and emotional functioning) have been demonstrated (Essau et al., 2006; Kimonis et al., 2008b). Kimonis et al. (2008b) suggested that these findings provide at least preliminary evidence that CU traits may be a constellation of several moderately related facets of affective and interpersonal functioning that are differentially related to specific impairments. Therefore, the Callousness, Uncaring, and Unemotional dimensions were utilized in the initial cluster analysis for the current study.

According to Cleckley (1941) and Karpman (1948), anxiety is a significant feature for distinguishing primary and secondary psychopaths. Similar to the methodology used in Poythress et al. (2010), the anxiety scale (ANX) from the Personality Assessment Inventory-Adolescent (PAI-A; Morey, 2007b) was used to assess this feature. The PAI-A is a 264-item, self-report inventory that includes 4 validity scales, 11 clinical scales, 5 treatment scales, and 2 scales that assess

interpersonal style. According to Morey (2007b, p. 61) the development of the PAI-A "involved an adaptation of the Personality Assessment Inventory (PAI; Morey, 1991, 2007a) items to content that is meaningful to adolescents, with the goal of creating an instrument that would closely parallel the adult version of the inventory." Similar to the PAI, the PAI-A scales have demonstrated satisfactory psychometric properties across large samples of community and clinical samples (Morey, 2007b). The ANX scale items assess a variety of cognitive, physiological, and affective experiences associated with anxiety. Additional PAI-A scales and indicators of interest in this study are described below in the external validation measures section. Along with the ICU subscales, the PAI-A ANX was used as a clustering variable in the initial model-based cluster analysis.

Putative Etiological Factors: Exploratory Cluster Analyses

Contingent on identifying primary and secondary variants in the initial cluster analyses, a second series of model-based cluster analyses more exploratory in nature was to be conducted to determine whether multiple pathways exist within the secondary variant as a function of maltreatment and exposure to community violence. The following measures were to be used in this second set of cluster analyses.

Maltreatment Experiences

The Childhood Trauma Questionnaire Short-Form (CTQ-SF; Bernstein et al., 2003) is a 28-item self-report retrospective questionnaire designed to assess five types of childhood traumatic experiences: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. The CTQ-SF is a modified version of the original 70-item Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998).

48

According to Bernstein et al. (2003, p.175), the original CTQ scales were based on the following definitions of abuse and neglect. Physical abuse was defined as, "bodily assaults on a child by an adult or older person that posed a risk of or resulted in injury." Emotional abuse referred to "verbal assaults on a child's sense of worth or well-being or any humiliating or demeaning behavior directed toward a child by an adult or older person." Sexual abuse referred to "sexual contact or conduct between a child younger than 18 years of age and an adult or older person." Physical neglect referred to "the failure of caretakers to provide for a child's basic physical needs, including food, shelter, clothing, safety, and health care." Emotional neglect was defined as, "the failure of caretakers to meet children's basic emotional and psychological needs, including love, belonging, nurturance, and support."

The response options are provided on a five-point Likert-type scale and define the frequency of maltreatment experiences (Never, Rarely, Sometimes, Often, or Very Often True). Each of the five maltreatment experiences on the CTQ-SF is represented by five items. An additional three items encompass the Minimization/Denial validity scale, which has a possible range of 0 to 3 (i.e., one point is given for each item that is given a response of "5").

Results of factor analytic work conducted by Bernstein et al. (2003) using the CTQ-SF demonstrated that the five-factor structure of the CTQ provided a good fit for the data across four heterogeneous samples with varying maltreatment histories. Notably, the CTQ-SF demonstrated good criterion-related validity in the adolescent psychiatric inpatient sample, which was the only sample in this study in which criterion-

49

related validity was examined. Corroborative data in the form of therapists'

maltreatment ratings based upon both interviews with informants and file review were

available for these youth. As previously mentioned, contingent on identifying

psychopathic variants in the initial cluster analyses, the total score of the CTQ-SF was to

be used as a clustering variable in the second series of cluster analyses focusing solely

on the secondary variant.

Exposure to Community Violence

The Children's Report of Exposure to Violence-Revised (CREV-R; Cooley,

Turner, & Beidel, 1995) is a 33-item self-report questionnaire that was used to assess

youth's exposure to community violence. According to the instrument's developers,

community violence is defined as "deliberate acts intended to cause physical harm

against a person or persons" (Cooley et al., 1995, p.1364). The initial 29 items are rated

on a five-point Likert-type scale (No, Never; One time; A few times; Many times; Every

day) based on the frequency of lifetime exposure as well as past year exposure for

various types of community violence (i.e., direct witness, hearsay, or direct experience)

across three categories of victims: "strangers, familiar persons, and self" (Cooley et al.,

1995, p.1364). These items assess various violent situations such as being stabbed,

mugged/robbed, chased or seriously threatened. The final four items of this measure are

open-ended questions that inquire about other violent incidents that were not specifically

assessed in the previous questions. The CREV-R has demonstrated good internal

consistency, construct validity, and two-week test-retest reliability. A total score for

lifetime exposure was calculated by summing the responses for the initial 29 items. This

same procedure was repeated for calculation of past year exposure. The lifetime exposure total score was to be used in the second set of exploratory cluster analyses contingent on the initial set of analyses yielding clusters consistent with primary and secondary psychopathy conceptualizations.

<div align="center">*External Validation Variables*</div>

Broad-band Internalizing Psychopathology

This basic dimension of psychopathology was operationalized on the PAI by aggregating individual scales into a composite indicator variable as outlined by Ruiz and Edens (2008). Based on their prior factor analytic work, the internalizing scale (INT) was operationalized by calculating the mean value of the Depression (DEP), Suicide (SUI), Anxiety-Related Disorders (ARD), Somatic Complaints (SOM), Schizophrenia (SCZ), and Anxiety (ANX) scales. DEP captures features of depression (e.g., thoughts of hopelessness; feelings of sadness), whereas SUI assesses thoughts and feelings about taking one's own life. ARD items query participants about symptoms related to phobias, obsessive-compulsive thoughts and ruminations, and residual or recurrent problems related to past traumatic events. SOM items tap an individual's preoccupation with physical functioning and health matters, whereas SCZ items assess positive and negative symptoms of schizophrenia as well as thought disorder. Given that the current study utilized the ANX scale as one of the clustering variables, it was not included in the calculation of the INT index, which is consistent with Poythress et al.'s (2010) computation of this summary variable.

Broad-band Externalizing Psychopathology

Similar to the derivation of the internalizing dimension, the externalizing scale (EXT) was also operationalized according to Ruiz and Edens' (2008) model. EXT was computed by taking the average of scores from the following scales: Alcohol Problems (ALC), Drug Problems (DRG), Aggression (AGG), Borderline Features (BOR), Mania (MAN), Paranoia (PAR), and Antisocial Features (ANT) scales. Items on the PAI-A ALC scale assess frequency and consequences of drinking, loss of control, and alcohol related craving. DRG items assess similar problems for substances other than alcohol. AGG assesses behaviors (i.e., verbal and physical aggression) and affect (e.g., anger, hostility) related to aggression. BOR items tap various elements of borderline personality disorder pathology, such as affective instability, impulsivity, potential self-destructive behaviors, and disrupted interpersonal relationships. MAN items focus on disruptions in mood, cognition, and behavior that are "prototypic signs of a manic episode" (Morey, 2007a, p.99). PAR items tap "symptoms and enduring personality characteristics of paranoia" (Morey, 2007b, p. 105). ANT items tap a history of illegal acts and authority problems, egocentricity, instability, and excitement-seeking behavior.

Consistent with the calculation of both the INT and EXT indices using various PAI scales in adult samples according to Ruiz and Edens' (2008) model, this procedure was replicated with the corresponding PAI-A scales. I predicted that individuals in the secondary variant would report higher levels of both internalizing and externalizing behaviors, relative to the primary variants. Additionally, contingent upon identification of the secondary variant, individuals within the secondary pathway characterized by a

more severe abuse/neglect history were predicted to report higher levels of internalizing problems relative to the exposure of violence pathway.

Dominance

The Dominance (DOM) scale of the PAI-A assesses level of control and independence in interpersonal relationships, with low scores indicative of submissiveness. Previous research conducted in adult male offender samples, demonstrated that high DOM predicted general and aggressive institutional misconduct (Edens, 2009). Validity study findings suggest that some of the interpersonal control exhibited by high scorers might be exploitative in nature (Morey, 2007b, p. 125). Primary variants as well as individuals in the secondary pathway characterized by elevated levels of exposure to community violence were predicted to report higher DOM scores relative to their counterparts, respectively.

Proactive and Reactive Aggression

The Reactive-Proactive Aggression Scale (R-PAS; Dodge, 1991; Dodge, Lochman, Harnish, & Bates, 1997; Raine et al., 2006) is a 23-item self-report measure that assesses proactive and reactive aggression. Youth rate each of the items on a three-point Likert-type scale, 0 (never), 1 (sometimes), or 2 (often). This measure has demonstrated strong reliability as well as construct, convergent, discriminant, and criterion validity with other theoretically and empirically relevant correlates (Raine et al., 2006). The proactive and reactive summary scores were used in the current study to determine whether secondaries engage in more reactive aggression relative to primaries, and whether individuals in the primary variant demonstrate higher levels of proactive

aggression compared to secondaries, as predicted. It was also hypothesized that within the anticipated secondary variant, the pathway characterized by elevated levels of exposure to community violence would engage in more proactive and combined aggression relative to the hypothesized pathway characterized by a more severe abuse/neglect history. The latter pathway was predicted to engage in more reactive aggression relative to the exposure to violence pathway.

Self-reported Delinquent Behavior

The Youth Self-Report Delinquency Scale (SRD; Elliott, Huizinga, & Ageton, 1985; Elliott, Huizinga, & Menard, 1989) is a 23-item self-report measure that assesses violent and nonviolent delinquent behaviors. For each delinquent behavior, the youth indicates whether he has ever done the behavior ("yes" or "no"), how many times he has engaged in that particular act, as well as the age in which he first participated in the behavior. Consistent with previous uses of this measure (Kimonis et al., 2008b, Krueger, Schmutte, Caspi, Moffitt, Campbell, & Silva, 1994), the total SRD score was created by summing the number of delinquent acts committed (with a possible range of 0-23). The current study also used the violent offenses subscale (e.g., aggravated assault, strong armed others, gang fights), and nonviolent offenses subscale (e.g., property, drug, and status offenses) summary scores. This is a well-validated measure that has demonstrated satisfactory convergent validity (Krueger et al., 1994) and internal consistency (Lau, Marsee, Kunimatsu, & Fassnacht, 2011; Vaughn et al., 2009).

A standardized file review was also conducted to assess official arrest history and age of first arrest. Secondaries were predicted to engage in a higher frequency of

54

total self-reported delinquency as well as non-violent and violent offending compared to primaries. Relatedly, it was anticipated that youth within the hypothesized secondary pathway characterized by high levels of exposure to community violence would engage in more violent offending relative to the group characterized by a more severe abuse history.

Substance Use

Self-reported substance use was assessed via a modified version of Vaughn et al.'s (2009) multi-item polysubstance use matrix. Youth indicated the number of days that they used each substance in the past month as well as past year. For each substance used, youth were asked to report their age at first use. Three separate variables were used in the study analyses to assess past year substance use, namely alcohol use, marijuana use, along with an "other drug" use summary score, which was created by summing the frequency of all other types of substances used including cocaine, amphetamines, ecstasy, hallucinogens, heroin, inhalants, and inappropriate use of prescription drugs. Consistent with prior research, secondaries were predicted to exhibit higher levels of substance use (i.e., alcohol and marijuana use) relative to primaries.

Supervision/Probation Violations

Violations incurred while on probation or under court supervision were obtained through a standardized review of each participant's institutional file as well as via self-report. Individuals in the hypothesized secondary variant were expected to incur more probation violations than youth in the primary variant.

Control Variables

Consistent with statistical procedures used in Tatar et al. (2012), chi-square and ANOVA tests were conducted to examine subgroup (i.e., variant) differences in age, ethnicity, duration of incarceration, and time spent on probation or supervision to determine necessary control variables.

Procedures

All study procedures were approved by the University Institutional Review Board. In addition, a Certificate of Confidentiality was secured by the National Institutes of Health to ensure that the information to be disclosed by the youths would remain confidential. The principal investigator randomly approached potential participants in either the lobby area of the R. J. Holmgreen Brazos County Juvenile Justice Center or at the on-site school located at the Juvenile Justice Center. After providing a brief oral description of the present study, the principal investigator then inquired about the youth's level of interest in study involvement. If a youth expressed interest in study participation, his parent(s) or legal guardian(s) were asked to complete an informed consent granting permission for their child to participate in the present study.

Of the 216 youth who were approached, 36 of these youth did not complete the consent process for either one of the following reasons: a) the youth was not interested in study participation or b) the youth's parent(s) or legal guardian(s) refused to allow the youth to participate. Thus, parental or legal guardian written informed consent was obtained for 180 youth. Based on other studies that have been conducted with vulnerable populations, this latter group of youth underwent a detailed assenting process, which

involved concretely assessing potential participants' comprehension and voluntariness. As a check of comprehension, a brief multiple-choice test was administered to each potential participant at the end of the consent dialogue, and anyone who answered more than 20% of the items incorrectly was presumed unable to give informed assent. Voluntariness to participate in the study was also assessed after completion of the comprehension test. Although no youth indicated that one's decision to participate in the study was involuntary, 5 youth failed the test of comprehension, resulting in 175 youth assenting to study participation.

Each youth participating in the study met individually with the principal investigator on two separate occasions, for approximately one hour each meeting. Across the two meetings, youth were asked to complete several self-report questionnaires as well as a computerized task. A standardized review of each youth's institutional file was conducted to collect relevant demographic information, prior arrest history, violations of supervision/probation, as well as other relevant study variables. Participants were compensated $15.00 for their participation in each study session, for a total of $30.00. Five youth failed to complete the second study session; thus, these individuals were not included in the study analyses. An additional 19 participants failed to complete a single study session due to a number of reasons, such as withdrawal from the study, discharge from probation, ran away from home, etc., reducing the final sample size to the 151 cases described above. Validity scale scores on every PAI-A profile (Infrequency and/or Inconsistency scores, specifically) were within the acceptable range, resulting in all profiles being included in study analyses.

Data Analytic Plan

The original analytic plan involved performing model-based cluster analysis (MCLUST; Fraley & Raftery, 2003) on the z-scores for the Callousness, Uncaring, and Unemotional factors of the ICU and the ANX scale from the PAI-A (Morey, 2007b). Specifically, the model-based cluster analysis was conducted using R (R Development Core Team, 2009) to classify participants into the hypothesized primary and secondary variants. MCLUST attempts to fit multiple mixture Gaussian models and evaluates the goodness of fit of multiple solutions within each model and across models using the Bayesian Information Criterion (BIC) which specifies the odds that one model is the best fit compared to the other models. While higher BIC values indicate a better statistical fit, differences among the top BIC values of competing models indicate the relative strength of evidence supporting the greater BIC. According to rubrics delineated by Kass and Raftery (1995, p. 777), 0-2 point differences in BIC values suggest weak evidence for the better fitting model, 2-6 as "positive" evidence, 6-10 "strong" support, and more than 10 is considered to be "very strong" evidence favoring the model with the larger BIC.

Contingent on extracting hypothesized clusters that resemble primary and secondary psychopathic conceptualizations, multivariate analyses of variance (MANOVA) and analyses of variance (ANOVA) were to be used to compare the resulting subgroups on theoretically relevant factors not used to derive them, namely psychiatric symptomatology, aggressive acts, delinquent behavior, substance abuse, probation violations, and prior arrests. Results of these external validation analyses

58

would determine if the emergent clusters yielded similar patterns of correlates as primary and secondary variants in both adult and youth samples.

If conceptually meaningful primary and secondary clusters emerged, the possible existence of multiple pathways within the identified secondary variant as a function of childhood maltreatment and exposure to community violence, was to be explored via a second series of model-based cluster analyses. Clustering variables for this exploratory analysis was to involve z-scores for the Childhood Trauma Questionnaire-Short Form (CTQ-SF) and the Children's Report of Exposure to Violence-Revised (CREV-R) lifetime total scores. External validation of the potential clusters within the secondary variant was to be examined via the same statistical procedures used for the initial emergent subgroups, i.e., primary and secondary variants. However, only those correlates considered to be critical in the distinction of separate pathways within the secondary variant were to be used in these second set of analyses.

In the absence of identifying a cluster solution that makes conceptual sense after conducting the initial series of cluster analyses to extract primary and secondary variants, then an supplementary, alternative classification approach was to be used to assign participants to preexisting subgroups based upon PAI-A ANT and ANX scale mean scores. Similar to the external validation analyses (described above) that were to be conducted on the hypothesized cluster-derived variants, these same procedures were to be replicated with the PAI-A derived subgroups. Additionally, exploration of multiple developmental pathways within the PAI-A-derived secondary subgroup as a function of

traumatic experiences was to be examined by assigning members in the secondary

subgroup to categories based upon on CTQ-SF and CREV-R lifetime total scores.

RESULTS

Descriptive Statistics

Descriptive statistics for the entire sample were computed for all study variables (see Table 1). Although most of the scores were normally distributed, several variables (designated with an asterisk), such as alcohol use in the previous year, number of prior arrests, number of supervision/probation violations, exhibited substantial positive skew. Logarithmic transformations of the skewed variables resulted in normally distributed scores. These transformed variables, rather than the original variables, were included in all subsequent analyses. Reliability analyses demonstrated adequate internal consistency for all examined variables, ranging from $\alpha = .61$ (PAI-A DOM scale) to $\alpha = .88$ (R-PAS total aggression score).

A few descriptive findings warrant highlighting. As can be discerned from Table 1, study participants reported extensive marijuana use. Similarly, youth endorsed elevated levels of drug problems on the PAI-A DRG scale ($M = 65.81$), which is consistent with substance usage in other juvenile justice samples (approximately $M = 64$; Morey, 2007b). Juveniles in the current sample reported similar ANT and DOM average T-scores as youths in a juvenile justice/correctional facility whose PAI-A mean profile was reported in the PAI-A manual (Morey, 2007b). However, youth in the current sample reported somewhat lower levels of ANX (49.72 compared to approximately 54.00). Also, although normative data has yet to be established for the ICU scale or subscales, the current study's participants endorsed substantially higher ICU traits relative to all published data on this instrument in both adolescent community samples

61

and an offender sample. For example, compared to ICU Callousness, Uncaring, and

Unemotional subscales and total scores for detained males (*n* = 98; 6.21, 9.28, 8.08,

26.07, respectively) and male sex offenders (*n* = 90; 4.13, 7.73, 7.64, 21.80,

respectively) reported in Kimonis et al. (2008b), youth in the current study reported

higher average scores on the these subscales and total score (9.28, 11.65, 9.67, 30.60

respectively).

Table 1 *Descriptive Statistics for All Variables - Entire Sample*

Variables	*N*	*M (SD)*	Range	α
ICU Callousness	151	9.28 (4.98)	1 - 29	.75
ICU Uncaring	151	11.65 (4.78)	0 - 24	.80
ICU Unemotional	151	9.67 (3.21)	0 - 15	.83
ICU Total Score	151	30.60 (10.52)	7 - 67	.87
Revised ICU Callousness	151	4.30 (3.74)	0 - 18	.79
Revised ICU Uncaring	151	7.86 (3.04)	0 - 15	.68
Revised ICU Total Score	151	12.16 (5.84)	0 - 33	.81
ANX	151	49.72 (10.72)	34 - 91	.84
ANT	151	54.79 (8.32)	40 - 77	.82
CTQ-SF Total Score	151	40.17 (13.00)	25 - 81	.76
CREV-R Total Score	151	28.00 (17.00)	0 - 62	.74
R-PAS Proactive Aggression	151	5.34 (4.55)	0 – 21	.84

Table 1 Continued

Variables	*N*	*M (SD)*	Range	α
R-PAS Reactive Aggression	151	12.52 (4.10)	3 -22	.78
R-PAS Total Aggression	151	17.86 (7.86)	3 – 42	.88
Alcohol Use*	151	21.65 (49.04)	0 - 350	-
Marijuana Use	151	117.52 (124.43)	0 - 365	-
Other Drug Use*	151	35.11 (100.36)	0 - 810	-
DOM	151	52.21 (8.69)	31 - 71	.61
Externalizing Dimension	151	55.08 (6.87)	40.33 - 74.00	.73
Internalizing Dimension	151	50.97 (7.84)	39.00 - 81.20	.86
Number of Previous Arrests*	151	3.12 (2.35)	1 - 13	-
Number of Supervision Violations*	151	1.72 (1.98)	0 - 9	-
SRD-Nonviolent Behavior	148	4.59 (2.87)	0 - 12	.76
SRD-Violent Behavior	148	2.69 (1.88)	0 - 8	.69
SRD-Total Score	148	7.28 (4.13)	0 - 18	.81

Note. ICU = Inventory of Callous-Unemotional Traits. ANX = Anxiety scale from the Personality Assessment Inventory – Adolescent Version. ANT = Antisocial Features scale from the Personality Assessment Inventory – Adolescent Version. SRD = Self-Reported Delinquency Scale. CTQ-SF = Childhood Trauma Questionnaire-Short Form. CREV-R = The Children's Report of Exposure to Violence-Revised. R-PAS = Reactive-Proactive Aggression Scale. DOM = Dominance scale from the Personality Assessment Inventory – Adolescent Version. Variables that are positively skewed and were transformed with a logarithmic transformation for subsequent analyses are designated with an *.

Initial Model-based Cluster Analyses

The first aim of the study was to investigate the utility of CU traits and theoretically relevant constructs for identifying meaningful variants consistent with subtypes of primary and secondary psychopathy. In order to classify participants into the hypothesized variants, model-based cluster analysis (MCLUST; Fraley & Raftery, 2003) was conducted using R (R Development Core Team, 2009). The initial analysis subjected standardized scores on the original ICU Callousness, Uncaring, Unemotional factors and PAI-A ANX to model-based clustering. Results of the MBC indicated that the two best fitting models were a three-cluster solution with equal groups of equal volume (Bayesian information criterion [BIC] = -1655.22) and a one-cluster solution with an equal group of equal volume (BIC = 1668.29). The difference in BIC fit of 13 between the two best fitting models strongly favors model 1.

Z-score means on clustering variables for the three groups are presented in Table 2.[1] Along with the disproportionate distribution of cases among the three clusters (cluster 1 [$n = 10$], cluster 2 [$n = 126$], and cluster 3 [$n = 15$]), cluster profiles were not readily interpretable within the prior theoretical discussion and *a priori* expectations about emergent clusters. For example, the two disproportionately smaller clusters (cluster 1 and cluster 3) arguably could be considered to reflect profiles that are consistent with two psychopathic subgroups. However, the above average anxiety levels present in both clusters is inconsistent with theoretical and empirical variants of primary and secondary

---

[1]ANOVA findings indicated that ethnic groups did not significantly differ on any of the clustering variables.

psychopathy conceptualizations. Not surprisingly, particularly given the disparate group sizes, multivariate analysis of variance (MANOVA) results, Wilk's Lambda = .07, F (8, 290) =.87, p = .54, μ^2 = .02, revealed no significant differences among the groups on the clustering variables. Thus, despite the very strong evidence favoring the three-cluster model, further investigation of the cluster sizes and profiles suggest that MBC using the specified clustering variables in the current sample does not yield groups consistent with primary and secondary variants.[2]

Given that the hypothesized psychopathy variants did not emerge from the cluster analysis, external validation analyses examining group differences among several theoretically and practically relevant criterion measures were not conducted. Additionally, the failure to identify a conceptually coherent secondary variant prevented the exploratory investigation of multiple developmental pathways within the secondary variant as a function of traumatic experiences.

---

[2]A number of exploratory MBCs were conducted with the originally proposed clustering variables, along with the inclusion of other theoretically relevant variables (i.e., childhood maltreatment [CTQ-SF total score] and antisocial behavior/delinquency [SRD total score]) that have been used in prior subtyping studies. None of the various permutations of these six variables yielded cluster profiles consistent with primary and secondary variants or strong evidence favoring the model with the highest BIC value.

Table 2 *Group Differences in Standardized Z scores for Original Cluster Analysis*

	Cluster Number and Possible Interpretive Label		
	1	2	3
	(*n* = 10)	(*n* = 126)	(*n* = 15)
Variable	*M*	*M*	*M*
ICU Callousness	1.41	-0.16	0.32
ICU Uncaring	-0.18	0.04	-0.01
ICU Unemotional	0.48	-0.02	-0.18
ANX	0.38	-0.33	2.24

Note. ICU = Inventory of Callous-Unemotional Traits. ANX = Anxiety scale from the Personality Assessment Inventory- Adolescent Version.

Investigation of Redefined Measures of Callousness and Uncaring Dimensions

The failure of the ICU dimensions to identify meaningful clusters among the current juvenile offender sample raised concerns about the psychometric properties of the ICU, along with its factor structure. Early factor analytic studies conducted in adolescent samples (e.g., Essau et al., 2006; Fanti, Frick, & Georgiou, 2009, Kimonis et al., 2008b), along with more recent research examining both the self-report and parent-report versions in young adult samples (Byrd, Kahn, & Pardini, 2013; Kimonis, Branch, Hagman, Graham, & Miller, 2013) generally have indicated that a three-bifactor structure demonstrated the best fit to the data. However, across the various factor analytic studies, marginal to adequate fit indices were obtained only after multiple post-hoc modifications were conducted, such as deleting certain items (Fanti et al., 2009;

Kimonis et al., 2008b) and specification of several residual covariances (e.g., Byrd et al., 2013).

Relatedly, researchers have raised serious questions about the Unemotional factor's ability to tap emotionality as related to callous-unemotional traits (e.g., Byrd et al., 2013; Hawes, Byrd, Henderson, Gazda, Burke, Loeber, & Pardini, 2014). Additionally, compared to the Uncaring and Callousness factors, the Unemotional dimension has not demonstrated consistent or robust correlations with external correlates (e.g., Kimonis et al., 2008b, 2013) and the Unemotional items appear to be tapping a construct distinct from the other two ICU subscales (e.g., Hawes et al., 2014; Roose, Bijttebier, Claes, & Lilienfeld, 2011). Further bolstering other researchers' concerns about the lack of validity of the Unemotional dimension, the ICU Unemotional factor was virtually unrelated to the PAI-A ANX scale in the current study ($r = -.01$), suggesting that unemotionality, as measured by the ICU, does not translate to an absence of emotional experience.

Given concerns about the structure of the ICU, an exploratory factor analysis (EFA) using principal axis factoring (varimax rotation) was conducted on all 24 of the original ICU items to ascertain the factor structure in the current data. The EFA resulted in a six-factor solution (eigenvalues greater than 1.0) with multiple cross-loading items. The resulting factors for the most part were not clearly interpretable and did not reflect the three dimensions the ICU is intended to tap.

To address some of the recurrent problems evident in the factor structure of the ICU, Hawes et al. (2014) recently attempted to develop a more psychometrically sound

67

version (Callous and Uncaring dimensions only) that retained only 12 of the original 24 items on the ICU parent-report in a young adult sample. Hawes et al.'s (2014) abbreviated version of the ICU includes various items that have been demonstrated to be important aspects of the Callousness and Uncaring dimensions in other factor analytic studies (e.g., Kimonis et al., 2013). Thus, a series of exploratory principal components analyses was conducted on the items identified by Hawes et al. (2014) as the best potential indicators of the Callousness construct. Through an iterative process, items that appeared problematic due to poor factor loadings or failure to load onto a coherent factor were deleted. Ultimately, a subset of 7 items was identified that appeared to yield a unidimensional, internally consistent ($\alpha = .79$) revised Callousness subscale (44.99% of the variance). This same process was used to identify an internally consistent ($\alpha = .68$) 5-item revised Uncaring subscale (45.32% of the variance).

A third EFA combining the revised subset of Callousness and Uncaring subscale items was conducted to examine whether a single dimension might emerge from these items. This analysis yielded a two-factor solution with eigenvalues greater than one emerging after 3 iterations. These factors explained 47.04% of the total variance. Rotated factor loadings are reported in Table 3. The first factor (34.68% of the variance) was composed of seven out of the eleven original Callousness subscale items. The second factor (12.35% of the variance) included five out of the eight original Uncaring subscale items. Item 18 "I do not feel remorseful when I do something wrong" was the only cross-loading item (.55). The revised ICU total score derived from the third EFA demonstrated strong internal consistency ($\alpha = .81$).

Table 3 *Results of Exploratory Factor Analysis of Original ICU Callousness and Uncaring Subscale Items*

Items	Factor Loadings	
	Factor 1	Factor 2
I do not care who I hurt to get what I want	.65	
I do not care about being on time	.66	
I do not care if I get into trouble	.67	
I do not care about doing things well	.76	
I seem very cold and uncaring to others	.55	
I do not feel remorseful when I do something wrong	.55	.55
I do not like to put the time into doing things well	.57	
I feel bad or guilty when I do something wrong		.61
I apologize to persons I hurt		.75
I try not to hurt others feelings		.67
I do things to make others feel good		.67
I easily admit to being wrong		.50

Model-based Cluster Analyses Using Redefined Callousness and Uncaring Subscales

In a secondary effort to identify clusters that are conceptually consistent with

primary and secondary variants, multiple permutations of the revised ICU Callousness

and Uncaring subscales and total score, PAI-A ANX scale, CTQ-SF total score, and

69

SRD total score were examined across twelve separate model-based cluster analyses.[3]

Review of the various cluster solutions, goodness-of-fit indices, and cluster profiles

resulted in the selection of model cluster analytic findings that yielded somewhat

meaningful clusters and strong evidence favoring the model with the largest BIC value.

The input variables for the most promising analysis involved standardized scores of the

revised ICU total score, PAI-A ANX scale, CTQ-SF total score, and the SRD total score.

Results of this MBC indicated that the two best fitting models were a three-cluster

solution (BIC = - 1638.79) and one-cluster solution (BIC = - 1647.83) of variable

volume, equal shaped group(s). The difference in BIC fit of 9 between the two best

fitting models provides strong evidence favoring the former model.

Z-score means on clustering variables for the three subgroups are presented in

Table 4. A MANOVA revealed significant differences between the clusters on the

cluster derivation variables, Wilk's Lambda = .19, $F(8, 284) = 46.06$, $p < .001$. One-way

individual analyses of variance (ANOVAs) examining mean differences between

clusters were conducted using the Bonferroni method. Results revealed that all main

effects were significant. The three clusters identified appear to generally adhere to

distinctions between primary ($n = 59$), secondary ($n = 34$), and non-psychopathic general

delinquents ($n = 55$). The secondary psychopathic profile included significantly higher

[3]Prior to running cluster analyses with the revised ICU dimensions extracted from the current data, cluster analyses were conducted using various combinations of Hawes et al.'s (2014) revised Callousness and Uncaring subscales and total ICU score, PAI-A ANX scale, along with other variables identified in the empirical literature as bearing implications for the etiology of psychopathic variants. Similar to the results of previous sets of model-based cluster analyses, none of the profiles conformed to any expected subtypes.

scores on anxiety and childhood maltreatment relative to the other two clusters as well as the highest average levels of callous-unemotional traits, although the secondary and primary variants did not significantly differ from one another on levels of CU traits. Inconsistent with the theoretical and empirical literature, the secondary variant demonstrated significantly lower scores on total delinquent behavior compared to the primary subgroup. The non-psychopathic subgroup demonstrated below average scores on all four of the clustering variables; however, the primaries and general delinquents did not differ significantly from one another on anxiety and childhood maltreatment.

Table 4 *Group Differences in Standardized Z scores for Supplementary Cluster Analysis*

	Cluster Number and Possible Interpretive Label		
	1	2	3
	Primary (*n* = 59)	Non-Psychopathic (*n* = 55)	Secondary (*n* = 34)
Variable	*M*	*M*	*M*
Revised ICU Total Score	0.32	-0.69	0.42
ANX	-0.26	-0.43	0.92
CTQ-SF Total Score	-0.20	-0.51	1.03
SRD Total Score	0.65	-0.78	0.06

Note. ICU = Inventory of Callous-Unemotional Traits. ANX = Anxiety scale from the Personality Assessment Inventory- Adolescent Version. CTQ-SF = Childhood Trauma Questionnaire-Short Form. SRD = Self-Reported Delinquency Scale.

External Validation of Clusters

Given that the emergent psychopathy variants demonstrated cluster profiles generally consistent with the theoretical and empirical literature, external validation analyses were conducted. MANOVA results indicated that the emergent clusters differed significantly across the criterion measures, Wilk's Lambda = .40, $F(20, 266) = 7.64$, $p <$ .001. Follow-up ANOVAs revealed significant main effects for all of the variables except for interpersonal dominance, number of previous arrests, and supervision/probation violations. Effect sizes were largest for the broad-band dimensions of internalizing ($\mu^2 = .33$) and externalizing psychopathology ($\mu^2 = .33$).

Variant means and standard deviations for each variable are presented in Table 5. Relative to primaries, secondaries only manifested significantly more internalizing psychopathology (INT). There was a nonsignificant trend for secondaries to engage in more externalizing behaviors (EXT), reactive and total aggressive acts. Contrary to expectations, secondaries engaged in more proactive aggression, whereas primaries reported higher levels of marijuana, alcohol, and other drug use, although none of these differences reached statistical significance. Additionally, higher levels of exposure to community violence in the primary subgroup compared to the other two subgroups was a trend approaching significance. Relative to primaries, the non-psychopathic group demonstrated significantly fewer aggressive acts (i.e., proactive, reactive, and total aggression), substance use (i.e., marijuana, alcohol, and other substance use), and externalizing behavior problems. Despite use of the revised ICU total score and additional theoretically relevant clustering variables, the clusters generally did not yield

72

similar patterns of correlates as primary and secondary variants. Additionally, given the various serious concerns raised regarding the psychometric properties and factor structure of the ICU, a supplementary, alternative classification approach was investigated.

Table 5 *Means (SDs) for Revised Clusters on Criterion Measures*

	Primary	Non-Psychopathic	Secondary
	($n = 59$)	($n = 55$)	($n = 34$)
Criterion Measures	*M (SD)*	*M (SD)*	*M (SD)*
R-PAS Proactive Aggression	6.75 (4.39) $_a$	2.76 (2.67)	7.18 (5.46) $_a$
R-PAS Reactive Aggression	13.61 (3.28) $_a$	10.36 (3.85)	14.32 (4.23) $_a$
R-PAS Total Aggression	20.36 (6.79) $_a$	13.13 (5.98)	21.58 (8.63) $_a$
Marijuana Use	176.97 (121.81)	64.29 (96.77) $_a$	100.76 (123.80) $_a$
Alcohol Use	0.98 (0.74) $_a$	0.45 (0.57) $_b$	0.72 (0.75) $_{a,b}$
Other Drug Use	1.02 (0.88) $_a$	0.19 (0.41) $_b$	0.64 (0.92) $_{a,b}$
Externalizing Dimension	56.94 (5.79) $_a$	50.25 (4.41)	59.43 (6.44) $_a$
Internalizing Dimension	49.53 (5.86) $_a$	47.43 (4.76) $_a$	58.79 (9.19)
DOM	54.69 (8.71) $_{a,b}$	50.85 (7.63) $_{a,c}$	50.85 (9.37) $_{b,c}$
Number of Prior Arrests	0.45 (0.32) $_{a,b}$	0.29 (0.31) $_{a,c}$	0.40 (0.31) $_{b,c}$
Number of Supervision Violations	0.40 (0.27) $_{a,b}$	0.29 (0.37) $_{a,c}$	0.30 (0.27) $_{b,c}$

Note. R-PAS = Reactive-Proactive Aggression Scale. DOM = Dominance scale from the Personality Assessment Inventory – Adolescent Version. Groups that share a subscript do not significantly differ from each other at $p < .004$ (Bonferroni-corrected).

Alternative Subgrouping Approaches

Because analyses did not identify clusters that statistically cohered into the expected profiles with predicted external correlates, an alternate approach to classifying participants into potentially theoretically/conceptually meaningful subgroups was investigated. Rather than rely on cluster-based solutions, participants were compartmentalized into four quadrants based on levels of antisocial features and anxiety (i.e., PAI-A ANT and ANX scales). Although these four pre-defined groups did not emerge as naturally occurring subgroups when the entire sample underwent cluster analysis, it is possible that important group differences could emerge on criterion measures among participants who fall into these quadrants even if the variables used to create these categories do not create subtypes that emerge from model-based statistical tests. Previous investigations have used a similar approach to classifying psychopathic individuals into low-anxious and high-anxious subgroups (Glass & Newman, 2006; Hiatt, Schmitt, & Newman, 2004; Newman, MacCoon, Vaughn, & Sadeh, 2005; Zeier, Maxwell, Newman, 2009). Following classification of participants as psychopathic versus non-psychopathic based on PCL-R cut scores (i.e., Psychopathic = PCL-R total score $\geq$ 30), persons in the high psychopathic group were further divided into low-anxious and high-anxious subgroups by using a median-split on a well-validated measure of anxiety.

In an effort to create subgroups that make conceptual sense, a proxy indicator of psychopathic traits, along with an alternative classification approach were selected. Rather than utilize the ICU scale to tap psychopathic traits, the PAI-A Antisocial

Features (ANT) scale was used for all subsequent analyses. The ANT scale was designed to assess key features of Antisocial Personality Disorder (APD) and psychopathy, such as callousness, lack of empathy, and stimulus seeking. Moderate to strong correlations have been demonstrated between the adult version of the ANT scale and both self-report and interview-based assessments of APD and psychopathy (Benning, Patrick, Salekin, & Leistico, 2005; Douglas, Hart, &Kropp, 2001; Edens, Hart, Johnson, Johnson, & Olver, 2000; Guy, Poythress, Douglas, Skeem, & Edens, 2008). Although the selection of ANT rather than the SRD total score is somewhat arbitrary, the ANT scale's inclusion of more traditionally psychopathic features (e.g., egocentrism), along with having normative data, led to ANT being the preferred choice for the alternative classification method.

To create relatively evenly sized subgroups of individuals with and without psychopathic traits, the current sample was split in half at the ANT sample mean score ($M = 54.79$). Participants receiving ANT T-scores ≥ 55 were assigned to the subgroup labeled "High Average" ANT ($n = 71$), whereas individuals with ANT T-scores ≤ 54 were placed in the "Below Average" ANT subgroup ($n = 80$). As discussed elsewhere, various theorists and researchers have stressed that anxiety is a significant trait for distinguishing primary (low-anxious) from secondary (high-anxious) psychopathy. Thus, the High Average ANT and Below Average ANT subgroups were then split at each of

their respective ANX mean scores (M = 53.48; M = 46.38, respectively)[4] resulting in

four separate subgroups, namely High ANT, Low ANX (primary psychopathic); High

ANT, High ANX (secondary psychopathic); Low ANT, High ANX (high-anxious, non-

psychopathic); Low ANT, Low ANX (low-anxious, non-psychopathic).[5]

Specifically, participants in the High Average ANT group with below average

ANX scores were assigned to the primary psychopathic quadrant (n = 44) whereas

individuals with above average ANX scores were placed in the secondary psychopathic

quadrant (n = 27). Similarly, youth in the Low Average ANT group with above average

ANX scores were assigned to the high-anxious, non-psychopathic subgroup (n = 37),

whereas participants with below average ANX scores were placed in the low-anxious,

non-psychopathic subgroup (n = 43).

Next, a series of independent t-tests were conducted examining mean differences

between the High ANT, Low ANX and the High ANT, High ANX subgroups ('primary'

and 'secondary,' respectively) on the various external criterion measures (see Table

---

[4]The High Average and Below Average ANT subgroups also were split using the ANX mean
score for the entire sample (M = 49.72), resulting in a similar pattern of correlates associated
with each of the four separate subgroups.
[5]Correlations among the ANT scale, the SRD total score, as well as both the original and revised
ICU scale and subscales were examined. Given the relatively strong correlations between ANT
and the following variables: SRD total score, revised Callousness subscale, original Callousness
subscale, and revised ICU total score (.52, .51, .47, and .39, respectively), the mean split
approach was used for the four latter variables as well. Examination of the constellation of
correlates associated with the four subgroups identified in each of the separate mean split
procedures suggested that the pattern of external criterion measures associated with the
ANT/ANX subgroup most closely resembled primary and secondary variants. Thus, analytic
findings for the ANT/ANX subgroups are described in detail.

6).[6]As predicted, compared to individuals in the 'primary' subgroup, those in the 'secondary' subgroup demonstrated significantly higher average levels of internalizing $t(42) = -7.85$, $p <. 001$, and externalizing symptomatology $t(69) = -5.49$, $p < .001$.[7] Additionally, the 'secondary' subgroup reported significantly more extensive childhood maltreatment history relative to the 'primary' subgroup, whereas higher levels of community violence was associated with the primaries. Although the 'primary' and 'secondary' subgroups did not significantly differ from one another on any other examined correlate, a number of trends are worth describing.[8]

Consistent with expectations, the 'secondary' subgroup engaged in higher levels of substance use (i.e., marijuana, alcohol, and other drug use), reactive aggression, total aggressive acts, nonviolent delinquent behavior, and total delinquent acts. Inconsistent with the primary and secondary conceptualizations, the secondaries engaged in higher levels of proactive aggression. Although primaries were more interpersonally dominant, contrary to hypotheses, the low-anxious primaries demonstrated more extensive arrest histories, higher numbers of supervision/probation violations, and more elevated levels of self-reported violent delinquent acts.[9]

---

[6] Due to the number of comparisons, a Bonferroni correction resulted in an adjusted p level of < .004

[7]EXT was recalculated without ANT because this scale was used to create the categories of interest.

[8]Chi-square analyses identified no statistically significant between-groups differences on type of index offense, legal status, or ethnic status. Additionally, independent t-tests indicated no statistically significant between-groups differences on length of supervision or time spent incarcerated in the past year. Thus, no control variables were deemed necessary to include in any of the subsequent analyses.

[9]Through the split-mean approach, the CTQ-SF and CREV-R total scores were used to separate the 'secondary' subgroup ($n = 27$) into four separate quadrants, in an effort to disaggregate the

Table 6 *Means (SDs) for ANT/ANX Mean Split Subgroups on Criterion Measures*

	High ANT/ Low ANX	High ANT/ High ANX	Low ANT/ High ANX	Low ANT/ Low ANX
	($n = 44$)	($n = 27$)	($n = 37$)	($n = 43$)
Criterion Measures	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
R-PAS Proactive Aggression	6.68 (3.99) $_a$	9.30 (5.86) $_a$	3.46 (3.10) $_b$	3.12 (2.83) $_b$
R-PAS Reactive Aggression	13.48 (3.59) $_{a,b}$	15.37 (3.78) $_a$	11.49 (3.96) $_{b,c}$	10.63 (3.71) $_c$
R-PAS Total Aggression	20.16 (6.72) $_a$	24.67 (8.74) $_a$	14.95 (6.15) $_b$	13.74 (5.91) $_b$
Marijuana Use	133.98 (127.77) $_{a,b,c}$	154.19 (134.45) $_{a,d,e}$	94.16 (120.33) $_{b,d,f}$	97.77 (113.80) $_{c,e,f}$
Alcohol Use	0.82 (0.77) $_{a,b,c}$	1.05 (0.68) $_{a,d,e}$	0.59 (0.70) $_{b,d,f}$	0.51 (0.61) $_{c,e,f}$
Other Drug Use	0.74 (0.83) $_{a,b,c}$	1.20 (0.92) $_a$	0.37 (0.69) $_{b,d}$	0.37 (0.69) $_{c,d}$
Externalizing Dimension	55.88 (5.44) $_a$	63.32 (5.71)	53.15 (5.15) $_{a,b}$	50.75 (5.50) $_b$
Internalizing Dimension	48.75 (5.50) $_{a,b}$	62.28 (7.85)	51.31 (5.23) $_a$	45.86 (3.59) $_b$
DOM	54.86 (7.51) $_{a,b}$	52.00 (9.85) $_{a,c,d}$	48.38 (9.01) $_{c,e}$	52.31 (7.85) $_{b,d,e}$
SRD Nonviolent Behavior	5.48 (2.82) $_{a,b,c}$	5.73 (2.86) $_{a,d,e}$	3.62 (2.74) $_{b,d,f}$	3.78 (2.55) $_{c,e,f}$
SRD Violent Behavior	3.41 (2.07) $_{a,b}$	3.23 (1.82) $_{a,c,d}$	2.03 (1.64) $_{c,e}$	2.17 (1.55) $_{b,d,e}$
SRD Total Score	8.89 (4.17) $_a$	8.96 (3.99) $_{a,b}$	5.65 (3.64) $_c$	5.95 (3.60) $_{b,c}$
Number of Prior Arrests	0.45 (0.32) $_{a,b,c}$	0.40 (0.28) $_{a,d,e}$	0.35 (0.36) $_{b,d,f}$	0.31 (0.30) $_{c,e,f}$
Number of Supervision Violations	0.39 (0.31) $_{a,b,c}$	0.35 (0.26) $_{a,d,e}$	0.29 (0.31) $_{b,d,f}$	0.33 (0.26) $_{c,e,f}$

Note. ANX = Anxiety scale from the Personality Assessment Inventory – Adolescent Version. ANT = Antisocial Features scale from the Personality Assessment Inventory – Adolescent Version. SRD = Self-Reported Delinquency Scale. R-PAS = Reactive-Proactive Aggression Scale. DOM = Dominance scale from the Personality Assessment Inventory - Adolescent Version. Groups that share a subscript do not significantly differ from each other at *p* < .004 (Bonferroni-corrected).

secondaries into distinct developmental pathways as a function of trauma experiences. Due to the small subgroup sizes, along with non-distinctive patterns of associated external criterion measures, the subgroups did not appear to be interpretable.

A second set of analyses involved examination of group mean differences across all four ANT/ANX subgroups on the previously described cluster validation variables. MANOVA results indicated that the four ANT/ANX subgroups differed significantly across this group of variables, Wilk's Lambda = .33, $F(33, 386) = 5.36$, $p < .001$. Follow-up ANOVAs revealed significant group differences for the majority of the criterion measures, with the exception of marijuana and alcohol use, along with number of previous arrests and supervision/probation violations. Patterns of distinct correlates associated with the primary and secondary psychopathic subgroups have been discussed in detail above, so the Low ANT subgroups are the focus of the remaining discussion (see Table 6).

Relative to the two High ANT subgroups, the Low ANT subgroups generally demonstrated substantially lower average scores on the various criterion measures. In terms of specific differences between the high-anxious, non-psychopathic and low-anxious, non-psychopathic subgroups, the former subgroup endorsed significantly higher internalizing symptoms, relative to the latter group. Although no other group differences reached statistical significance, non-significant trends for the high-anxious, non-psychopathic group members involve the lowest scores across all four subgroups on marijuana use, dominant interpersonal style, number of supervision/probation violations, and delinquent behavior (i.e., violent, nonviolent, and total delinquent behavior).

CONCLUSIONS

The purpose of the current study was to determine whether callous-unemotional trait subgroups with distinctive personality and behavioral profiles could be identified among adolescent male offenders. The hypothesis tested was that theoretically and practically relevant correlates associated with the emergent clusters would resemble primary and secondary psychopathy conceptualizations. Despite using various permutations of the original ICU subscales, PAI-A ANX, as well as other theoretically relevant variables previously determined to be important in distinguishing separate etiological pathways of psychopathy, none of the model-based cluster analyses yielded clusters consistent with primary and secondary subtypes.

Contrary to previous subtyping investigations (e.g., adults, Poythress et al., 2010; Skeem et al., 2007; juveniles, Kimonis et al., 2011; Vaughn et al., 2009), cluster analyses in the current study initially only involved measures of callous-unemotional traits and anxiety, resulting in neither the behavioral/impulsive dimension of psychopathy nor trauma history (i.e., childhood maltreatment) being incorporated at this stage of analysis. The two prior subtyping studies in youth samples that have focused on CU traits specifically have included measurements of conduct problems and impulsivity along with other theoretically relevant variables (e.g., trauma history) in cluster derivation (Fanti, Demetriou, & Kimonis, 2013; Kahn, Frick, Feeny, Youngstrom, Youngstrom, & Findling, 2013). In the current study, failure to yield conceptually meaningful clusters in the initial set of MBCs resulted in inclusion of the SRD total score as a proxy behavioral indicator (i.e., total self-reported delinquent behavior) as

well as the CTQ-SF total score (i.e., childhood maltreatment) in the supplementary

MBCs to address this potential methodological shortcoming. Despite inclusion of these

additional clustering variables, none of the various permutations of these six variables

yielded cluster profiles consistent with primary and secondary variants.

Failure to identify distinct CU trait variants even with inclusion of additional

theoretically relevant variables raises questions about the utility of subtyping youth on

the ICU. Although it is plausible that naturally occurring, homogenous clusters of CU

traits do not exist in the current data, the ICU itself appears to be a problematic

assessment measure of these traits. For example, as discussed elsewhere, across both

adolescent and young adult samples the ICU three-bifactor model only achieved

marginal to adequate fit indices after numerous, idiosyncratic modifications. In addition

to problems with the ICU's underlying factor structure, a number of more recent

empirical investigations have raised serious concerns about the lack of validity of the

Unemotional dimension in particular (e.g., Byrd et al., 2013; Hawes et al., 2014;

Kimonis et al., 2013). Relative to the Uncaring and Callousness factors, the Unemotional

subscale is more weakly related to other self-report psychopathy measures and its items

do not consistently load onto the broader CU trait (Kimonis et al., 2013). Several of the

Unemotional items appear to tap lack of emotional *expression* (e.g., "It's easy for others

to tell how I'm feeling"), rather than absence of emotional experience, the aspect of

emotionality related to psychopathy.

Given the growing body of empirical evidence challenging the existence of a

clear factor structure underlying the ICU as well as the construct validity of the

81

Unemotional factor, supplementary analyses were performed after removing this scale. Also, because factor analyses have failed to support the original structure of the Callousness and Uncaring subscales (Byrd et al., 2013; Hawes et al., 2014; Kimonis et al, 2013), revised unidimensional subscales were constructed via exploratory factor analyses. A series of model-based cluster analyses that involved multiple permutations of the revised ICU scale(s) and other purported etiological variables ultimately resulted in a combination of clustering variables that were able to disaggregate the sample into somewhat conceptually meaningful psychopathic and non-psychopathic variants.

Similar to prior research, the primary and secondary variants did not differ significantly in their levels of CU traits (juvenile samples, Fanti et al., 2013; Kimonis et al., 2011; adult samples: Hicks et al., 2004; Poythress et al., 2010; Vassileva et al., 2005). This finding is in line with Karpman's (1941, 1948) assertion that psychopathic variants are phenotypically indistinguishable. Consistent with both theory and previous research, the secondary variant demonstrated significantly more elevated levels of anxiety and childhood maltreatment relative to the primary and non-psychopathic variants. However, contrary to expectations, the primary variant endorsed engaging in more delinquent behavior than the secondaries. This unexpected finding could possibly be due to the operationalization of total delinquent behavior, which was computed by summing the total number of different delinquent acts committed, rather than the summation of the actual frequency count of each delinquent behavior in the past year. Essentially, the former computation fails to capture the variability in the actual number of times a specific delinquent behavior was committed by each youth. Not surprisingly,

the non-psychopathic subgroup demonstrated significantly lower levels of CU traits, anxiety, delinquent behavior, and childhood maltreatment, relative to the CU trait variants.

Similar to previous empirical investigations (e.g., Frick, Bodin, et al., 2000; Vaughn et al., 2009), both CU trait variants exhibited higher levels of psychopathology, substance use, delinquent and aggressive behaviors, and supervision/probation violations than the non-psychopathic juveniles. As expected, relative to the primary variant, secondaries endorsed significantly higher levels of broad-band internalizing psychopathology; however, the two CU trait variants did not significantly differ from another on any other external validation measure. Closer examination of the pattern of mean scores on the external correlates associated with the primary and secondary variants revealed trends somewhat inconsistent with proposed hypotheses. For example, the secondary variant showed greater levels of proactive and reactive aggression relative to the primaries. Although diverging from the majority of theoretical and empirical literature, at least three subtyping studies have found similar patterns of higher proactive and reactive aggression associated with secondary psychopathic subgroups among adult and male juvenile offender samples (e.g., Hicks et al., 2004; Kimonis et al. 2011, 2012). It is entirely possible that secondary variants within justice-involved samples in particular engage in elevated levels of aggressive acts in general rather than engaging in a specific form of aggression.

In terms of other unanticipated associations between particular criterion measures and the two CU variants, the primary variants showed higher average levels of

substance use (i.e., marijuana, alcohol, and other drug use) compared with the secondary variants. This non-significant trend is contrary to the growing body of empirical subtyping literature that has documented higher levels of substance use among secondaries relative to primaries (e.g., adults, Swogger & Kosson, 2007; Vassileva et al., 2005; juveniles, Kimonis et al., 2011; Vaughn et al., 2009; Wareham et al., 2009). Across these various studies, substance use frequency was assessed via idiosyncratic rating scales, rather than summing total number of times used in the past year, which likely contributed to the inconsistent findings.

As previously discussed, serious problems with the ICU, along with the inability of the revised scales to identify CU trait variants with profiles consistent with primary and secondary psychopathic conceptualizations, necessitated the use of an alternative classification approach. Splitting the entire sample at the PAI-A ANT mean score, then further dividing the ANT subgroups by the PAI-A ANX mean score, resulted in four subgroups: High ANT, Low ANX (primary psychopathic); High ANT, High ANX (secondary psychopathic); Low ANT, High ANX (high-anxious, non-psychopathic); Low ANT, Low ANX (low-anxious, non-psychopathic). Consistent with past theories for secondary subtypes (Karpman, 1941, 1948), the 'secondary' subgroup had a significantly more extensive trauma history (e.g., abuse and neglect) relative to the other three subgroups.

Consistent with the external validation findings for the primary, secondary, and non-psychopathic clusters identified via the latter set of cluster analyses, the two PAI-A-derived psychopathic subgroups were closer in mean scores than the two PAI-A-derived

non-psychopathic subgroups and vice versa. Specifically, the above average ANT subgroups generally had markedly higher mean scores than the below average ANT subgroups across all correlates. In terms of the above average ANT subgroups, although the profiles for the PAI-A-derived 'primary' and 'secondary' subgroups did not entirely align with theoretical and empirical conceptualizations of psychopathic subtypes, the constellation of correlates associated with the respective subgroups was more consistent with anticipated patterns than those related to the cluster-derived subgroups. For example, as predicted, the PAI-A -derived 'secondary' subgroup demonstrated significantly higher levels of broad-band internalizing as well as externalizing psychopathology relative to primaries.

Previous subtyping empirical investigations with juvenile samples have yielded similar patterns of findings for internalizing (Vaughn et al., 2009) and externalizing psychopathology (Kahn et al., 2013). Despite only approaching statistical significance, more extensive substance use among the PAI-A-derived 'secondary' subgroup relative to the 'primary' subgroup is consistent with findings from the empirical subtyping literature (e.g., adults, Swogger & Kosson, 2007; Vassileva et al., 2005; juveniles, Kimonis et al., 2011; Vaughn et al., 2009; Wareham et al., 2009). Additionally, as predicted, there was a trend for the PAI-A-derived 'primary' subgroup to be more interpersonally dominant than the secondaries, although the mean scores for the two subgroups did not significantly differ.

Contrary to hypotheses, the PAI-A-derived 'secondary' subgroup endorsed more reactive and proactive aggressive acts. Given that a similar pattern of findings was

demonstrated in the external validation analyses of the cluster-derived subgroups, it appears that at least in the current sample, secondaries endorse higher rates of diverse forms of aggression regardless of the classification approach. As previously discussed, with the exception of findings reported in three prior research studies, these patterns of aggression contradict the larger empirical subtyping research base. As suggested by Skeem et al., (2003), it is possible that proactive and reactive aggression cannot distinguish psychopathic subtypes. Further examination of instrumental and reactive aggression via other measures is warranted before one can conclude that these specific forms of aggression cannot differentiate primary and secondary psychopathic subgroups among juveniles.

Despite secondaries endorsing higher levels of both proactive and reactive aggression, the PAI-A-derived 'primary' subgroup demonstrated more violent delinquent behaviors relative to the 'secondary' subgroup. Given that several of the SRD items specifically tap aggressive behaviors (e.g., "been involved in gang fights," "hit [or threatened to hit] one of your parents"), these divergent findings initially may appear to be unclear. However, higher levels of violent offending were associated with the primary psychopathic subgroup in another subtyping study that measured offending behaviors via the SRD among juvenile offenders (Vaughn et al., 2009). Thus, the specific instrument selected to assess delinquent behavior in conjunction with use of an offender sample, seems to have influenced these findings.

It is conceivable that the engagement in more violent behavior possibly is related to the 'primary' groups more extensive exposure to community violence. As suggested

by Cooley-Strickland, Quille, Griffin, Stuart, Bradshaw, and Furr-Holden (2009), essentially, youth residing in high crime, violent neighborhoods may be learning violent behavior through mechanisms consistent with social learning theory (Bandura, 1973). Specifically, youth exposed to violence may "model aggression as an effective, normative, and justified way of resolving conflict" (Cooley-Strickland et al., 2009, p. 131). In a similar vein, across both classification approaches, more extensive arrest histories and higher frequency of supervision/probation violations were associated with the 'primary' subgroup. Again, this pattern of mean differences is contrary to expectations that the more impulsive, reactive 'secondary' subgroup (Karpman, 1948; Skeem et al., 2007) would more frequently violate supervision conditions and engage in illegal acts that result in police contact.

Consistent with emergent clusters identified in prior subtyping research with juvenile samples, the two PAI-A-derived non-psychopathic subgroups demonstrated considerably lower mean scores on the various external correlates relative to the PAI-A-derived psychopathic subgroups (e.g., Christian et al., 1997; Frick, Bodin, et al., 2000; Vaughn et al., 2009; Wareham et al., 2009). Due to the mixed cluster validation findings in the literature, no directional hypotheses were proposed for specific group differences between the low- and high-anxious, non-psychopathic subgroups. However, consistent with Kahn et al.'s (2013) "anxious-conduct" non-psychopathic subgroup, the PAI-A-derived high anxious, non-psychopathic subgroup demonstrated significantly higher levels of internalizing symptomatology relative to the low-anxious subgroup. Given that the above average and below average ANT groups were split into quadrants based on

87

anxiety scores, it is not surprising that both the PAI-A-derived secondary psychopathic subgroup and the high anxious, non-psychopathic subgroup demonstrated significantly higher internalizing problems relative to their respective low-anxious counterparts.

In terms of non-significant trends, the PAI-A-derived low-anxious, non-psychopathic subgroup demonstrated higher levels of marijuana use, interpersonal dominance, delinquent behavior (nonviolent, violent, and total), and previous supervision/probation violations relative to their high-anxious counterparts. Thus, the high-anxious, non-psychopathic subgroup reported higher levels of psychological distress, alcohol use, and aggressive acts (proactive, reactive, and total) compared with their low-anxious counterparts. Given that the PAI-A Aggression scale (AGG) is incorporated into the calculation of broad-band externalizing behavior problems, it is not surprising that the high-anxious, non-psychopathic subgroup demonstrated higher levels of externalizing behaviors and aggressive acts relative to the low-anxious subgroup.

Interestingly, despite exhibiting higher levels of internalizing and externalizing psychopathology, the high-anxious, non-psychopathic subgroup appeared to engage in less antisocial behaviors relative to the low-anxious, non-psychopathic subgroup. In terms of differences in alcohol use, previous research has demonstrated that in general, youth's substance use involvement begins with alcohol or tobacco, then progresses to marijuana, and eventually other drugs (Kandel, 2002).Thus, the non-psychopathic group is comprised of a subgroup of youth who are experiencing a number of mental health issues and possibly are in the very early stages of substance use and delinquent behavior onset compared to the low-anxious, non-psychopathic general delinquents.

Summary of Main Study Findings

The current study examined whether justice-involved male youths could be disaggregated into distinct CU trait variants, consistent with past research on primary and secondary variants of psychopathy. Although it could be argued that the pre-defined, split mean PAI-A-derived psychopathic subgroups most closely resembled primary and secondary psychopathic variants relative to the cluster-derived subgroups, the profiles were not entirely consistent with the theoretical and empirical literature. An important caveat to consider while interpreting the external validation analytic findings is that with the exception of internalizing and externalizing behaviors (internalizing only for the cluster-derived subgroups), primary and secondary variants did not significantly differ from one another on any other criterion measure. Thus, evidence for the existence of distinct correlates associated with specific psychopathic variants is mostly weak in the current sample.

Exploratory Analyses for the Multiple Developmental Pathways as a Function of Traumatic Experiences

The failure to identify conceptually clear subgroups by only cluster analyzing CU traits and anxiety led to the inclusion of other theoretically relevant variables, such as childhood maltreatment, in subsequent MBCs. The set of clustering variables that ultimately yielded subgroups generally consistent with primary and secondary conceptualizations included maltreatment history. Thus, inclusion of a trauma variable in the initial cluster derivation analyses precluded use of the originally intended approach to identify potential multiple pathways within the secondary variant as a function of type

89

of traumatic experience. Furthermore, given the small subgroup size ($n = 27$) of the PAI-A-derived 'secondary,' splitting this subgroup at the childhood maltreatment and exposure to community violence mean scores resulted in four extremely small-sized groups that yielded patterns of correlates that did not make conceptual sense.

Interestingly, the subgroup labeled 'primary' in both classification approaches reported trends toward higher levels of overall exposure to community violence relative to the secondary psychopathic and non-psychopathic subgroups. Although this difference did not reach statistical significance, this trend suggests the possibility of a potential alternative etiological explanation for the development of CU traits among low-anxious youth exposed to chronic community violence. As previously discussed, no subtyping study to date has attempted to identify psychopathic subtypes using exposure to domestic and/or community violence. Rather, the disaggregation of psychopathy into variants or subtypes has traditionally used a global indicator of abuse history or total summary score on a generic negative lifetime events survey.

Clearly, future research examining the development of CU traits as a consequence of differing types of violence exposure is warranted, although the combination of high psychopathic traits, low anxiety, and environmental stressors is strikingly contrary to the theoretical literature. For example, Karpman (1948) argued that secondary psychopathy reflects an environmentally acquired emotional disturbance. Specifically, he theorized that secondary psychopathy results from "unresolved emotional conflict," produced by exposure to harsh punishment, parental rejection, overindulgence, or abuse. Karpman also identified the presence of neurosis or anxiety as

90

the key marker for this particular subtype and observed secondaries to be more vulnerable to negative emotionality. Similarly, Lykken (1995) argued that secondaries are more vulnerable to anxiety and other negative emotions, whereas primary psychopaths possess an innately fearless temperament.

Thus, identification of a psychopathic variant characterized by trauma exposure and low anxiety is contradictory to existing theory. As suggested by Cooley-Strickland et al., (2009), it is possible that youth who are chronically and repeatedly exposed to violence become desensitized resulting in the previous anxiety-producing stimuli no longer eliciting a physiological response. Becoming rather emotionally detached from one's environment and developing a more callous interpersonal style may serve as a coping mechanism/means of survival for these youth.

Do Primary and Secondary Subtypes of Psychopathy Really Exist among Delinquent Youth?

In an effort to address a number of the previously identified methodological limitations of prior subtyping studies, the current study recruited a large, juvenile male only sample, used sophisticated statistical analyses, and selected theoretically, practically relevant external criterion measures. Inclusion of these perceived methodological strengths, along with use of revised, unidimensional ICU subscale(s) and differing classification approaches, analyses still failed to yield meaningful, homogeneous CU trait variants consistent with the theoretical and empirical literature.

A wide array of diverse methodologies has been applied to the identification of conceptually meaningful primary and secondary subtypes/variants. Thus, not

surprisingly, empirical investigations have not been entirely consistent in defining precisely what 'primary' and 'secondary' refer to, particularly in the juvenile subtyping literature. Across the various studies, substantial variability exists in a number of features related to sample composition, such as sample size, ethnic/racial minority representation, country of residence, recruitment (i.e., clinic-referred, community, justice-involved), and gender. For example, although adult subtyping studies primarily have involved male only samples (e.g., Hicks et al., 2004; Poythress et al., 2010; Skeem et al., 2007; Vassileva et al., 2005), the majority of empirical investigations examining psychopathic variants among juveniles have included mixed gender samples (Andershed et al., 2008; Christian et al., 1997; Kahn et al., 2013; Vaughn et al., 2009; Vincent et al., 2003; Wareham et al., 2009).

In addition to the current study, only three other investigations sought to identify psychopathic variants among juvenile male only samples (Kimonis et al., 2011, 2012; Lee et al., 2010). Interestingly, each of the latter three investigations involved juvenile offenders. Despite removing the potential confounding factor of including women in the variant derivation, the model-based cluster analysis findings of the current study and Lee et al. (2010) provided limited support for the existence of primary and secondary variants of psychopathy in male youth.

Another feature of subtyping investigations that has differed across studies is the statistical approach to subtype/variant derivation. A number of recent studies have applied more sophisticated approaches, such as model-based cluster analyses (Banfield & Raftery, 1993), to specified cluster variables, in an effort to identify conceptually

meaningful clusters that resemble primary and secondary conceptualizations of psychopathy (adults, Hicks et al., 2004; Poythress et al., 2010; Skeem et al., 2007; juveniles, Kimonis et al., 2011, 2012; Lee et al., 2010). Other statistical procedures included latent class factor analysis (Wareham et al., 2009), finite mixture modeling (Vaughn et al., 2009) and traditional cluster analyses (Andershed et al., 2008; Christian et al., 1997; Frick, Bodin, et al., 2000; Kahn et al., 2013; Vincent et al., 2003). With the exception of Kahn et al. (2013), each of the more recent empirical investigations has utilized model-based cluster analysis to address the shortcomings of other approaches, such as traditional cluster analysis.

Choice of clustering variables/measures and criterion measures to validate clusters also differs substantially across studies. Initial cluster analytic investigations among juvenile samples (e.g., Christian et al., 1997; Frick, Bodin, et al., 2000; Vincent et al., 2003) sought to identify subtypes into meaningful groups by examining differences in psychopathic trait levels on various multi-dimensional measures of psychopathic traits (e.g., APSD, PCL :YV). Selection of clustering variables in more recent research is based upon both theoretical and empirical conceptualizations of psychopathic traits, although the precise variables and measurement of said variables varies considerably across studies. For example, Kahn et al. (2013) applied cluster analysis to the following variables: the combined parent and youth report on the CU factor scale from the APSD (Frick & Hare, 2001), the Anxious-Depressed Scale (ANX-DEP) from the Youth Self-Report (Achenbach & Rescorla, 2003), and trauma exposure and PTSD symptom scores from The Child Abuse and Trauma Scale (March, 1999),

93

whereas Kimonis et al., (2011) utilized the four scales of the PCL: YV and three scales of the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1985). Clearly, the use of these differing cluster variables and their respective measures could impact the nature of the psychopathic variants identified.

In terms of the diverse, idiosyncratic selection of external validation measures, more recent investigations use an array of theoretically and practically relevant external criterion variables, relative to the more limited selection of criterion measures included in earlier research. For example, Vaughn and colleagues (2009) demonstrated that primaries and secondaries differed from one another in a theoretically meaningful manner across a variety of correlates, namely rates of personal victimization, past year drug use, violent offending, and total self-reported delinquency, whereas Kimonis et al., (2011) used maltreatment history, depression, psychiatric symptomatology, anger, and substance use as external criterion variables. Of particular note, none of the cluster derivation/external validation methodologies used in a specific study has been replicated in its entirety using an independent sample.

The application of diverse methodologies to cluster derivation and validation appears to have resulted in psychopathic subtypes that appear to diverge in important ways (e.g., relative sample size) across studies. As discussed elsewhere, theorists (e.g., Karpman, 1941, 1948) posited that primary psychopathy is characterized by an innate affective deficit, whereas psychopathic traits characteristic of secondary psychopathy develop as a consequence of an environmental stressor such as parental rejection, abuse, or trauma. Thus, one would surmise that the sample size of secondary psychopathic

variants would be relatively larger than the primary counterpart. Contrary to expectations, a number of studies, particularly in the juvenile realm, have yielded substantially larger primary subtypes/variants relative to the secondaries (Kimonis et al., 2011, [$n = 74$ vs. $n = 39$], 2012 [$n = 43$ vs. $n = 22$]; Skeem et al., 2007 [$n = 66$ vs. $n = 41$]; Vaughn et al., 2009 [$n = 74$ vs. $n = 39$]; Veen et al., 2011 [$n = 77$ vs. $n = 38$]). These noteworthy findings call into question the use of a diverse array of correlates. It is possible that psychopathic variants among youth, if they exist, may look very different than primary and secondary psychopathy in adults, and/or juveniles who are labeled 'primary' (elevated psychopathic traits, low anxiety) may develop psychopathic traits through a different etiological mechanism, rather than in-born affective deficits.

Apart from the already acknowledged problems with the ICU scale, a number of additional factors may have influenced the study findings. For example, the current sample was comprised primarily of Hispanics and African Americans (82.70%). Although only a limited number of cluster analytic studies among youth samples have involved predominantly ethnic minorities (e.g., Kahn et al., 2013), a single known empirical investigation to date has included a large proportion of Hispanics (Kimonis et al., 2011). Even though the two ethnic minority groups did not differ significantly in their levels of callous-unemotional traits, the lack of psychopathy research conducted with Hispanics (youth or adults) raises the question of whether theoretical and empirical variants of psychopathy are generalizable to this population. Clearly, further research is needed to determine whether the manifestation of callous-unemotional traits differs in diverse ethnic minority populations relative to Caucasians.

Limitations/Future Directions

In addition to other factors previously discussed, a number of limitations warrant mentioning. The study sample included various levels of supervision that characterize legal statuses and dispositions of justice-involved youth living in the community. Although the majority of the sample was comprised of adjudicated youth (71%), the inclusion of first-time offenders and youth who committed status or misdemeanor offenses may have resulted in lower ratings on several of the criterion measures relative to incarcerated offenders. Average CU trait levels endorsed in the current sample were, however, considerably higher than those reported in other studies comprised of juvenile offenders (Kimonis et al., 2008b). To note, the current study is the first empirical subtyping investigation to examine psychopathic variants among juvenile offenders in a community corrections sample, rather than an institutionalized sample.

Second, with the exception of official record data (e.g., previous arrests, number of supervision/probation violations, etc.), all other constructs were assessed via adolescents' self-report. Reliance on primarily self-report data may have resulted in minimization of perceived undesirable characteristics or behaviors. Future research should consider including multi-method data (e.g., interview and psychophysiological) and multiple informants to address this issue.

Although selection of clustering variables and external criterion measures was guided by the theoretical and empirical literature, clearly the precise correlates and the measurement tools used to assess said correlates impacts the study results. Finally, the current study involved cluster analysis/classification of the entire sample. Clinically,

96

callous-unemotional traits are only designated as a specifier within the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM–V*; American Psychiatric Association, 2013) Conduct Disorder diagnosis. Thus, future studies are needed that utilize callous-unemotional traits to disaggregate conduct-disordered youth into meaningful subgroups.

To date, all subtyping studies have examined an individual's membership in a specified group at a particular point in time. No research has followed their emergent juvenile psychopathic subtypes/variants over an extended time period in an effort to determine the temporal stability of these groups. Given that the stability of youth psychopathic traits across major developmental periods continues to be a subject of debate (Blonigen et al., 2006; Burke et al., 2007), it is possible that subtypes/variants are not particularly sustainable. Additionally, the nomological net associated with the respective variants may shift over time. The possibility of differential rates of stability as a function of psychopathic subtype should be considered as well.

In summary, the current study findings offer little support for the utility of callous-unemotional traits to disaggregate justice-involved youth into meaningful homogenous subgroups. The inherent problems with the ICU's underlying factor structure, along with a lack of validity of the Unemotional dimension in particular (e.g., Byrd et al., 2013; Hawes et al., 2014; Kimonis et al., 2013) suggest that possibly the assessment tool, rather than the construct of CU traits, led to the somewhat discouraging findings. However, utilization of an alternative classification approach via the Personality Assessment Inventory-Adolescent Version (Morey, 2007b) yielded

97

subgroups that also were not entirely consistent with theoretical and empirical

conceptualizations of primary and secondary psychopathy. Thus, the present study's

contribution to the growing subtyping literature appears to further complicate our

understanding of juvenile psychopathic variants. Clearly, further examination of the

distinct developmental pathways of callous-unemotional traits among juvenile samples is

needed in order to more concisely parse out the heterogeneity of juvenile psychopathic

traits.

REFERENCES

Achenbach, T. M. (1991). *Manual for the youth self-report and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.

Achenbach, T. M., & Rescorla, L.A. (2003). *Manual for the ASEBA school-age forms and profiles*. Burlington: University of Vermont.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Andershed, H., Gustafson, S.B., Kerr, M., & Stattin, H. (2002a). The usefulness of self-reported psychopathy-like traits in the study of antisocial behavior among non-referred adolescents. *European Journal of Personality, 16,* 383-402.

Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002b). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blaauw, & L. Sheridan (Eds.), *Psychopaths: Current international perspectives* (pp. 131-158). The Hague: Elsevier.

Andershed, H., Köhler, D., Louden, J. E., & Hinrichs, G. (2008). Does the three-factor model of psychopathy identify a problematic subgroup of young offenders? *International Journal of Law and Psychiatry, 31*, 189-198.

Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, NJ: Prentice Hall.

Banfield, J. D., & Raftery, A. E. (1993). Model-based Gaussian and non-Gaussian clustering. *Biometrics, 49*, 803-821.

Barry, C. T., Frick, P. J., DeShazo, T. M., Grooms, T., McCoy, M. G., Ellis, M. L., et al. (2000). The importance of callous-unemotional traits for extending the concept of psychopathy to children. *Journal of Abnormal Psychology*, *109,* 335-340.

Benning, S.D., Patrick, C.J., Salekin, R. T., & Leistico, A.R. (2005). Convergent and discriminant validity of psychopathy factors assessed via self-report: A comparison of three instruments. *Assessment, 12,* 270-289.

Bernstein, D., & Fink, L. (1998). *Childhood trauma questionnaire: A retrospective self-report*. San Antonio, TX: The Psychological Corporation.

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect, 27*, 169-190.

Blackburn, R. (1975). An empirical classification of psychopathic personality. *British Journal of Psychiatry, 127,* 456-460.

Blackburn, R. (1987). Two scales for the assessment of personality disorder in antisocial populations. *Personality and Individual Differences, 8*, 81-93.

Blair, R.J.R., Budhani, S., Colledge, E., & Scott, S. (2005). Deafness to fear in boys with psychopathic tendencies. *Journal of Child Psychology and Psychiatry, 46*, 327-336.

Blair, R.J.R., & Coles, M. (2000). Expression recognition and behavioural problems in early adolescence. *Cognitive Development, 15*, 421-434.

Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective

impairment in the processing of sad and fearful expressions in children with

psychopathic tendencies. *Journal of Abnormal Child Psychology, 29,* 491-498.

Blonigen, D.M., Hicks, B.M., Kruger, R.F., Patrick, C.P., & Iacono, W.G. (2006).

Continuity and change in psychopathic traits as measured via normal-range

personality: A longitudinal-biometric study. *Journal of Abnormal Psychology,*

115, 85-95.

Burke, J.D., Loeber, R., & Lahey, B.B. (2007). Adolescent conduct disorder and

interpersonal callousness as predictors of psychopathy in young adults. *Journal of*

Clinical Child and Adolescent Psychology, 36, 334-346.

Byrd, A. L., Kahn, R. E., & Pardini, D. A. (2013). A validation of the Inventory of

Callous-Unemotional traits in a community sample of young adult males. *Journal*

of Psychopathology and Behavioral Assessment, 35, 20-34.

Cale, E.M., & Lilienfeld, S.O. (2002). Sex differences in psychopathy and antisocial

personality: A review and integration. *Clinical Psychology Review, 22*, 1179-

1207.

Campbell, M. A., Porter, S., & Santor, D. A. (2004). Psychopathic traits in adolescent

offenders: An evaluation of criminal history, clinical, and psychosocial

correlates. *Behavioral Sciences & the Law, 22,* 23-47.

Cauffman, E., Feldman, S., Waterman, J., & Steiner, H. (1998). Posttraumatic stress

disorder among incarcerated females. *Journal of the American Academy of Child*

& Adolescent Psychiatry, 37, 1209-1216.

Cauffman, E., Kimonis, E. R., Dmitrieva, J, & Monahan, K. (2009). A multi-method assessment of juvenile psychopathy: Comparing the predictive utility of the PCL: YV, YPI, and NEO-PRI. *Psychological Assessment, 21,* 528-542.

Christian, R. E., Frick, P. J., Hill, N. L., Tyler, L., & Frazer, D. R. (1997). Psychopathy and conduct problems in children: II. Implications for subtyping children with conduct problems. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 233-241.

Cleckley, H. (1941, 1976, 1982). *The mask of sanity*. St. Louis, MO: C.V. Mosby.

Cooke, D.J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment, 13*, 171-188.

Cooley-Quille, M., Boyd, R. C., Frantz, E., & Walsh, J. (2001). Emotional and behavioral impact of exposure to community violence in inner-city adolescents. *Journal of Clinical Child Psychology, 30*, 199-206.

Cooley-Strickland, M., Quille, T.J., Griffin, R.S. Stuart, R.A., Bradshaw, C.P., & Furr-Holden, D. (2009). Community violence and youth: Affect, behavior, substance use, and academics. *Clinical Child & Family Psychology Review, 12*, 127-156.

Cooley, M. R., Turner, S. M., & Beidel, D. C. (1995). The emotional impact of children's exposure to community violence: A preliminary study. *Journal of the American Academy of Child & Adolescent Psychiatry, 34*, 1362-1368.

Derogatis, L. R. (1993). *Brief symptom inventory: Administration, scoring, and procedures manual*. Minneapolis, MN: National Computer Systems.

Dodge K.A. (1991). The structure and function of reactive and proactive aggression. In D. Pepler & K. Rubin (Eds), *The development and treatment for childhood aggression* (pp. 201-218). Hillsdale: Erlbaum.

Dodge, K.A., Lochman, J.E., Harnish, J.D., & Bates, J.E. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology, 106*, 37-51.

Douglas, K.S., Hart, S.D., & Kropp, P.R. (2001). Validity of the Personality Assessment Inventory for forensic assessments. *International Journal of Offender Therapy and Comparative Criminology, 45,* 183-197.

Edens, J.F. (2009). Interpersonal characteristics of male criminal offenders: Personality, psychopathological, and behavioral correlates. *Psychological Assessment, 21*, 89-98.

Edens, J.F., Hart, S.D., Johnson, D.W., Johnson, J.K., & Olver, M.E. (2000). Use of the Personality Assessment Inventory to assess psychopathy in offender populations. *Psychological Assessment, 12*, 132-139.

Edens, J. F., Skeem, J., Cruise, K. R., & Cauffman, E. (2001). Assessment of "juvenile psychopathy" and its association with violence: A critical review. *Behavioral Sciences & the Law, 19,* 53-80.

Elliott, D. S., Huizinga, D., & Ageton, S. S. (1985). *Explaining delinquency and drug use*. Beverly Hills, CA: Sage.

Elliott, D. S., Huizinga, D., & Menard, S. (1989). *Multiple problem youth: Delinquency, substance use, and mental health problems*. New York: Springer-Verlag.

Enebrink, P., Anderson, H., & Langstrom, N. (2005). Callous-unemotional traits are associated with clinical severity in referred boys with conduct problems. *Nordic Journal of Psychiatry, 59*, 431-440.

Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment, 13*, 454-469.

Falkenbach, D., Poythress, N., & Creevy, C. (2008). The exploration of subclinical psychopathic subtypes and the relationship with types of aggression. *Personality and Individual Differences, 44,* 821-832.

Fanti, K.A., Demetriou, C.A., & Kimonis, E.R. (2013). Variants of callous-unemotional conduct problems in a community sample of adolescents. *Journal of Youth and Adolescence, 42*, 964-979.

Fanti, K., Frick, P. J., & Georgiou, S. (2009). Linking callous-unemotional traits to instrumental and non-instrumental forms of aggression. *Journal of Psychopathology and Behavioral Assessment, 31,* 285-298.

Fitzpatrick, K.M. (1993). Exposure to violence and presence of depression among low-income, African-American youth. *Journal of Consulting and Clinical Psychology, 61*, 528-531.

Fitzpatrick, K.M., & Boldizar, J.P. (1993). The prevalence and consequences of exposure to violence among African American youth. *Journal of the American Academy of Child & Adolescent Psychiatry, 32*, 424-430.

Flannery, D. J., Singer, M. I., & Wester, K. (2001). Violence exposure, psychological trauma, and suicide risk in a community sample of dangerously violent

adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*, 435-442.

Ford, J.D., Fraleigh, L.A., & Connor, D.F. (2010). Child abuse and aggression among seriously emotionally disturbed children. *Journal of Clinical Child & Adolescent Psychology, 39*, 25-34.

Forth, A. E. & Burke, H. C. (1998). Psychopathy in adolescence: Assessment, violence and developmental precursors. In D. Cooke, A. Forth, & R. Hare (Eds.), *Psychopathy: Theory, research and implications for society* (pp. 205-230). Dordrecht: Kluwer.

Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). *The Hare Psychopathy Checklist: Youth Version.* North Tonawanda, NY: Multi-Health Systems.

Fraley, C., & Raftery, A.E. (2003). Enhanced model-based clustering, density estimation, and discriminant analysis software: Mclust. *Journal of Classification, 20*, 263-286.

Frick, P. J. (1995). Callous-unemotional traits and conduct problems: A two-factor model of psychopathy in children. *Issues in Criminological and Legal Psychology, 24*, 47-51.

Frick, P.J. (2004). *The inventory of callous-unemotional traits*. Unpublished rating scale: University of New Orleans.

Frick, P.J. (2006). Developmental pathways to conduct disorder. *Child and Adolescent Psychiatric Clinics of North America, 15*, 311-331.

Frick, P. J., Barry, C. T., & Bodin, S. D. (2000). Applying the concept of psychopathy to
children: Implications for the assessment of antisocial youth. In C. B. Gacono
(Ed.) *The clinical and forensic assessment of psychopathy: A practitioner's guide*
(pp. 3-24). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Frick, P.J., Bodin, S.D., & Barry, C.T. (2000). Psychopathic traits and conduct problems
in community and clinic-referred sample of children: Further development of the
psychopathy screening device. *Psychological Assessment, 12,* 382-383.

Frick, P.J., Cornell, A.H., Barry, C.T., Bodin, S.D., & Dane, H.E. (2003). Callous-
unemotional traits and conduct problems in the prediction of conduct problem
severity, aggression, and self-report of delinquency. *Journal of Abnormal Child
Psychology, 31*, 457-470.

Frick, P. J., & Dantagnan, A. L. (2005). Predicting the stability of conduct problems in
children with and without callous-unemotional traits. *Journal of Child and
Family Studies, 14*, 469-485.

Frick, P.J., & Dickens, C. (2006). Current perspectives on conduct disorder. *Current
Psychiatry Reports, 8*, 59-72.

Frick, P. J., & Hare, R. (2001). *Antisocial process screening device*. Toronto, Ontario,
Canada: Multi-Health Systems.

Frick, P.J., Kimonis, E.R., Dandreaux, D.M., & Farrell, J.M. (2003). The 4-year stability
of psychopathic traits in non-referred youth. *Behavioral Sciences & the Law, 21*,
713-736.

Frick, P. J., Lilienfeld, S. O., Ellis, M., Loney, B., & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*, *27,* 383-392.

Frick, P. J., & Marsee, M. A. (2006). Psychopathy and developmental pathways to antisocial behavior in youth. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 355-374). New York: Guilford.

Frick, P. J., & Morris, A. S. (2004). Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology*, *33,* 54-68.

Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology*, *103,* 700-707.

Frick, P. J., Stickle, T. R., Dandreaux, D. M., Farrell, J. M., & Kimonis, E. R. (2005). Callous-unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Child Psychology*, *33,* 471-487.

Frick, P.J., & White, S.F. (2008). Research review: The importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry, 49,* 359-375.

Gendreau, P., Goggin, C., & Smith, P. (2002). Is the PCL-R really the ―unparalleled measure of offender risk? A lesson in knowledge accumulation. *Criminal Justice and Behavior, 29,* 397-426.

Glass, S. J., & Newman, J. P. (2006). Recognition of facial affect in psychopathic

offenders. *Journal of Abnormal Psychology, 115,* 815-820.

Gorman-Smith, D., & Tolan, P. (1998). The role of exposure to community violence and

developmental problems among inner-city youth. *Development and*

Psychopathology, 10, 101-116.

Guy, L. S., Poythress, N. G., Douglas, K. S., Skeem, J. L., & Edens, J. F. (2008).

Correspondence between self-report and interview-based assessments of

Antisocial Personality Disorder. *Psychological Assessment, 20,* 47-54.

Hare, R.D. (1980). A research scale for the assessment of psychopathy in criminal

populations. *Personality and Individual Differences, 1*, 111-119.

Hare, R.D. (1993). *Without conscience: The disturbing world of the psychopaths among*

us. New York: Guilford Press.

Hare, R.D. (1991/2003). *The Hare Psychopathy Checklist – Revised.* Toronto, Ontario,

Canada: Multi-Health Systems.

Hare, R.D., & Neumann, C. (2006). The PCL-R assessment of psychopathy:

Development, structural properties, and new directions. In C.J. Patrick (Ed.),

Handbook of psychopathy (pp. 55-88). New York: Guilford.

Harpur, T., Hakstian, R., & Hare, R.D. (1988). Factor structure of the Psychopathy

Checklist. *Journal of Consulting and Clinical Psychology, 56*, 741-747.

Harpur, T., Hare, R., & Hakstian, R. (1989). A two-factor conceptualization of

psychopathy: Construct validity and implications for assessment. *Psychological*

Assessment, 1, 6-17.

Hawes, S. W., Byrd, A.L., Henderson, C.E., Gazda, R.L., Burke, J.D., Loeber, R., &
Pardini, D.A. (2014). Refining the parent-reported Inventory of Callous-
Unemotional Traits in boys with conduct problems. *Psychological Assessment*,
26, 256-266.

Hiatt, K. D., Lorenz, A. R., & Newman, J. P. (2002). Assessment of emotion and
language processing in psychopathic offenders: Results from a dichotic listening
task. *Personality and Individual Differences, 32,* 1255-1268.

Hiatt, K. D., Schmitt, W. A., & Newman, J. P. (2004). Stroop tasks reveal abnormal
selective attention among psychopathic offenders. *Neuropsychology,*
18, 50-59.

Hicks, B.M., Markon, K.E., Patrick, C.J., Krueger, R.F., & Newman, J.P. (2004).
Identifying psychopathy subtypes on the basis of personality structure.
Psychological Assessment, 16, 276-288.

Jang, K. L., Livesley, W. J., & Vernon, P. A. (1996). The genetic basis of personality at
different ages: A cross-sectional twin study. *Personality and Individual*
Differences, 21, 299-301.

Jenkins, E.J., & Bell, C.G. (1994). Post-traumatic stress disorder and violence among
inner city high school students. In S. Friedman (Ed.), *Anxiety disorders in*
African Americans. NY: Springer.

Kahn, R.E., Frick, P.J., Feeny, F.C., Youngstrom, E.A., Youngstrom, J.K., & Findling,
R.L. (2013). Distinguishing primary and secondary variants of callous-

unemotional traits among adolescents in a clinic-referred sample. *Psychological Assessment, 25,* 966-978.

Kandel, D.B. (Ed.), (2002). *Stages and pathways of drug involvement: Examining the gateway hypothesis.* New York: Cambridge.

Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminal Psychopathology, 3*, 112-137.

Karpman, B. (1948). The myth of the psychopathic personality. *American Journal of Psychiatry, 104,* 523-534.

Karpman, B. (1955). Criminal psychodynamics: A platform. *Archives of Criminal Psychodynamics, 1,* 3-100.

Kennealy, P. J., Skeem, J. L., Walters, G, D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior and disinhibition to predict violence? *Psychological Assessment, 22*, 569-580.

Kimonis, E. R., Branch, J., Hagman, B., Graham, N., & Miller, C. (2013). The psychometric properties of the Inventory of Callous-Unemotional Traits in an undergraduate sample. *Psychological Assessment, 25,* 84-93.

Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathic traits, aggression, and the processing of emotional stimuli in non-referred children. *Behavioral Sciences & the Law, 24,* 21-37.

Kimonis, E.R., Frick, P.J., Munoz, L.C., & Aucoin, K.J. (2008a). Callous-unemotional traits and the emotional processing of distress cues in detained boys: Testing the

moderating role of aggression, exposure to community violence, and histories of abuse. *Development and Psychopathology, 20,* 569-589.

Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Munoz, L.C., Aucoin, K.J., & Morris, A.S. (2008b). Assessing callous-unemotional traits in adolescent offenders: Validation of the inventory of callous-unemotional traits. *International Journal of Law and Psychiatry, 31*, 241-252.

Kimonis, E. R., Skeem, J., Cauffman, E., & Dmitrieva, J. (2011). Are secondary variants of 'juvenile psychopathy' more reactively violent and less psychosocially mature than primary variants? *Law and Human Behavior, 35,* 381-391.

Kimonis, E.R., Tatar, J., & Cauffman, E. (2012). Substance related disorders among juvenile offenders: What role do psychopathic traits play? *Psychology of Addictive Behaviors, 26,* 212-225.

Krischer, M. K., & Sevecke, K. (2008). Early traumatization and psychopathy in female and male juvenile offenders. *International Journal of Law and Psychiatry, 31,* 253-262.

Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G. & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: modeling the externalizing spectrum. *Journal of Abnormal Psychology, 111*, 411-424.

Krueger, R.F., & Markon, K.E. (2006). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology, 2*, 111-133.

Krueger, R.F., Markon, K.E., Patrick, C.J., Benning, S.D., & Kramer, M.D. (2007).
Linking antisocial behavior, substance use, and personality: An integrative
quantitative model of the adult externalizing spectrum. *Journal of Abnormal
Psychology, 116*, 645-666.

Krueger, R. F., Schmutte, P. S., Caspi, A., Moffitt, T. E., Campbell, K., & Silva, P.A.
(1994). Personality traits are linked to crime among men and women: Evidence
from a birth cohort. *Journal of Abnormal Psychology, 103*, 328-338.

Kruh, I. P., Frick, P. J., & Clements, C. B. (2005). Historical and personality correlates
to the violence patterns of juveniles tried as adults. *Criminal Justice and
Behavior, 32*, 69-96.

Lau, K.S.L., Marsee, M.A., Kunimatsu, M.M., & Fassnacht, G. M. (2011). Examining
associations between narcissism, behavior problems, and anxiety in non-referred
adolescents. *Child & Youth Care Forum, 40*, 163-176.

Lee, Z., Salekin, R.T., & Iselin, A-M. R. (2010). Psychopathic traits in youth: Is there
evidence for primary and secondary subtypes? *Journal of Abnormal Child
Psychology, 38*, 381-393.

Lilienfeld, S. (1994). Conceptual problems in the assessment of psychopathy. *Clinical
Psychology Review, 14*, 17-38.

Loeber, R., Brinthaupt, V. P., & Green, S. (1990). Attention deficits, impulsivity, and
hyperactivity with or without conduct problems: Relationships to delinquency
and unique contextual factors. In R. J. McMahon & R. D. Peters (Eds.), *Behavior*

disorders of adolescence: Research, intervention, and policy in clinical and school settings (pp. 39-61). New York: Plenum Press.

Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (2003). Callous-unemotional traits, impulsivity, and emotional processing in adolescents with antisocial behavior problems. *Journal of Clinical Child and Adolescent Psychology, 32,* 66-80.

Lykken, D. T. (1995). *The antisocial personalities*. Mahwah, NJ: Erlbaum.

Lynam, D.R. (1996). The early identification of chronic offenders: Who is the fledgling psychopath*? Psychological Bulletin, 120,* 209-234.

Lynam, D. R., (1998). Early identification of the fledgling psychopath: Locating the psychopathic child in the current nomenclature. *Abnormal Psychology, 107*, 566-575.

Lynam, D.R., Caspi, A, Moffitt, T.E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2005). Adolescent psychopathy and the big five: Results from two samples. *Journal of Abnormal Psychology, 33*, 431-443.

March, J. (1999). Assessment of pediatric posttraumatic stress disorder. In P. Saigh & J. D. Bremner (Eds.), *Posttraumatic stress disorder: A comprehensive text* (pp. 199-218). Needlam Heights, MA: Allyn & Bacon.

McCord, W., & McCord, J. (1959/1964). *The psychopath: An essay on the criminal mind.* Princeton, NJ: Van Nostrand Company.

Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences, 19,* 523-540.

Miller, L.S., Wasserman, G.A., Neugebauer, R., Gorman-Smith, D., & Kamboukos, D. (1999). Witnessed community violence and antisocial behavior in high-risk, urban boys. *Journal of Clinical Child Psychology, 28*, 2-11.

Morey, L. C. (1991). *Personality assessment inventory: Professional manual.* Odessa, FL: Psychological Assessment Resources.

Morey, L. C. (2007a). *Personality assessment inventory: Professional manual (2nd ed.).* Odessa, FL: Psychological Assessment Resources.

Morey, L.C. (2007b). *Personality assessment inventory-adolescent: Professional manual*. Lutz, FL: Psychological Assessment Resources.

Munoz, L.C., & Frick, P.J. (2007). The reliability, stability, and predictive utility of the self-report version of the Antisocial Process Screening Device. *Scandinavian Journal of Psychology, 48,* 299-312.

Newman, J. P., MacCoon, D. G., Vaughn, L. J., & Sadeh, N. (2005). Validating a distinction between primary and secondary psychopathy with measures of Gray's BIS and BAS constructs. *Journal of Abnormal Psychology, 114,* 319-323.

O'Brien, B. S., & Frick, P. J. (1996). Reward dominance: Associations with anxiety, conduct problems, and psychopathy in children. *Journal of Abnormal Child Psychology, 24,* 223-240.

Osofsky, J.D., Werers, S., Hann, D.M., & Fick, A.C. (1993). Chronic community violence: What is happening to our children? *Psychiatry, 56*, 36-45.

Pardini, D.A. (2006). The callousness pathway to severe violent delinquency. *Aggressive Behavior, 32*, 1-9.

Patrick, C.J. (1994). Emotion and psychopathy: Startling new insights. *Psychophysiology, 31*, 319-330.

Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: Startle reflex modulation. *Journal of Abnormal Psychology*, *102*, 82-92.

Patrick, C. J., Curtin, J. J., & Tellegen, A. (2002). Development and validation of a brief form of the Multidimensional Personality Questionnaire. *Psychological Assessment, 14,* 150-163.

Patrick, C. J., Zempolich, K. A., & Levenston, G. K. (1997). Emotionality and violent behavior in psychopaths: A biosocial analysis. In A. Raine, P.A. Brennan, D. P. Farrington, & S.A. Mednick (Eds.), *Biosocial bases of violence* (pp. 145-161). New York: Plenum Press.

Petrila, J., & Skeem, J. L. (2003). An introduction to the special issues on juvenile psychopathy and some reflections on the current debate: Juvenile psychopathy: The debate. *Behavioral Sciences & the Law, 21*, 689-694.

Pollak, S. D., Cicchetti, D., Hornung, K., & Reed, A. (2000). Recognizing emotion in faces: Developmental effects of child abuse and neglect. *Developmental Psychology, 36*, 679-688.

Porter, S. (1996). Without conscience or without active conscience? The etiology of psychopathy revisited. *Aggression and Violent Behavior, 1,* 179-189.

Porter, S., & Woodworth, M. (2006). Psychopathy and aggression. In C.J. Patrick (Ed.), *Handbook of psychopathy* (pp. 481-494). New York: Guilford Press.

Poythress, N.G., Edens, J.F., Skeem, J.L., Lilienfeld, S.O., Douglas, K.S., Frick, P.J., Patrick, C.J., Epstein, M., & Wang, T. (2010). Identifying subtypes among offenders with Antisocial Personality Disorder: A cluster-analytic study. *Journal of Abnormal Psychology, 119,* 389-400.

Poythress, N. G., & Skeem, J. L. (2006). Disaggregating psychopathy: Where and how to look for subtypes. In C.J. Patrick (Ed.), *Handbook of psychopathy* (pp.172-192). New York: Guilford.

Raine, A., Dodge, K.A., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., Stouthamer- Loeber, M., & Liu, J. (2006). The Reactive–Proactive Aggression Questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. *Aggressive Behavior, 32*, 159-171.

Reynolds, C. R., & Richmond, B. O. (1985). *Revised children's manifest anxiety scale*. Los Angeles, CA: Western Psychological Services.

Roose, A., Bijttebier, P., Claes, L., & Lilienfeld, S. O. (2011). Psychopathic traits in adolescence: Associations with the revised reinforcement sensitivity theory systems. *Personality and Individual Differences, 50,* 201-205.

Ruiz, M.A., & Edens, J.F. (2008). Recovery and replication of internalizing and externalizing dimensions within the Personality Assessment Inventory. *Journal of Personality Assessment, 90,* 585-592.

Salekin, R. T., & Frick, P. J. (2005). Psychopathy in children and adolescents: The need for a developmental perspective. *Journal of Abnormal Child Psychology, 33*, 403-409.

Seagrave, D., & Grisso, T. (2002). Adolescent development and the measurement of

juvenile psychopathy. *Law and Human Behavior, 26,* 219-239.

Singh, J.P., Gann, M., & Fazel, S. (in press). A comparative study of violence risk

assessment tools: A systematic review and metaregression analysis of 68 studies

involving 25,980 participants. *Clinical Psychology Review*.

Skeem, J. L., & Cauffman, E. (2003). Views of the downward extension: Comparing the

Youth Version of the Psychopathy Checklist with the Youth Psychopathic Traits

Inventory. *Behavioral Sciences & the Law, 21,* 737-770.

Skeem, J. L., Edens, J. F., Camp, J., & Colwell, L. H. (2004). Are there ethnic

differences in levels of psychopathy? A meta-analysis. *Law and Human*

Behavior, 28, 505-527.

Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two

subtypes of psychopathic violent offenders that parallel primary and secondary

variants. *Journal of Abnormal Psychology, 116*, 395-409.

Skeem, J., Poythress, N. G., Edens, J. F., Lilienfield, S. O., & Cale, E. M. (2003).

Psychopathic personality or personalities? Exploring potential variants of

psychopathy and their implications for risk assessment. *Aggression and Violent*

Behavior, 8, 513-546.

Swogger, M. T., & Kosson, D. S. (2007). Identifying subtypes of criminal psychopaths.

Criminal Justice and Behavior, 34, 953-970.

Tatar, J. R., Cauffman, E., Kimonis, E. R., & Skeem, J. L. (2012). Victimization history and post-traumatic stress: An analysis of psychopathy variants in male juvenile offenders. *Journal of Child and Adolescent Trauma.*

Turner, H.A., Finkelhor, D., & Ormrod, R. (2006). The effect of life-time victimization on the mental health of children and adolescents. *Social Science & Medicine, 62*, 13-27.

Vassileva, J., Kosson, D. S., Abramowitz, C., & Conrod, P. (2005). Psychopathy versus psychopathies in classifying criminal offenders. *Legal and Criminological Psychology, 10,* 27-43.

Vaughn, M.G., Edens, J.F., Howard, M.O., & Smith, S.T. (2009). An investigation of primary and secondary psychopathy in a statewide sample of incarcerated youth. *Youth Violence and Juvenile Justice, 7*, 172-188.

Veen, V.C., Andershed, H., Stevens, G.W.J.M., Doreleijers, T.A.H., & Vollebergh, W.A.M. (2011). Psychopathic subtypes and associations with mental health problems in an incarcerated sample of adolescent boys. *The International Journal of Forensic Mental Health, 10,* 295-304.

Vincent, G. M., Vitacco, M. J., Grisso, T., & Corrado, R. R. (2003). Subtypes of adolescent offenders: Affective traits and antisocial behavior patterns. *Behavioral Sciences & the Law, 21*, 695-712.

Vollebergh, W. A. M., Iedema, J., Bijl, R. V., de Graaf, R., Smit, F., & Ormel, J. (2001). The structure and stability of common mental disorders. The NEMESIS study. *Archives of General Psychiatry 58*, 597-603.

118

Wareham, J., Dembo, R., Poythress, N. G., Childs, K., & Schmeidler, J. (2009). A latent class factor approach to identifying subtypes of juvenile diversion youths based on psychopathic features. *Behavioral Sciences & the Law, 27*, 71-95.

Weeks, R., & Widom, C. S. (1998). Self-reports of early childhood victimization among incarcerated adult male felons. *Journal of Interpersonal Violence, 13*, 346-361

Weiler, B. L., & Widom, C. S. (1996). Psychopathy and violent behavior in abused and neglected young adults. *Criminal Behavior and Mental Health, 6,* 253-271.

Widom, C.S., Schuck, A.M., & White, H.R. (2006). An examination of pathways from childhood victimization to violence: The role of early aggression and problematic alcohol use. *Violence & Victims, 21*, 675-690.

Yang, M., Wong, S.C.P., & Coid, J., (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin, 136*, 740-767.

Zeier, J.D., Maxwell, J.D., & Newman, J.P. (2009). Attention mediates the processing of inhibitory information in primary psychopathy. J*ournal of Abnormal Psychology, 118*, 554-563.

APPENDIX A

			PAI-A Derived Subgroups			
			Subgroup1	Subgroup 2	Subgroup 3	Subgroup 4
Revised Clusters	Primary	Count	28	9	7	15
		% within Revised Clusters	47.50%	15.30%	11.90%	25.40%
		% within PAI-A Subgroups	63.60%	34.60%	18.80%	36.60%
	General Delinquent	Count	12	0	20	23
		% within Revised Clusters	21.80%	0.00%	36.40%	41.80%
		% within PAI-A Subgroups	27.30%	0.00%	54.10%	56.10%
	Secondary	Count	4	17	10	3
		% within Revised Clusters	11.80%	50.00%	29.40%	8.80%
		% within PAI-A Subgroups	9.10%	65.40%	27.00%	7.30%

CORRELATION MATRIX OF ALL STUDY VARIABLES

Scale	Callous	Un.C.	UnE.	ICU Total	Rev. Call.	Rev. Un.C.	Rev. Total	PA	RA	Total Agg..	Marj. Use	Alc. Use	Other Use	EXT	INT	ANT	ANX	DOM
ICU																		
Callous	-	.56***	.35***	.84***	.93***	.53***	.87***	.53***	.41***	.52***	.24***	.21**	.22**	.40**	.29***	.47***	.23**	.13
Un.C.	.56***	-	.48***	.87***	.56***	.91***	.83***	.28	.25	.29	.16*	.13	.11	.13	.07	.17*	.03	-.06
Un.E.	.35***	.48***	-	.69***	.30***	.50***	.45***	.10	-.01	.06	-.06	-.03	.00	-.02	.06	-.02	-.01	.01
Total	.84***	.87***	.69***	-	.78***	.81***	.92***	.41***	.31***	.40***	.17*	.15	.15	.24**	.18*	.30***	.12	.04
Rev. Call	.93***	.56***	.30***	.78***	-	.48***	.89***	.52***	.39***	.51***	.21**	.19*	.25**	.44***	32***	.51***	.29***	.07
Rev. Un.C.	.53***	.91***	.50***	.81***	.48***	-	.83***	.30***	.26**	.30***	.10	.07	.04	.08	.03	.12	.01	.02
Rev. Tot.	.87***	.83***	.45***	.92***	.89***	.83***	-	.49***	.38***	.48***	.18*	.15	.19*	.32***	.22**	.39***	.18*	.06
R-PAS PA	.53***	.28***	.10	.41***	.52***	.30***	.49***	-	.65***	.92***	.16*	.25**	.27***	.59***	.34***	.59***	.35***	.21**
RA	.41***	.25**	-.01	.31***	.39***	.25**	.38***	.65***	-	.90***	.15	.23***	.18*	.53***	.28***	.47***	.31***	.18*
Total Agg	.52***	.29***	.06	.40***	.51***	.30***	.49***	.92***	.90***	-	.17*	.27***	.25**	.62***	.34***	.59***	.36***	.22**
Substance																		
Marj. Use	.24**	.16*	-.06	.17*	.21*	.10	.18*	.16*	.15	.17*	-	.46***	.49***	.36***	.08	.24**	.03	.16
Alc. Use	.21*	.13	-.03	.15	.16*	.07	.15	.25**	.23**	.27***	.46***	-	.62***	.37***	.16	.29***	.16	.15
Other Use	.22**	.11	.00	.15	.25**	.04	.18*	.27***	.18/*	.28***	.49***	.62***	-	.48***	.27***	.36***	.23**	.12

Scale	Callous	Un.C.	UnE.	ICU Total	Rev. Callous	Rev. Un.C.	Rev. Total	PA	RA	Total Agg.	Marj. Use	Alc. Use	Other Use	EXT	INT	ANT	ANX	DOM
PAI-A																		
EXT	.40***	.13	-.02	.24**	.44***	.08	.32***	.59***	.53***	.62***	.36***	.37**	.48**	-	.70***	.78***	.38***	.26***
INT	.27***	.07	.06	.18*	.32***	.03	.22**	.34***	.28***	.34***	.03	.16	.27***	.70***	-	.41***	.86***	-.03
ANT	.47***	.17*	-.02	.30***	.51***	.12	.39***	.59***	.47***	.58***	.24**	.29***	.36***	.76***	.41***	-	.36	.19*
ANX	.23**	.03	-.01	.12	.29***	-.01	.18*	.35***	.31***	.36***	.03	.16	.23**	.62***	.85***	.38***	-	-.13
DOM	.13	-.06	.01	.04	.07	.02	.06	.21**	.18*	.22**	.16	.15*	.12	.26***	-.03	.19*	.28***	-
SRD																		
Total	.38***	.34***	.08	.36***	.39***	.30***	.40***	.53***	.35***	.49***	.43***	.45***	.55***	.53***	.12	.52	.12	.19*
Violent	.36***	.29***	.04	.31***	.36***	.27***	.31***	.50***	.44***	.52***	.27***	.28***	.32***	.46***	.13	.44***	.12	.20*
Nonviolent	.31***	.30***	.09	.31***	.32***	.25*	.33***	.44***	.22**	.37***	.45***	.46***	.59***	.46***	.16	.46***	.09	.15
Behavioral																		
Arrests	.06	.03	-.12	.01	.06	.08	.08	.23**	.20	.24**	.07	-.07	.03	.16	.05	.22**	.01	.07
Violations	.11	.08	.02	.09	.11	.12	.13	.18*	.06	.13	.08	-.11	.02	.07	-.05	.13	-.03	.13
Trauma																		
CTQ-SF	.25*	.20*	.04	.22**	.29***	.12	.25*	.28***	.31**	.33***	.04	.15	.17*	.38***	.40***	.33***	.39***	-.11
CREV-R	.24**	.05	-.02	.13	.21**	.02	.15	.35***	.20*	.30***	.33***	.41***	.44***	.38***	.12	.28***	.06	.24**

Appendix B Continued

Scale	Total Delinquency	Violent	Nonviolent	Arrests	Violations	CTQ-SF	CREV-R
ICU							
Callous	.38***	.36***	.31***	.06	.10	.25***	.24***
Un.C.	.34***	.29***	.30***	.03	.08	.20*	.05
Un.E.	.08	.04	.09	-.12	.02	.04	-.02.
Total	.36***	.31***	.31***	.01	.09	.22***	.13
Rev. Call	.39***	.36***	.32***	.06	.11	.29***	.21**
Rev. UnC	.30***	.27***	.25***	.08	.12	.12	.02
Rev. Tot.	.40***	.37***	.33***	.08	.13	.25**	.14
R-PAS							
PA	.52***	.50***	.44***	.23**	.18*	.28***	.35***
RA	.35***	.44***	.22***	.20*	.06	.31***	.20*
Total Agg	.49***	.52***	.37***	.24**	.13	.33***	.30***
Substance							
Marj. Use	.43***	.27***	.45***	.07	.08	.04	.33***
Alc. Use	.45***	.28***	.46***	-.07	-.12	.15	.41***

Appendix B Continued

Scale	Total Delinquency	Violent	Nonviolent	Arrests	Violations	CTQ-SF	CREV-R
Other Use	.55***	.32***	.59***	.03	.02	.17*	.41***
PAI-A							
EXT	.53***	.46***	.46***	.16*	.06	.38***	.38***
INT	.17*	.13	.16*	.05	-.05	.40***	.12
ANT	.52***	.44***	.46***	.22**	.13	.33***	.28***
ANX	.12	.12	.09	.01	-.03	.39***	.06
DOM	.19*	.20*	.15*	.07	.13	-.11	.24***
SRD Total	-	.80***	.90***	.30***	.27***	.13	.54***
Violent	.80***	-	.49***	.27***	.21*	.16*	.45***
Nonviolent	.92***	.49***	-	.25**	.25**	.03	.49***
Behavioral Arrests	.30***	.27***	.25***	-	.64***	.11	.17*
Violations	.27***	.21*	.25**	.64***	-	-.03	.15
Trauma CTQ-SF	.13	.16*	.08	.11	-.03	-	.16*
CREV-R	.54***	.45***	.49***	.16*	.15	.16*	-

Note. ICU = Inventory of Callous-Unemotional Traits. PAI-A = Personality Assessment Inventory-Adolescent Version. ANX = Anxiety scale from the Personality Assessment Inventory – Adolescent Version. ANT = Antisocial Features scale from the Personality Assessment Inventory – Adolescent Version. DOM = Dominance scale from the Personality Assessment Inventory – Adolescent Version. SRD = Self-Reported Delinquency Scale. CTQ-SF = Childhood Trauma Questionnaire-Short Form. CREV-R = The Children's Report of Exposure to Violence-Revised. R-PAS = Reactive-Proactive Aggression Scale. Call = ICU Callousness Subscale. Un.C. = ICU Uncaring Subscale. Un.E. = ICU Unemotional Subscale. Rev = Revised. Tot. = Total. EXT = Externalizing Dimension. INT = Internalizing Dimension. PA = Proactive Aggression. RA = Reactive Aggression. Total Agg = Total Aggression. Marj. Use = Marijuana Use. Alc. Use = Alcohol Use.
*** $p < .005$, ** $p < .01$, * $p < .05$