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Serial Homicide Perpetrators' Self-Reported Psychopathy and Criminal Thinking

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Abstract The current research reports 61 male serial murderers' responses to self-report questionnaires designed to assess levels of psychopathy and criminal thinking. Three separate measures of psychopathy were included. Contrary to our predictions, results indicated that our sample of serial murderers did not demonstrate strong evidence of psychopathy. Rather, the percentage of inmates who could be classified as having psychopathic tendencies is on par with the general population of prisoners. Only half of the participants had an interpretable criminal thinking style scale. Temperament and power issues were the two factors of greatest significance for understanding the serial homicide perpetrators' criminal cognition. In line with expectations, multiple significant correlations were observed for the measures. Implications and limitations of the research are discussed.

Keywords Serial murder · Psychopathy · Criminal thinking · PICTS · PPI-R

Introduction

Psychopathy is a personality disorder associated with aggressiveness, impulsivity, manipulation, selfishness, callousness, remorselessness, and a severe lack of empathy (Cleckley 1976; Hare 1996; Harris et al. 2001). Previous research has examined the prevalence of psychopathy in violent criminals, but no study has qualified the presence of psychopathic personality traits in serial homicide perpetrators. In an effort to add to the sparse literature of serial homicide, the current research utilized self-reported data from serial killers across the United States, with a particular focus on the psychopathy and criminal thinking styles of these individuals.

Serial Murderers

Serial murderers have long simultaneously disturbed and intrigued the public. Often, these crimes are viewed as the most heinous, yet least understood forms of human criminal actions, with one author commenting, "male serial killers represent the darkest, most sinister side of human existence, yet we are fascinated to read about them" (Hickey 2010, p. 217). Despite society's fascination with this unique subset of offenders, research has thus far failed to adequately explain the underlying motivations of the serial murderer. One problem unique to researching this population is the debate regarding the definition of a serial killer. Failing to define the target population universally leads to difficulties in generalizing research findings and the ability of researchers to make definitive statements about the serial killer population.

Over the years, there have been many debates and definitions put forth regarding the necessary features required to label an offender a serial killer. Some researchers suggest that the number of murders required should be no less than four, which separates the serial killer from the general perpetrator who may commit double or even triple homicide (Fox and Levin 1998); others argue that a minimum of three victims is standard for inclusion (Holmes and Holmes 2010). In an effort to create a unified, agreed upon definition of a serial killer, the Federal Bureau of Investigation's (FBI) National Center for the Analysis of Violent

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Crime (NCAVC) brought together a panel of experts from various fields, such as law enforcement, social sciences, and media. Based on that convening, the NCAVC recommends that (a) two or more victims is sufficient for the classification of an offender as a serial killer and (b) that offenses occur at different places or times, a necessary differentiation between serial and mass murderers (Morton and Hilts 2008, p. 9). Morton et al. (2014) added one more criterion to their research: "The offender had either been found guilty during trial, plead guilty, accepted a guilty plea without admitting guilt, or there was a preponderance of evidence linking the offender to the specific offense or offenses" (p. 10). One disputed characteristic of serial killers is that there is a "cooling-off" period between murders (e.g., Busch and Cavanaugh 1986; Fox and Levin 1998, 2015; Greene and Heilbrun 2011; Kraemer et al. 2004; Morton and Hilts 2008). The cooling off period indicates a time during which the killer returns to his normal lifestyle without murderous activity (Morton and McNamara 2005) and is used to differentiate serial from spree killers. The researchers at the NCAVC discarded the cooling off criteria, noting little agreement in its application (Morton and Hilts 2008).

Two previous studies have explored the personality of serial murderers (Culhane et al. 2014, 2016). Culhane et al. (2014) administered the Minnesota Multiphasic Personality Inventory—2 (Butcher et al. 1989) to a group of male serial murderers. The average profile of the sample was one indicative of a disturbed individual. Elements of criminality, paranoia, and schizophrenia were all present. The authors performed a cluster analysis on their sample and found two distinct groups. The larger group, termed the Non-Disturbed Cluster, showed a profile similar to that of a non-violent criminals. The other, or Disturbed Cluster, had an average profile with numerous clinical elevations. The authors concluded that there were great variations in the personality make-up of serial homicide offenders. Criminal offenders have long presented more pathology on this particular inventory dating back to the original incarnation, the MMPI (Cornell et al. 1988).

Similarly, working from the same sample, Culhane et al. (2016) explored serial murderers' responses to the Millon Clinical Multiaxial Inventory—III (MCMI-III; Millon et al. 2009). Results from the computer-scored interpretations were both expected and surprising. As predicted, killers expressed a high rate of traits associated with personality disorders. The surprising finding to the authors was the breadth of the disorders experienced by the murderers. There was no disorder that particularly stood out, rather the offenders had nearly even distribution on multiple personality disorders.

Psychopathy and Violent Crime

Psychopathy is a strong predictor of criminal activity (DeLisi 2009) and the strongest predictor of violent recidivism in offenders (Harris et al. 2001). Estimates suggest that approximately 80% of psychopaths are men (Greene and Heilbrun 2011) and that psychopaths account for approximately 1% of the general population (Hare 1996). Although 1% of the general population is seemingly small, psychopaths constitute anywhere from 15 to 25% of the incarcerated population in the federal system (Woodworth and Porter 2002). As compared to non-psychopathic offenders, those with psychopathy are more likely to be involved in the criminal justice system at a young age (Forth and Book 2007) and for more violent crimes (Hare and McPherson 1984). In a study of male inmates, Hare and McPherson (1984) found that psychopathic offenders were convicted 3.5 times more often than non-psychopathic offenders for violent crimes.

Psychopathic offenders perpetrate the most severe forms of physical abuse against their victims (Huss and Langhinrichsen-Rohling 2000), and the crimes are often more heinous than those committed by non-psychopathic offenders (e.g., Woodworth and Porter 2002). Research by Williamson et al. (1987) indicates that psychopathic offenders are frequently motivated by external factors, such as a material gain, and less likely to be in a heightened emotional state during a violent act, as compared to non-psychopathic offenders. Cornell et al. (1996) found that psychopathic offenders were more likely to have committed some form of instrumental violence, or purposeful and goal-directed violence, during their criminal history than were non-psychopathic offenders. Woodworth and Porter (2002) found that murders committed by psychopaths were more likely to be instrumental or "cold-blooded" (based on external motivation, premeditated, and unemotional) in nature, when compared to murders committed by non-psychopathic offenders. In fact, 93.3% of murders committed by psychopaths were primarily instrumental in nature as compared to 48.4% of murders committed by non-psychopathic offenders. Non-psychopathic offenders were more likely commit "crimes of passion," wherein the crime is committed under emotional or anxiety-provoking circumstances (Woodworth and Porter 2002).

Although there has been a great deal of research on psychopathic homicide perpetrators (e.g., Hare and McPherson 1984; Häkkänen-Nyholm and Hare 2009; Woodworth and Porter 2002), studies focusing on psychopathic offenders who commit multiple homicides are virtually non-existent. The most common method for collecting data on potential psychopathy is Hare's (2003) Psychopathy Checklist—Revised (PCL-R). The PCL-R identifies certain individuals as being more prone to recidivism, and particularly violent recidivism, based on their adherence to the traits of a psychopathic personality. Other research has questioned the incremental predictions of PCL-R scores on violent recidivism beyond age and criminal history (Walters 2012b). Walters (2012b) goes on to argue that alternative measures should be used to expand our understanding of the relationship between psychopathy and criminality. There are other methods for

assessing psychopathic personality traits, such as self-report surveys. Hare has developed his own, as have others (discussed subsequently). This research uses this alternative method and explores psychopathy from the perspective of the serial violent offender.

Criminal Thinking

General criminal thinking is a significant predictor of repeat criminal behavior (Walters 2012a), a hallmark of serial violence. A core feature of antisocial cognition is the offender's criminal thinking, or the attitudes, beliefs, and rationalizations an offender uses to assuage any guilt from criminal behaviors (Walters 2012a). In an extensive meta-analysis of recidivism, Gendreau et al. (1996) concluded that antisocial personality was a significant predictor of adult offender recidivism. They also noted that criminogenic needs, or antisocial cognitions, values, and behaviors (see Andrews and Bonta 1994), were also strong predictors. Indeed, antisocial personality and the offender's criminogenic needs were both in the top four of many significant predictors. Whited et al. (2017) argued that the term of criminogenic thinking maybe more appropriate and is conceptualized similarly to Walters (2006). For simplicity, we use the term criminal thinking in conjunction with the measure used. Walters (1995, 2006) hypothesizes that there are eight thinking styles for the criminal system of cognition: mollification, cutoff, entitlement, power orientation, sentimentality, superoptimism, cognitive indolence, and discontinuity (for a review of these individually, see Walters 2006). The criminal thinking of offenders is not a personality trait, but rather how the individual processes the world around him. Still, given the similarities among many of these thinking styles and psychopathy, there is ample opportunity to see significant correlations among distinct measures of each. Previous research has found significant correlations between the eight styles and an antisocial features scale of a personality inventory (Walters and Geyer 2005). In addition to the relationships among the styles and antisocial thinking, Walters' (2006) questionnaire, the Psychological Inventory of Criminal Thinking Styles, or PICTS, assesses composite measures of proactive and reactive criminal thinking, or the planned versus spontaneous criminal cognitions, respectively. Walters and Yurvati (2017) argue that these factors are higher-order criminal thinking dimensions and are more reliable and valid than the subordinate thinking styles. They (Walters and Yurvati 2017) also underscore the differences between proactive and reactive crimes. Proactive criminal thinking leads to crimes that are more instrumental in nature, such as robbery and burglary, while reactive criminal thinking tends to be impulsive, with crimes such as domestic violence and assault. An understanding of how serial homicide perpetrators think about their crimes is a missing piece of the research puzzle.

The Current Study

In keeping with the goal of examining serial killers from the firsthand perspective of the offender (Skrapec 2001) and expanding the scant body of literature, the current research explored the self-reported data of serial homicide perpetrators. The data presented here were amassed as part of a larger, nation-wide data collection effort, with a specific focus on psychopathy and criminal thinking. It was hypothesized that the nature of a serial murderer's criminal behaviors will dictate an increased presence of psychopathic personality traits (e.g., cold heartedness and callous affect). Therefore, this sample's average scores on the various psychopathy measures administered should be on par with other confirmed psychopathic samples. Furthermore, we expected that the percentage of serial killers demonstrating scores in the psychopathic ranges would be greater than the general prison population of 15–25%. With respect to criminal thinking, no predictions were made regarding the proactive or reactive style of thinking of the inmates. This part of our study was purely exploratory. Finally, in line with previous research, we expected to find numerous correlations for the various measures of psychopathy, as well as significant correlations among the psychopathy measures and the criminal thinking measure.

Method

Participants

Participation was solicited from over 550 incarcerated suspected multiple murderers from across the United States. Identified offenders were sent an initial solicitation inquiring about interest in participating in a research study via mail correspondence. After indicating a willingness to participate, specific state Department of Corrections' Institutional Review Boards (IRB) were contacted. Several inmates indicated a desire to participate, but they were ultimately unable to because of their respective IRBs' decisions. Of those individuals able to participate, we received responses from 81 suspected serial murderers. Included in the 81 responses were those of seven female offenders. Complete information about part of the female sample has already been reported in another article (Hildebrand and Culhane 2015) and will not be included in the current analysis.[1] Three additional females and 13 males (four mass murderers and nine single murderers) were also excluded. The data presented here includes 61 male serial murderers confirmed through searches of criminal justice records (e.g.,

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[1] Complete study information on four female serial murderers was reported by Hildebrand and Culhane (2015). The remaining three female serial murderers had not returned their participant packets by the time of article publication and were not included.

police reports, court convictions), Newton's *The Encyclopedia of Serial Killers* (2000), and news reports. In accordance with the previous descriptions, those referred to as serial murderers in our sample had to have killed at least two people during two different incidents (Morton and Hilts 2008). The mean age of these participants was 50.98 ($SD =$ 10.62; range 32–79). The majority of the sample (67.2%) self-identified their race/ethnicity as White. The second largest group was Black (18.0%), followed by Hispanic (4.9%). The remaining 9.8% self-identified as other. Our participants had a mean of 22.77 years incarcerated ($SD = 9.01$) and a range of 5–45 years. The offenders had a mean number of kills that could be confirmed through court reports/ newspaper coverage of 4.52 ($SD = 4.88$; range 2–28) and a mean number of kills that were suspected of perpetration of 5.13 ($SD = 5.49$; range 2–29).

Materials

Inmates were sent a packet of self-report measures to complete individually at their respective prisons. Inmates were not monitored while completing these surveys for reasons of confidentiality. The packet contained several surveys including measures focusing on psychopathology, anger, aggression, and risk factors related to family, self-control, neutralization, and community. The current study focuses on responses to the following four scales measuring psychopathy and criminal thinking (more in-depth scale descriptors are located in Appendix A):

Psychopathic Personality Inventory—Revised (PPI-R; Lilienfeld and Widows 2005). This is a 154-item measure which is completed using a four-point scale (*false, mostly false, mostly true, true*). The PPI-R produces a total scale score ($\alpha = .89$) and eight subscales used to assess the core characteristics of psychopathy [Machiavellian Egocentricity ($\alpha = .82$), Rebellious Nonconformity ($\alpha = .88$), Blame Externalization ($\alpha = .76$), Carefree Nonplanfulness ($\alpha = .53$), Social Influence ($\alpha = .07$), Fearlessness ($\alpha = .63$), Stress Immunity ($\alpha = .61$), and Coldheartedness ($\alpha = .75$)]. The PPI-R also includes four validity scales (Virtuous Responding, Deviant Responding, Inconsistent Responding-15, and the more conservative Inconsistent Responding-40). T-scores were computed based on the normative correctional sample, which consists of 154 male inmates in a pre-release treatment facility in New Jersey (Lilienfeld and Widows 2005). This scale has been found to possess acceptable reliability and validity (e.g., Lilienfeld and Widows 2005).

Levenson's Self-Report Psychopathy (LSRP; Levenson et al. 1995). The LSRP is a 26-item scale used to assess psychopathic attitudes with responses ranging from "*disagree strongly*" to "*agree strongly*" on a 4-point Likert scale. This measure produces a 2-factor model assessing Primary and Secondary Psychopathy. Primary Psychopathy items were designed to assess psychopathic affect, specifically a selfish, uncaring, and manipulative attitude toward others with questions such as, "In today's world, I feel justified in doing anything I can get away with to succeed" (Levenson et al. 1995, p. 152–153). Secondary Psychopathy, on the other hand, relates to impulsivity and a self-defeating lifestyle, and was assessed with questions such as, "When I get frustrated, I often 'let off steam' by blowing my top" (Levenson et al. 1995, p. 152–153). In addition to these two factors, the LSRP provides an overall score of psychopathy. Coefficient alphas for this sample were .93 for Primary Psychopathy, .81 for Secondary Psychopathy, and .94 for the overall psychopathy scale. The LSRP has been found to possess satisfactory reliability and validity with both student (e.g., Levenson et al. 1995) and criminal samples (e.g., Walters et al. 2008).

Self-Report Psychopathy Scale—III (SRP-III; Paulhus et al. in press). This scale includes 64 items designed to assess psychopathy with items rated on a five-point Likert scale (1 *disagree strongly*–5 *agree strongly*). The SRP-III is composed of four subscales [Interpersonal Manipulation ($\alpha = .81$), Callous Affect ($\alpha = .81$), Erratic Life Style ($\alpha = .82$), and Criminal Tendencies ($\alpha = .78$)], as well as a global psychopathy score ($\alpha = .94$).

Psychological Inventory of Criminal Thinking Styles (PICTS; Walters 1995). The PICTS is an 80-item, self-report measure scored on a four-point Likert scale with responses ranging from 1 (*disagree*) to 4 (*strongly agree*). The items load onto eight thinking styles [Mollification ($\alpha = .76$), Cutoff ($\alpha = .79$), Entitlement ($\alpha = .69$), Power Orientation ($\alpha = .81$), Sentimentality ($\alpha = .61$), Superoptimism ($\alpha = .63$), Cognitive Indolence ($\alpha = .68$), and Discontinuity ($\alpha = .75$)] thought to be pertinent to maintaining a criminal lifestyle. Additionally, two content scales, Current Criminal Thinking and Historical Criminal Thinking, four factor scales, Problem Avoidance, Interpersonal Hostility, Self-Assertion/ Deception, and Denial of Harm, and a special scale, Fear-of-Change, are also calculated. Furthermore, the PICTS also contains two composite scales (Proactive and Reactive Criminal Thinking) designed to indicate which style of thinking an individual subscribes (Walters 2006). Finally, the PICTS produces two validity scales (Confusion-revised and Defensiveness-revised) which allow the administrator to identify answer patterns consistent with faking, reading problems, careless response patterns, or defensive responding. T-scores were computed based on a correctional sample, which consisted of 450 male inmates in minimum, medium,

and maximum security federal prisons (Walters 2006). The PICTS possesses satisfactory reliability and validity (e.g., Walters 1995). The eight criminal thinking scales were most pertinent to the research at hand, but exploratory examinations of the other measures were also conducted.

Results

PPI-R

Four inmates have been excluded from the following PPI-R analyses for having a raw score over 45 on the Inconsistent Responding 40 scale. Lilienfeld and Widows (2005) indicate such profiles are inconsistent and invalid due to atypical responding patterns, such as random or careless responses, a reading level below 4th grade, or attempts to deliberately sabotage the test.

Following omission of invalid responses, the sample's PPI-R Total score was calculated. The sample had a mean total raw score of 294.16 ($SD = 40.23$), a score slightly higher than the Lilienfeld and Widows' normative prison sample score of 283.86, t (56) = 1.93, $p = .058$, $d = .51$. In total, only 13 of the 57 serial homicide perpetrators (22.8%) had total PPI-R scores in the elevated range. This was contrary to the hypothesis that serial murderers would have increased prominence of psychopathic traits compared to the general prison populations.

There are very few published PPI-R data from offender samples (Miller and Lynam 2012). Therefore, the normative prison sample data are used for comparisons throughout these analyses. Table 1 displays the means, standard deviations, and t test values comparing this sample to the means of the offender sample of Lilienfeld and Widows. Five of the eight content scales of interest were significantly different from the normative correctional group. First of these, Rebellious Nonconformity, indicated a heightened "reckless lack of concern regarding social norms" (Lilienfeld and Widows 2005, p. 21). In other words, the serial offenders did not feel confined by society's rules and had no hesitation in rebelling against them. A second scale of significance was Carefree Nonplanfulness. Individuals with an elevated score on this scale can be described as indifferent when it comes to planning his actions, and he makes no effort to create and achieve long-term goals (Lilienfeld and Widows 2005).

Serial murderers scored higher than the normative correctional sample on the Fearlessness scale. The higher the score on this scale, the less one fears physical danger, and the more eager he may be to take physical risks. Furthermore, this sample displayed a significantly elevated Coldheartedness score. This scale measures the level of attachment, guilt, empathy,

Table 1 Mean raw scores for the psychopathic personality inventory—revised content scales and factors ($n = 57$)

Subscale	M	SD	t	d
Content scale				
Machiavellian Egocentricity	38.00	10.94	−.26	.07
Rebellious Nonconformity	32.53	9.47	4.25***	1.14
Blame Externalization	35.40	9.72	1.09	.29
Carefree Nonplanfulness	36.60	10.55	2.25*	.60
Social Influence	42.79	9.15	−4.70***	1.24
Fearlessness	35.09	9.50	3.53**	.94
Stress Immunity[a]	37.93	6.30	1.52	.41
Coldheartedness	35.77	9.63	2.19*	.59
Factor				
Self-Centered Impulsivity	142.56	31.08	2.30*	.61
Fearless Dominance	116.65	16.78	2.10*	.56

[a] A mean of 36.66 was used for the t test comparison of Stress Immunity. The sourcebook had a typographical error, and the correct mean was received from a Personal Communication (December 20, 2016) with Lilienfeld

*$p < .05$

**$p = .001$

***$p < .001$

and loyalty one has to those around him, or "a diverse array of traits that appear to be characterized by a paucity of social emotions" (Lilienfeld and Widows 2005, p. 33), with higher scores indicating a higher level of coldheartedness and low levels of positive emotions. Finally, while significantly different, interpretation of the content scale of Social Influence is largely unreliable because of the extremely low internal consistency.

When considering factor scores, our sample had significantly higher means for both factors of Self-Centered Impulsivity and Fearless Dominance. Those with a moderately elevated Total score and elevated Self-Centered Impulsivity PPI-R Factor score (serial homicide sample $M = 142.56$, $SD = 31.08$; t (56) = 2.30, $p = .025$, $d = .61$) are said to have a heightened risk for Axis I pathology (e.g., depression, anxiety disorders, bipolar disorder, schizophrenia), as well as feelings of grandiosity and poor impulse control (Lilienfeld and Widows 2005).

Because the average profile of a serial murderer was not indicative of any clinical elevations, a hierarchical cluster analysis using Ward's method (Ward 1963) for the eight content scales was performed. This test revealed two distinct groups. The first group ($n = 28$) had a PPI-R Total score approaching clinical elevation ($T = 63$) and a single clinical elevation for their content scales. Only Rebellious Nonconformity ($M = 38.96$; $SD = 8.10$) showed an average T score greater than 65. The other group ($n = 29$) showed no elevations on any scale.

LSRP

The short length of the LSRP does not allow for a check of random or faking response pattern. Therefore, the inmates who were excluded from the PPI-R and PICTS (discussed subsequently) were excluded from further analyses of the two remaining psychopathy scales ($n = 54$). The LSRP provides three main scores: Primary Psychopathy ($M = 28.91$, $SD = 9.72$), Secondary Psychopathy ($M = 20.78$, $SD = 5.72$), and a Total LSRP score ($M = 49.69$, $SD = 14.42$). To assess this sample for elevated psychopathy, we compared these inmates against the original community sample (Levenson et al. 1995), as well as a correctional sample (Walters et al. 2008). Results of these analyses can be seen in Table 2.

Our sample was not significantly different from Walters and colleagues' correctional sample on either of the LSRP scales, signifying they show no more or less psychopathic attributes. However, serial murderers were moderately higher, albeit at the $p = .067$ level, than the original community sample on the Secondary Psychopathy scale. They were not different from the community sample in Primary Psychopathy. This would suggest the serial murderers lead a slightly more self-defeating lifestyle, with increased impulsivity and a lack of long-term goals, than community members.

SRP-III

The serial murderers had a total SRP-III mean of 187.11 ($SD = 35.59$). The SRP-III accounts for a four-factor model of psychopathy, assessing Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Criminal Tendencies. Neumann and Declercq (2009) obtained SRP-III subscale scores from three different populations: a community sample, a college sample, and an offender sample, which was divided into psychopathic and non-psychopathic offenders. Table 3 illustrates the mean comparisons of our sample of serial murderers and these three groups.

Table 2 LSRP scores of the serial murderers compared to community and correctional samples

Scale	M	SD	t	d
Primary psychopathy				
Serial murderers	28.91	9.72		
Levenson et al.'s (1995) community sample	29.13	6.86	−.17	.04
Walters et al.'s (2008) correctional sample	28.70	7.60	.16	.04
Secondary psychopathy				
Serial murderers	20.78	5.72		
Levenson et al.'s (1995) community sample	19.32	4.06	1.87*	.48
Walters et al.'s (2008) correctional sample	21.10	5.64	−.41	.11

LSRP = Levenson's Self-Report Psychopathy scale

*$p = .067$

Table 3 SRP-III scale means of serial murderers compared to Neumann and Declercq's (2009) community, college, and offender samples

	M	SD	t	p	d
Interpersonal manipulation					
Serial murderers	42.78	10.41			
Community sample	31.00		8.31	>.001	2.26
College sample	39.00		2.67	.010	.73
Offenders					
Non-psychopathic	45.00		−1.57	.120	.43
Psychopathic	56.00		−9.33	>.001	2.54
Callous affect					
Serial murderers	43.44	9.61			
Community sample	30.00		10.29	>.001	2.80
College sample	37.00		4.93	>.001	1.34
Offenders					
Non-psychopathic	44.00		−.42	.674	.11
Psychopathic	51.00		−5.78	>.001	1.57
Erratic lifestyle					
Serial murderers	49.44	10.30			
Community sample	32.00		12.45	>.001	3.39
College sample	41.00		6.02	>.001	1.64
Offenders					
Non-psychopathic	53.00		−2.54	.014	.69
Psychopathic	61.00		−8.24	>.001	2.24
Criminal tendencies					
Serial murderers	51.44	10.40			
Community sample	20.00		22.21	>.001	6.04
College sample	25.00		18.68	>.001	5.08
Offenders					
Non-psychopathic	48.00		2.43	.018	.66
Psychopathic	55.00		−2.51	015	.68

SRP-III = Self-Report Psychopathy—III

The serial murderer sample greatly differed from the community and college samples. Our sample was significantly higher on every scale and had a large magnitude of difference in nearly every statistical test. There were some differences seen between the community sample tests and the college sample tests. This may be a function of the types of college students used for the normative data. For example, Clow and Scott (2007) found significant differences among criminal justice majors and nursing majors on measured psychopathy. Future research may wish to explore this further. As the SRP-III comparisons would suggest, though there are significant differences, our sample of serial murderers most closely match Neumann and Declercq's (2009) non-psychopathic offender sample on all four subscales. The sample of serial homicide perpetrators was significantly lower than the psychopathic offender group on each of the four

subscales, indicating they are not, on average, at a diagnosable score of psychopathy as measured by the SRP-III.

A hierarchal cluster analysis using Ward's Method (Ward 1963) revealed two distinct groups. Unlike the cluster analysis of the PPI-R scores, this analysis revealed a much smaller group with psychopathic tendencies ($n = 14$). It is important to remember that 13 of the PPI-R Total scores were in the clinically elevated range of psychopathy. Twelve of those 13 fall into this new cluster analysis group of elevated psychopathy scores on the SRP-III suggesting a substantial overlap of the two measures and simultaneously cross-validating each. It is also important to note that the mean scores for the 14 killers in this cluster had mean scores in line with or higher than Neumann and Declercq's (2009) psychopathic offender scores [Interpersonal Manipulation (56.57; $SD = 7.18$), Callous Affect (54.71; $SD = 6.91$), Erratic Lifestyle (62.14; $SD = 6.63$), and Criminal Tendencies (60.71; $SD = 8.69$)].

PICTS

Three inmates' response patterns were notable and omitted from the following PICTS analyses. One inmate had a Confusion T-score over 80, which indicates "a 'fake bad' response style, reading/languages difficulties, or haphazard responding" (Walters 2006, p. 39). The other two removals were inmates with a Defensiveness T-score over 65, which is indicative of a defensive "fake good" response style (Walters 2006).

Following omission of invalid responses, T-scores for the two composite scales, Proactive ($M = 53.69$) and Reactive ($M = 52.71$) Criminal Thinking, were analyzed. The Proactive Criminal Thinking scale discerns those who are considered calculating and goal-oriented in their criminal activities. The Reactive Criminal Thinking scale was designed to determine those who are considered impulsive in their criminal activities. According to Walters (2006), a T-score under 55 on both of these scales indicates that the sample's "criminal belief system is either weak, absent, or hidden" (Walters 2006, p. 39). Therefore, those with both Proactive and Reactive t-scores under 55 ($n = 31$) were excluded from a more in-depth examination of the PICTS. All 27 of the remaining participants had a differentiated profile, which indicates a more concise interpretation (Walters 2006).

The eight thinking styles, presented in Table 4, show two high elevations for the differentiated profiles. The Cutoff scale and the Power Orientation scale both had t-score averages above 60. The Cutoff scale measures impulsivity and a high elevation is indicative of a "hot temper" (Walters 2006 p. 46). These individuals also are more likely to react to situations instead of anticipating problems before they arise (Walters 2006). The Power Orientation scale was also elevated and is symptomatic of a person who craves power and seeks control. Such a lifestyle is suggestive of one who wants not only to

Table 4 T-Score means and standard deviations of the Psychological Inventory of Criminal Thinking Styles (PICTS) Thinking Styles Scales for all valid participants ($n = 58$) and for those with a differentiated profile of criminal thinking ($n = 27$)

Scale	All valid participants		Differentiated profiles	
	M	SD	M	SD
Mollification	50.09	11.77	55.74	12.69
Cutoff	53.45	10.62	61.33	9.65
Entitlement	50.98	11.17	57.56	12.07
Power Orientation	54.16	12.64	60.63	12.97
Sentimentality	45.05	9.50	47.52	9.72
Superoptimism	51.52	10.42	57.74	9.34
Cognitive Indolence	53.17	8.60	57.85	8.23
Discontinuity	52.31	9.45	57.63	9.89

control people, but also situations, which may bring about conflict with others (Walters 2006).

An exploratory examination of the remaining measures of the PICTS for the differentiated profiles resulted in two elevated t-scores, Self-Assertion/Deception (AST) and Historical Criminal Thinking (HIS). Walters (2006) reports these two scales are highly correlated and the AST factor scale ($M = 63.19$, $SD = 9.42$) "measures the tendency to assert one's will over the environment in order to achieve one's objectives regardless of who gets hurt in the process or how unrealistic one's goals may be" (p. 51). The HIS scale ($M = 62.70$, $SD = 8.53$) is a composite of questions about a past identification of criminality. Given the length of incarceration for the sample, this makes theoretical sense. Finally, an examination of the differentiated profiles revealed a slightly higher t-score for Proactive Criminal Thinking ($M = 62.07$, $SD = 10.05$) than Reactive Criminal Thinking ($M = 59.70$, $SD = 9.02$). The difference was not significant.

Correlations

Total scores from the three psychopathy measures were highly correlated, in line with expectations. The PPI-R total had a correlation with the LSRP of .83 ($p < .001$) and a correlation of .87 ($p < .001$) with the SRP-III. The LSRP and SRP-III were also significantly correlated at .79 ($p < .001$). The Proactive Criminal Thinking scale was significantly correlated with the three total scores of the psychopathy measures (PPI-R $r = .73$; LSRP $r = .62$; SRP-III $r = .73$). All correlations were significant at the $p < .001$ level. Likewise, the Reactive Criminal Thinking scale was significantly correlated ($p < .001$) with the three measures (PPI-R $r = .69$; LSRP $r = .67$; SRP-III $r = .71$), as well as the Proactive Criminal Thinking scale ($r = .55$, $p < .001$).

The 14 self-report psychopathy subscales and the eight criminal thinking subscales of the PICTS had numerous

significant correlations (see Table 5). Consistent with previous literature (e.g., Seibert et al. 2011), three scales from the PPI-R (Social Influence, Stress Immunity, and Blame Externalization) displayed the smallest mean correlations. Both subscales of the LSRP demonstrated numerous significant correlations with the other subscales and large magnitudes seen throughout. The Criminal Tendencies subscale of the SRP-III had the smallest, yet often significant, correlations with other measures. As expected, the PICTS scales were significantly correlated among themselves, as well as with several of the psychopathy subscales. Like previous research (Walters and Geyer 2005), such correlations indicate significant overlap among the thinking styles of criminality and clinical personality measures of antisocial features. This significant relationship has held true for psychopathy measures and criminal thinking as well (Mandracchia et al. 2015). Further, strong evidence of validity exists for these correlations, as evident by the same relationship holding true with measures of criminal thinking other than the PICTS.

Discussion

The present research assessed the self-reported psychopathy and criminal thinking of the largest known sample of serial murderers to date. The results of this study would suggest that this sample of serial murderers do not demonstrate strong evidence of psychopathy, contrary to what many may believe. Instead, the percentage of inmates who could be classified as having psychopathic tendencies is on par with the general population of prisoners. Still, there are some marked differences between this sample and the average inmate normative data. For example, the serial killers had an elevated disregard for their own physical safety and a willingness to engage in risky behaviors without anxiety, as evident by their increased fearlessness scores on the PPI-R. Likewise, the sample here was more inclined to anti-authority attitudes than is the average offender. Still, this sample does not vary much from other criminal samples on the majority of these self-report measures.

The Measures

Because serial murderers are scattered throughout prisons in the United States, self-report scales were used in this study. These types of measures are also more convenient for incarcerated study participants; they can be completed more quickly than traditional interview methods, such as the PCL-R (Hare 2003). With appropriate institutional permissions, these scales can be mailed to the inmates to complete at their convenience rather than requiring face-to-face involvement.

The utilization of self-report scales to measure psychopathy has been considered controversial for many reasons.

Lilienfeld and Fowler (2006) suggest that, despite the inclusion of validity checks on many self-report scales, psychopaths may manipulate their responses to self-report measures based on certain situational factors. For example, when placed in a situation in which a psychopath wants to present themselves in a positive light (e.g., parole board hearings), they are able to manipulate their responses in such a way as to create a positive impression (Lilienfeld and Fowler 2006). Respondents in this study were mailed a packet of questionnaires to complete and return at their leisure, which may have provided them adequate time to manipulate their responses to the various questionnaires. However, it seems unlikely that the initial solicitation letter would have created a situation wherein an offender would want to portray themselves in either a positive or negative light. Because all responses are kept confidential, the offender had nothing to gain by faking extreme mental health issues (e.g., such as in an attempt to utilize an insanity plea) or by lying to make themselves look good. Very few cases were removed from the sample due to validity scales of the measures. The ability to complete the measures in their cells without the pressure of an observer and the reassurance of confidentiality should have allowed the inmates enough assurance to respond honestly. In addition, studies have shown that even when instructed to lie on one self-report measure of psychopathy (the Psychopathic Personality Inventory, the former version of the PPI-R used here), scores were not significantly influenced by the malingering (Edens et al. 2000; Lilienfeld and Fowler 2006). Lilienfeld and Fowler (2006) also suggest that some psychopaths may lack the insight into their own psychological problems to respond appropriately to measures assessing their behavioral impact on others, an additional disadvantage of self-report measures with potentially psychopathic samples. Such offenders may be unable to respond to questions regarding emotion because the individual does not appropriately sense emotion.

The PPI-R, LSRP, and SRP-III are three commonly used self-report measures used to assess psychopathy, but this research added the additional dimension of criminal thinking. The PICTS scale assesses the "eight thinking styles hypothesized to support and maintain a criminal lifestyle" discussed above (Walters 2006, p. 5). Although some research has previously associated criminal thinking and psychopathy (Mandracchia et al. 2015), none has compared multiple measures of psychopathy and the PICTS. With respect to this sample's criminal thinking, many of the participants did not have an interpretable PICTS, as both Proactive and Reactive thinking scores were below the recommended cutoff. Those that did present an interpretable score showed marked levels of impulsivity and power/control issues beyond that of the average criminal sample. The similarities between these behaviors and identified behaviors of psychopathic individuals are noteworthy. The sample may have also aged out of many of the patterns of criminal thinking. The average age of the

Table 5　Bivariate correlations among self-report subscales (n = 54)

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
LSRP																						
1. P	—																					
2. S	.73***	—																				
PPI-R																						
3. ME	.75***	.72***	—																			
4. RN	.60***	.67***	.63***	—																		
5. BE	.32†	.42‡	.45***	.50***	—																	
6. CN	.62***	.75***	.57***	.47***	.12	—																
7. SOI	-.23	-.32*	-.08	-.15	-.31*	-.34**	—															
8. F	.54***	.51***	.45***	.47***	.12	.48***	-.11	—														
9. STI	-.21	-.41‡	-.39**	-.25*	-.40**	-.28*	.30*	.08	—													
10. C	.69***	.51***	.52***	.37*	-.04	.67***	-.19	.36**	-.05	—												
SRP-III																						
11. IM	.79***	.73***	.78***	.64***	.27*	.70***	-.07	.58***	-.22	.62***	—											
12. CA	.74***	.71***	.69***	.67***	.28*	.65***	-.20	.55***	-.11	.66***	.81***	—										
13. EL	.65***	.79***	.70***	.69***	.29*	.76***	-.08	.61***	-.24*	.54***	.80***	.74***	—									
14. CT	.38*	.43†	.33*	.46***	.00	.55***	-.02	.50***	-.02	.44***	.56***	.59***	.63***	—								
PICTS																						
15. M	.66***	.58***	.61***	.61***	.54***	.49***	-.20	.35*	-.37**	.37**	.69***	.59***	.54***	.38**	—							
16. CO	.57***	.70***	.64***	.54***	.24*	.70***	-.20	.53***	-.39**	.49***	.68***	.58***	.79***	.65***	.53***	—						
17. E	.57***	.49***	.60***	.64***	.43***	.43***	.08	.44***	-.04	.42‡	.67***	.58***	.59***	.53***	.68***	.48***	—					
18. PO	.71***	.72***	.78***	.67***	.39***	.47***	.00	.52***	-.36***	.41‡	.75***	.63***	.70***	.41‡	.65***	.62***	.66***	—				
19. S	.33**	.30*	.29*	.43‡	.25*	.25*	.15	.45*	-.15	.11	.39*	.20	.38*	.29*	.42‡	.34*	.52***	.54***	—			
20. SO	.54***	.39**	.49***	.58***	.24*	.31*	-.02	.43‡	-.16	.23*	.50***	.42‡	.50***	.41***	.54***	.47***	.61***	.60***	.46***	—		
21. CI	.58***	.67***	.67***	.58***	.34*	.55***	-.11	.36**	-.35***	.24*	.60***	.46***	.67***	.35**	.44**	.63***	.40‡	.61***	.33***	.55***	—	
22. D	.32*	.62***	.41‡	.49***	.34**	.59***	-.24*	.30*	-.31*	.23	.45***	.37*	.54***	.24*	.43‡	.60***	.31*	.38*	.32**	.36**	.65***	—

LSRP = Levenson Self-Report Psychopathy Scale; P = Primary Psychopathy; S = Secondary Psychopathy; PPI-R = Psychopathic Personality Inventory—Revised; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness; SRP-III = Self-Report Psychopathy Scale—III; IM = Interpersonal Manipulation; CA = Callous Affect; EL = Erratic Lifestyle; CT = Criminal Tendencies; PICTS = Psychological Inventory of Criminal Thinking Styles; M = Mollification; CO = Cutoff; E = Entitlement; PO = Power Orientation; S = Sentimentality; SO = Superoptimism; CI = Cognitive Indolence; D = Discontinuity

*p < .05
†p = .01
**p < .01
‡p = .001
***p < .01

participants was over 50, and they had been incarcerated for nearly two decades.

Limitations and Future Research

In addition to the previously discussed limitations of using self-report measures, this sample is relatively small. Numerous additional convicted serial killers responded to the initial solicitation letter sent by researchers; however, we were denied access by several states' Department of Corrections. As a result, those represented in this study are those who agreed to participate and were housed in states whose Institutional Review Board granted access to offenders.

Another potential limitation may be the length of the study. The complete survey packet included several measures and was estimated to take approximately two and a half hours to complete. This may have led to fatigue, which often causes respondents to answer randomly. In an effort to counteract this potential bias, we randomized the order of the measures contained in the survey packets. We are also comforted in the fact that the vast majority of included participants were not excluded from the dataset because of failed validity checks. Future efforts to collect this magnitude of data should consider sending the surveys at different times to ensure participants took breaks between measures. Even more preferential, the data could be collected via in-person structured interviews and monitored collection of the self-report data.

A final limitation of the current research might be that the correctional comparison samples used by other authors as normative data were not separated by offense category (i.e., violent and non-violent). It may be beneficial to compare the current sample to these sub-groups to determine if there are differences in responses to these self-report scales. Theoretically speaking, it is likely that serial killers are more like other violent offenders than non-violent offenders. It is possible that assessing violent and non-violent offender populations in the aggregate masks the true psychological features of the violent population. Parsing out the violent population group might reveal different comparison results.

Conclusions

People are simultaneously intrigued and horrified by the concept of a serial murderer. The idea that someone could deliberately and repeatedly commit such depraved acts leads many to believe the individual must be a psychopath; particularly noting the cold-blooded nature of the crimes. Although much psychopathy research has focused on correctional samples, the field has failed to account for the anecdotal expectations of what a serial killer's personality must be. The current research has added to this literature by finding that these individuals might not all be the psychopaths we often assume they are.

Appendix A

PPI-R (Lilienfeld and Widows 2005)

Machiavellian Egocentricity

Measures the willingness to manipulate another person for one's own selfish means. Having a cynical view of human nature and a tendency to augment rules and regulations to one's advantage. Perceived superiority of other people and propensity for deception.

Rebellious Nonconformity

Measures the expression of anti-authority attitudes and a reckless disregard for the norms of society. Scores are also indicative of a rebellious nature and a tendency to make multiple life changes as a result of boredom.

Blame Externalization

Measures a lack of personal responsibility for life as evident by the perception of mistreatment from an unfair world, bad luck, or other people's actions. Tendency to play the victim.

Carefree Nonplanfulness

Measures a failure to plan ahead and an unwillingness to consider other strategies for problem solving life events. A person who acts without thinking of the consequences, has limited/no long-term plans for life, and does not learn from previous mistakes.

Social Influence

Measures an individual with charm and the ability to influence others. Scores reflect a person who can be chatty, unanxious about interacting in social events, confident, and make a good impression on others at first glance.

Fearlessness

Measures those generally lacking in a normal amount of anxiety related to risky situations or physical confrontations. A person who takes chances or risks and lacks fear of danger.

Stress Immunity

Measures behaviors reflective of a calm individual when under pressure. Also reflective of an absence of nervous habits.

Coldheartedness

Measures a lack of personal attachments and in feelings of guilt or empathy when others are suffering. An absence of caring emotional traits, which are replaced by a tendency to be callous.

LPS (Levenson et al. 1995)

Primary

Measures "a selfish, uncaring, and manipulative posture toward others" (p. 152).

Secondary

Measures impulsivity and the tendency to lead a self-defeating lifestyle.

SRP-III (Paulhus et al., in press)

Interpersonal Manipulation

Measures one's tendency to lie and manipulate others.

Callous Affect

Measures a general lack of empathy toward others, as well as a lack of concern for their well-being.

Erratic Life Style

Measures a tendency to lead a life style with reckless behaviors, as well as impulsive behaviors.

Criminal Tendencies

Measures the antisocial lifestyle of the participant, as well as demonstrated criminality.

PICTS (Walters 2006)

Mollification

Justifying a person's actions, while also blaming the individual's environment. Refusing to take responsibility for one's actions.

Cutoff

Low emotional control, and explosive reactions to even slight provocations, as well as a "rapid elimination of deterrents to crime" (p. 6).

Entitlement

A mistaking wants for needs and a sense of privilege, or a feeling that one is unique and deserves special attention from others or society.

Power Orientation

Needs include power and control of all life situations, as well as the drive for more power in life or the exertion of control over the environment.

Sentimentality

A selfless behavior pattern of doing for others, but also with the superficial purpose of clearing the conscious for criminal deeds or mistreatment of others. Failing to recognize harm done to others.

Superoptimism

A thinking style that minimizes the consequences of criminal actions, as well as a tendency to act incredulous at failed criminal enterprises.

Cognitive Indolence

The tendency to take short-cuts in life and avoid problems, as well as the inability to think critically about resolving situations.

Discontinuity

A lack of following through with promises or commitments. A person perceived as flighty or unpredictable.

Current Criminal Thinking

One's identification with his current criminal belief system.

Historical Criminal Thinking

One's past identification with his previous criminal belief system.

Problem Avoidance

A tendency to avoid problems by engaging in defeatist activities, such as crime and/or drug use.

Interpersonal Hostility

"Extreme hostility leading to confusion or the appearance of confusion" (p. 51).

Self-Assertion/Deception

The person's willingness to hurt others for the purpose of achieving his goals, even if the goals are unrealistic.

Denial of Harm

One's rationalizations for the harm done to others in the pursuit of criminal enterprises, as well as the minimization of damage inflicted.

Fear-of-Change

The resistance to change by an individual resulting in difficulties by others to intervene and correct behaviors.

References

Andrews DA, Bonta J (1994) The psychology of criminal conduct. Anderson, Cincinnati

Busch KA, Cavanaugh JL (1986) The study of multiple murder: preliminary examination of the interface between epistemology and methodology. J Interpers Violence 1(1):5–23. https://doi.org/10.1177/088626086001001002

Butcher JN, Dahlstrom WG, Graham JR, Tellegen A, Kaemmer B (1989) MMPI-2: Minnesota Multiphasic Personality Inventory-2: manual for administration and scoring. University of Minnesota Press, Minneapolis

Cleckley H (1976) The mask of sanity, 5th edn. Mosby, St. Louis

Clow KA, Scott HS (2007) Psychopathic traits in nursing and criminal justice majors: a pilot study. Psychol Rep 100(2):495–498. https://doi.org/10.2466/pr0.100.2.495-498

Cornell DG, Miller C, Benedek EP (1988) MMPI profiles of adolescents charged with homicide. Behav Sci Law 6(3):401–407. https://doi.org/10.1002/bsl.2370060308

Cornell DG, Warren J, Hawk G, Stafford E, Oram G, Pine D (1996) Psychopathy in instrumental and reactive violent offenders. J Consult Clin Psychol 64(4):783–790. https://doi.org/10.1037/0022-006X.64.4.783

Culhane SE, Hildebrand MM, Walker S, Gray MJ (2014) MMPI-2 characteristics of male serial murderers [electronic version]. Appl Psychol Crim Just 10(1):21–45

Culhane SE, Hildebrand MM, Mullings AF, Klemm J (2016) Self-reported disorders among serial homicide offenders: data from the Millon Clinical Multiaxial Inventory—III. J Forensic Psychol Pract 16(4):268–286. https://doi.org/10.1080/15228932.2016.1196099

DeLisi M (2009) Psychopathy is the unified theory of crime. Youth Violence Juvenile Justice 7(3):256–273. https://doi.org/10.1177/1541204009333834

Edens JF, Buffington JK, Tomicic TL (2000) An investigation of the relationship between psychopathic traits and malingering on the Psychopathic Personality Inventory. Assessment 7(3):281–296. https://doi.org/10.1177/107319110000700307

Forth AE, Book AS (2007) Psychopathy in youth: a valid construct. In: Hervé H, Yuille JC (eds) The psychopath: theory, research, and practice. Erlbaum, Mahwah, pp 369–387

Fox JA, Levin J (1998) Multiple homicides: patterns of serial and mass murder. Crime Justice 23:407–455. https://doi.org/10.1086/449274

Fox JA, Levin J (2015) Extreme killing: understanding serial and mass murder, 3rd edn. Sage Publications, Beverly Hills

Gendreau P, Little T, Goggin C (1996) A meta-analysis of the predictors of adult offender recidivism: what works! Criminology 34(4):575–607. https://doi.org/10.1111/j.1745-9125.1996.tb01220.x

Greene E, Heilbrun K (2011) Wrightsman's psychology and the legal system, 7th edn. Wadsworth, Belmont

Häkkänen-Nyholm H, Hare RD (2009) Psychopathy, homicide, and the courts: working the system. Crim Justice Behav 36(8):761–777. https://doi.org/10.1177/0093854809336946

Hare RD (1996) Psychopathy: a clinical construct whose time has come. Crim Justice Behav 23(1):25–54. https://doi.org/10.1177/0093854896023001004

Hare RD (2003) The hare psychopathy checklist—revised manual, 2nd edn. Multi-Health Systems, Toronto

Hare RD, McPherson LM (1984) Violent and aggressive behavior by criminal psychopaths. Int J Law Psychiatry 7(1):35–50. https://doi.org/10.1016/0160-2527(84)90005-0

Harris GT, Skilling TA, Rice ME (2001) The construct of psychopathy. Crime Justice 28:197–264. https://doi.org/10.1086/652211

Hickey, E. (2010) Serial murderers and their victims (5th ed.). Belmont, CA: Wadsworth.

Hildebrand, M. M., & Culhane, S. E. (2015) Personality characteristics of the female serial murderer. Journal of Criminal Psychology, 5 (1), 34–50. https://doi.org/10.1108/JCP-04-2014-000710.1108/JCP-04-2014-0007

Holmes, R. H., & Holmes, S. T. (2010) Serial murder (3rd. ed.). Thousand Oaks, CA: Sage.

Huss MT, Langhinrichsen-Rohling J (2000) Identification of the psychopathic batterer: the clinical, legal, and policy implications. Aggress Violent Behav 5:403–422

Kraemer, G. W., Lord, W. D., & Heilbrun, K. (2004) Comparing single and serial homicide offenses. Behavioral Sciences & The Law, 22(3), 325–343. https://doi.org/10.1002/bsl.581

Levenson MR, Kiehl KA, Fitzpatrick CM (1995) Assessing psychopathic attributes in a noninstitutionalized population. J Pers Soc Psychol 68(1):151–158. https://doi.org/10.1037/0022-3514.68.1.151

Lilienfeld SO, Fowler KA (2006) The self-report assessment of psychopathy: problems, pitfalls, and promises. In: Patrick CJ (ed) Handbook of psychopathy. The Guilford Press, New York, pp 107–132

Lilienfeld SO, Widows MR (2005) Professional manual of the psychopathic personality inventory—revised. Psychological Assessment Resources, Inc., Lutz

Mandracchia JT, Gonzalez RA, Patterson KL, Smith PN (2015) Psychopathy and criminogenic thinking in adult male prisoners. J Contemp Crim Just 31(4):409–425. https://doi.org/10.1177/1043986215608472

Miller JD, Lynam DR (2012) An examination of the psychopathic personality inventory's nomological network: a meta-analytic review. Personal Disord 3(3):305–326. https://doi.org/10.1037/a0024567

Millon T, Millon C, Davis RD, Grossman S (2009) MCMI-III manual, 4th edn. Pearson, Bloomington

Morton RJ, Hilts MA (eds) (2008) Serial murder: multi-disciplinary perspectives for investigators. National Center for the Analysis of Violent Crime (NCAVC), Washington, DC

Morton RJ, McNamara JJ (2005) Serial murder. In: Byard R, Corey T, Henderson C, Payne-James J (eds) Encyclopedia of forensic and legal medicine. Elsevier, London. https://doi.org/10.1016/B0-12-369399-3/00319-0

Morton RJ, Tillman JM, Gaines SJ (2014) Serial murder: pathways for investigations. National Center for the Analysis of Violent Crime (NCAVC), Washington, DC

Neumann CS, Declercq F (2009) Latent variable models of the Self-Report of Psychopathy—III (SRP-III) across three large diverse samples and replication in an offender sample. Paper presented at the Biennial Conference of the Society for the Scientific Study of Psychopathy. New Orleans

Paulhus DL, Hemphill JF, Hare RD (in press) Scoring manual for the Hare Self-Report Psychopathy Scale—III. Multi-Health Systems, Toronto

Seibert LA, Miller JD, Few LR, Zeichner A, Lynam DR (2011) An examination of the structure of self-report psychopathy measures and their relations with general traits and externalizing behaviors. Personal Disord 2(3):193–208. https://doi.org/10.1037/a0019232

Skrapec, C. A. (2001) Phenomenology and serial murder: Asking different Questions. Homicide Studies, 5(1), 46–63.

Walters GD (1995) The psychological inventory of criminal thinking styles: part I: reliability and preliminary validity. Crim Justice Behav 22(3):307–325. https://doi.org/10.1177/0093854895022003008

Walters GD (2006) The psychological inventory of criminal thinking styles (PICTS) professional manual. Center for Lifestyle Studies, Allentown

Walters GD (2012a) Criminal thinking and recidivism: meta-analytic evidence on the predictive and incremental validity of the Psychological Inventory of Criminal Thinking Styles (PICTS). Aggress Violent Behav 17(3):272–278. https://doi.org/10.1016/j.avb.2012.02.010

Walters GD (2012b) Psychopathy and crime: testing the incremental validity of PCL-R—measured psychopathy as a predictor of general and violent recidivism. Law Hum Behav 36(5):404–412. https://doi.org/10.1037/h0093928

Walters GD, Geyer MD (2005) Construct validity of the psychological inventory of criminal thinking styles in relationship to the PAI, disciplinary adjustment, and program completion. J Pers Assess 84(3):252–260. https://doi.org/10.1207/s15327752jpa8403_04

Walters GD, Yurvati E (2017) Testing the construct validity of the PICTS proactive and reactive scores against six putative measures of proactive and reactive criminal thinking. Psychol Crime Law 23(1):1–14. https://doi.org/10.1080/1068316X.2016.1217335

Walters GD, Brinkley CA, Magaletta PR, Diamond PM (2008) Taxometric analysis of the Levenson Self-Report Psychopathy scale. J Pers Assess 90(5):491–498. https://doi.org/10.1080/00223890802248828

Ward, J. H., Jr. (1963) Hierarchical grouping to optimize an objective function. Journal of the American Statistical Association, 58, 236–244

Whited WH, Wagar L, Mandracchia JT, Morgan RD (2017) Partners or partners in crime? The relationship between criminal associates and criminogenic thinking. Int J Offender Ther Comp Criminol 61(5):491–507. https://doi.org/10.1177/0306624X15599605

Williamson SE, Hare RD, Wong S (1987) Violence: criminal psychopaths and their victims. Can J Behav Sci 19(4):454–462. https://doi.org/10.1037/h0080003

Woodworth M, Porter S (2002) In cold blood: characteristics of criminal homicides as a function of psychopathy. J Abnorm Psychol 111(3):436–445. https://doi.org/10.1037//0021-843X.111.3.436