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A New MMPI-2 Measure Of Psychopathy: An Empirical Approach

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ABSTRACT

The purpose of the current study was to develop a new scale on the MMPI-2 to identify individuals with global psychopathy, as measured by the PCL-R. The study consisted of four smaller studies, including 1) derivation of the scale 2) cross-validation 3) external validation, 4) factor analysis. The derivation sample consisted of male prison inmates (N = 170) and a second sample of male prison inmates (N = 126) was utilized for cross-validation. A third sample of male and female college students (N = 308) was utilized for the purpose of correlating the developed scale with existing measures of personality disorders and an emotion recognition task.

Using empirical keying methods, 32 items were identified for the resulting scale, Psychopathic Attitudes and Behaviors (*PAB*). Results of study 1 demonstrated *PAB* to have adequate internal consistency and the strongest correlation to PCL-R total scores when compared to extant MMPI-2 scales. Further, *PAB* was found to adequately predict group membership. These results were replicated in Study 2 and *PAB* appeared to successfully cross-validate in an alternative sample.

Results of Study 3 examining the relationship between *PAB* elevations and errors on an emotion recognition task indicated no significant relationship between scores on *PAB* and deficits in the ability to recognize facial expressions of emotions. However, results examining the relationship between mean scores for those above the cutoff and those below the cutoff on *PAB* and the PDQ-4 narcissistic, antisocial, and conduct disorder scales were significant,

providing some support for external validation. Finally, the exploratory factor analysis in Study 4 yielded a three-factor solution, which did not parallel the PCL-R factors.

Overall, the study was successful in developing a more efficient MMPI-2 scale to measure psychopathic traits, as it outperformed the theoretically-related scales already existing on the MMPI-2. However, the item content was not representative of the full range of interpersonal and affective traits associated with primary psychopathy and the scale was more significantly related to the social deviance factor of the PCL-R, which suggests *PAB* may be more representative of the secondary variant of psychopathy.

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CHAPTER 1

INTRODUCTION

Psychologists, popular media, and the general public, alike, have long held a fascination with the psychopathic personality. However, a consensus understanding of the construct has been historically elusive. Despite this lack of clarity, there is general agreement that those possessing psychopathic traits can be disruptive and dangerous to family, friends, and society. Although the construct can be traced to the late 1800s, Cleckley (1941) was the first to outline a clear set of 16 criteria that identified the core features of psychopathy based largely on his own clinical experiences. Currently, psychopathy is operationally defined by a constellation of interpersonal, affective, lifestyle, and antisocial traits and behaviors (Hare & Neumann, 2009). Interpersonally, psychopaths are callous, deceptive, superficial, selfish, dominant, grandiose, and manipulative (Hare & Neumann, 2009; Harpur, Hare, & Hakstian, 1989). Individuals with psychopathy display shallow affect, are unable to form strong emotional bonds, and lack empathy, guilt, and remorse. Behaviorally, these individuals are irresponsible, impulsive, lacking in realistic long-term goals, and display a propensity for violating or ignoring social norms (Hare & Neumann, 2009).

These traits form the basis of a widely accepted two-factor conceptualization of psychopathy (Harpur et al., 1989). The first factor is generally considered the core of

psychopathy, encompassing the aforementioned interpersonal and affective traits within an individual, whereas the second factor is related to overall social deviance and a chronically unstable, antisocial lifestyle. Although criminal behavior is not a necessity, many psychopathic individuals come into contact with the legal system. It has been estimated that only one percent, or less, of the general community possess enough traits to be considered psychopathic, whereas around fifteen percent of male prisoners, and seven percent of female prisoners in a North American sample would be categorized as psychopathic (Hare, 1996). The label of "psychopath" can carry a great deal of stigma and have a significant influence on legal outcomes (Lyon & Ogloff, 2000); thus, it is clear that thorough and accurate assessment of this construct is necessary.

An additional issue that commonly arises in research on psychopathy is that of its relationship with antisocial personality disorder (ASPD). Although the two constructs are conceptually related and overlap in several ways, a consistent distinction must be made between the two. Much of the confusion surrounding this controversy has been caused by changes in terminology and diagnostic criteria throughout the history of the Diagnostic and Statistical Manual (DSM), which will be discussed in greater detail later. As with the previous version, the current version of the manual (DSM-5; American Psychiatric Association, 2013) states that the term "ASPD" is essentially interchangeable with psychopathy, sociopathy, and dissocial personality disorder, despite the fact that the given diagnostic criteria for ASPD grossly underemphasize the interpersonal and affective components (i.e., factor one) of psychopathy (Hare & Neumann, 2009). As such, the current diagnostic criteria for ASPD are largely behaviorally-based and are more strongly related to the lifestyle/antisocial (i.e., factor two) features of psychopathy. For the reasons listed, Hare and Neumann (2009) have proposed an

asymmetrical relationship between psychopathy and ASPD, suggesting that most psychopathic individuals would meet criteria for ASPD, but only a small subset of individuals meeting criteria for ASPD would also be categorized as psychopaths.

The gold standard and most widely accepted measure of psychopathy is the Psychopathy Checklist-Revised (PCL-R; Hare, 1991; Hare & Neumann, 2009). The PCL-R is based upon the previously described two-factor conceptualization of psychopathy. Although it has been noted that the PCL-R is currently the only reliable and valid method for identifying psychopathy and that no other testing is necessary beyond the PCL-R, there are several limitations to its use that imply a need for a more concise method of assessment. For example, extensive training is needed to administer and interpret the PCL-R. In addition, the administration can be lengthy, as it necessarily involves extensive interviews and a review of all available historical and contemporaneous data related to the individual being assessed (Gacono & Meloy, 2009). Due to some of the limitations and practicality issues of the PCL-R, the Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995) was created to act as an indicator for additional assessment (Bodholdt, Richards, & Gacono, 2000). Although somewhat shorter and requiring of less extensive record reviews, the PCL: SV presents some of the same issues as its predecessor, the PCL-R. Additionally, because the PCL: SV acts as a screener it is necessary to use additional assessment measures to supplement its results.

The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is a 567 item self-report inventory used to assist in the identification of a variety of clinical disorders and personality characteristics. Although the use of self-report measures in the identification of psychopathy poses some unique considerations, particularly the possibility of deception (Gacono & Meloy, 2009), it may also offer some benefit above other assessment tools. For example, administration

is quicker, as the burden of time lies with the testing subject rather than the clinician or researcher. Additionally, scoring programs have been created that make this tool much less time consuming than many other methods of assessment. However, interpretation of this instrument also requires extensive training and good clinical judgment. Although concerns have been raised regarding deception, the MMPI-2 is equipped with many validity indicators highly sensitive to distortion and malingering (Gacono & Meloy, 2009). Despite the MMPI-2's potential as an assessment tool for psychopathy, at this time there is no single scale that effectively identifies the full range of psychopathic traits. Because psychopathy is a multifaceted construct it is generally necessary to use at least two, but generally more, scales in conjunction with one another. Many of the available MMPI-2 scales relate much more closely with ASPD than psychopathy as a whole. However, because of the confusion regarding the interchangeability of terminology it is clear that this could potentially lead to overgeneralizations. The MMPI-2 is consistently used in both clinical and research settings; thus, a scale that is more closely related to psychopathy could assist in differentiating between the two constructs as well as provide valuable information regarding prevalence rates.

The current study seeks to assist in the assessment of psychopathy through the creation of a much-needed supplementary scale on the MMPI-2 that will reliably identify psychopathic traits related to both factors of psychopathy. It is hypothesized that the scale will be a more successful indicator of psychopathy than the currently available MMPI-2 scales. It is also hypothesized that through factor analysis, two factors will emerge that closely correlate with the currently accepted conceptualization of psychopathy. It should be noted that the MMPI-2 is not meant to "diagnose" disorders, as collateral information will always be necessary, but rather to provide a road map for future and clinical/research hypotheses. Thus, the results of the current research should not be

expected to replace the PCL-R as a standard of psychopathy assessment, but to provide assistance when such an instrument is not a feasible option for clinicians or researchers.

CHAPTER 2

LITERATURE REVIEW

Early History of Psychopathy

The history of psychopathy is not a straightforward one. Over the years, the terminology used to describe the psychopathic personality has been inconsistent, at best; thus, the conceptualization of this construct has continuously changed, which has made it difficult to arrive at any consensus definition. Millon, Simonsen, and Birket-Smith (1998) provided a much-needed comprehensive overview of the historical beginnings of the construct of psychopathy. Most reviews tend to begin with Pinel's (1801/1962) concept of *manie sans delire* (insanity without delirium), as it was not until the 19th century that interest in this construct began to increase. However, writings dating back to the philosopher Theophrastus (372-288 B.C.) summarize a personality type, termed *the unscrupulous man*, that describes an individual with little regard for morality, a propensity for manipulation, and who is free of guilt or shame. Thus, it is clear that what we now call psychopathy is not only a modern phenomenon, but appeared in Classic times, as well.

As noted above, Pinel (1801/1962) introduced the concepts of *la folie raisonnante* and *manie sans delire*, to refer to a form of madness in which an individual's rationality is still intact. Pinel was one of the first to posit that madness need not include a disintegration of the mind.

Rush (1812) also noted cases in which individuals were fully coherent and reasonable, but displayed socially depraved behaviors. He was the first theorist to implicate defects in moral faculties, and described these people as exhibiting an innate, preternatural moral depravity. Prichard (1835) continued to build on the notion that these individuals' behaviors are actually deficits in character and morality by using the label *moral insanity* to describe defects in natural affections, or, more simply, a lack of a sense of rightness, goodness, or responsibility. Prichard was also among the first to differentiate between the development of traits due to transient stress and traits that are linked to strong natural predispositions. Although the concept of moral insanity continued to gain attention throughout the 19th century, it was not until 1891 that Koch introduced the term *psychopathic inferiority*. However, at that time Koch's label of psychopathic was essentially an umbrella term used to encompass all of the traits that we now call personality disorders (Lykken, 1996).

It was Kraepelin, considered by many to be the father of our current psychiatric diagnostic system (Blashfield, 1984), who, in the late 19th and early 20th centuries, finally used the term *psychopathic personality* in reference to amoral or immoral criminal types of personalities. Throughout the many editions of his book, *Psychiatrie: Ein Lehrbuch*, Kraepelin described psychopaths as deficient in either affect or volition, and exhibiting morbid dispositions or personality peculiarities (Millon et al., 1998). Kraepelin (as cited in Cleckley, 1964) outlined seven types of psychopaths: the excitable, the unstable, the impulsive, the eccentric, the liars and swindlers, the antisocial, and the quarrelsome. Partridge (1930) introduced the term sociopath in reference to these psychopathic individuals' common disposition to violate social norms. It should be noted that this use of the term sociopath does not match the current conceptualization, which will be discussed later in greater detail.

The history of psychopathy is riddled with changes in terminology and different interpretations of the same construct. For the purposes of the current research, an operationalization based on the influential theory of psychopathy by Cleckley (1941) in his seminal work *The Mask of Sanity* will be adopted. Cleckley outlined thorough descriptions, based on his own clinical experiences and observations, of the psychopathic personality. Through his experiences, Cleckley developed a set of 16 criteria that largely form the basis of our current conceptualization of psychopathy. The criteria are as follows:

1. superficial charm and good intelligence
2. absence of delusions or irrational thinking
3. absence of nervousness or neurosis
4. unreliability
5. untruthfulness and insincerity
6. lack of remorse or shame
7. inadequately motivated antisocial behavior
8. poor judgment and failure to learn by experience
9. pathologic egocentricity and incapacity for love
10. general poverty in major affective reactions
11. specific loss of insight
12. unresponsiveness in general interpersonal relations
13. fantastic and uninviting behavior with drink and sometimes without
14. suicide rarely carried out
15. sex life impersonal, trivial, and poorly integrated
16. failure to follow any life plan (Cleckley, 1964, p. 363)

In his original work, Cleckley attempted to rectify confusion in terminology by using the label "semantic dementia" to describe what he later called psychopathy. Semantic dementia or aphasia referred to the underlying ability of those with psychopathy to mimic language and affect superficially with no apparent indication of its superficiality. Of the psychopath, Cleckley (1964, p. 420) wrote that "…his rational power enables him to mimic directly the complex play of human living," which exemplifies some of the core components of the affective deficits that are inherent in individuals with psychopathy, as well as their ability to fool others through tactful charm and manipulation. However, this proposed change in terminology did not last, as in subsequent editions of the text (e.g., 1976; 1982) he returned to the term psychopathy. Cleckley used the terms sociopathy and psychopathy interchangeably throughout the text of the 1964 edition, as they were considered synonymous based on the psychiatric nomenclature of the time. Although one might have hoped that the confusion regarding this construct would have ended with Cleckley, this is not the case, as there remains significant controversy surrounding psychopathy and its equivalence, or lack of equivalence, with the terms sociopathy and antisocial personality. The first step to clarifying this confusion is to outline the current definition of psychopathy.

Modern Conceptualizations of Psychopathy

More recently, our conceptualziation of psychopathy has been largely informed by the work of Hare, through the creation and use of the Psychopathy Checklist (PCL; Hare, 1980) and the Psychopathy Checklist-Revised (PCL-R; Hare, 1991). The PCL and PCL-R were created based on Cleckley's 16 criteria and will be discussed later in greater detail. However, after a great deal of research and factor analyses of these scales, psychopathy is now operationally defined as a constellation of interpersonal, affective, lifestyle, and antisocial traits and behaviors

(Hare & Neumann, 2009). Interpersonally, psychopaths are considered callous, deceptive, superficial, selfish, dominant, grandiose, and manipulative. Individuals classified as psychopaths often display shallow affect, are unable to form strong emotional bonds, and lack empathy, guilt, and remorse. Behaviorally, individuals with psychopathy are irresponsible, impulsive, lacking in realistic long-term goals, and display a propensity for violating or ignoring social norms (Hare & Neumann, 2009). This commonly-held definition of psychopathy clearly encompasses both a compilation of behaviors and personality traits.

It should be noted that although the PCL-R-based conceptualization of psychopathy has dominated the field for approximately two decades, some researchers have criticized this conceptualization as the reification of the PCL-R and not the construct of psychopathy (Skeem & Cooke, 2010). In order to offer a more balanced viewpoint and theoretically based conceptualization has been introduced, which has been termed the triarchic conceptualization of psychopathy (Patrick, Fowles, & Krueger, 2009), which is centered around *disinhibition*, *boldness*, and *meanness*, as these are thought to be the core phenotypic constructs related to psychopathy. Additionally, this conceptualization attempts to incorporate the developmental research tied to psychopathy, in general, in order to provide a broader theory with less emphasis on a measurement instrument. Disinhibition is used to describe the propensity towards dysregulation of affect, lack of planfulness, impulse control problems, and an inability to delay gratification. The construct of boldness is described as the ability to remain calm under pressure, high self-assurance and efficacy, tolerance for danger, and an ability to recover quickly from stressful situations. The authors did not equate boldness with fearlessness, but with reduced sensitivity in the brain's defensive motivational system (Patrick et al., 2009). Finally, meanness is thought to encompass deficient empathy, lack of close attachments, exploitativeness,

rebelliousness, callousness, empowerment through cruelty, and excitement seeking (Patrick et al., 2009).

In one of the first attempts to examine this theory empirically, Sellbom and Phillips (2013) utilized a number of assessment instruments in both incarcerated and non-incarcerated samples of women. The assessments they used included the Triarchic Personality Measure (Patrick, 2010), the Psychopathic Personality Inventory-Revised (Lillienfeld & Andrews, 1996), Levenson's Self-Report Psychopathy Scale (Levenson et al., 1995), the Emotional Empathy Scale (Mehrabian & Epstein, 1972), the Emotionality-Activity-Sociability-Impulsivity Scale (Buss & Plomin, 1984), the Machiavellianism Inventory (Christie & Geis, 1970), the Narcissistic Personality Inventory (Raskin & Terry, 1988), the Behavioral Inhibition Scale/Behavioral Activation Scale (Carver & White, 1994), the Antisocial Processes Screening Device-Youth Version (Frick & Hare, 2001), and the Inventory of Callous Unemotional Traits (Frick, 2004). The overall findings suggested that the triarchic domains explained a substantial amount of variance within the various psychopathy measures. It should be noted, however, that these were all self-report measures and the PCL-R was not examined in this study, which makes it unclear how the latter instrument relates to the triarchic conceptualization. Further, all participants in this study were female, which limits the generalizability of the obtained results (Sellbom & Phillips, 2013). Because research examining the triarchic theory remains in its infancy, the current study focused on the more empirically supported conceptualization of psychopathy related to PCL-R factors.

Psychopathy and Antisocial Personality

In 1932, the American Psychiatric Association (APA) published its first formal collection of psychiatric illnesses, which included the terminology psychopathic personality. The creators

of the first version of the *Diagnostic and Statistical Manual* (DSM; APA, 1952), however, opted to change the original terminology from psychopathic personality to Sociopathic Personality Disorder, Antisocial Reaction. Although there were six personality disturbances listed under the broader Sociopathic Personality, the description of Antisocial Reaction bears the most striking similarity to psychopathy, as it described individuals who are frequently in trouble, unable to learn from experience, callous, emotionally immature, lacking in responsibility and judgment, and display an ability to rationalize their behavior. An additional personality disturbance listed under the Sociopathic Personality heading was that of the Dyssocial Reaction. Although these two disturbances bore several similarities, they could be differentiated on the basis of etiology, as Dyssocial Reaction stemmed from environmental factors, whereas Antisocial Reaction was genetic in nature (Gurley, 2009). This is an important distinction because theories regarding psychopathy often separate the construct into the categories of primary and secondary psychopathy, which are thought to reflect different etiologies. These theories will be more thoroughly reviewed in a later section.

DSM-II (APA, 1968) revealed a shift in conceptualization from Sociopathic Personality Disorder and its six disturbances to the single disorder of Personality Disorder, Antisocial Type. The descriptions provided in DSM-II were similar to those found in the DSM under the Sociopathic Personality, Antisocial Reaction, although the list of personality characteristics now included selfishness, impulsivity, and lack of guilt, as well as low frustration tolerance (Gurley, 2009). A stipulation was added that required individuals diagnosed with this disorder have more than just an extensive criminal history to meet criteria for a diagnosis of antisocial personality. The descriptions outlined in the DSM and DSM-II continued to closely resemble those of

psychopathy by including a wide array of personality characteristics and behaviors, with the notable caveat that criminal behavior, alone, was not sufficient for diagnosis.

DSM-III (APA, 1980) brought drastic changes in the classification system of all mental disorders, including antisocial personality disorder. The revised classification of antisocial personality disorder was largely informed by the longitudinal study of Robins (1966) that focused on the progression of sociopathic tendencies from childhood through adulthood. A consistent criticism that had been directed toward previous versions of the DSM was that no clear criteria were provided to the diagnostician, which necessarily increased the subjectivity of interpretations and made it difficult to establish reliable operational definitions of disorders (Hare, 1998). DSM-III's changes were dramatic with regard to what was formerly known as Psychopathic Personality, Sociopathic Personality, Antisocial Reaction, or Personality Disorder, Antisocial Type. DSM-III again shifted terminology, moving from Personality Disorder, Antisocial Type to Antisocial Personality Disorder (ASPD) to parallel the terminology used for all personality disorders. In attempting to create a reliable set of criteria that could be operationalized and researched, DSM-III provided a description of a disorder substantially based on behavioral criteria. The adopted criteria were based on the Research Diagnostic Criteria (RDC) developed by Spitzer, Endicott, and Robins (1978) and required evidence of at least three antisocial behaviors, such as truancy, thefts, or vandalism, prior to age 15 although a full diagnosis of Conduct Disorder was not necessary. In addition, the antisocial individual was required to display a pattern of at least four antisocial or socially immoral behaviors, such as irritability, failure to plan ahead, inability to sustain consistent work, or failure to accept social norms with respect to lawful behavior, after the age of 18. Particular personality traits were no longer present in the descriptions, nor were they necessary for a diagnosis. DSM-III also

included Sociopathic Personality in the index, with the note to "see Antisocial Personality Disorder" (Gurley, 2009). Because the APA has generally used the terms sociopathy, psychopathy, and antisocial personality disorder interchangeably, one might assume an intention that these constructs should continue to be viewed as synonymous; however, DSM-III diagnostic criteria grossly underemphasized the core personality components that had been integral in the previous editions.

The changes in DSM-III did not go unnoticed and the psychological community's criticisms regarding this conceptual shift were not limited to those concerning the criteria for ASPD (Hare, Hart, & Harpur, 1991). Thus, DSM-III-R (1987) was created to correct some of the errors for ASPD and many other disorders that had been brought to the attention of the APA. For many researchers, however, DSM-III-R was nothing short of a disappointment with regard to ASPD, as many of the changes were small, and the lack of personality trait criteria remained consistent (Gurley, 2009). In regard to ASPD, the only notable change made in the revision was the addition of the criterion "lacks remorse;" presumably this addition was meant to appease the critics upset by the lack of personality traits included in the criteria. However, this addition did little to bring the criteria back to the core affective and interpersonal traits associated with psychopathy.

Soon after the release of the DSM-III-R, work began on DSM-IV (1994), and this time a Task Force was created in order to reanalyze the criteria for ASPD and begin field trials to assess possible revisions (Widiger et al., 1996). The field trials were held over 12 sites and assessed the previous DSM-III-R criteria, as well as International Classification of Diseases 10th revision (ICD-10; World Health Organization, 1992) and PCL-R items considered to be more reflective of personality traits (Hare, 1996). The results of the field trials were promising, in that the new

items were found to be at least as reliable as the behavioral items found in the DSM-III-R (See Appendix A for the criteria involved in the field trials; Widiger et al., 1996).

However, despite the promise of the personality items, the seven DSM-IV criteria were based on the previous 10 DSM-III-R criteria (Hare, 1996). Hare, who was involved in the field trials, noted that the 7-item criteria set was not actually evaluated during the trials. Although the 10-item criteria from DSM-III-R were evaluated, the deletion of three items leaves the reliability and validity of the new criteria set questionable. As with the DSM-III-R, the criteria for ASPD includes the necessity of evidence of conduct disorder before the age of 15, a criterion that was also not directly evaluated in the field trials (Hare, 1996), making the inclusion of this stipulation debatable. Overall, the DSM-IV criteria for ASPD were again behaviorally based with little recognition of personality traits within the diagnostic criteria (See Appendix B for full criteria).

Of greater concern are statements found within the text of the DSM-IV indicating that antisocial personality disorder may also be referred to as psychopathy, sociopathy, or dissocial personality disorder (APA, 1994; 2000). In addition, the text states:

> Lack of empathy, inflated self-appraisal, and superficial charm are features that have commonly been included in traditional conceptions of psychopathy and may be particularly distinguishing of Antisocial Personality Disorder in prison or forensic settings where criminal, delinquent, or aggressive acts are likely to be nonspecific. (p. 647)

These statements are problematic because the actual criteria of ASPD do not include these personality traits; as such, they are not necessary for an individual to meet full diagnostic criteria. Because the criteria are not reflective of the full range of symptoms that would be necessary for an individual to be considered psychopathic, it is erroneous and misleading to state that these

terms may be used interchangeably. It should be noted that no changes were made to the ASPD criteria or related text in the DSM-IV-TR (APA, 2000) or the recently released DSM-5 (APA, 2013), although there were initial efforts toward revamping the conceptualization of personality disorders in the development of DSM-5.

Initially, the DSM-5 personality disorder task force proposed a paradigm shift in the classification of personality disorders with the introduction a dimensional model (Skodel, Morey, Bender, and Oldham, 2013). Although the proposed changes appeared promising with regard to the identification of psychopathic traits, disagreement within the field and a lack of research regarding the new model eventually resulted in the revisions being denied. In February of 2010, the workgroup released the proposed changes to the public for comment. Although it is noted that many of the comments indicated a preference for the model, there remained questions regarding the overall empirical justification of the changes (Skodel et al., 2013). For example, there were questions regarding the deletion and reclassification of a number of personality disorders. Additionally, a number of critiques were launched by prominent researchers in the field of personality disorders, some of whom had participated in the workgroup but left due to the disagreements. The criteria were ultimately unchanged from the DSM-IV-TR, and the new dimensional model of personality disorders was added to the DSM-5 section for "Emerging Measures and Models" for further research. With regard to psychopathy, some of the promising suggested additions included ego-centrism, lack of empathy or remorse, callousness, and use of charm and seduction to meet one's own ends (APA, 2013).

Partly due to failed attempts at rectifying the confusion surrounding psychopathy and ASPD, as well an uncertain future for the classification of personality disorders in general, it appears that for the time being things will remain just as confused as ever. The current diagnostic

criteria for ASPD remain largely behaviorally based and more strongly related to the lifestyle and antisocial features of psychopathy, as opposed to the affective and interpersonal traits.

At this point in time, one of the most helpful ways of understanding the differences between ASPD and psychopathy is through the base rates that have been reported in the literature. It has been estimated that the prevalence rate for ASPD is between 2% and 3% in the general population (Moran, 1999), whereas psychopathy could be found in about 1% of the general population (Hare, 1996). Additionally, in a forensic population, the base rate for psychopathy is between 15% and 25%, whereas the base rate for ASPD is estimated between 50% and 75% (Hare, 1998). For the reasons listed above, Hare and Neumann (2009) proposed that there is an asymmetrical relationship between psychopathy and ASPD, as most psychopathic individuals would meet criteria for ASPD, but only a small subset of individuals meeting criteria for ASPD would also be categorized as psychopaths. Because it is clear that there are significant differences in the operational definitions of these constructs, it is important that both researchers and clinicians understand the distinction between them when conducting assessments.

Psychopathy and Narcissistic Personality Disorder

Although the relationship between psychopathy and Narcissistic Personality Disorder (NPD) has not generated the degree of controversy as that of the relationship between ASPD and psychopathy, there are notable similarities in the phenotypic expression of the disorders (Hart & Hare, 2000). Hart and Hare (2000) have noted that NPD shares about half of the symptoms associated with psychopathy. In one study of the association between PCL-R scores and DSM-III Axis I and II disorders, NPD was moderately correlated (r =.39) with psychopathy overall, but was more strongly correlated (r = .49) with factor 1 (interpersonal/affective) of the PCL-R (Hart & Hare, 1989). Hart and Hare have proposed that the first facet, indicating selfishness,

callousness, a remorseless use of others, a lack of empathy, and grandiosity, is likely related to NPD, whereas the second factor, indicating a chronically unstable lifestyle, is associated with ASPD. Blackburn (2007), using the International Personality Disorder Examination (IPDE; World Health Organization, 1995), found an overall correlation with the PCL-R (r = .51), but a much stronger association (r = .73) with Factor 1 of the PCL-R. However it should be noted that when these relationships were examined using the Personality Disorder Questionnaire-Fourth Edition (PDQ-IV; Hyler, 1994) and MCMI, the correlations were significantly less. Another study using structured interviews found similar results, in that individuals with NPD had significantly higher Factor 1 scores on the PCL:SV, as compared to those who did not have a diagnosis of NPD (Huchzermeier et al., 2007). Although there is little research or coordination between the literature on NPD and psychopathy, at a conceptual level it appears that there is potential for research further examining this relationship.

Subtypes of Psychopathy

Early on, distinctions were made regarding differing typologies of psychopathy. Beginning with Karpman (1941), there has been a trend toward classifying psychopaths into two distinct categories: the idiopathic (primary) psychopath and the symptomatic (secondary) psychopath. The difference between primary and secondary psychopathy is thought to reflect the etiologies of the two, as well as subtle differences in the expression of the disorder. Karpman believed that the two types were phenotypically similar, but that primary psychopathy is mainly a heritable disorder reflecting affective deficits, whereas secondary psychopathy reflects affective disturbances that are largely environmentally acquired. It has been noted that primary psychopaths use people more often for their own purposes and display a greater propensity for emotional detachment (Porter, 1996), whereas secondary psychopaths may manifest positive

social traits or emotions from time to time, but are more reactive, impulsive, hostile, and socially deviant (Karpman, 1941). However, one of the most noteworthy distinctions that has been posited is the observed difference in levels of trait anxiety (Blackburn, 1975). It is thought that primary psychopaths can be characterized by a lack of anxiety, as well as fearlessness (Karpman, 1941; Lykken, 1995), which closely aligns with Cleckley's (1964) criterion of an absence of nervousness or neurosis. It follows, then, that secondary psychopaths will appear psychopathic in much the same way, but will experience significant anxiety and negative affect that leads to a greater likelihood of antisocial outcomes (Blackburn, 1975).

Although Lykken chose different terminology (i.e., psychopathy and sociopathy) to describe the differences between primary and secondary psychopathy his conceptualizations are much the same. Lykken described the difference between psychopathy and sociopathy as one rooted in socialization. Although etiological theories of psychopathy will be described later, it is notable that many researchers believe psychopathy has strong genetic underpinnings. It has been posited that these inherent traits may make socialization unlikely in even the best of circumstances. Thus, it is thought that psychopathy will develop through a complex interaction of genetic and environmental factors.

In contrast, sociopathy is posited to be mainly a product of deficient socialization. Sociopathy is thought to develop through parental failures, rather than inherent defects in affect and temperament. Lykken (1995) described the successful socialization process as occurring through the instillation of conscientiousness, prosociality, and acceptance of adult responsibility. In addition to the etiological differences, Lykken continues to ascribe to the differences in anxiety and fearfulness between the two concepts.

Hicks, Markon, Patrick, Krueger, and Newman (2004) suggested that within-group heterogeneity, as well as phenotypic similarities between the subtypes of psychopathy, obscures the detection of group differences. This hypothesis was examined using cluster analysis with the PCL-R and a brief form of the Multidimensional Personality Questionnaire (MBQ-BF; Patrick, Curtin, & Tellegen, 2002). It was found that two distinct clusters provided the best fit for the model; these clusters were then examined further through the identification of personality characteristics related to them. Results indicated that the two clusters closely resembled primary and secondary psychopathy as described by Karpman (1941) and Lykken (1995). The first group was characterized by low stress reactivity, high levels of fearlessness, as well as planfulness and a propensity for strategic action, which led to the label of "emotionally stable psychopaths." The second group was characterized by very high negative emotionality, very high aggression and stress reactivity, and disinhibition, leading to the label of "aggressive psychopaths." These results provide some support for the theoretical distinctions between primary and secondary psychopathy. Further, because high scores on the PCL-R did not differentiate the two groups, this provides some evidence that measurement of these group differences may be obscured by the lack of specificity in the measurement instruments available (Hicks et al., 2004).

Although these findings might lead to the assumption that someone is a primary psychopath, a secondary psychopath, or not a psychopath at all, many researchers do not subscribe to such a staunch belief. In fact, some suggest that psychopathy should be considered a dimensional construct with primary psychopathy at one extreme, non-psychopathic individuals at the other, and ASPD, secondary psychopathy, and sociopathy somewhere in the middle (Coid & Ullrich, 2010; Edens, Marcus, Lilienfeld, & Poythress, 2006). Research using taxonometric procedures have found conflicting results. Harris, Rice, and Quinsey (1994) used the PCL-R to

examine a categorical perspective of psychopathy, finding that there was indeed an either/or outcome, in that only two groups emerged, those in the psychopathy group and those not in the psychopathy group. However, more recent research using similar procedures found evidence suggesting that psychopathy was not underpinned by a latent taxon and that it may be a dimensional construct (Edens et al., 2006). Additional research has examined the distinctions between ASPD and psychopathy and found that psychopathy might be considered an extreme form of ASPD. However, one problem with this notion is, again, the strong criminality focus inherent in the ASPD criteria that is not necessary for a diagnosis of psychopathy, along with the fact that many believe antisocial behaviors are a consequence of core personality traits (Coid & Ullrich, 2010). For the purposes of the current paper the focus will remain on the theories most closely related to primary psychopathy, whether reflective of a discrete class or just the most extreme end of the spectrum.

Etiological Theories

There are many divergent beliefs as to the main contributors to the development of psychopathy. Suggested factors include both genetic and environmental causes. Researchers have also explored hypotheses of low anxiety and fearfulness, affective deficits, neurological defects, neurochemical deficiencies, history of abuse and poor socialization, defects in behavioral inhibition, and semantic aphasia (Cleckley's concept revisited). Each of these will be discussed below.

Deficits in Emotion, Cognition, and Language

It has been suggested that the most important characteristic of psychopathy is the psychopathic individual's impaired emotional responsiveness (Muller et al., 2008). This may explain why studies of brain regions associated with emotional responsiveness and recognition

have become so predominant in psychopathy research. Further, it has been reported that a lack of emotional responsiveness may also impact or interact with cognition (Muller et al., 2008) and moral decision-making (Harenski, Harenski, Kiehl, & Shane, 2010). It has been posited that deficient emotional learning and poor conditioning may cause the psychopathic individual to develop the previously-discussed traits of fearlessness and callousness (Herpertz & Sass, 2000). This theory is based on the psychopath's lack of responsiveness to aversive stimuli and difficulty in learning associations between aversive stimuli and appropriate responses (Herpertz & Sass, 2000; Lykken, 1957). One theory is that, in general, deficient conditioning and an inability to learn from punishment may impede the development of the conscience (Herpertz & Sass, 2000).

As previously noted, some researchers suggest that psychopaths exhibit deficits in their ability to experience anxiety or fear compared to non-psychopathic individuals (Lykken, 1957; 1995). This theory suggests that, since the mechanisms related to low fear or anxiety are found within the autonomic nervous system (ANS), the ANS of a psychopath functions differently than that of a non-psychopathic individual (Hare, 1970). To test this theory, Lykken (1957) incorporated a sample of 49 psychopaths, as identified by the Cleckley criteria, and 15 control subjects; the psychopathy (sociopathy) groups were further divided into primary and secondary types, to assess the distinctions previously noted by Karpman and others regarding trait anxiety in these groups. It was hypothesized that the primary psychopathic group would show impaired anticipatory and manifest anxiety of aversive stimuli, as well as poor avoidance learning. The participants were first required to complete questionnaires identifying levels of anxiety or fear on items reflecting unpleasant or generally fear inducing activities or occurrences. The groups' galvanic skin responses (GSRs) were assessed in a situation including a loud buzzer followed by painful electric shocks. Overall, the results provided support for relatively low endorsements of

anxiety, less GSR reactivity, and low avoidance learning in the primary psychopathy group. This research has continued to be extended and replicated. For example, in a similar study, Hare (1965) utilized electrical shocks to measure how much fear is elicited by cues associated with the impending punishment. The results indicated that psychopathic individuals evidenced less response to electrical shocks and less anticipatory fear (i.e. low skin conductance responses) compared to a control group.

Although these studies are essentially the tip of the iceberg, they suggest that situations that might normally induce fear do not in individuals considered primary psychopaths (Hare, 1966). Additionally, results have suggested that psychopaths may recover, or at least habituate, more quickly than non-psychopaths at the termination of a stressful situation (Lykken, 1957; Hare, 1968). The psychopath's lack of reactivity to anxiety or fear inducing stimuli would likely result in an inability to inhibit immediate behavior (Hare, 1966). Previous findings of hyporeactivity within the sympathetic nervous system (SNS), which is part of the ANS, have led some to hypothesize that psychopaths have a weak behavioral inhibition system (BIS), which regulates response to aversive stimuli, and a normal to strong behavioral activation system (BAS), which is associated with emotionality and impulsivity (Gray, 1987; as cited in Fowles, 2000). Fowles (2000) suggested that, based on this theory, individuals with psychopathy would exhibit poor passive avoidance in conflict situations, essentially seeking rewards with little or no regard for consequences or punishment. Additionally, they would be expected to display average to above average active avoidance, for example, lying, manipulating, or feigning remorse in order to avoid punishment. Newman et al. (2005) examined the BIS and BAS of primary and secondary psychopaths, by examining PCL-R scores in comparison to scores on the Welsh Anxiety Scale (WAS; Welsh, 1956). Their findings indicated that, as hypothesized, primary

psychopaths did exhibit a weak BIS and a relatively average BAS (Lykken, 1995; Newman, MacCoon, Vaughn, & Sadeh, 2005). Although there has been some support for this theory, it is, perhaps, lacking in explanation for other essential components of psychopathy, such as defects in emotions in general, rather than just fear and anxiety.

Interestingly, there is evidence of possible differences in inhibitory control and negative emotional processing in psychopathy and ASPD (Verona, Sprague, & Sadeh, 2012). Verona et al. (2012) utilized the Go/No-Go task to examine the ability of individuals with psychopathy, ASPD, and a normal control group to inhibit behavior when presented with emotionally salient stimuli. It was found that both groups differed from the normal group in their ability to engage in inhibitory control and negative emotional processing. However, it was found that, regardless of inhibitory control demands, the psychopathy group demonstrated reduced neural processing of negative emotion. In other words, the psychopathy group was not differentiating negative and neutral words, as would be expected in normal individuals. However, the ASPD group showed greater processing of negative emotional words, regardless of inhibitory control demands. The results of this study indicated the possibility that individuals with psychopathy do not modulate responses to a given situations based on processing contextual information, such as emotional cues, whereas, for individuals with ASPD, impulsivity may be exacerbated by the presence of negative emotional stimuli (Verona et al., 2012). In addition to providing a unique contribution to the literature regarding the emotional processing in psychopathy, this study also provides some evidence for a distinction between ASPD and psychopathy.

Some of the first evidence implicating specific brain regions involved in psychopathy stemmed from injuries sustained to the orbitofrontal cortex by railway worker Phineas Gage. These injuries led to behavioral disinhibition and aggression, resulting in symptoms strikingly

similar to those found in psychopathy, a phenomenon some later termed *pseudopsychopathy* (Herpertz & Sass, 2000). Since these findings, studies have continued to focus on investigating the role of various brain regions in psychopathic individuals. Recent literature has shown that psychopathic individuals' exhibit decreased activity in the amygdala, ventromedial prefrontal cortex, anterior cingulate, and anterior temporal cortex (Harenski et al., 2010).

The paralimbic hypothesis has suggested that dysfunctions in regions within and around the limbic system result in a lack of reactivity to emotional stimuli, as well as other salient stimuli necessary for moral reasoning. It has been found that individuals with psychopathy are just as likely to acknowledge that something is wrong (e.g., a moral transgression), but that the behavioral responses to moral reasoning are often incongruent. Past fMRI studies have shown atypical brain activity in psychopaths, which may be critical when an individual is faced with a moral decision. The paralimbic hypothesis has implicated dysfunction in multiple regions within and surrounding the limbic system, which tend to be underactive to emotional and other salient stimuli, such as moral violations or reasoning, as being salient in the expression of psychopathic traits. In particular, it is thought that dysfunction in the ventromedial prefrontal cortex and amygdala causes psychopaths to be less sensitive to aversive consequences related to moral transgressions. Past studies that have demonstrated that lesions in the ventromedial prefrontal cortex can cause psychopathic-like behavior and impaired moral reasoning in previously healthy individuals (Harenski et al., 2010). It has also been noted that the amygdala in individuals with psychopathy has less volume and shows reduced activation during emotional tasks compared to individuals without psychopathy (Kiehl et al., 2001; Blair et al., 2004). Further evidence in support of this finding can be drawn from studies citing similar deficiencies for the recognition

of fearful faces in both psychopaths and individuals with amygdala lesions (Adolphs, Tranel, Damasio, & Damasio, 1995; Blair et al., 2004).

Research has indicated that both children and adults with psychopathic traits show consistent impairments in their ability to recognize and react to distress cues (Deeley et al., 2006). When psychopathic individuals are presented with facial or vocal expressions of fear and, to a lesser degree, sadness (Blair et al., 2002), they tend to demonstrate under-reactivity in comparison to other primary emotions, as well as control groups (Blair et al., 2002; Deeley et al., 2006). Bagley, Abramowitz, and Kosson (2009) replicated and extended these findings by demonstrating additional deficits in identifying vocal happiness based on semantic cues. It has been hypothesized that individuals who are unable to experience the normal aversive responses when presented with distress stimuli experience less empathy, which leads to disinhibition of behaviors that increase distress in others (Harenski et al., 2010).

In addition to verbal expressions of emotions and semantic cues, individuals with psychopathy have been found to show deficits in recognizing facial expressions of emotions, particularly expressions of fear and sadness (Blair et al., 2004; Wilson, Juodis, & Porter, 2011). However, some studies have not observed these deficits (Kosson, Suchy, Mayer, & Libby, 2002; Pham & Philippot, 2010). Pham and Philippot (2010) found that poor emotion recognition was seen in both criminal psychopaths and criminal non-psychopaths, suggesting a common deficit among criminals, rather than one associated specifically with psychopathy. One meta-analysis of 22 such studies reported findings indicating significant deficits in affect recognition for fear, sadness, anger, disgust, surprise, and happiness, with the largest deficits being seen in fear and sadness (Wilson et al., 2011). However, a more recent meta-analysis has demonstrated that across 26 studies, psychopaths were found to have pervasive deficits in emotion recognition,

which were significant for all (not just negative) emotions in both vocal and facial expressions of emotions (Dawel, O'Kearney, McKone, & Palermo, 2012).

Similar empathic deficits were demonstrated in a study focused on measuring cognitive empathy of individuals scoring highly on the PCL-R (Brook & Kosson, 2013). It was found that a group of individuals categorized as psychopathic had significantly poorer empathic accuracy in identifying negative emotions during simulated interpersonal interactions than the nonpsychopathic group. Surprisingly, it was found that these deficits were more strongly related to the social deviance/antisocial factor of the PCL-R than they were the affective/interpersonal factor (Brook & Kosson, 2013).

In addition, researchers and clinicians often note that psychopaths' cognitions, experiences, and use of language tend to lack depth and affect (Hare, 1996). Cleckley (1976) noted that there is a marked inconsistency between the way psychopaths actually behave and the things that they say. It has been found that psychopaths have a harder time distinguishing between affective and neutral words than do non-psychopaths (Williamson, Harpur, & Hare, 1991). In addition, psychopaths have demonstrated difficulty processing the semantic meaning of language, particularly when faced with abstract words, and, again, tend to make more errors than non-psychopaths (Kiehl et al., 2004). Such findings have also been associated with right hemisphere brain abnormalities, in particular the anterior superior temporal gyrus (Kiehl et al., 2004). Research has suggested that a lack of emotional or cognitive investment in understanding the significance of semantic meanings allows psychopaths to coolly say one thing while simultaneously doing another (Louth, Williamson, Alpert, Pouget, & Hare, 1998).

It is clear that individuals with psychopathy experience emotions, cognition, and language differently than individuals without psychopathic traits. In particular, individuals with

psychopathy have been found to utilize different brain regions than normal control groups when presented with emotionally salient stimuli, such as facial emotional expressions (Deeley et al., 2006), as well as cognitive and moral decision making tasks (Harenski et al., 2010; Muller et al., 2008). Recent research has also found that there is an important interaction between emotion and cognition in psychopathic individuals, as the brain areas activated in normal individuals when presented with emotionally salient stimuli and cognitive tasks are not activated in the same way in psychopaths (Muller et al., 2008). Further, it has been found that, although they are capable of identifying moral violations, psychopaths may not experience the emotions necessary to inhibit such transgressions (Harenski et al., 2010). These findings shed some light on the importance of experiencing emotions when faced with moral decisions, as individuals lacking emotional responsiveness may be unable to experience the empathy, or even fear, necessary to understand the impact of their actions on others. Overall, it has been found that psychopaths are both affectively and semantically shallow, indicating that the networks intended to integrate these processes are not as well-developed in psychopathic individuals as in normal individuals (Hare, 1998: Kiehl et al., 2004).

Sato et al. (2011) employed pattern recognition techniques and magnetic resonance imaging (MRI) to examine differences in gray matter quantification between psychopaths and healthy controls. It was found that the superior temporal sulcus and superior temporal gyrus provided the richest information in discriminating the two groups. Notably, these two areas have been tied to cognition and emotion, in particular empathy, morality, compassion, embarrassment, and recognition of emotional cues in others. Overall, it was found that gray matter concentration in these areas of the brain could discriminate between individuals high on PCL:SV score and normal individuals, with a moderate-to-high accuracy rate.

Genetic and Environmental Contributions

Studies focusing on genetic and environmental contributions to disorders generally utilize methods involving twins or adoption. These methods provide information on genetic influences, as well as on the impact of shared and non-shared environments. There has been some evidence that psychopathic traits develop early and remain stable throughout childhood, adolescence, and into early adulthood (Bolinskey, Trumbetta, Hanson, & Gottesman, 2010; Forsman et al., 2008; Lynam et al., 2009). Findings such as these provide support for examining psychopathic personality traits in children as a means of understanding its developmental pathways. Additionally, a better understanding of contributory elements of the development of psychopathy in children may lead to earlier identification and more effective preventative efforts.

Traits related to adult psychopathy have been found to manifest similarly in children, adolescents, and young adults (Viding, Blair, Moffitt, & Plomin, 2005). Research on psychopathy in children generally utilizes similar differentiation between antisocial behaviors and callous-unemotional traits (i.e. affective and interpersonal core of psychopathy) as is seen in studies of adults. It is thought that the presence of callous unemotional traits increases the risk of developing a persistent course of psychopathic traits into adulthood. Viding et al. (2005) utilized a sample of 3,487 pairs of seven year-old twins. Distinctions were made between the presence of callous unemotional traits, antisocial behaviors, or the combination of the two, based on teacher ratings. The focus of the study was to determine the heritability of callous-unemotional traits and the extent to which those possessing these traits are different than those possessing only antisocial behaviors (e.g. non-psychopathic). Overall, heritability was estimated at 67% for callous-unemotional traits in children; shared environmental factors were not associated with the presence of these traits, whereas the presence of just antisocial behavior was highly influenced

by both shared and non-shared environmental factors. More recent research has reported similar findings in a group of 605 twin and triplets, between the ages of nine and ten (Bezdjian, Raine, Baker, & Lynam, 2011). Overall estimates of heritability for the callous/disinhibited factor (noted to be comparable to the callous-unemotional traits previously mentioned) were approximately 60%. However, this study found significant sex differences, with estimates for boys at about 64%, and at 49% for girls. Additionally, no significant relationship was found for shared environmental influences in psychopathic personality traits, whereas effects were noted for unique (non-shared) environmental contributions. Moreover, research including adolescent twin pairs, ages 16 to 17, has reported comparable heritability estimates (63%) for a latent psychopathic personality factor (Larsson, Andershed, & Lichtenstein, 2006). Additionally, the results are consistent with the previously mentioned research in that shared environment was not found to contribute to variance in psychopathy, whereas non-shared environmental factors explained 37% of the variance.

Course of Psychopathy

Research focusing on the course and stability of psychopathy has generally supported a continuous pattern of psychopathic personality traits throughout the lifespan. Callous-unemotional traits in children (Fontaine, McCrory, Boivin, Moffitt, &Viding, 2011; Lynam et al., 2009), and affective and interpersonal traits throughout adulthood (Harpur & Hare, 1994) have been found to be particularly stable. One of the most notable studies of the outcomes of psychopathic personality, although called sociopathic personality in the study, followed 523 children from 1922 to the 1950's (Robins, 1966). Of the original sample, 94 met lifetime criteria of sociopathic personality and 82 of those were available for follow-up to outcomes assessment. Overall, 12% had remitted, 27% had some improvement, and 61% were unimproved.

Additionally, in spite of the fact that some individuals had improved in their overall antisocial tendencies with age, many were not free of ongoing interpersonal difficulties and remained generally disagreeable individuals. Harpur and Hare (1994) extended these findings by examining both antisocial behaviors and affective-interpersonal traits across different age groups of male prisoners and forensic psychiatric patients. Overall, the findings were consistent with Robins' findings, in that, although antisocial behaviors appeared to decline with age the core affective and interpersonal traits remained stable across age groups.

More recent research has focused on the stability of psychopathic traits across childhood and adolescence. Lynam et al. (2009) examined data from 1,500 boys from age 7 to 18. Findings indicated that juvenile psychopathy was fairly stable throughout adolescence and that the levels found were comparable to those seen in other basic dimensions of personality. The results also indicated that childhood and adolescent psychopathic traits could be considered predictive of psychopathic traits later in life. Additional research has further demonstrated this stable course for children displaying both high levels of callous-unemotional traits and high levels of conduct problems (Fontaine et al., 2011). However, trait level and predictability of future outcome have been shown to be correlated, with lower the levels of these traits associated with lesser predictive validity. Overall, research indicates that psychopathic personality can be found early in childhood and remain consistent into young adulthood, and as individuals' age throughout their adult lives it appears that antisocial behaviors may remit while the core personality traits remain intact.

Racial and Ethnic Differences in Psychopathy

Studies reporting on racial and ethnic differences in psychopathy have been controversial. Lynn (2002) reviewed a number of studies which focused on differential rates in delinquency,

sexual behavior, crime, aggression, Conduct Disorder, and Attention Deficit Hyperactivity Disorder and concluded that Black and Native American individuals show higher levels of psychopathy than their White counterparts, East Asians show lower levels of psychopathy than Whites, and Hispanic groups show scores somewhere in between. However, one meta-analysis found that the differences between Black and White groups were not meaningfully different, averaging a one-point difference on the PCL-R (Skeem, Edens, Camp, & Colwell, 2005). It should be noted that research has found the PCL-R to generalize across ethnic groups (Cooke, Kosson, & Michie, 2001).

Skeem et al. (2005) argued that there were significant problems with Lynn's (2002) analyses and subsequent claims that differences in psychopathy across races can be linked to genetic factors. First, they noted that the source of information on psychopathy levels was gathered mainly from the MMPI-2 scale *4* and other indicators of social deviance, rather than measures of the full construct of psychopathy. Skeem et al. demonstrated that, with the use of a more comprehensive method of assessment (i.e., the PCL-R), there were actually no significant differences in the level of affective and interpersonal traits of psychopathy between Black and White groups. Further, they suggested that there was little evidence to support the claim that genetic factors account for the differences demonstrated across ethnicities, and that much of the available evidence is supportive of environmental explanations (Skeem et al., 2005; Zuckerman, 2003). Lynn also claimed that these differences can be tied to evolution and selection factors based on climate. Although differential rates of criminality and antisocial behavior have been found across different ethnic groups, many contend that recent history involving poverty rates and prejudice is a more plausible explanation (Skeem et al., 2005; Zuckerman, 2003). These

issues have no clear resolution, but it is obvious that further study will be necessary to fully understand the variability in psychopathy and the traits it is associated with.

Assessment

Considerations

Although there are some conceptual similarities between the construct of psychopathy and the DSM-5 diagnosis of ASPD, one must remain cognizant that they are not the same, which can be seen most clearly through the differing base rates. It has been demonstrated that a diagnosis of ASPD does not generally provide the same predictive utility in clinical and forensic decisions (Butcher, 2009) as does a diagnosis of psychopathy. For example, individuals meeting full criteria for psychopathy, as assessed by the PCL-R, are at a higher risk for reoffending and for future violence (Ogloff, 2006), as compared to those only meeting diagnostic criteria for ASPD. Additionally, it has been found that individuals with psychopathy not only have worse prognoses with regard to treatment, but that their presence in treatment groups can be detrimental to group dynamic and functioning (Ogloff, 2006). Thus, assessment of all of the traits and behaviors associated with global psychopathy is necessary, rather than focusing only on the specific behaviors indicated in the ASPD diagnostic criteria.

Gacono and Meloy (2009) have suggested that additional considerations are necessary due to the chronically deceptive nature of psychopathy, which can include blaming others, malingering or exaggeration, and conscious denial. They cautioned that the researcher or clinician must utilize any and all validity data to confirm or disconfirm the appropriateness of any diagnoses and that diagnostic data should necessarily include many sources, such as face-to-face interviews, historical information, and testing. Additionally, an evaluator must consider the

context in which the assessment is occurring (e.g., forensic, research, clinical, etc.), as well as the underlying purpose of the assessment (e.g., treatment, sanity, sentencing, etc.).

As previously noted, the most widely accepted tool for the assessment of psychopathy is the Psychopathy Checklist Revised (PCL-R; Hare, 1991). The PCL-R includes each of the sources suggested by Butcher (2009); thus, it is generally accepted as a standalone measure of psychopathy, whereas many other instruments will necessarily require additional sources of information. However, it is also noted that the MMPI-2 is an acceptable instrument for the assessment of psychopathy when used in conjunction with other data (Gacono & Meloy, 2009). Although this paper will focus on these two instruments, a brief discussion of additional methods of assessment of psychopathy, such as the Rorschach and the Psychopathic Personality Inventory (PPI; Lilienfeld, 1996) is in order.

Rorschach Inkblot Method

The Rorschach has a controversial history as a projective personality assessment tool, and the controversy continues in regard to the assessment of psychopathy. Gacono and Meloy (2009) have suggested that the Rorschach can be considered a useful and generally valid instrument for assessing psychopathy and ASPD. They suggested that, with use of the Comprehensive System, the Rorschach can be successful in distinguishing between individuals with ASPD and individuals with psychopathic ASPD. Additionally, they noted that individuals with psychopathy have difficulty malingering responses on the Rorschach, with the only successful means of "beating" the Rorschach being constricting response frequency. However, others have responded to such claims with a great deal of skepticism regarding the instrument's utility. A recent meta-analysis of 22 studies, which focused on examining the discriminating ability of 37 Rorschach variables, found that only five variables yielded modest relationships with psychopathy (Wood et

al., 2010). Thus far, Gacono and Meloy's claims for the usefulness of the Rorschach in this context have failed to be replicated by additional research (Lilienfeld, Wood, & Garb, 2000). Additionally, there has been little correspondence between results of the Rorschach and self-report inventories, which is said to make its validity for most purposes doubtful. Because scoring of the Rorschach has been found to be unreliable and subjective, and the validity not well-demonstrated, it has been recommended that assessments in a forensic context (e.g., those often associated with the assessment of psychopathy) be based on more dependable and psychometrically sound techniques (Lilienfeld et al., 2000). Thus, it appears that the Rorschach's usefulness for assessing psychopathy remains equivocal, at best.

Psychopathic Personality Inventory

The Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) is a self-report measure of psychopathy developed specifically to assess the core personality traits associated with psychopathy. The authors have noted that a significant problem in the self-report assessment of psychopathy is that many of the available measures utilize a behaviorally based approach; as such, they tend to more effectively assess ASPD rather than psychopathy. Additionally, such behaviorally-based measures have been developed in, or specifically for use in, forensic populations, which may limit their utility in noncriminal populations. Thus, Lilienfeld and Andrews chose to focus on the personality traits associated with psychopathy and identified eight corresponding subscales, including Machiavellian egocentricity, social potency, cold-heartedness, carefree non-planfulness, fearlessness, blame externalization, impulsive nonconformity, and stress immunity. Although this measure has received some support regarding its reliability and validity, and positive findings for the utility of the PPI indicate that perhaps

self-report measures can be useful in the assessment of psychopathy, the focus of the current research will remain on the PCL-R and its facets, as well as the MMPI-2.

PCL-R and its Derivatives

PCL. The initial version of the Psychopathy Checklist (PCL) was released by Hare in 1980. The focus of development was to create a research scale for the assessment of psychopathy in forensic settings. The scale was based on an assessment of the 16 criteria originally provided by Cleckley (1976). In the initial stages of development, two separate investigators rated case history and interviews on each of the criteria for a sample of 143 inmates. Later, the criteria underwent principal components analysis, which identified five main factors accounting for 64% of the total variance. Following this, the researchers listed any trait or behavior that they felt was implicitly or explicitly used in their assessments. After analyses of 100 items, 22 were found to best discriminate individuals with high and low ratings of psychopathy. The resulting checklist and its five factors were found to correlate .90 with the 16 Cleckley criteria. However, soon after the development of the original PCL, work on a revised version began.

PCL-R. The revisions to the PCL were based on feedback from users and also served to clarify some of the scoring procedures. Hare and Neumann (2006) noted that changes were cautiously implemented to avoid compromising the overall quality and intent of the checklist. The new version deleted two items that were considered unreliable and difficult to score, leaving 20 items. Additionally, 10 items were slightly revised, although care was taken to ensure that the meaning of these items was maintained from the original version. The manuals for subsequent versions (Hare, 1991; 2003) were also updated to include more detailed scoring instructions and contained more information on the psychometric properties of the tools (Hare & Neumann, 2006). The manual for the second edition (2003) is approximately three times as large as the first

edition, due to the amount of research that has incorporated the PCL-R. Based on the research it has been noted that the PCL-R is a highly reliable and valid measure of psychopathy (Hare et al., 1990; Hare & Neumann, 2006).

In its current state, the PCL-R includes 20-items, which are scored on a 3-point scale (0, 1, or 2), making the highest possible ranking 40 points. Ratings are made based on extensive reviews of all available historical and current data, as well as a semi-structured interview. The optimal cutoff score for a designation of psychopathy has been suggested to be 30, or higher. In addition, Gacono and Meloy (2009) reported that several stipulations that must be met prior to use of PCL-R. For example, evaluators should be licensed professionals with forensic experience, have training in reliable scoring procedures, be familiar with current research in the field of psychopathy, use the instrument with samples similar to those in which it was validated (i.e., forensic), always review collateral information before interviewing, and first ensure that collateral information is available. Administration, scoring, and interpretation can be quite lengthy, which can pose practicality issues for its application in research and clinical settings.

PCL: SV. Partly as a means to address the practicality issues associated with the PCL-R, the Psychopathy Checklist: Screening Version was developed (PCL: SV; Hart, Cox, & Hare, 1995). The PCL: SV consists of only 12-items, as opposed to 20, which are scored on a three point scale (0, 1, or 2), for a maximum of 24 points (Hare & Neumann, 2009). The intended purpose of this scale is to screen for psychopathy; thus, an actual psychopathy designation requires additional assessment. It has been suggested that this tool is an appropriate research tool for use in a variety of settings. Overall, research indicates that it is comparable to the PCL-R and exhibits a similar factor structure (Hare & Neumann, 2009).

Factor Structure. Until recently, the dominant view regarding the factor structure of the PCL-R, and subsequently the construct of psychopathy, has been a two-factor conceptualization (Harpur et al., 1989; Cooke & Michie, 2001). The previously listed interpersonal, affective, lifestyle, and antisocial traits and behaviors form the basis of the commonly cited two-factor conceptualization of psychopathy, which was originally developed through factor analysis of the PCL and PCL-R items (Harpur, et al., 1989). Factor one is generally considered the core of psychopathy and is called *the selfish, callous, and remorseless use of other* factor; it encompasses the aforementioned interpersonal and affective traits of an individual (Harpur et al., 1989). Factor two is appropriately titled the *chronically unstable and antisocial lifestyle; social deviance* factor, and is related to overall social deviance. This factor is thought to identify more specific behaviors, such as impulsivity and irresponsibility. Interestingly, some research has found that the PCL-R factors differentially correlate with various constructs thought to relate to psychopathy (Hicks & Patrick, 2006). More specifically, it was found that the PCL-R interpersonal/affective factor (1) was negatively related to negative emotionality; whereas, the social deviance/antisocial factor (2) was positively related to negative emotionality (Hicks & Patrick, 2006). It is suggested that separating these factors/facets of psychopathy may improve prediction, as the use of total scores provided negligible predictive power compared to the significant prediction associated with concurrent use of the factor scores (Hicks & Patrick, 2006).

Recent research, however, has questioned the two-factor conceptualization of psychopathy. Cooke and Michie (2001), for example, conducted several studies of the factor structure of PCL-R data with a large North American (N=1,389) sample, as well as data from a Scottish sample (N= 247). They concluded that the two-factor structure of psychopathy may not

provide the best fit, but that three hierarchical factors are necessary to explain the construct of psychopathy. Their results indicated that this three-factor model is rooted in the domain of personality dispositions, and that the behaviors associated with this construct arise only as a result of the personality traits that underlie the behaviors. Further, they suggested that several PCL-R items should be deleted due to the emphasis on specific behaviors and criminality, as such behaviors may be seen as a consequence of psychopathy, rather than necessary for inclusion in the construct. However, this divergent view has been met with some resistance and ignited controversy over the PCL-R and its place as the gold standard for assessing psychopathy.

In response, some researchers now suggest a possible four-factor, higher-order structure (Neumann, Hare, & Newman, 2007). Neumann et al. (2007) maintained the need to include antisocial tendencies in structural models of psychopathy, and noted that there is no empirical justification for regarding antisocial tendencies as consequences of traits and that this type of "dissocial disposition" that is impervious to socialization is a distinguishing factor of psychopathy. The authors utilized PCL-R data from large sample of male and female offenders and forensic psychiatric patients. A confirmatory factor analysis supported the four-factor model of psychopathy, and indicated that the four-factors can be accounted for by a "super-factor" that encompasses both personality and antisocial tendencies as core components of psychopathy. The four factors are essentially the original two factors each divided into two facets. They were appropriately named the *interpersonal*, *affective*, *antisocial*, and *lifestyle* facets.

There remains no unanimous agreement regarding this issue. In fact, the debate has extended beyond factor structure and is now focused on the current conceptualizations of psychopathy as they have been operationalized by the PCL-R (Skeem & Cooke, 2010). Some have noted that because the PCL-R was developed within a criminal population the definition of

psychopathy has suffered, and that the reification of the tool has stifled advances in the conceptual understanding of psychopathy. However, contradictions in claims that antisociality is not central to psychopathy, but that it is inherent, do little to clarify the real role of such tendencies within the construct. More research is needed to bring closure to these issues.

PCL-R Relationship to ASPD. A comparison of the DSM-IV-TR diagnostic criteria of ASPD and the PCL-R items has indicated that only three out of eight items associated with factor 1 on the PCL-R correspond with the diagnostic criteria for ASPD, whereas six out of ten items on factor 2 are represented in the ASPD criteria (Ogloff, 2006). This, again, reveals the lack of convergence between ASPD criteria and psychopathy, and more specifically with the PCL-R. The ASPD criteria are much broader than those of the PCL-R and run the risk of becoming over-inclusive when attempting to identify the construct of psychopathy. Research has supported this notion and has found ASPD to be more strongly associated with the facets related to lifestyle and antisocial tendencies than with the affect and interpersonal facets (Hare & Neumann, 2009). These findings have been replicated when psychopathy and ASPD are viewed as continuous as well as categorical.

MMPI and MMPI-2

History. The Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1940) was published with the intention that it be used in medical and psychiatric clinics, as the variety of subjects included in the inventory would be more significant to psychiatrists than were any of the already-available personality inventories. However, soon after the MMPI was put into use, researchers began to notice its potential in many other settings (Dahlstrom, Welsh & Dahlstrom, 1975), and it began to be used in a wide variety of forensic, psychiatric, mental health, employment, and research settings (Butcher & Williams, 2009).

Hathaway and McKinley began with a list of over 1,000 items derived from various sources, including their own clinical experience, psychiatric textbooks, earlier scales, and psychiatric examination direction forms. Through the process of empirical keying, these items were reduced to 504. Originally, each item was printed on an index card, which subjects were then required to sort into three categories: True, False, or Cannot Say. It has been noted that one of the motivations for creating the MMPI was to correct some of the mistakes of past personality inventories, particularly the methods of construction which largely focused on content of items (Friedman, Bolinskey, Levak, & Nichols, 2015). The items on each scale were only accepted or rejected on the basis of differentiation or as a means to eliminate "undesirable statistical trends," such as to prevent excessively high intercorrelations between scales (McKinley & Hathaway, 1944). The criterion groups used in the construction of the individual scales were selected from psychiatric patients thought to be prototypical cases of specific diagnostic categories. These categories make up the eight original Clinical Scales and include Scale *1* (Hypochondriasis), *2* (Depression), *3* (Hysteria), *4* (Psychopathic Deviate), *6* (Paranoia), *7* (Psychasthenia), *8* (Schizophrenia), and *9* (Hypomania scales). However, the standardization group has been criticized for being non-generalizable (Friedman et al., 2015). The normative group consisted of 724 individuals who were predominantly white, from the Midwest, and of low educational standing, generally having about an eighth-grade education. This resulted in an underestimation of T-scores by about .5 standard deviations from the mean.

The MMPI began undergoing revisions in 1982 for various reasons, including what was perceived to be the inappropriateness of the standardization group used. Other perceived problems addressed by the revision included the fact that the original linear T score transformations used with the clinical scales made it difficult to compare scores between scales,

as well as a perception that some items had become outdated or objectionable, making them difficult to interpret by test takers or just generally irrelevant (Friedman et al., 2015; in press). In addition to outdated items, the MMPI lacked items relevant to more contemporary concerns such as substance abuse and family functioning. To amend these issues, a new version of the test, known as the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, Kaemmer, 1989), was released. The MMPI-2 normative group is considered to be more diverse and representative of the U.S. population. Although there were necessary changes made to the item pool of the MMPI-2, it is thought that the general integrity of the Clinical and Validity scales remained intact throughout the revision. Finally, the restandardization introduced uniform T scores for the eight original clinical scales (i.e., not including scales *5* and *0*), which allow for easier comparisons across the clinical scales (Friedman et al., 2015).

Restructured Clinical (RC) Scales and MMPI-2 Restructured Form (MMPI-2-RF). Although the MMPI-2 now contains a variety of scales, constructed with various methods, beyond the original clinical and validity scales, one of the recent controversies concerns the introduction of a set of Restructured Clinical (RC) scales and, subsequently, a shortened version of the MMPI-2 based on those scales. A primary concern regarding the RC Scales is not that the addition of new scales on the MMPI-2 is unwelcome, but that these scales mark a conceptual shift from the original empirical methods of developing the clinical scales and are intended to replace their original clinical scale counterparts without adequate justification (cf., Butcher, 2011). The RC Scales were developed for the MMPI-2 in order to remove general demoralization from the existing Clinical Scales (Tellegen, Ben-Porath, McNulty, Arbisi, Graham, & Kaemmer, 2003). Demoralization is a concept that can be described as the general emotional distress that underlies most clinical diagnoses (Binford & Liljequist, 2008). The

justification of the removal of items measuring demoralization is based on the hypotheses that A) all of the clinical scales include items measuring demoralization, B) demoralization should be measured as its own construct, C) demoralization is not essential component of the constructs measured by the Clinical Scales, and D) that the removal of demoralization from the clinical scales will create more homogeneous scales with less item overlap (Butcher & Williams, 2009).

Significant concerns have been raised regarding the RC Scales as improved versions of the Clinical Scales. The RC Scales were developed using factor analytic methods divergent from the empirical criterion keying methods implemented by McKinley and Hathaway. It is suggested that this method of development rendered the RC Scales completely new measures that are not appropriate to compare to the Clinical Scales and the research that they have generated over 70 years (Butcher, 2010). Others have suggested that although the resulting scales were offered by their creators as more homogeneous measures of their core constructs, they may, in fact, be too narrow as measures of heterogeneous disorders (Caldwell, 2006). Additionally, it is noted that the RC Scales are actually mathematically redundant with several Content and Supplementary Scales (Caldwell, 2006; Friedman et al., 2015; Nichols, 2006). A final concern is that the RC Scales may have low sensitivity to mental health problems (Butcher & Williams, 2009). It is clear that these scales have not yet been proven as new clinical scales and additional research will continue to be necessary.

The MMPI-2-RF (Ben-Porath & Tellegen, 2008), a shortened version of the MMPI-2, was developed largely based on the RC scales. The MMPI-2-RF was shortened from 567 items to 338-items with 50 scales. Notably, the original clinical scales were not included in the MMPI-2-RF, causing some contention in the field. Because of this exclusion, some researchers have criticized the new form as being a completely new assessment instrument that would require its

own body of research to provide validation (Butcher & Williams, 2009; Greene, 2011). However, others have embraced the new measure and begun to initiate the necessary research. In fact, some research has begun to focus specifically on the use of the MMPI-2 RF in the assessment of global psychopathy (Marion et al., 2013; Phillips, Sellbom, Ben-Porath, & Patrick, 2013). Overall, the results of these studies have been promising for the MMPI-2-RF as an indicator of psychopathy. However, because the scales, aside from the RC scales, implemented in the studies are largely specific to the MMPI-2-RF and are not routinely used with the classic version of the MMPI-2, the results will not be reviewed in great detail. The remainder of the review will focus on the scales commonly associated with MMPI-2.

MMPI, Delinquency, and Criminality. The MMPI and MMPI-2 have a long history in the assessment of psychopathic, antisocial, and delinquent behavior. The first scale developed with the intention of assessing psychopathy was the Psychopathic Deviate (*Pd*; McKinley & Hathaway, 1944) Scale, now generally known as *Scale 4*. The construction of *Scale 4* followed the same criterion keying guidelines previously mentioned. The criterion group was made of male and female psychiatric patients, between the ages of 17 and 22, who had been diagnosed with psychopathic personality, asocial and amoral type. It was noted that many of the patients exhibited behaviors such as lying, truancy, stealing, substance abuse, sexual promiscuity, or forgery, but that there were no severely criminal types of behaviors. The final scale was made up of items that related to social maladjustment, absence of pleasant experiences, and some items relating to paranoia. The items varied in factor content and were not found to strongly intercorrelate, which was thought to contribute to greater clinical usefulness.

Early research on the MMPI and its scales in assessing delinquency and antisocial behaviors has supported *Scale 4*'s utility in identifying groups of delinquents. Capwell (1945)

was among the first researchers to focus on differences between delinquent and non-delinquent groups using the MMPI. Capwell assessed two groups of girls with several measures of personality, intelligence, and achievement. The first group consisted of 101 delinquent girls between age 13 and 19, while the second group included 85 non-delinquent girls between ages 12 and 18. The groups were tested at two different time points on each measure, in order to assess change. The results indicated that non-delinquent girls had higher scores of IQ and achievement. Overall, the MMPI was the most successful personality assessment inventory in discriminating between the two groups; moreover, *Scale 4* was the most successful scale on the MMPI, followed by *Scale 6*. Monachesi (1946) extended these results by replicating the study design with the inclusion of groups of delinquent and non-delinquent males. However, the results of this study were somewhat less definitive. Although similar discriminatory success was found for the delinquent and non-delinquent females, findings were inconsistent for the male groups, with the non-delinquent boys actually scoring higher than the delinquent group on a number of scales, including *Cannot Say* and scales *1, 5, 7, 8,* & *9*.

Hathaway and Monachesi (1950) conducted a study of 4,046 male and female adolescents in the ninth grade. The focus of this study was, again, to examine the profile pattern differences between delinquent and non-delinquent adolescents. The delinquent groups were identified as children who had been in contact with the juvenile justice system based on records from a police department, juvenile court, and probation department. In this study it was found that not all of the scales were successful in discriminating between delinquents and non-delinquents, but that scales *4*, *6*, and *9* were highly effective. Additionally, it was the combination of high scores on scales *4* and *9* that were the most efficient predictors of delinquency in both males and females. Elevations on these scales have generally stood the test

of time and have continued to be widely used as measures of antisocial behavior and psychopathic personality traits, although some studies have found higher scores on these scales in non-forensic samples rather than in a forensic sample (Archer, Bolinskey, Morton, & Farris, 2003).

Megargee has contributed a great deal to research on antisocial and criminal behaviors through his development of a MMPI-based computer classification system for adult offenders. Although his system is not widely used, it has provided a comprehensive system that thoroughly describes ten different types of offenders and their different MMPI profile patterns. Megargee's research began in order to correct what he saw as weaknesses in the then-current classification systems, including a lack of operational definitions and failure to demonstrate validity (Megargee & Bohn, 1979). The classification system created was based on approximately 5,000 MMPIs, as well as collateral information from a larger project collected at a federal institution for youthful offenders. The MMPI profiles were analyzed to determine if they fell into distinct clusters in a reliable way. It was found that the profiles could be reliably classified into about ten different groupings, which the authors referred to as *Able, Baker, Charlie, Delta, Easy, Foxtrot, George, How, Item,* and later *Jupiter*. The intention behind using these arbitrary titles was to avoid descriptive labels that might encourage overemphasis on specific characteristics and reification of constructs (Megargee, 1984; Megargee & Bohn, 1979). With the release of the MMPI-2, it was necessary for the system to be modified, although it was found that the previous classifications also applied to MMPI-2 profiles (Megargee, 2006). Research has found that Megargee's revised system can successfully classify 90% to 95% of MMPI-2 profiles within correctional settings.

Although each of the character types described by Megargee's system is important within the criminal justice system, the one of most relevance to the current research is the Group Able type; these profiles are characterized by elevations on clinical scales *4* and *9*, and typically low scores on scale *0* and *5* (Megargee, 2006). Individuals within this group are described as coming from fairly stable homes, are educated, socially skilled, gregarious, ambitious, dominant, and experience minimal anxiety or guilt. Additionally, amorality, impulsivity, immaturity, and hedonism are characteristic of Group Able. Based on these descriptions, it is easy to see how the Able group appears to closely resemble the previously discussed concept of primary psychopathy.

Current Status of the MMPI-2 in the Assessment of Psychopathy. When assessing psychopathy using the MMPI-2 there are several scales and combinations of scales that can prove to be useful indicators. As previously noted, elevations on Clinical Scales *4* and *9* have been shown to be related to criminal behavior and ASPD, and have commonly been used to measure psychopathic personality traits (Sellbom, Ben-Porath, Lilienfeld, Patrick, & Graham, 2005). High scorers on *Scale 4* may be impulsive, resentful and rebellious. Additionally, they have problems with authority and accepting rules, and will likely have legal difficulties. Individuals with elevations on *Scale 9* (Hypomania) are excitable, over productive, superficially warm, and quick-tempered. Individuals with the combination of elevations on both scales *4* and *9*, or the *4-9/9-4* codetype, are often narcissistic, impulsive, manipulative and power oriented (Friedman et al., 2015). However, it has been found that although *Scales 4* and *9* correlate with the social deviance factor of psychopathy, criminal behavior, and ASPD, they are not as sensitive to the affective-interpersonal factor (Sellbom et al., 2005).

Sellbom et al. (2005) suggested that in order to measure the affective-interpersonal traits associated with psychopathic personality it would be beneficial to examine low scores on scales of negative emotionality. Because psychopaths report low levels of anxiety and high levels of fearlessness, they suggested that several scales on the MMPI-2 measuring negative emotionality and fearfulness may provide additional indications of psychopathic personality traits. In particular, the Fears (*FRS*) Content Scale, clinical scales *2* and *7*, *RC2* (Low Positive Emotions), *RC7* (Dysfunctional Negative Emotions), and the PSY-5 Scales Introversion/Low Positive Emotionality (*INTR*), and Negative Emotionality/Neuroticism (*NEGE*) have been suggested as scales of interest in the assessment of psychopathic personality.

In addition, the Antisocial Practices (*ASP*) Content Scale is a useful indicator of psychopathic characteristics (Sellbom et al., 2005). High scores on *ASP* may indicate disregard for the law, resentment toward authority, manipulativeness, cynical attitudes, dishonesty, impulsiveness, aggression, and possible substance abuse problems (Graham, 2000). Lilienfeld (1996) found that *ASP* was a better measure than *Scale 4* of global indices of psychopathy and antisocial behavior as assessed through self-report, interview, and observer ratings. It was also found that *ASP* had significant correlations to Machiavellianism, fearlessness, aggression, externalization of blame, and impulsivity. However, this study did not determine whether the *ASP* scale was primarily correlated with the social deviance factor, the affective-interpersonal factor, or both factors of psychopathic personality.

Additional scales that may be associated with psychopathic personality traits are the PSY-5 scales Aggressiveness (*AGGR*) and Disconstraint *(DISC*; Sellbom et al., 2005). The expression of the *AGGR* scale is thought to reflect cruelty rather than rage, and measure instrumental aggression, hostility, and dominance. Elevations on *DISC* may suggest

undermodulation of impulses, spontaneity, cognitive and moral flexibility, and harm avoidance (Friedman et al., 2015).

As noted above, the RC Scales were introduced to the MMPI-2 in order to remove the general factor of demoralization from the Clinical Scales (Tellegen, Ben-Porath, McNulty, Arbisi, Graham, & Kaemmer, 2003). Demoralization is a concept that can be described as the general emotional distress that is seen in most clinical diagnoses (Binford & Liljequist, 2008). Thus, it was that thought that the removal of demoralization would create a more homogeneous set of clinical scales, with less overlap, and fewer intercorrelations between the scales (Tellegen et al., 2003). If the new scales are, indeed, more homogeneous constructs, that they may prove to be more efficient measures of psychopathic personality traits than their original clinical counterparts. Binford and Liljequist (2008) evaluated behavioral correlates of select RC scales (*RC2*, *RC4*, and *RCd*), clinical scales (*2* and *4*) and conceptually related content scales (*DEP*, *CYN*, and *ASP*). Overall, *RC4* (Antisocial Behavior) showed stronger correlations with many antisocial behaviors as compared to clinical scale *4* and the content scales *ASP* and *CYN*. However, *RC2* was not as predictive of behaviors related to depression as clinical scale *2* or the content scale *DEP* (Binford & Liljequist, 2008). The authors suggested that, at least *RC4*, might be a better predictor of certain antisocial behaviors than *Scale 4* and Content Scale *ASP* (Binford & Liljequist, 2008).

Sellbom et al. (2005) investigated the overall utility of the MMPI-2 in assessing psychopathy and its factors, using the PPI as the criterion indicator. They examined several scales (*4, 9, RC4, RC9, ASP, AGGR*, and *DISC*) associations with the social deviance facet of psychopathy, and several scales (*2, 7, RC2, RC7, FRS, INTR, NEGE, AGGR*, and *DISC*) they believed would show associations with the affective-interpersonal facet. They also focused

particular attention on the traditional clinical scales *4* and *9*, and whether the addition of low scores on clinical scales *2* and *7* would add incrementally to the prediction of psychopathy and its factors. The final focus was to examine whether the RC scales would prove to be more efficient measures of psychopathic characteristics than the traditional clinical scales. As expected, their findings showed that there were relationships with clinical scales *4* and *9*, *RC4* (antisocial behavior), *RC9* (hypomanic activation) and *ASP* (antisocial practices) to the social deviance factor of psychopathy. The results supported the use of low scores on scales measuring negative emotionality, such as *RC7* (dysfunctional negative emotions) and *NEGE* (negative emotionality), and reversed positive emotionality scales *RC2* (low positive emotions) and *INTR* (introversion), in order to measure the affective-interpersonal factor. It was also noted that *FRS* (fearfulness) Content Scale might be valuable beyond the other MMPI-2 scales in assessing the fearlessness traits associated with psychopathy. Overall, the findings indicated that the most parsimonious combination of scales to assess psychopathic personality traits were elevations on *RC4* and *RC9*, with low scores on *RC2* and *RC7*. However, the authors suggested that the MMPI-2 be used as a predictor of the separate facets of psychopathy, rather than as a predictor of global psychopathy (Sellbom et al., 2005).

Caldwell (2006), however, has raised some concerns with regard to using *RC4* rather than Scale *4*. He suggested that although *RC4* may be a more homogeneous measure of social deviance, it might in fact be too narrow as a measure of psychopathy. Because psychopathy has multiple contributory elements (i.e., differing facets and traits) the factor analytic approach employed in the development of *RC4* necessarily created a homogeneous measure for a heterogeneous entity. Caldwell asserted that *RC4* provides a focused prediction of social deviance, but suggested that Scale *4* is better suited to examine diverse code types that tap

different patterns of the expression of psychopathic personality traits. Rogers, Sewell, Harrison, and Jordan (2006) found that *RC4* demonstrated low correlations with criminal justice involvement, but much higher correlations with substance abuse. Further, Bolinskey and Nichols (2011) have demonstrated that *RC4*'s items contain a strong substance abuse component that may increase the risk of false positive identification of broad antisocial dispositions and behaviors based on the endorsement of substance abuse items, alone. These findings have provided some evidence for the restricted nature of *RC4*.

In part as a response to Caldwell's criticisms regarding the use of the *RC* Scales in measuring psychopathic personality traits, Sellbom, Ben-Porath, and Stafford (2007) provided a comparison study of the MMPI-2 measures of psychopathic deviance in a forensic setting. The authors suggested that Scale *4*'s lack of correlation with core features of psychopathy indicates limited validity for its use as a measure of psychopathic personality traits. Four MMPI-*2* scales (*4*, *RC4*, *ASP*, and *DISC*) were examined as measures of psychopathy, as identified by the PCL:SV, from both a dimensional and a categorical perspective. It was hypothesized that *RC4*, *ASP*, and *DISC* would be better predictors of psychopathy than Scale *4*, and that, overall, *RC4* would be the strongest measure of social deviance, with *DISC* as the strongest measure of affective-interpersonal traits. When examined from a categorical perspective, the four scales were found to be comparable measures of psychopathy, with no significant differences in their correlations. However, when psychopathy was investigated from a dimensional perspective it was shown that *RC4*, *ASP*, and *DISC* were in fact stronger measures than Scale *4*, with *RC4* demonstrating the strongest validity as a predictor of psychopathy. *RC4* yielded the highest correlations with social deviance, and as predicted, *DISC* had the highest correlations with affective-interpersonal traits. However it should be noted that although *RC4* did have the

strongest correlations, the differences between *RC4* and *ASP* were not statistically significant (Sellbom et al., 2007).

Although many studies regarding the discriminating quality of MMPI-2 scales have been completed, few have examined scales in the prediction of psychopathy. One such study was completed with a sample of ninth graders at age 14, using adolescent scores to predict schizophrenia and adult psychopathy (Bolinskey, Trumbetta, Hanson, & Gottesman, 2010). Overall, the scales found to predict adult psychopathy included a combination of elevations on *RC4*, *PAG* (passive-aggressive personality), *DEP-2* (dysphoria), *TPA* (type A personality), *Ma4* (ego inflation), and *Hy1* (denial of social anxiety), and low scores on *Mf7* (restraint), *Do* (social dominance), and *DEP-4* (suicidal ideation). The results suggest that even early on, these individuals may display little restraint in their affect and behaviors, perhaps leading to the propensity to behave in antisocial ways. Additionally, due to the low scores on *Do*, these individuals might be viewed as somewhat immature and awkward in their social interactions, as compared to their non-delinquent counterparts. It should be noted that because the *RC4* scale was derived from items on the original MMPI, it was not as heavily loaded with substance abuse items as is the standard version of the scale (Bolinskey et al., 2010).

The Harris-Lingoes *Pd* subscales have also proven valuable in discriminating the sources of elevations on *Scale 4*. Lilienfeld (1999) examined the *Scale 4* subscales in order to determine whether certain scales are more highly related to global psychopathy and antisocial behaviors than others, whether some components of psychopathy are assessed better than others, and the incremental and construct validity of the *Scale 4* subscales. The findings supported the overall construct validity of the *Scale 4* subscales, although it was suggested that some scales may be perform better as measures of psychopathy than others. Specifically, *Pd2* (Authority Problems)

appeared to be the most consistent measure of psychopathy, and may provide the most unique information in the measurement of psychopathy and its facets, although in certain instances the other *Scale 4* subscales provided incremental validity beyond *Pd2*. Overall, it appears that the *Scale 4* subscales can provide important information when interpreting elevations and assist in understanding relationships with the specific facets of psychopathy.

Hansen, Stokkeland, Johnsen, Pallesen, and Waage (2013) recently examined the specific relationship between the PCL-R and the MMPI-2 by incorporating a four-facet model (interpersonal, affective, impulsive, and antisocial) of the PCL-R. Their ultimate goal was to examine the four-facets' relationships to the clinical scales, as well as the *ANX* Content Scale. Their sample included 22 male inmates with valid MMPI-2 protocols, although, it should be noted that only five participants scored above their cutoff of 26 on the PCL-R, which was acknowledged as a limitation (Hansen et al., 2013). When examining total PCL-R scores, only the relationship between *Scale 2* and psychopathy was significant. However, there were significant relationships among the facet scales, as the interpersonal facet was found to have a significant negative correlation with *Scale 0* (Social Introversion), which was noted to possibly indicate a propensity for superficial relationships, and a need for power, status, and recognition (Hansen et al., 2013). This facet also demonstrated a significant negative relationship with the *ANX scale*, which was expected based on research indicating a relationship between psychopathy and low negative emotionality. The affective facet was found to negatively correlate with *Scale 3*, which the author's hypothesized may be related to previous traumatic exposure. A significant positive relationship was found between the impulsive facet and clinical scales *4* and *6*, a codetype that has been found to associate with substance abuse and problems with the law. Finally, the antisocial facet was found to have significant positive correlations with *Scales 4* and

9. These results are in line with previous research suggesting that a *4/9* or *9/4* codetype may be associated with ASPD and poor behavior control, juvenile delinquency, and early behavior problems (Hansen et al., 2013).

Psychopathy is a complex multifaceted construct which may prove difficult to identify with just one MMPI-2 scale. As research has demonstrated, using several scales in conjunction with each other may provide a clearer picture of the traits associated with psychopathic personality. There is promising evidence that low scores on scales measuring negative emotionality can provide additional information concerning the affective and interpersonal traits associated with psychopathic personality. Additional research regarding the use of the RC scales, particularly *RC4*, is necessary to replicate findings that indicate they are stronger predictors of psychopathic personality traits than their clinical scale counterparts. Specifically, research would benefit from examining the source of elevations on *RC4*, to determine the contributions of the substance abuse component of the scale in relation to psychopathy. Due to the heterogeneity of psychopathy it appears that there is no simple combination of scales used to measure psychopathic personality traits. As previously noted, with use of the currently available scales, the MMPI-2 may be better suited as an indicator of the facets of psychopathy, rather than as a global predictor of psychopathy (Sellbom et al., 2005).

Present Study

From a historical perspective, psychopathy appears to be one of the earliest-recognized psychiatric disorders. However, the search for agreement on any operational definition and mode of assessment continues to be a source of controversy among researchers and clinicians. The most notable contribution to our current understanding of the construct most likely originated with Cleckley's 16 criteria, which form the basis for the PCL-R, the most widely accepted tool

for the assessment of psychopathy. The PCL-R includes an evaluation of a variety of personality traits and behaviors, related to affective, interpersonal, lifestyle, and antisocial domains. Recently, researchers have begun to question the inclusion of antisocial behaviors associated with criminality, as well as whether the most appropriate factor structure of psychopathy includes two, three, or four superordinate factors (Cooke & Michie, 2001). However, proponents of the PCL-R contend that antisocial traits and behaviors are essentially a hallmark characteristic of psychopathy, and that their inclusion in the assessment of psychopathy are necessary to maintain the integrity of the construct (Neumann et al., 2007). Thus, the present study will examine the core affective and interpersonal traits, as well as the lifestyle and antisocial traits and behaviors traditionally associated with global psychopathy.

Although the PCL-R is the most accepted tool used in the assessment of psychopathy at this time, it is lengthy and involves a good deal of training. As such, the burden of time lies on the evaluator, making the practical utility of the instrument somewhat limited. The MMPI-2, which has also been suggested to be an option for assessing psychopathic traits (Gacono & Meloy, 2009), is a self-report measure. However, there is currently no one scale on the MMPI-2 that captures the full picture of global psychopathy, and many of the scales are much more strongly correlated with the antisocial traits and behaviors. Thus, it would be useful to create a scale on the MMPI-2, which identifies all of the domains associated with psychopathy.

The present study focused on contributing to the research associated with the assessment of psychopathy through the creation of a supplementary scale on the MMPI-2, to identify psychopathic traits and behaviors related to both factors, as they are assessed through the PCL-R. The scale was created through empirical-keying methods, after which it was factor analyzed to

examine whether the commonly cited two factor structure is replicated in the scale. The scale was also be cross-validated and examined for external validity.

External validity was evaluated by examining the relationship between elevations on the created scale and deficits in emotional facial recognition. Based on research indicating that individuals with psychopathy exhibit deficits in the ability to recognize facial expressions of emotions (Wilson et al., 2011), it was hypothesized that elevations on the new scale would be related to deficits in recognition of facial emotions, particularly negative emotions (i.e., fear, sadness, or anger; Stevens et al., 2001). Finally, the PDQ-4 antisocial and narcissistic scales were used to provide additional external validation. Because psychopathy and ASPD are conceptually similar and it has been indicated that all individuals meeting criteria for psychopathy would also meet criteria for ASPD, the assumption follows that individuals high on the psychopathy scale would also be high on the PDQ-4 antisocial scale. However, based on the theory of an asymmetrical relationship, the opposite would not be expected to be true. The ASPD criteria of DSM-5, and subsequently the antisocial scale of the PDQ-4, are particularly representative of the behavioral aspects of psychopathy. Additionally, past research has indicated that criteria associated with NPD are conceptually similar to many of the interpersonal and affective traits associated with the construct of psychopathy. Thus, it was thought that together, the antisocial and narcissistic scales of the PDQ-4 would be representative of the full range of behavioral and interpersonal/affective traits associated with psychopathy and should be related to the derived scale.

The final goal was to examine the scale's utility as an indicator of global psychopathy in comparison to the already existing scales on the MMPI-2. It was first hypothesized that the created scale would be a better indicator of psychopathy as it is identified by the PCL-R than

other MMPI-2 scales. A second hypothesis was that after analysis, two factors, paralleling those of the PCL-R, would emerge on the created scale.

The present study used a correlational design to develop a supplementary scale for the measurement of global psychopathy on the MMPI-2 using archival data, which includes both scores on the PCL-R and MMPI-2. The overall study was divided into four smaller studies for ease of reading. The studies were as follows: 1) derivation of the scale, 2) cross validation, 3) external validation, 4) factor analysis. This study utilized a sample for the derivation of the scale, a second sample for cross-validation, and a third sample for external validity using a measure of facial emotion recognition and the Personality Disorder Questionnaire-4 (PDQ-4). Finally, this study examined the factor structure of the subsequent scale that was developed for the MMPI-2 using a combined data set of the derivation and cross-validation samples.

CHAPTER 3

STUDY 1: SCALE CONSTRUCTION

The study used empirical scale construction methods to identify items on the MMPI-2 that discriminated between high scorers on the PCL-R and low scorers on the PCL-R. In accordance with recommendations for use of the PCL-R, the psychopathy groups consisted of individuals with total scores of 30 or above on the PCL-R. MMPI-2 items were first identified using tetrachoric correlation coefficients, which are frequently used when examining binary data. These methods were used to determine the correlation between item endorsement and whether or not someone was classified as a psychopath or non-psychopath. The next step was to examine the internal consistency of the scale. Finally, a cutoff score was determined and the efficacy of the resulting scale was examined in comparison to conceptually related MMPI-2 scales, including clinical scales *4* (psychopathic deviate) and *9* (hypomania), *RC4* (antisocial behaviors), Content Scale *ASP* (antisocial practices), and PSY-5 scales *AGGR* (aggression) and *DISC* (disconstraint).

Methods

Measures

PCL-R. The Psychopathy Checklist-Revised (PCL-R; Hare, 1991; 2003) is a 20-item checklist, which is intended to measure both the behavioral and affective/interpersonal traits of

psychopathy. A trained rater utilizes an interview and all available collateral information and assigns a score ranging from 0 to 2 on each item. The PCL-R has been validated in a variety of samples, including male and female offenders, forensic psychiatric patients, sex offenders, substance abusers, African American offenders, as well as in populations of offenders in several other countries (Hare & Neumann, 2006). The interrater reliability for pooled standard assessment data for total score was .87 for a single rating and .93 for the average of two ratings. Cronbach's alpha for pooled file review data sets was .87 and the average inter-item correlation (AIC) was .25. The reliability in English and Swedish samples was similar.

MMPI-2. The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is a self-report questionnaire, including 567 "True" or "False" statements. It is considered a reliable and valid tool for the assessment of personality traits for a range of settings and purposes. The one-week test-retest coefficients for the nine clinical scales range from .76 to .93 for men and .75 to .92 for women. The internal consistency coefficients of the clinical scales range from .34 to .85 for men and .37 to .87 for women (Butcher et al., 2001). However, it should be noted that these scales were not created with the expectation that the content would be homogeneous. Thus, it is not surprising that there is substantial variability in the internal consistency. The MMPI-2 has, been shown to be valid in a variety of contexts. By using the empirical method of criterion keying in the construction of the clinical scales, they have been shown to effectively identify individuals possessing traits similar to those in which the scale was constructed.

Participants

In order to exclude cases that have responded in an unreliable manner, individuals with profiles on the MMPI-2 meeting the following criteria were removed from the analyses: *VRIN* $\leq$ 13, *TRIN* >5 or <13, *F* $\leq$ 30, *Fb* < 20, *Fp* T score < 120, *Cannot Say* $\leq$ 20, and *L T* score $\leq$ 83.

The derivation sample consisted of 170 adult male participants, who were in a state correctional facility in Texas at the time of data collection. Participants were administered both the MMPI-2 and the PCL-R as a part of a larger study of psychopathy, with the 34 participants who met the inclusion criteria of 30, or above, on the PCL-R comprising the psychopathy group. The mean age was 35.71 years, with a range of 19 to 70 years, inclusive. The non-psychopathy group was made up of 136 individuals scoring 29 or below on the PCL-R. The mean age of the non-psychopathy group was 37.38 years with a range of 22 to 76 years, inclusive. The difference in mean age between the psychopathy group and the non-psychopathy group was not significant (t (168) = .505, p = .478). Data on race and ethnicity were not available for this sample.

The cross validation sample was utilized for a portion of scale construction and consisted of 126 adult male participants, who were incarcerated in a federal correctional facility at the time of data collection. Participants were administered both the MMPI-2 and the PCL-R as a part of a larger study of psychopathy, with the 23 participants who met the inclusion criteria of 30 or above on the PCL-R, making up the psychopathy group. Within the psychopathy group 53.2 % were White, 41.9 % were Black, and 4.8% Hispanic. The mean age was 35.78 years (ranging from 26 to 61) and the mean years of education was 9.87 (ranging from 6 to 14). The non-psychopathy group was made up of 103 individuals scoring 29 or below and the PCL-R. Of the non-psychopathy group, 55.9% were White, 39.9% were Black, 2.8% were Hispanic, and 1.4% were considered other. The mean age of the non-psychopathy group was 38.45 years (ranging from 21 to 64) and the mean years of education was 11.25 (ranging from 2 to 20). The difference in mean age between the psychopathy group and the non-psychopathy group was not significant (t (124) = .622, p = .432). The present study utilized empirical scale construction procedures,

which focused on the ability of each item on the MMPI-2 to discriminate between the two groups.

Procedures

The initial item pool was developed with a two-pronged approach using tetrachoric correlations. The first wave of analyses was based on the results of calculating correlations between item endorsements on the 567 items on the MMPI-2 and whether or not an individual was classified as a psychopath, based on PCL-R total scores. Items were retained if the absolute value of the tetrachoric correlation was $r_t \geq .2$. Next, items from the derivation sample were examined in the cross-validation sample. Items significant at $r_t \geq .2$ in both samples were retained for the final scale.

The final step in determining item inclusion for the scale was to examine the internal consistency of the scale. Internal consistency, often measured by Cronbach's alpha coefficient, refers to the degree to which items on a measure are intercorrelated with one another (Clark & Watson, 2005). It is noteworthy that the alpha coefficient is also influenced by the number of items and dimensionality of a given scale (Cortina, 1993). Although the goal of this study is to develop a scale measuring a single underlying construct (i.e. psychopathy), it is hypothesized that psychopathy is made up of two separate, but related, factors. It has been noted that alpha may underestimate reliability in the presence of multidimensionality (Schmitt, 1996; Osburn, 2000). Very high levels of alpha may indicate redundant items that measure only a very specific aspect of a construct, which could negatively impact the clinical usefulness of the scale with regard to measuring the full construct. Of further concern when relying on alpha as an estimate of internal consistency is that alpha will become inflated as the number of items on a scale grows (Cortina, 1993). In order accommodate these considerations and to maintain balance between

high alpha coefficients and the clinical usefulness of the scale, an alpha coefficient in the moderate range of .65 to .70 will be considered adequate. Further, Clark and Watson (1995) have suggested that the examination of the average interitem correlations (AIC) may provide a more useful index of internal consistency, as this statistic is less influenced by scale length. It has been suggested that AIC values should, again, be moderate in magnitude; as correlations approach 1.0, construct validity may suffer due to redundancy. Thus, the recommended moderate range of .15 to .50 was selected

Determining a Cut-off Score. In order to determine the best cutoff score for the derived psychopathy scale a Receiver Operating Characteristic (ROC) analysis was utilized. ROC curve analyses are often used in dichotomous decision-making processes. The ROC analysis determines the most efficient means of categorizing those who belong in the psychopathy group and those who do not (Pintea & Moldovan, 2009). In other words the ROC analyses assess the ability of a measure (e.g., scale) to discriminate between different categories of subjects. Because the two distributions overlapped, the goal was to find the point in the distribution that maximized true positive (sensitivity) and true negative (specificity) identification, while minimizing false positive and false negative identification. This is done through the calculation of a decision matrix, which was applied to each possible cut-off point of the scale. Additionally, an examination of the ROC graph was completed to gain a visual representation of the sensitivity and false positive rate corresponding to the individual cut-off points. According to Pintea and Moldovan (2009), the optimal cutoff point is the most northwestern point in the ROC space, which indicates the highest true positive rate and lowest false positive rate.

Examining Efficacy. The next goal of the analyses was to examine the scale's efficacy in comparison to already existing MMPI-2 scales, including scales *4, 9, RC4*, *ASP*, *ASP1, ASP2*,

AGG, *DISC,* and the Harris Lingoes subscales of *Scale 4*. To do this, the correlations between PCL-R total scores and each of the scale total scores were examined. Additionally, cutoff scores were used for assigning predicted group membership. A χ^2 test for independence was utilized to assess the accuracy of the prediction, along with estimates of positive predictive power (PPP), negative predictive power (NPP), sensitivity, and specificity for each scale, which are the most common measures of effectiveness of a test or indicator (Dawes, 1962; Gottesman & Prescott, 1989). Accuracy is the percentage of all individuals correctly classified by the scale. PPP is the percentage of individuals who are identified as having a disorder that actually have that disorder. NPP is the percentage of individuals who are identified as not having a disorder that actually do not have that disorder. Sensitivity is the percentage of individuals who have a disorder that are identified as having that disorder. Specificity is the percentage of individuals who do not have a disorder that are correctly identified as not having that disorder. However, it should be noted that accuracy, PPP, and NPP are greatly impacted by base rates within a given population, which often differ substantially between the general population and the samples used within empirical research (Gottesman & Prescott, 1989).

For a given measure, increasing prevalence rates will lead to an increase in PPP and a reciprocal decrease in NPP. Because this population, which was chosen largely based on the presence of psychopathy, necessarily will have higher base rates than would be expected general population, it would be inappropriate to generalize accuracy, PPP, and NPP to other populations. For the purposes of the present investigation the most importance will be placed on sensitivity and specificity, which are impacted by base rates to a lesser extent because they are measured within the group of interest (Gottesman & Prescott, 1989).

An additional indicator of a measure's effectiveness is the odds ratio statistic. This statistic relates the odds of one condition being true, given the presence or absence of a second condition. Although less common in psychology, this statistic has long been used in medical and epidemiological studies. Because the calculations for the statistic are simple, and its interpretation is intuitive, requiring little formal quantitative training for understanding, its application to risk studies is beneficial.

Results

Tetrachoric correlations were calculated between MMPI-2 items endorsements and classification of psychopathy, as identified by cutoff scores of ≥ 30 on the PCL-R. Correlations $r_t \geq .2$ were identified in the derivation sample and then examined in the cross-validation sample. Items $r_t \geq .2$ in both samples were retained for the derived scale, Psychopathic Attitudes and Behaviors (*PAB*). Based on these analyses, 32 items were retained. See Table 1 for item numbers, direction of endorsement, correlation coefficients, and item content for the resulting scale.

Examination of Cronbach's Alpha coefficients revealed *PAB* to be adequately reliable within the derivation sample (32 items; $\alpha = .83$). Further, the AIC (average interitem correlation) of .14, was considered acceptable for the purposes of the present study.

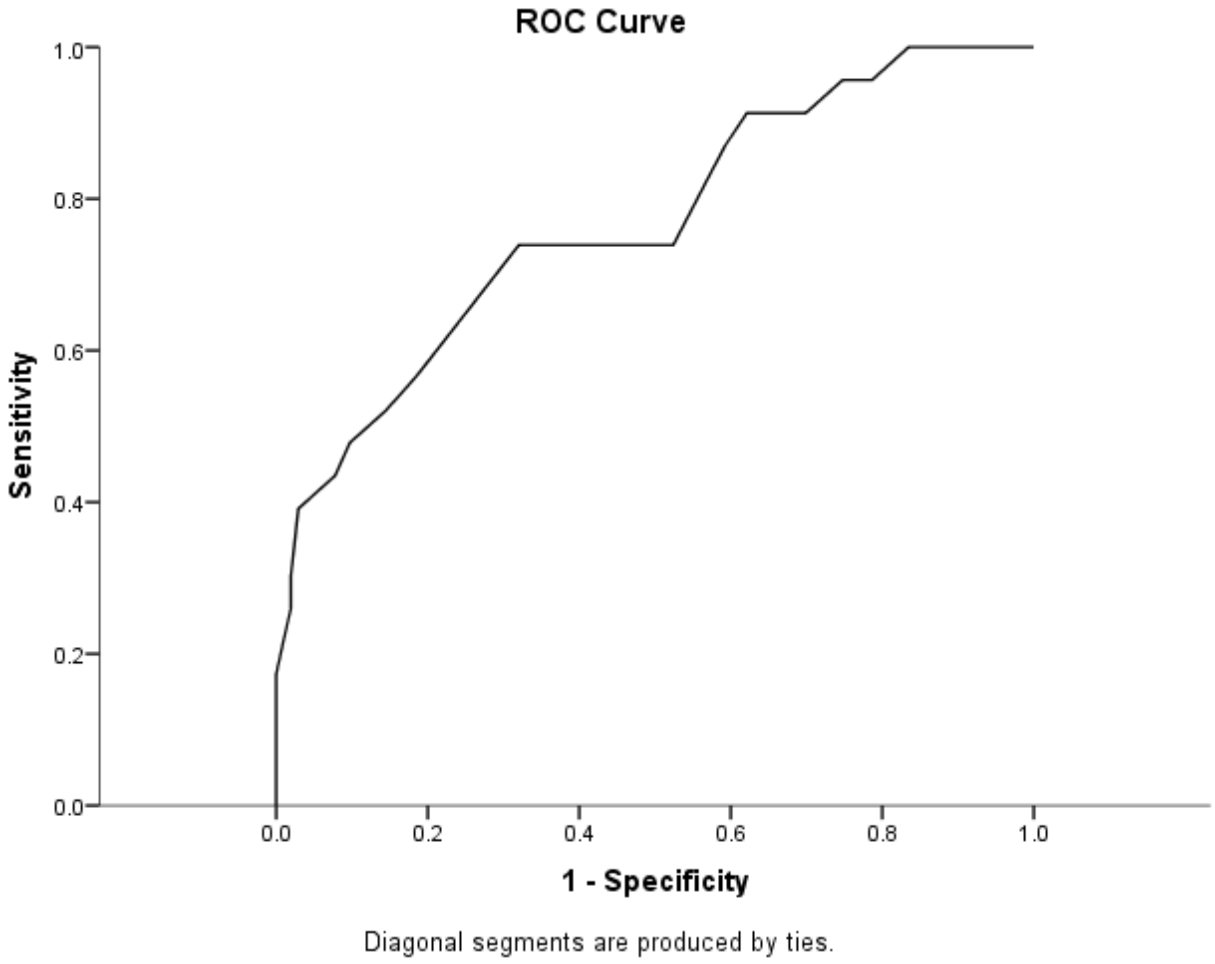
Given that *PAB* demonstrated adequate internal consistency, the next step in data analyses was to determine the optimal cut score for the classification of psychopathy. For this analysis an ROC curve was calculated and evaluated. The ROC graph is a bidimensional representation of the sensitivity and 1-specificity, which correspond to each possible cut point score of *PAB* (Pintea & Moldovan, 2009). The ROC graph is illustrated in Figure 1.

Table 1

Item Number, Direction of Endorsement, Correlation Coefficient by Sample, and Item Content for Psychopathic Attitudes and Behaviors (*PAB*)

Item#	r_t (derivation)	r_t (cross-validation)
40 (T)	.26	.22
44 (T)	.26	.37
50 (T)	.32	.25
52 (T)	.22	.56
72 (T)	.22	.28
81 (T)	.25	.29
82 (T)	.22	.21
84 (T)	.30	.60
85 (T)	.28	.29
98 (T)	.22	.29
105 (T)	.30	.36
122 (T)	.23	.35
123 (T)	.29	.26
202 (T)	.40	.28
239 (T)	.30	.26
241 (T)	.25	.41
250 (T)	.23	.42
258 (T)	.38	.31
269 (T)	.49	.21
307 (T)	.23	.24
323 (T)	.32	.31
327 (T)	.38	.35
338 (T)	.21	.27
345 (T)	.37	.22
352 (T)	.21	.23
371 (T)	.25	.21
434 (T)	.25	.31
444 (T)	.25	.29
489 (T)	.21	.24
508 (T)	.36	.28
547 (T)	.25	.29
553 (T)	.35	.25

Figure 1. Receiver Operating Characteristics (ROC) curve for various cutting scores on Psychopathic Attitudes and Behaviors (*PAB*).



For the ROC analysis the primary statistic of interest is the area under the curve (AUC), which is indicative of the overall performance of a diagnostic test. Essentially, this statistic indicates the probability that scores will be higher for a random subject identified as a psychopath than for a random subject identified as normal. The AUC for *PAB* was .75, which is considered to be moderate accuracy (Pintea & Moldovan, 2009). The coordinates of the curve are presented in Table 2 and will provide information about the sensitivity and 1-specificity at various cut points on the curve, allowing for the identification of the optimal cut-off score. Based on the coordinates presented in Table 2, the optimal point that maximizes true positive identification of psychopathy based on PCL-R scores of 30 and above and true negative identification of individuals is a score of 15. See Table 3 for a summary of the accuracy, PPP, NPP, Sensitivity, and Specificity; given a cut-off score of 15.

The next step in the derivation of the scale was to examine the efficacy of *PAB* in comparison to already existing MMPI-2 scales intended to measure antisocial and psychopathic traits. First, correlations between PCL-R total scores and *PAB* scores were calculated and examined. Table 4 shows Pearson correlation coefficients and significance levels, as well as means and standard deviations, for the scales of interest and PCL-R total scores. Based on the correlation analyses, *PAB* demonstrated a significant positive correlation with PCL-R total scores (r = .40, $p \leq .01$, 95% CI = .27 - .52), which is considered a medium effect. Further, *PAB* demonstrated the highest correlation with PCL-R total scores as compared to the other MMPI-2 scales of interest. *PAB* demonstrated significant positive correlations with all of the MMPI-2 scales of interest but one, *Pd3* (social imperturbability), in which there was actually a significant negative correlation (r = -.27; $p \leq .01$, 95% CI = -.13 to -.40).

Table 2

Coordinates of the ROC Curve for Psychopathic Attitudes and Behaviors (*PAB*)

Cut-off Score	Sensitivity	1-Specificity
.00	1.00	1.00
1.50	1.00	.99
2.50	1.00	.97
3.50	1.00	.96
4.50	1.00	.90
5.50	1.00	.85
6.50	.94	.80
7.50	.91	.73
8.50	.88	.68
9.50	.85	.62
10.50	.82	.54
11.50	.82	.48
12.50	.74	.39
13.50	.65	.32
14.50	.65	.26
15.50	.56	.16
16.50	.50	.13
17.50	.38	.10
18.50	.32	.06
19.50	.21	.04
20.50	.18	.03
21.50	.18	.02
22.50	.12	.01
24.50	.06	.01
27.50	.03	.00
30.00	.00	.00

Table 3

Accuracy, PPP, NPP, Sensitivity, and Specificity for Psychopathic Attitudes and Behaviors (*PAB*) *with a Cut-off of 15*

	PCL-R Psychopath						
PAB	Yes	No	Accuracy	PPP	NPP	Sensitivity	Specificity
Deviant	22	35	72.35%	38.60%	89.38%	64.71%	74.26%
Non-Deviant	12	101					

Table 4

Means, Standard Deviations, Pearson Correlation Coefficients, and Significance Levels for Psychopathic Attitudes and Behaviors (*PAB*), *MMPI-2 Scales of Interest, and PCL-R Total Scores*

MMPI-2 Scales	*M*	*SD*	*r* PCL-R Total Score	*r* PAB
PAB	12.05	5.35	.40**	1.00
RC4	64.00	12.04	.20**	.56**
Scale 4 (Pd)	65.98	11.53	.15	.49**
Familial Discord (Pd1)	58.50	11.87	.15	.36**
Authority Problems (Pd2)	62.48	9.28	.17*	.22**
Social Imperturbability (Pd3)	49.48	9.43	.13	-.27**
Social Alienation (Pd4)	57.85	11.61	.18*	.54**
Self-Alienation (Pd5)	61.14	12.02	.19*	.62**
Antisocial Practices (ASP)	55.67	11.73	.25**	.76**
Antisocial Behavior (ASP1)	63.01	9.74	.19*	.70**
Antisocial Attitudes (ASP2)	50.77	11.28	.23**	.49**
Aggressiveness (AGGR)	49.65	9.96	.35**	.61**
Disconstraint (DISC)	56.39	10.52	.26**	.48**
Scale 9 (Ma)	53.74	11.30	.16*	.70**

Note: N = 170

* $p \leq .05$ ** $p \leq .01$

In order to ensure that *PAB* was not a redundant measure, item overlap was examined between each of the MMPI-2 scales of interest. *PAB* did not overlap with more than five items on any of the scales. The greatest item overlap occurred between *PAB* and *ASP*. Content scale *ASP* (antisocial practices) is made up of 22 items, sharing five items (22.7%) with *PAB*. Scale *4* (psychopathic deviate) contains 50 items, sharing four items (8%) with *PAB*. It may also be noted that *Scale 4* shares an additional item with *PAB* but was keyed as false instead of true, thus it will not be counted towards the overlap. *RC4* (antisocial behaviors) contains 22 items, sharing four items (18.2%) with *PAB*. The PSY-5 scale *DISC* (disconstraint) contains 28 items, sharing four items (14.3%) with *PAB*. Finally, PSY-5 scale *AGG* (aggression) contains 18 items, sharing four items (22.2%) with *PAB*. The subscales are not reported, as they include the items already reported for *Scale 4* and *ASP*.

A χ^2 tests for independence was run for *PAB* and each MMPI-2 scale of interest for actual group membership by predicted group membership. As a general rule, a χ^2 tests for independence with 1 degree of freedom (*df*) and $\alpha = .05$, the critical value of χ^2 is 3.84. This indicates that when χ^2 is above 3.84, the phi coefficient (φ) is statistically significant at the .05 level. *PAB* yielded a significant result of χ^2 (1) = 18.54 (φ = .33); the odds ratio for predicted classification was 5.29 (95% CI = 2.37 – 11.79). A χ^2 tests for independence for *RC4* was not significant, χ^2 (1) = 1.70 (φ = .10); the odds ratio for predicted classification was 1.66 (95% CI = .77 – 3.55). A χ^2 tests for independence for *Scale 4* was not significant, χ^2 (1) = .38 (φ = .05); the odds ratio for predicted classification was 1.27 (95% CI = .59 – 2.69). A χ^2 tests for independence for *Pd1* (Familial Discord) was significant, χ^2 (1) = 4.77 (φ = .17); the odds ratio for predicted classification was 2.32 (95% CI = 1.08 – 4.98). A χ^2 tests for independence for *Pd2* (Authority Problems) was not significant, χ^2 (1) = .21 (φ = .04); the odds ratio for predicted classification was 1.19 (95% CI =

.56 – 2.53). A χ^2 tests for independence for *Pd3* (Social Imperturbability) was not calculated, as none of the participants scored deviant on this scale. A χ^2 tests for independence for *Pd4* (Social Alienation) was significant, χ^2 (1) = 5.43 (φ = .18); the odds ratio for predicted classification was 2.47 (95% CI = 1.14 – 5.35). A χ^2 tests for independence for *Pd5* (Self-Alienation) was not significant, χ^2 (1) = 1.19 (φ = .08); the odds ratio for predicted classification was 1.52 (95% CI = .71 – 3.23). A χ^2 tests for independence for *ASP* was significant, χ^2 (1) = 11.42 (φ = .26); the odds ratio for predicted classification was 3.76 (95% CI = 1.69 – 8.35). A χ^2 tests for independence for *ASP1* was significant, χ^2 (1) = 9.94 (φ = .24); the odds ratio for predicted classification was 4.92 (95% CI = 1.69 – 14.31). A χ^2 tests for independence for *ASP2* was significant, χ^2 (1) = 4.02 (φ = .15); the odds ratio for predicted classification was 2.26 (95% CI = 1.01 – 5.10). A χ^2 tests for independence for *AGGR* was significant, χ^2 (1) = 3.80 (φ = .15); the odds ratio for predicted classification was 3.20 (95% CI = .94 – 10.72). A χ^2 tests for independence for *DISC* was significant, χ^2 (1) = 4.18 (φ = .16); the odds ratio for predicted classification was 2.28 (95% CI = 1.02 – 5.11). A χ^2 tests for independence for *Scale 9* was significant, χ^2 (1) = 7.79 (φ = .21); the odds ratio for predicted classification was 3.35 (95% CI = 1.39 – 8.07). Accuracy, sensitivity, specificity, and predictive powers of classification for *PAB* and the MMPI-2 scales of interest are shown in Table 5.

Finally, Pearson correlation coefficients were calculated between each scale and the separate PCL-R factors. *PAB* demonstrated a significant correlation with PCL-R factor one (r = .32, $p \leq .05$, 95% CI = .18 - .45). Additionally, *ASP* (r = .21, $p \leq .01$, 95% CI = .06 - .35), *ASP2* (r = .23, $p \leq .01$, 95% CI = .08-.37), *DISC* (r = .18, $p \leq .05$, 95% CI = .03 - .32), *AGG* (r = .33, $p \leq .01$, 95% CI = .19-.46), and *Pd3* (r = .15, $p \leq .05$, 95% CI = .01 - .29) demonstrated significant correlations with PCL-R Factor 1.

Table 5

Accuracy, Predictive Powers, Sensitivity, and Specificity For Psychopathic Attitudes and Behaviors (*PAB*) *and Conceptually-Related MMPI-2 Scales in Derivation Sample*

		PCL-R Psychopath						
MMPI-2 Scale		Yes	No	Accuracy	PPP	NPP	Sensitivity	Specificity
PAB	(Deviant)	22	35	72.35%	38.60%	89.38%	64.71%	74.26%
	(Non-deviant)	12	101					
RC4	(Deviant)	20	63	54.71%	24.10%	83.91%	58.82%	53.68%
	(Non-deviant)	14	73					
Scale 4	(Deviant)	19	68	51.18%	21.84%	81.93%	55.88%	50.00%
	(Non-deviant)	15	68					
Pd1	(Deviant)	17	41	65.88%	29.31%	84.82%	50.00%	69.85%
	(Non-deviant)	17	95					
Pd2	(Deviant)	17	62	53.53%	21.52%	81.32%	50.00%	54.41%
	(Non-deviant)	17	74					
Pd3	(Deviant)	0	0	80.00%	-----	80.00%	0.00%	100.00%
	(Non-deviant)	34	136					
Pd4	(Deviant)	16	36	68.24%	30.77%	84.75%	47.06%	73.53%
	(Non-deviant)	18	100					
Pd5	(Deviant)	17	54	58.24%	23.94%	82.83%	50.00%	60.29%
	(Non-deviant)	17	82					
ASP	(Deviant)	16	26	74.12%	38.10%	85.94%	47.06%	80.88%
	(Non-deviant)	18	110					
ASP1	(Deviant)	8	8	80.00%	50.00%	83.12%	23.53%	94.12%
	(Non-deviant)	26	128					
ASP2	(Deviant)	15	40	61.90%	27.27%	88.73%	65.22%	61.17%
	(Non-deviant)	8	63					
AGG	(Deviant)	5	7	78.82%	41.67%	81.65%	14.71%	94.85%
	(Non-deviant)	29	129					

DISC	(Deviant)	13	29	70.59%	30.95%	83.59%	38.24%	78.68%
	(Non-deviant)	21	107					
Scale 9	(Deviant)	11	17	76.47%	39.29%	83.80%	32.35%	87.50%
	(Non-deviant)	23	119					

Note: PPP = Positive Predictive Power; NPP = Negative Predictive Power

PCL-R factor two showed significant correlations with *PAB* (r = .40, $p \leq .01$, 95% CI = .24 - .53), *AGG* (r = .29, $p \leq .01$, 95% CI = .14 - .42), *RC4* (r = .29, $p \leq .01$, 95% CI = .14 - .42), *DISC* (r = .29, $p \leq .01$, 95% CI = .14 - .42), *ASP2* (r = .28, $p \leq .01$, 95% CI = .13 - .41), *ASP1* (r = .28, $p \leq .01$, 95% CI = .13 - .41), *ASP* (.26, $p \leq .01$, 95% CI = .11-.39), *Pd5* (r = .24, $p \leq .01$, 95% CI = .09 - .38), Scale *4* (r = .23, $p \leq .01$, 95% CI = .08 - .37), *Pd21* (r = .21, $p \leq .01$, 95% CI = .06 - .35), Scale *9* (r = .20, $p \leq .05$, 95% CI = .05 - .34), *Pd4* (r = .19, $p \leq .05$, 95% CI = .04 - .33), *ASP1* (r = .19, $p \leq .05$, 95% CI = .04 - .33), and *Pd1* (r = .18, $p \leq .05$, 95% CI = .03 - .32).

Discussion

The goal of Study 1 was to develop an item pool that will reliably measure psychopathy as it is identified by the PCL-R. The empirical scale construction procedures implemented, produced a reliable measure of PCL-R psychopathic traits. Because the methods of scale construction were completely empirical and were based on the ability of an individual MMPI-2 item to differentiate between high and low scorers on the PCL-R, item content was not considered for a given item to be accepted or rejected on *PAB*. Overall, 32 items demonstrated sufficient discriminatory ability and were maintained for the final scale, all of which were keyed True.

Given the ultimate goal of creating an MMPI-2 scale that measures both the affective and interpersonal traits (Factor 1) of psychopathy and the antisocial lifestyle and behavioral characteristics (Factor 2) of psychopathy (Hare & Neumann, 2009), several of the identified items appear, at face value, to relate to each of the factors of psychopathy. For example, items 239, 81, 323, 345 could potentially represent the PCL-R suggested Factor 1 traits of callousness, deceptiveness, dominance, grandiosity, shallow affect, and inability to form strong emotional

bonds (Hare & Neumann, 2009). However, it should be kept in mind that this portion of interpretation was largely subjective and that there was not a strong presence of easily identifiable items indicating the affective and interpersonal traits commonly associated with PCL-R factor 1. The antisocial attitudes and behaviors of Factor 2 may be represented by items 84, 123, 250, 489, and 269. Results demonstrated that *PAB* was moderately significantly correlated with both factors of the PCL-R, which indicates that the study was somewhat successful in measuring both factors of the PCL-R as intended. Additionally, it appears that an internally reliable pool of items was developed from the available sample.

The next aim of Study 1 was to examine the efficacy of *PAB* in comparison to the already existing MMPI-2 scales intended to measure antisocial and psychopathic traits. *PAB* successfully outperformed each of the conceptually related MMPI-2 scales. Elevations on *PAB* showed the strongest correlations with overall PCL-R scores and demonstrated the highest sensitivity of any of the studied MMPI-2 scales. Because the already existing MMPI-2 scales have been reported to correlate more significantly to Factor 2 (Sellbom et al., 2005; Sellbom et al., 2007) it makes sense that a scale developed directly from, both Factors 1 and 2 of the PCL-R, would provide a more comprehensive assessment of psychopathic traits. However, when examining correlations among the separate PCL-R factors and the MMPI-2 scales, several scales (*AGG, DISC, ASP, ASP1, PAB*) demonstrated significant correlations with both PCL-R factors.

Study 1 has several limitations that should be addressed. First, the sample used to derive the scale had a relatively small number of PCL-R identified psychopaths with valid MMPI-2 profiles. This is not surprising given that a key characteristic of psychopathy is thought to be deceptiveness. Additionally, because it was a population of prison inmates there may have been some perceived gain in presenting oneself as either worse (faking bad) or better (faking good).

For example, the possibility of early release for good behavior or of special accommodations for the seriously mentally ill could have been motivators for exaggeration. Regardless of the reason, the strength of the correlations was likely impacted by the small sample size to some degree. Partly in an effort to ensure that the chosen items would perform as intended, items were only retained if they demonstrated significant correlations in the derivation sample and the cross validation sample.

An additional limitation regarding the use of an all-male prison population should be considered. Because the populations used were very specific it may be difficult to generalize the results to other populations. That is, it is unclear if *PAB* will perform as intended in alternative populations. In order to rectify this issue it will be necessary to validate *PAB* in a variety of populations. Further, the PCL-R has also been criticized for its development in a criminal population (Skeem & Cooke, 2010). With recent claims that the PCL-R actually focuses too much on antisocial and criminal tendencies, the development of *PAB* based on the PCL-R and utilizing a criminal population, it is likely the same concerns may be raised about *PAB*.

CHAPTER 4

STUDY 2: CROSS-VALIDATION

After deriving the scale, *PAB* was then cross-validated in an additional sample of incarcerated men. Cross-validation was sought by examining the relationship between *PAB*, the MMPI-2 scales of interest and PCL-R total scores. Next, cutoff scores were applied to each scale and the chi-square test for independence analyses were completed to determine how well the scales predicted PCL-R psychopathy and non-psychopathy group membership. The internal consistency was also calculated to examine reliability of the scale within a new sample. Additional steps were taken to compare the correlations between *PAB* and the MMPI-2 scales of interest for the derivation and cross-validation samples, as well as the correlations between the scales and the individual PCL-R factor scores.

Methods

Measures

The measures used in this study consisted of the MMPI-2 (Butcher et al., 1989) and the PCL-R (Hare, 1991; 2003), which were thoroughly described in the preceding chapter.

Participants

The cross validation sample consisted of 126 adult male participants, who were incarcerated at the time of data collection. Participants were administered both the MMPI-2 and

the PCL-R, with 23 participants meeting the criterion of 30 or above on the PCL-R, making up the psychopathy group. As with the derivation sample, individuals were required to meet specific MMPI-2 validity criteria (*VRIN* ≤ 13, *TRIN* >5 or <13, *F* ≤ 30, *Fb* < 20, *Fp* T score < 120, *Cannot Say* ≤ 20, and *L T* score ≤ 83) to be included in the final sample.

Within the psychopathy group 53.2 % were White, 41.9 % were Black, and 4.8% Hispanic. The mean age was 35.78 years (ranging from 26 to 61) and the mean years of education was 9.87 (ranging from 6 to 14). The non-psychopathy group was made up of 103 individuals scoring 29 or below and the PCL-R. Of the non-psychopathy group, 55.9% were White, 39.9% were Black, 2.8% were Hispanic, and 1.4% were considered other. The mean age of the non-psychopathy group was 38.45 years (ranging from 21 to 64) and the mean years of education was 11.25 (ranging from 2 to 20). There was no significant difference between the mean age of the psychopathy group and the mean age of the non-psychopathy group (t (124) = .622, p = .432).

Procedures

The cross-validation sample (N = 126) was used to examine the resulting scale and determine if it replicated in another sample. First, the scale scores were calculated and the cut-off score determined in the previous analysis was applied. Next, correlations were calculated between the scale scores and a chi-square test for independence analysis was calculated, along with associated effect sizes (e.g., *phi* coefficients and odds ratios). Accuracy, positive predictive power (PPP), negative predictive power (NPP), sensitivity, and specificity were calculated for the derived scale in the replication sample. Internal consistency was again estimated using Cronbach's alpha coefficients and the AIC estimation.

Results

First, as noted above, scale scores were calculated and cut-off scores were applied to the scales of interest. For the MMPI-2 scales of interest a T-score of ≥65 was considered deviant and for *PAB* a raw score of ≥15 was considered deviant. The next step in the cross-validation of the scale was to examine the efficacy of *PAB* in comparison to already existing MMPI-2 scales intended to measure antisocial and psychopathic traits. First, correlations between PCL-R total scores and scale total scores were calculated and examined. Table 6 shows Pearson correlation coefficients and significance levels, as well as means and standard deviations, for the scales of interest and PCL-R total scores. Based on the correlation analyses *PAB* demonstrated a significant positive correlation with PCL-R total scores (r = .34, $p \leq .01$, 95% CI = .18 - .49), which is considered a medium effect. Further, *PAB* demonstrated the highest correlation with PCL-R total scores compared to the other MMPI-2 scales of interest. *PAB* demonstrated significant positive correlations with all of the MMPI-2 scales of interest but one, *Pd3,* in which there was actually a significant negative correlation (r = -.18; $p \leq .05$, 95% CI = -.01 -.34).

A χ^2 tests for independence was run for *PAB* and each MMPI-2 scale of interest for actual group membership by predicted group membership. For this analysis a critical value of 3.84 was again utilized to indicate the phi coefficients (φ) statistical significance at the .05 level. *PAB* yielded a significant result of χ^2 (1) = 13.77 (φ = .33); the odds ratio for predicted classification was 6.01 (95% CI = 2.17 – 16.64). A χ^2tests for independence for *RC4* was not significant, χ^2 (1) = 3.64 (φ = .17); the odds ratio for predicted classification was 2.52 (95% CI = .96 – 6.64). A χ^2tests for independence for *Scale 4* was not significant, χ^2 (1) = 3.19 (φ = .16); the odds ratio for predicted classification was 2.58 (95% CI = .89 – 7.49). A χ^2tests for independence for *Pd1* (Familial Discord) was not significant, χ^2 (1) = 1.38 (φ = .11); the odds ratio for predicted

Table 6

Means, Standard Deviations, Pearson Correlation Coefficients, and Significance Levels for Psychopathic Attitudes and Behaviors (*PAB*), *MMPI-2 Scales of Interest, and PCL-R Total Scores in Cross-Validation Sample*

MMPI-2 Scales	*M*	*SD*	*r* PCL-R Total Score	*r* PAB
PAB	13.23	5.62	.34**	1.00
RC4	62.17	12.20	.26**	.62**
Scale 4 (Pd)	70.37	15.53	.12	.58**
Familial Discord (Pd1)	61.16	15.69	.12	.41**
Authority Problems (Pd2)	58.31	9.99	.17*	.36**
Social Imperturbability (Pd3)	46.98	9.96	.09	-.18*
Social Alienation (Pd4)	64.90	14.43	.01	.55**
Self-Alienation (Pd5)	64.81	15.26	.08	.61**
Antisocial Practices (ASP)	58.56	13.31	.29**	.72**
Antisocial Behavior (ASP1)	60.60	10.78	.27**	.65**
Antisocial Attitudes (ASP2)	54.76	12.01	.22*	.53**
Aggressiveness (AGGR)	48.70	12.51	.14	.44**
Disconstraint (DISC)	53.16	12.20	.22*	.57**
Scale 9 (Ma)	56.94	13.44	.20*	.72**

Note: N = 126

* $p \leq .05$ ** $p \leq .01$

classification was 1.72 (95% CI = .69 – 4.26). A χ^2tests for independence for Pd2 (*Authority Problems*) was not significant, χ^2 (1) = .31 (φ = .05); the odds ratio for predicted classification was 1.31 (95% CI = .51 – 3.32). A χ^2tests for independence for *Pd3* (Social Imperturbability) was not calculated, as none of the participants scored deviant on this scale. A χ^2tests for independence for *Pd4* (Social Alienation) was not significant, χ^2 (1) = 1.99 (φ = .13); the odds ratio for predicted classification was 1.99 (95% CI = .76 – 5.26). A χ^2tests for independence for *Pd5* (Self-Alienation) was significant, χ^2 (1) = 4.17 (φ = .18); the odds ratio for predicted classification was 2.78 (95% CI = 1.01 – 7.61). A χ^2tests for independence for *ASP* was significant, χ^2 (1) = 8.34 (φ = .26); the odds ratio for predicted classification was 3.79 (95% CI = 1.48 – 9.68). A χ^2tests for independence for *ASP1* was significant, χ^2 (1) = 6.00 (φ = .22); the odds ratio for predicted classification was 3.19 (95% CI = 1.23 – 8.32). A χ^2tests for independence for *ASP2* was significant, χ^2 (1) = 5.32 (φ = .21); the odds ratio for predicted classification was 2.95 (95% CI = 1.15 – 7.60). A χ^2tests for independence for *AGGR* was not significant, χ^2 (1) = .41 (φ = .06); the odds ratio for predicted classification was 1.57 (95% CI = .39 – 6.31). A χ^2tests for independence for *DISC* was not significant, χ^2 (1) = 1.65 (φ = .19); the odds ratio for predicted classification was 1.93 (95% CI = .70 – 5.35). A χ^2tests for independence for *Scale 9* was significant, χ^2 (1) = 4.62 (φ = .19); the odds ratio for predicted classification was 2.72 (95% CI = 1.07 – 6.89). Accuracy, sensitivity, specificity, and predictive powers of classification for *PAB* and the MMPI-2 scales of interest are shown in Table 7.

Based on Cronbach's alpha coefficients, *PAB* was found to demonstrate high internal reliability within the cross validation sample (32 items; α = .82). *PAB* yielded an AIC of .13, which may be considered a low, but acceptable, reliability given the high alpha coefficient.

Table 7

Accuracy, Predictive Powers, Sensitivity, and Specificity For Psychopathic Attitudes and Behaviors (*PAB*) *and Conceptually-Related MMPI-2 Scales In Cross-Validation Sample*

		PCL-R Psychopath						
MMPI-2 Scale		Yes	No	Accuracy	PPP	NPP	Sensitivity	Specificity
PAB	(Deviant)	17	33	69.05%	34.00%	92.11%	73.91%	67.96%
	(Non-deviant)	6	70					
RC4	(Deviant)	16	49	55.56%	24.62%	88.52%	69.57%	52.43%
	(Non-deviant)	7	54					
Scale 4	(Deviant)	18	60	48.41%	23.08%	89.58%	78.26%	41.75%
	(Non-deviant)	5	43					
Pd1	(Deviant)	12	40	59.52%	23.08%	85.14%	52.17%	61.17%
	(Non-deviant)	11	63					
Pd2	(Deviant)	9	34	61.90%	20.93%	83.13%	39.13%	66.99%
	(Non-deviant)	14	69					
Pd3	(Deviant)	0	0	81.75%	-----	81.75%	0.00%	100.00%
	(Non-deviant)	23	103					
Pd4	(Deviant)	16	55	50.79%	22.54%	87.27%	69.57%	46.60%
	(Non-deviant)	7	48					
Pd5	(Deviant)	17	52	53.97%	24.64%	89.47%	73.91%	49.51%
	(Non-deviant)	6	51					
ASP	(Deviant)	14	30	69.05%	31.82%	89.02%	60.87%	70.87%
	(Non-deviant)	9	73					
ASP1	(Deviant)	10	20	73.81%	33.33%	86.46%	43.48%	80.58%
	(Non-deviant)	13	83					
ASP2	(Deviant)	15	40	61.90%	27.27%	88.73%	65.22%	61.17%
	(Non-deviant)	8	63					
AGG	(Deviant)	3	9	76.98%	25.00%	82.46%	13.04%	91.26%
	(Non-deviant)	20	94					

DISC	(Deviant)	7	19	72.22%	26.92%	84.00%	30.43%	81.55%
	(Non-deviant)	16	84					
Scale 9	(Deviant)	11	26	69.84%	29.73%	86.52%	47.83%	74.76%
	(Non-deviant)	12	77					

Note: PPP = Positive Predictive Power; NPP = Negative Predictive Power

An additional step was taken to compare the correlations obtained between *PAB* and the MMPI-2 scales of interest for the derivation and cross-validation samples. First, Fisher's *Z* transformations were calculated for the correlations in each population. Once *Z* transformations were obtained, they were entered into an equation examining the difference and resulting in a *Z* ratio. This statistic is evaluated using the standard normal distribution, thus, if the *Z* ratio is +1.96 or -1.96 it is considered to be significantly different at $\alpha = .05$, two tailed (Warner, 2008). The correlations showed consistency between the two samples, with only one scale, *AGGR* (*Z* ratio = 1.99), demonstrating a significant difference. See Table 8 for a summary of the Fisher's *Z* transformations and *Z* ratio scores for each MMPI-2 scale.

Finally, Pearson correlation coefficients were calculated between each scale and the separate PCL-R factors. *PAB* was the only MMPI-2 scale to demonstrate a significant correlation with PCL-R factor one ($r = .19$, $p \leq .05$, 95% CI = .02 - .35). PCL-R factor two showed significant correlations with *PAB* ($r = .40$, $p \leq .01$, 95% CI = .24 - .53), *ASP2* ($r = .39$, $p \leq .01$, 95% CI = .23 - .53), *RC4* ($r = .39$, $p \leq .01$, 95% CI = .23 - .53), *ASP* ($r = .38$, $p \leq .01$, 95% CI = .22 - .52), *DISC* ($r = .32$, $p \leq .01$, 95% CI = .15 - .47), *ASP1* ($r = .28$, $p \leq .01$, 95% CI = .11 - .43), *Pd2* (.24, $p \leq .01$, 95% CI = .07 - .39), *Scale 9* ($r = .23$, $p \leq .01$, 95% CI = .06 - .39), *Scale 4* ($r = .22$, $p \leq .01$, 95% CI = .05 - .38), *Pd1* ($r = .20$, $p \leq .01$, 95% CI = .03 - .36). Scale *PAB* showed the strongest correlations with both factors of the PCL-R.

Discussion

The aim of Study 2 was to cross-validate *PAB* in an alternate sample of incarcerated adult males. Overall, *PAB* demonstrated adequate internal consistency reliability and, as expected, was a strong indicator of psychopathy as measured by the PCL-R. As in the derivation sample, when compared with the alternative MMPI-2 scales of interest, *PAB* showed the strongest correlation

Table 8

Fisher's Z Trasnformations, Z Ratio Scores, and Significance Level

	Derivation Sample	Cross-validation Sample	
MMPI-2 Scale	*Z* Transformation	*Z* Transformation	*Z* ratio
RC4	.63	.73	-.78
Scale 4	.54	.66	-1.06
Pd1	.38	.44	-.49
Pd2	.22	.38	-1.29
Pd3	-.28	-.18	-.80
Pd4	.60	.62	-.12
Pd5	.73	.71	.14
ASP	1.00	.91	.75
ASP1	.87	.78	.77
ASP2	.54	.59	-.45
AGG	.71	.47	1.99*
DISC	.52	.65	-1.05
Scale 9	.87	.91	-.34

Note: *$\alpha < .05$

with the PCL-R total score. Additionally, *PAB* showed the significant correlations with both factors and was the only scale to demonstrate a significant correlation with factor one of the PCL-R. Given the research indicating that the existing MMPI-2 scales are much better at identifying antisocial traits than the affective and interpersonal aspects of psychopathy (Sellbom et al., 2005), it was expected that a scale developed based on PCL-R psychopathy would be a stronger indicator of global psychopathy. However, it should be noted that *PAB*'s correlation with PCL-R factor one is considered to be a small effect, and a medium relationship was observed with factor two. Overall, the correlation coefficients showed consistency between the derivation and cross-validation samples, indicating that the scale did replicate in the second sample.

It may also be useful to consider the method of scale development when assessing *PAB* across samples. When implementing empirical criterion keying methods, items are identified solely based on statistical values with no consideration of item content. This method of scale development may be beneficial in the assessment of psychopathy, as the items are not bound by face validity. Because psychopathy is associated with deception, a method of scale construction that allowed for subtle items, or items that do not appear to relate to psychopathy, may have made it more difficult to manage impressions. However, this method of scale construction also makes it difficult to ensure that items will be selected that represent the full range of psychopathic traits. Although *PAB* appears to perform adequately at identifying psychopathic traits related to high scorers on the PCL-R, it does not appear to demonstrate the intended relationship to the affective and interpersonal traits associated with factor one of the PCL-R.

One important limitation to acknowledge is that in the development of the scale the cross-validation sample was utilized to reject items that did not demonstrate correlation coefficients of

≥ .2, making it more likely that *PAB* would replicate in the sample. Although, this could be viewed as a limitation in the cross-validation of *PAB*, it was determined that the benefits of developing an accurate scale outweighed the potential weakening of the cross-validation. It would be beneficial to cross-validate the scale with several other, more diverse, samples in the future.

CHAPTER 5

STUDY 3: EXTERNAL VALIDATION

Following cross validation of *PAB*, external validity of the scale was sought by examining the relationship between elevations on *PAB* and errors on a task requiring the recognition of facial expressions of emotion. Based on research indicating a relationship between psychopathy and deficits in emotion recognition for negative emotions, it was hypothesized that elevations on *PAB* would correlate significantly with the number of errors in recognizing facial expressions of negative emotions (e.g., anger, sadness, and fear). Further external validation was sought by examining between group differences for individuals who scored above and below the previously noted cutoff score on PAB and the antisocial and narcissistic personality scales of the PDQ-4. It was hypothesized that the mean scores of those above the cutoff would be significantly higher than those falling below the cutoff. A final step in seeking external validation was to calculate the correlations between *PAB* and the already existing MMPI-2 scales and to compare the obtained correlations with those found in the derivation and cross-validation samples.

Methods

Measures

MMPI-2. The MMPI-2, described fully in Chapter 3, was utilized in this study.

Penn Emotion Recognition Task (ER-40). The ER-40 (Gur et al., 2002) is a computer-based test that consists of a series 40 color photographs of facial expressions of emotions: happiness, sadness, anger, fear, or neutral (no emotion). Participants are shown the photographs, in a random order, one at a time and instructed to indicate which emotion is being demonstrated. For each emotion there are four female faces and four male faces, equaling 40 faces. The faces are balanced for age, gender, ethnicity, and intensity of emotion. Scoring is based on correct responses for male versus female faces, correct identification of an emotion, false positive identification of an emotion, and the number of mild and intense emotion expressions identified correctly. Although based on the larger Penn Emotion Recognition task, which has demonstrated adequate validity and reliability, psychometric information is not available for the ER-40.

PDQ-4. The Personality Disorder Questionnaire-4 (PDQ-4; Hyler, 1994) is a 99-item questionnaire that screens for the presence of DSM-IV personality disorders. The questionnaire consists of first-person statements referring to emotions/behaviors that the examinee may have experienced/evidenced consistently over the past several years to which an examinee responds "True" or "False." The PDQ-4 has been shown to be both reliable and valid (Dubro, Wetzler, & Kahn, 1988; Hyler et al., 1990), although there is evidence that respondents may over-report personality disorder symptomology (Whyte, Fox, & Coxell, 2006). Given the possibility of over-reporting on the PDQ-4, diagnostic suggestions from the measure will not be included in our analyses. Because psychopathy is not a scale on the PDQ-4, scores from the antisocial personality disorder, conduct disorder, and narcissistic personality disorder subscales of the

PDQ-4 will serve as proxies for the experience of symptoms similar to those of an individual with psychopathy. The scales included in the present study assess antisocial and narcissistic symptomology, which are similar to the behavioral and interpersonal aspects of psychopathy.

Participants

An archival sample of 308 college students was used to test for partial external validity for *PAB*. Participants were administered the MMPI-2, the ER-40, and the PDQ-4 as a part of a larger longitudinal study of psychosis proneness. As with Studies 1 and 2, individuals with profiles on the MMPI-2 meeting the following criteria were excluded from the analyses: *VRIN* ≤ 13, *TRIN* >5 or <13, *F* ≤ 30, *Fb* < 20, *Fp* T score < 120, *Cannot Say* ≤ 20, and *L T* score ≤ 83. The sample included 78 male participants (25.3%) and 230 female participants (74.7%). The mean age was 19.26 years (ranging from 18 to 23). Within the sample, 242 participants (78.6%) identified as White/Caucasian, 46 participants (14.9%) identified as African American, 6 participants (1.9%) identified as Hispanic, 4 participants (1.3%) identified as Asian, 2 participants (.6%) identified as Native American, and 8 participants (2.6%) identified as Other. A χ^2 test of goodness-of-fit test, based on Fall 2010 enrollment data for this University, indicated that this sample was representative of the population from which it was drawn with 19.7% of students identifying as non-White.

Procedures

External validation was sought by examining elevations on the derived scale and the relationship to deficits in recognition of facial expression of emotion on the ERT-40. It was expected that individuals scoring high on the derived scale would make more errors in identifying negative emotions, such as fear, sadness, or anger. Thus, the relationship between scores on the derived scale and the number of mistakes in the identification of these emotions

was examined to provide further evidence of the scale's utility. For this analysis, correlation analyses were used to examine the relationship between mean number of errors in emotion recognition and PAB score.

The PDQ-4 antisocial, conduct disorder, and narcissistic scales were then incorporated to provide further validation. For this analysis, those above the cutoff on PAB were compared to those below the cutoff on the antisocial, conduct disorder, and narcissistic PDQ-4 scales were examined. This was accomplished by completing an independent means *t* test for the psychopathy group versus the non-psychopathy group for the mean of the antisocial, conduct disorder, and narcissistic PDQ-4 scales; effect sizes (Cohen's *d*) were calculated for each comparison.

Results

For the initial external validation of *PAB*, Pearson correlation coefficients were calculated between scale elevations and errors in recognition of facial expressions of emotion on the ER-40. Of particular interest were errors in the recognition of negative emotions, such as anger, fear, and sadness. However, correlation coefficients are also reported for happiness and no emotion, as well. In addition, correlation coefficients were calculated between scale scores and errors in emotion recognition for male and female faces, moderate and extreme level of expressiveness, total errors, and overall errors for all negative emotions. Results indicate no significant relationships between scores on *PAB* and deficits in the ability to recognize facial expressions of emotions. See Table 9 for correlations between *PAB* scores and errors on the ER-40.

The next indicator of external validation compared the mean scores of the group scoring above the cutoff on *PAB* and the group scoring below the cutoff and scores on theoretically-related scales (i.e., antisocial, conduct disorder, and narcissistic personality disorder) on the

Table 9

Pearson Correlation Coefficients for PAB and errors in emotion recognition on the ERT-40

ERT-40 Variable	PAB
Anger	.04
Fear	.03
Sadness	.00
Happy	.05
No Emotion	-.08
Negative Emotion Total	.04
Overall Total	.01
Female Faces	-.03
Male Faces	.04
Moderate Level of Expression	.04
Extreme Level of Expression	.03

Note: N = 308

* $p \leq .05$ ** $p \leq .01$

PDQ-4. Independent means *t* tests were used to compare PDQ-4 CD, NPD, and ASPD scores for the two groups. Overall, results were significant in that the group scoring above the cutoff on PAB demonstrated significantly higher scores on PDQ-4 scales measuring narcissistic personality disorder, antisocial personality disorder, and conduct disorder scales. In addition, the differences among the distributions showed medium to large effects. See Table 10 for means, standard deviations, *t* scores, effect sizes, and significance levels.

An additional step implemented to provide partial external validation was to calculate Pearson correlation coefficients between *PAB* and the already existing MMPI-2 scales of interest in the sample of college students. These correlations were then compared to the previously reported correlations for the combined cross-validation and derivation samples. In order to accomplish this comparison it was necessary to complete Fisher's *Z* transformations for the *r* values, which allows for the comparison of correlations based on different samples. Significant positive correlations were found between *PAB* and all but one (*Pd3*) of the MMPI-2 scales of interest for the college student sample. Significant differences between the derivation sample and the external validation sample were found for *Pd3* (*Z* = -4.45), *ASP* (*Z*= 2.11), and *ASP1* (*Z* = 1.97). Only one significant difference, *Pd3* (*Z* = -3.12), was found between the cross validation sample and external validation sample. All other scales correlations demonstrated consistency between samples. See Table 11 for a summary of Pearson correlation coefficients for scales of interest and *PAB* in the external validation sample, Fisher's *Z* Transformations, and *Z* ratio scores between the derivation sample, cross validation sample, and the external validation sample.

Discussion

The overall goal of Study 3 was to provide external validation for *PAB* by examining its relationship with theoretically related measures. The first aim was to examine the relationship

Table 10

Means, Standard Deviations, t-Scores, Effect Sizes (d), and Significance Levels for the Deviant and Non-Deviant Groups on PDQ-4 Scales in the External Validation Sample

PDQ-4

Scale	Group	*N*	*M*	*SD*	*t (df)*	*d*
NPD	Non-deviant	240	2.28	1.46	-6.83 (306)**	0.94
	Deviant	68	3.66	1.51		
APD	Non-deviant	240	0.98	1.01	-5.67 (306)**	0.78
	Deviant	68	1.81	1.25		
CD	Non-deviant	240	0.68	1.04	-5.76 (306)**	0.79
	Deviant	68	1.66	1.79		

Note: NPD = Narcissistic Personality Disorder; APD = Antisocial Personality Disorder; CD = Conduct Disorder.

** $p \leq .01$

Table 11

Pearson Correlation Coefficients for MMPI-2 Scales and PAB for the External Validation Sample, Fisher's Z Transformations, Z Ratio Scores Between the Derivation Sample and the External Validation Sample, Z Ratio Scores Between the Cross Validation Sample and the External Validation Sample, and Significance Level

MMPI-2 Scale	*r*	Z Transformation	D-E z ratio	C-E z ratio
RC4	.55	.62	.15	1.00
Scale 4	.56	.63	-1.00	.28
Pd1	.32	.33	.47	.97
Pd2	.24	.24	-.22	1.24
Pd3	-.15	.15	-4.45*	-3.12*
Pd4	.58	.66	-.61	-.41
Pd5	.63	.74	-.17	-.30
ASP	.66	.79	2.11*	1.07
ASP1	.59	.68	1.97*	.91
ASP2	.45	.48	.53	.99
AGG	.56	.63	.79	-1.50
DISC	.43	.46	.66	1.76
Scale 9	.66	.79	.77	1.07

Note: D = Derivation Sample; C = Cross Validation Sample; E = External Validation Sample

*α = .05

between elevations on *PAB* and deficits in the recognition of facial expressions of negative emotions on the ER-40. This step was intended to provide external validation, given previous research findings that individuals with psychopathy have deficiencies in recognizing and reacting to distress cues and facial or vocal expressions of negative emotions (Bagley et al., 2009; Blair et al., 2002; Deeley et al., 2006). However, there was no significant relationship between elevations on *PAB* and deficits in recognizing facial expression of emotions. It is important to keep in mind that the sample utilized for external validation was quite different than those used in the derivation and cross-validation of scale. The initial samples consisted solely of incarcerated males, whereas the external validation sample was made up of undergraduate psychology students, the majority of whom were females. This limitation is clearly relevant given the lower base rates of psychopathy in the general population as compared to an incarcerated population (e.g. 1% vs 15%). It is very likely that the subset of individuals scoring highly on *PAB* would not meet the PCL-R cutoff for psychopathy, making the literature regarding deficits in emotion recognition difficult to generalize to this population. Additionally, the original samples were all male which may also limit the generalizability of the scale in a population of both males and females. Finally, the overall lack of errors in emotion recognition among these participants led to a small amount of variance (i.e., restricted range), which will necessarily affect the observed relationship between two variables; it is likely that in a sample with more variance in emotion recognition, a greater degree of relationship would be observed.

The second aim in external validation was to examine differences between those above and those below the cutoff on *PAB* and their scores on conceptually related scales on the PDQ-4 (i.e., antisocial personality disorder, narcissistic personality disorder, and conduct disorder). Research has indicated a consistent relationship between traits of ASPD and the

lifestyle/antisocial factor of psychopathy, as measured by the PCL-R (Hare & Neumann, 2009). Additionally, researchers have begun to acknowledge the conceptual links between Narcissistic Personality Disorder and the affective and interpersonal factor 1 traits of psychopathy (Hart & Hare, 2000), a relationship that has also been demonstrated empirically (Blackburn 2007; Huchzermeier et al., 2007). Because the larger goal of the study was to develop an MMPI-2 scale that measures both factors of psychopathy, it was thought that *PAB* would show a significant relationship to PDQ-4 scales measuring NPD, as well as those measuring behavioral traits associated with factor 2, such as ASPD and Conduct Disorder. Results of Study 3 indicated that, as hypothesized, those above the cutoff on *PAB* scored significantly higher on PDQ-4 scales measuring NPD, ASPD, and CD, with medium to large effects. These findings are important given that they provide partial external validation and evidence that *PAB* does measure what it intended to measure.

An additional step in the external validation of *PAB* was to again examine the relationship between scores on *PAB* and scores on the already existing MMPI-2 scales intended to measure antisocial and psychopathic traits. As with the other samples, significant positive correlations were found between *PAB* and all but one MMPI-2 scale of interest. Further, except for three scales (*Pd3, ASP, ASP1*), the correlations were found to be consistent across all three samples. Findings that *PAB* performs as intended in several samples are promising given the differences among the sample populations (e.g. male prisoners vs. male and female college students).

One significant limitation to Study 3 is the inability to examine the relationship between elevations on *PAB* and an already validated criterion measure of psychopathy in this sample. This limitation makes it unclear whether the cutoff score and items are indicative of global

psychopathy in this population or if it is picking up on traits unique to a population of undergraduate students. For example, an MMPI-2 item such as item 345, which refers to one's ability to do great things if given the chance, could indicate grandiosity among psychopathic offenders, but healthy optimism among undergraduate students seeking higher education. Future research might focus on further externally validating *PAB* by examining elevations on the scale in various populations and correlations with other measures of psychopathy (i.e., PPI or PCL-R) to provide further support for construct validity.

CHAPTER 6

STUDY 4: FACTOR ANALYSIS

The final goal of this project was to examine the factor structure of the developed scale. It was hypothesized that two factors would emerge that closely paralleled those often found with the PCL-R. The factors were extracted using the unweighted least squares (ULS) method of exploratory factor analysis. The appropriate number of factors was determined based on a parallel analysis and visual examination of the scree plot. The final step was to examine the obtained factors and determine their relevance to current research and theory. Several professionals with knowledge of current theory related to the construct of psychopathy were consulted to gain a better understanding of the item content.

Method

Participants

For this analysis, the derivation sample and cross validation sample were combined in order to increase the sample size, as it is not recommended to complete factor analyses on small sample sizes. The combined data set ($N = 296$) included 57 participants who scored ≥30 on the PCL-R, making up the psychopathy group, and the remaining 239 participants in the non-psychopathy group. The mean age of the psychopathy group was 35.74 (ranging from 19 to 70). The mean age of the non-psychopathy group was 37.84 (ranging from 21 to 76). There was no

significant difference between the mean age of the psychopathy group and the mean age of the non-psychopathy group (t (294) = 1.02, p = .314).

Data Analysis

An unweighted least squares (ULS) method of exploratory factor analysis (FA) was used to examine the patterns of correlations and the item groupings. Factor analysis is a multivariate statistical procedure used to determine the number of common factors underlying a set of variables. Essentially, FA is considered a dimension-reduction procedure (Hatcher, 2013) in that it begins with a relatively large number of variables, which are then reduced to a smaller number of dimensions, based on underlying latent factors. The ULS method of FA was determined to be appropriate because this estimation method does not depend on distributional assumptions (Krijnen, 1996). Additionally, it has been noted to be one of the most popular methods of exploratory FA and is appropriate when examining relatively small sample sizes (Jung, 2013). The ULS-FA method is based on a common factor model, which divides the variance of each measured variable (e.g., MMPI-2 item) into unique variance and common variance. The common variance, reported as communalities, is shared among the variables and may be thought of as latent variables, which serve to explain the relationships between the variables of interest (Jung 2013).

It has been suggested that traditional FA procedures are not appropriate for dichotomous variables (Hatcher, 2013). As it is well established that phi-coefficients rely heavily on endorsement frequency of items, they are not optimal for item-level factor analysis of dichotomous variables (Guilford, 1941; Waller, 1999); thus, tetrachoric correlation matrices were employed in this portion of the analyses. Each tetrachoric correlation matrix was entered into the PFA, and the results of each were then be subjected to a Promax rotation. This rotation

procedure is appropriate because it allows for the identification of correlated factors, which is expected for the construct of psychopathy.

The appropriate number of components to retain was determined based on a parallel analysis, which has been found to be superior to other methods in determining the number of factors to retain (Zwick & Velicer, 1986; as cited in Jung, 2013). Parallel analysis procedures compare eigenvalues from the factor analysis with those generated in a factor analysis of random data, with the same number of cases as the actual data and the same item-response range. Through this comparison, factors are accepted based on whether their actual eigenvalue is greater than those found in the random data. Most often, several random data sets are generated, which often yield a normal distribution, and the mean or 90^{th} percentile is used as the comparison eigenvalue. However, because MMPI-2 responses are dichotomous and the distributions are often skewed, a comparison with the normally distributed random data set would likely be inappropriate; thus, we used a variation of parallel analysis in which random data were created using permutations of the actual data set. In order to preserve the distribution and item endorsement frequency, the random data sets were generated by randomly shuffling cases from the actual dataset. Ten random permutations were produced for each of the actual data sets using a procedure in SPSS (O'Connor, 2000). Next the tetrachoric matrices for each of the random data sets was submitted to the PFA. The eigenvalues for each of the ten random data sets was averaged and used for the comparison of the actual data sets eigenvalues.

Structure matrix coefficients were required to have an absolute value of .45 or higher for an item to be included on a particular factor. Additionally, estimates of internal consistency were calculated for each factor. The final factor structure was then examined for interpretability and relevance to current theory.

Results

The parallel analysis indicated that given the number of variables and samples size, the threshold of appropriate factors to retain was no greater than seven. However, after examining the scree plot, which is a visual representation of eigenvalues, it appeared that a three-factor solution was most appropriate to retain. See Figure 2 for the scree plot. It should be noted that the three-factor structure only accounts for 28.77% of the common variance. See Table 12 for an overview of eigenvalues and percent of variance accounted for by number of factors. Following a Promax rotation, the factor pattern matrix for the three-factor solution displayed a simple structure and appeared interpretable. An item was determined to load on a factor if the correlation between the items and factor, as given in the structure matrix, was ≥ an absolute value of .45. See Table 13 for the rotated structure matrix. Using this criterion, items 338, 327, 307, 40, and 508 loaded on Factor 1; items 105, 84, 82, 52, and 202 loaded on Factor 2; and items 269, 241, 250, and 85 loaded on Factor 3. Next, estimates of internal consistency were calculated for each factor.

Factor 1 yielded a moderate alpha coefficient of .64 and an AIC of .27. An examination of factor content (See Table 13 for items) is somewhat unclear with regard to the first factor, as there does not appear to be a consistent theme among the items. At face value, the content of this factor does not appear to reflect affective or interpersonal characteristics as would be expected if it was representative of PCL-R Factor 1. The first factor of *PAB* was named deviant responding due to what appears to be heterogeneous item content. For example, while one item (item 508) indicates the possible presence of magical thinking, another item is reflective of somatic complaints (item 40).

Figure 2. Scree plot for unweighted least squares factor analysis of Psychopathic Attitudes and Behaviors (*PAB*)

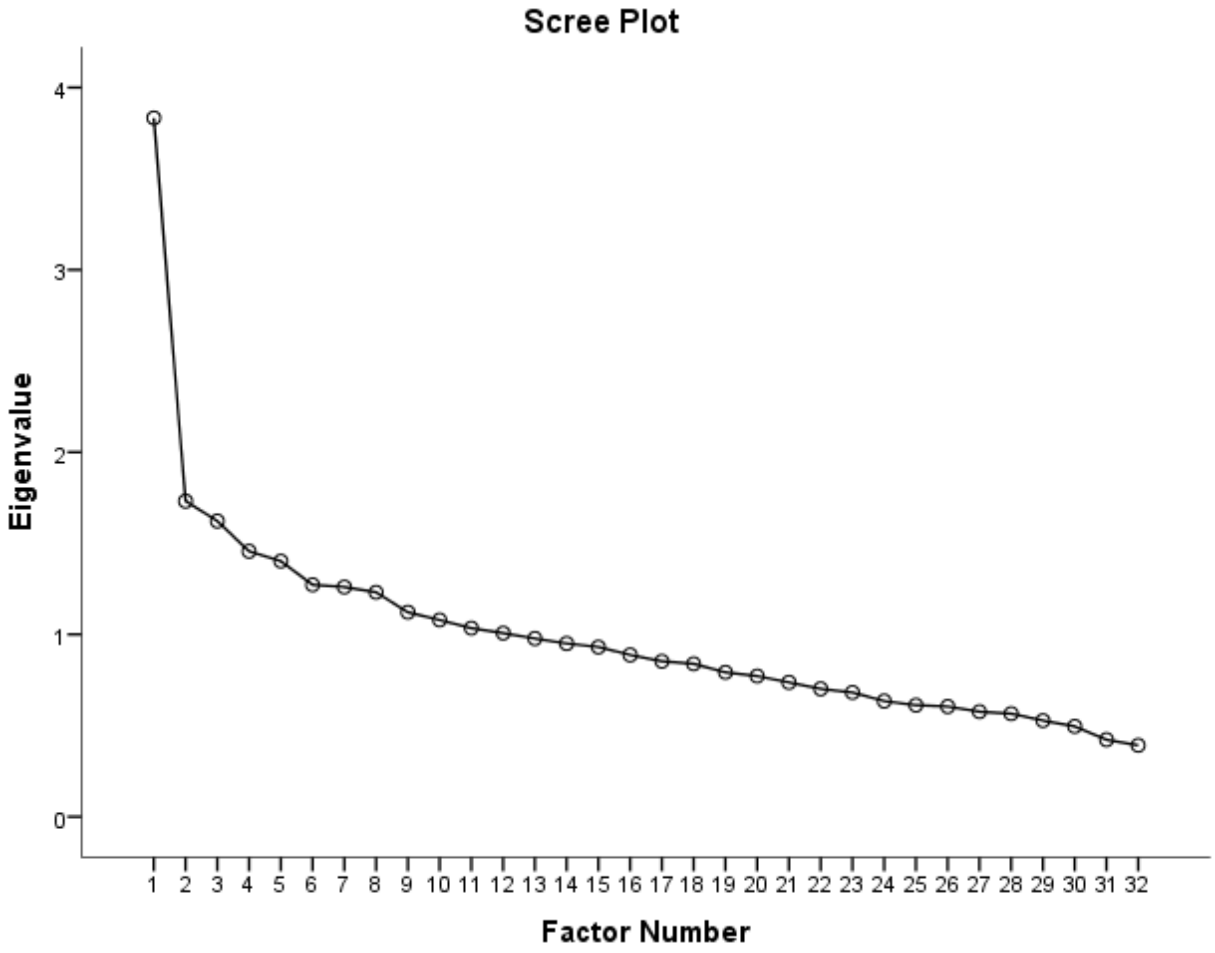


Table 12

Eigenvalues, % of Variance, and Cumulative % Variance from Unweighted Least Squares Factor Analysis

	Initial Eigenvalues		
Factor	Total	% of Variance	Cumulative %
1	5.45	17.03	17.03
2	2.05	6.40	23.43
3	1.71	5.34	28.77
4	1.60	5.00	33.77
5	1.41	4.40	38.17
6	1.28	4.01	42.18
7	1.20	3.74	45.92
8	1.12	3.51	49.42
9	1.12	3.49	52.91
10	1.03	3.23	56.15
11	1.02	3.18	59.33
12	.96	2.99	62.32
13	.90	2.81	65.13
14	.88	2.74	67.86
15	.85	2.66	70.53
16	.79	2.48	73.01
17	.76	2.37	75.38
18	.74	2.31	77.68
19	.71	2.22	79.91
20	.68	2.12	82.02
21	.65	2.04	84.06
22	.61	1.91	85.97
23	.55	1.72	87.68
24	.54	1.68	89.36
25	.52	1.62	90.98
26	.51	1.59	92.58
27	.48	1.49	94.07
28	.45	1.40	95.47
29	.42	1.30	96.76
30	.38	1.20	97.96
31	.37	1.15	99.11
32	.28	.89	100.00

Table 13

Structure Matrix after Promax Rotation

MMPI-2 Item #	Factor 1	Factor 2	Factor 3
338	.56*		
327	.52*		
307	.50*		
40	.48*		
508	.47*		
44	.43		
553	.40		
352	.39		
444	.38		.32
547	.38		
258	.36		
50	.35		
122	.31		
72			
345			
105		.63*	
84		.60*	
82	.50	.55*	
52	.38	.53*	
202		.45*	
489		.43	
98	.36	.36	
434		.31	
269		.33	.56*
241	.40		.52*
250		.40	.47*
85	.42	.33	.46*
81	.34		.42
123		.40	.40
323			
371			
239			

Note: * signifies ≥ ± .45
Factor 1 = Deviant Responding; Factor 2 = Antisocial Behaviors; Factor 3 = Antisocial Attitudes.

Factor 2 yielded a moderate alpha coefficient of .68 and an AIC of .30. Factor 2 was named Antisocial Behavior as much of the item content reflected socially deviant or conduct disordered behaviors (e.g. Items 105 and 84).

Factor 3 yielded a small alpha coefficient of .59 and a moderate AIC of .27. Although Factor 3 yielded an alpha coefficient slightly below the recommended cutoff of .65, it will be considered acceptable given the AIC and the small number of items loading on the obtained factors. Factor 3 was named Antisocial Attitudes due to item content indicating deviant beliefs and thought structures (e.g., items 85 and 250).

All of the AIC were within the acceptable range of .15 to .50. A factor correlation matrix indicated that all factors were moderately correlated. See Table 14 for the factor correlation matrix.

Discussion

The goal of Study 4 was to complete a factor analysis of *PAB* to determine if factors emerged which parallel the PCL-R affective/interpersonal and social deviance/antisocial lifestyle factors. The results of this study were somewhat less clear, as they require a good deal of content interpretation. After an examination of the results a three-factor solution was the most fitting. Overall, it does not appear that the emerging factors were representative of all of the factors or facets associated with the PCL-R. Although some research (Cooke & Michie, 2001) has indicated a three factor model rooted in personality dispositions may better explain the construct of psychopathy, the three factors found for *PAB* demonstrated general deviant symptoms, behavioral impulsivity, reactivity, and antisocial attitudes, rather than the affective and interpersonal traits associated with primary psychopathy.

Table 14

Factor Correlation Matrix

Factor	1	2	3
1	1.00	.47	.34
2	.47	1.00	.31
3	.34	.31	1.00

Note: Factor 1 = Bizarre and Negative Mentation; Factor 2 = Antisocial Behaviors; Factor 3 = Antisocial Attitudes.

The PCL-R first factor, affective and interpersonal characteristics were not well represented in the item content associated with the deviant responding factor of *PAB*. It is interesting to note that several of the items seemed to reflect negativity and a general lack of control over cognition and internal experiences (e.g., items 327, 307, and 40). Item 338 may indicate frustration regarding a lack of control over the behavior of others or it may also be interpreted as indicative of a sense of entitlement or having expectations of others that are often unattainable. The final item (item 508) may have a number of explanations. Initially, item 508 appears to indicate magical thinking; however, it may also be indicative of a grandiose sense of one's own ability to understand and manipulate others. Although there may be various explanations for any given items, this particular item grouping does not demonstrate a clear theme among the items, making the explanation somewhat subjective. It is also important to remain cognizant that this factor only accounted for 17% of the shared variance, and the overall three-factor structure only accounted for approximately 29% of the shared variance. This indicates that 71% of the variance was not explained by the three factors that emerged and could be attributed to other, unknown, variables. For example, the shared variance could account for commonalities among a prison population in general and not traits associated specifically with psychopathy.

After an examination of item content and consulting with several professionals familiar with the psychopathy literature, it was determined that the item content of *PAB* factors two and three appear to be representative of the social deviance and antisocial lifestyle factor of the PCL-R. Thus, as expected, items that are reflective of a deviant lifestyle and generally antisocial attitudes were well-represented on *PAB*. These results are not surprising given the MMPI-2's consistent success in measuring antisocial traits and behaviors. This leads to the possibility that it

is not *PAB*'s failure to identify clear indicators of the affective and interpersonal traits associated with psychopathy but rather a limitation of the MMPI-2 item pool. Perhaps the reason it has been historically difficult to measure global psychopathy with the MMPI-2 scales speaks to a lack of items related to the affective and interpersonal traits of psychopathy and overabundance of items indicating the more overt behavioral traits related to criminality or an antisocial lifestyle.

Overall, the results of the factor analysis do little to clarify theory regarding the factor structure of psychopathy, the role of criminality, and whether or not the core of psychopathy are the interpersonal and affective traits.

CHAPTER 7

GENERAL DISCUSSION AND IMPLICATIONS

The main goal of this study was to develop a scale for the MMPI-2 that would reliably measure global psychopathy as it is identified by the PCL-R. The PCL-R has been criticized as being difficult to administer, lengthy, and necessarily involves a good deal of contemporaneous data that is not always available (Gacono & Meloy, 2009). Although it would be unrealistic to think that an MMPI-2 scale would replace such a comprehensive assessment tool, the MMPI-2 is easily and frequently administered for research and clinical purposes, making a scale measuring psychopathy highly desirable as a screener. Additionally, research has not found any one of the already existing MMPI-2 scales to be an effective indicator of global psychopathy. Although some have proven more effective than others (e.g. *ASP* and *RC4*; Lilienfeld, 1996; Sellbom et al., 2005), it has been reported that the already existing scales are more indicative of ASPD or the social deviance facet of PCL-R psychopathy than global psychopathy (Sellbom et al., 2005). However, because there has been evidence that combinations of several scales may be used in conjunction with one another as indicators of global psychopathy, it was assumed that there was a viable item pool related to the PCL-R affective and interpersonal traits of psychopathy.

PAB appears to have been partially successful in satisfying the overall goal of the study, as it demonstrated internal consistency and a strong relationship with psychopathy, as identified

by the PCL-R. With the applied cutoff score of 15, *PAB* demonstrated adequate sensitivity and specificity and was accurate in 72.3% of the derivation sample and 69.05% in the cross validation sample. More importantly, *PAB* demonstrated a stronger relationship with total PCL-R scores than any of the already existing individual scales theoretically related to psychopathy. It was also the only scale to demonstrate significant correlations with both PCL-R factors one and two in both the derivation and cross validation samples.

However, when examining item content of *PAB* there appears to be an overabundance of items related the social deviance and antisocial lifestyle traits of psychopathy and a relative dearth of items representing the affective and interpersonal traits commonly associated with psychopathy. Because the scale construction methods were empirical, there was not rational consideration of item content during development. This method allowed for the construction of a scale based purely on items found to differentiate the PCL-R psychopathy group from the non-psychopathy group and was free of subjectivity. Although this may be seen as a strength in the construction methods, interpretation of the item content necessarily relies on theory and subjectivity. For example, a statement that appears to indicate the experience of regret may not necessarily imply remorse for how others are impacted by one's actions but rather how the individual is impacted by their own choices (i.e., prison). Further, items indicating somatic symptoms could also be associated with anger or anxiety.

It is interesting to note that many items in the final scale do not demonstrate traits or characteristics typically associated with the primary construct of psychopathy. Several items appear to measure more neurotic or anxious affect, such as items 444, 40, 82, and 122. One criticism of the PCL-R has been the relative absence of traits associated with low anxiety and fearlessness (Lilienfeld & Andrews, 1996), which could explain the presence of these items on

PAB. However, the validity of this explanation is unclear given recent research suggesting correlations between PCL-R psychopathy and measures of low anxiety and fearlessness (Neumann et al., 2013). An alternative theory provided by Neumann et al. (2013) is that psychopathy is marked by a general dysregulation of affective experiences, not just low trait anxiety and fear. This theory could explain the items on PAB that appear to relate to anxious or unstable affect.

Another explanation may be that *PAB* failed to measure primary psychopathy as it was intended and may more closely relates to either ASPD or the secondary variant of psychopathy. Verona et al. (2012) found that impulsivity may be exacerbated by negative emotional stimuli for individuals with ASPD, indicating that not only are negative emotions present but that these individuals are more reactive to negative emotions. Others posit that typical measures of fearlessness in psychopathy may actually be indicative of impulsive disinhibition (Neumann et al. 2013). It is possible that *PAB*, as is the case with the other MMPI-2 scales, is a better measure of antisocial traits than those associated with primary psychopathy. It is also possible that *PAB* is tapping into the traits of psychopathy more related to impulsive disinhibition, as opposed to low anxiety and fearlessness.

Perhaps because this is a self-report questionnaire, individuals are more likely to endorse overt behaviors, which require little insight into one's own personality structure, than they are to endorse interpersonal or affective traits that may be seen as negative. Personality disorders, in general, are characterized by a lack of insight into maladaptive personality traits, thus it could follow that individuals scoring high on psychopathic personality traits also might not be aware of their own lack of empathy, glibness, or grandiosity. It is also worth considering that the sample utilized was a prison population, which is indicative of a high prevalence of socially deviant and

antisocial behavior. Additionally, there is likely to be less stigma surrounding criminal or antisocial attitudes than there would be in the general population, which may have contributed to participants' comfort in endorsing items related to social deviance.

The second aim of the study was to cross-validate *PAB* in another sample of adult male prisoners. As hypothesized, *PAB* was successfully cross-validated in this portion of the study. Internal consistency remained high in the cross-validation sample and when compared to the already existing MMPI-2 scales, *PAB* demonstrated a stronger relationship to PCL-R total scores and each individual PCL-R factor. Given the similarity of the derivation and cross-validation samples, this provides some evidence that *PAB* may be a useful indicator of psychopathic traits for men in a prison setting. However, *PAB* appears to have a stronger relationship with the social deviance and antisocial lifestyle factor of the PCL-R.

One possible explanation for this could be a function of individuals identified as psychopathic being a heterogeneous group and perhaps having at least two subtypes under the umbrella of the construct psychopathy, both of which may be reflected in elevated PCL-R total scores (Hicks et al., 2004). Many researchers have hypothesized that there are primary and secondary variants of psychopathy, which are thought to differ phenotypically as well as etiologically (Hicks et al., 2004; Karpman, 1941; Lykken, 1995). Some researchers have made note of the similarities between PCL-R factors one and two and the primary and secondary variants of psychopathy (Hicks et al., 2004). In examining the subtypes of psychopathy, Hicks et al. (2004) identified two types, which appear similar to historic conceptualizations of primary and secondary psychopathy variants. The first type was termed emotionally stable psychopathy, which is characterized by high agency and low reactivity to stress and was related more to PCL-R factor one. The second type of psychopathy was called aggressive psychopathy, which was

thought to reflect high negative emotionality, low constraint, and low communion. Aggressive psychopathy is thought to relate more significantly with PCL-R factor two (Hicks et al., 2004; Hicks & Patrick, 2006). In fact, it has been found that after controlling for shared variance between the two PCL-R factors they show opposite relationships with measures of negative emotionality (NEM; Hicks & Patrick, 2006). Factor one, which is often considered to be the core of primary psychopathy, has demonstrated negative associations with emotional distress and NEM, whereas factor two has shown positive associations with same constructs. Because it is possible to reach a total score of 30 on the PCL-R through a number of different combinations of traits, it is possible that the sample utilized in scale creation was made up of predominantly aggressive (secondary) psychopaths. This would potentially explain the relatively low number of items associated with PCL-R factor one personality traits and the high number of items associated with antisocial attitudes and behaviors.

Alternatively, because factors one and two of the PCL-R have been found to be divergently related to NEM (Hicks & Patrick, 2006), it is possible that failing to separate the factor scores in the derivation of *PAB* made it difficult to identify items associated with the interpersonal and affective traits of primary psychopathy. Although it is only speculation, it is possible that *PAB* is largely representative of the phenotypic overlap between primary and secondary subtypes of psychopathy and does not strongly relate to the unique aspects of either primary or secondary psychopathy. If in fact the sample utilized was heterogeneous, and included both primary and secondary psychopaths; correlations uniquely associated with one subtype may have been suppressed by associations with the alternate subtype. For example, NEM has been found to positively correlate with factor two and negatively correlate with factor

one. It is possible then, that an item measuring NEM may not demonstrate a significant correlation with PCL-R total scores because the opposite correlations suppress each other.

Another possible explanation relates to psychopathy, as it is measured by the PCL-R, in a more general sense. The PCL-R has been criticized for its development in a prison population and for being overly focused on criminality and antisocial behaviors, with little emphasis on low anxiety and fearlessness (Skeem & Cooke, 2010). Thus, it follows that the creation of *PAB* from PCL-R total scores within a male prison population may be subjected to the same criticism. If these criticisms of the PCL-R are accurate, it would be likely that the items identified through PCL-R total scores would also be biased in that there could be an overemphasis on criminality and little emphasis on personality dispositions. This offers an alternative explanation for the strong presence of items reflective of a deviant lifestyle and antisocial attitudes.

The third aim of the study was to obtain partial external validation of *PAB* by examining its relationship with theoretically related measures. Based on previous research indicating that individuals with psychopathy demonstrate deficits in recognizing verbal and facial expressions of negative emotions (Blair et al., 2004; Wilson et al., 2011), it was hypothesized that elevations on *PAB* would relate to deficits in recognition of facial expressions of negative emotions as measured by the ERT-40. However, in a sample of college students there were no significant relationships between elevations on *PAB* and deficits in emotion recognition in general. The most likely explanation for the lack of relationship is that those individuals scoring above the cutoff of 15 on *PAB* were not a group of primary psychopaths. Particularly given that the scale was developed in an all-male prison population, it is unclear how well the scale would generalize to a college sample of men and women. As has been noted previously, the base rates of psychopathy are substantially different between these two populations. It has been estimated that

the base rate of psychopathy in the general population is approximately 1% (Hare, 1996), whereas it is estimated to be between 15% and 25% in a prison population (Hare, 1998). Because the base rates are markedly different, it would also be expected that the negative predictive power would increase and positive predictive power would decrease. As such, *PAB* would be a better indicator of individuals who do not have psychopathic traits than it would of individuals who do possess psychopathic traits. To clarify these results it would be necessary to validate the scale in a college population using another, more empirically and theoretically sound criterion indicator of psychopathy. Alternatively, it would be beneficial to examine the relationship between psychopathy and deficits in emotion recognition in a sample of male prisoners, more similar to that of the derivation and cross-validation samples.

Partial external validity was accomplished by comparing the mean scores of a group scoring above the cutoff of 15 on *PAB* and a group scoring below and scores on theoretically related PDQ-4 scales. As expected, the mean scores of those scoring above the cutoff on *PAB* were significantly higher on scales measuring NPD, adult antisocial symptoms, and CD symptoms. Given past research noting relationships between NPD and PCL-R factor one (Hare & Hart, 2000; Huchzermeier et al., 2007) and ASPD and PCL-R factor two (Hare & Neumann, 2009), it is not surprising that this relationship was found. These findings provide unique information given the previously noted dearth of research regarding the relationship between psychopathy and NPD. In spite of notable similarities in phenotypic traits and overlap between symptoms, there has been significantly more research focused on the relationship between ASPD and psychopathy than NPD and psychopathy.

The final goal of this study was to examine the factor structure of the derived scale. Although this step was exploratory, it was thought that, given research that the PCL-R contains

two distinct, but correlated, factors, a two-factor solution mirroring those of the PCL-R would emerge. The results of the current study did not support this hypothesis, as a 3-factor solution was decided to be the best fit for the combined data set. Moreover, the factors that emerged only contained items that resembled the social deviance and antisocial attitudes facets of PCL-R factor two. As was suggested previously, it is entirely possible that the participants in this study had traits more related to the secondary or aggressive/reactive (Hicks et al., 2004) variant of psychopathy. This would provide a reasonable explanation both for the items and factors associated with *PAB*. It is also possible, as was described above, that the items significantly correlated with one or the other factor were suppressed by the use of PCL-R total scores due to possible divergent correlations associated with the factors.

Based on a number of the explanations posited above, it is worth considering that perhaps primary and secondary psychopathy are distinct but related and often comorbid constructs. Hicks and Patrick (2006) likened the relationship between psychopathy subtypes to the tripartite model often used to explain the comorbidity between depression and anxiety. The authors compared the differential relationship to autonomic hyperarousal between anxiety and depression and NEM present in the psychopathy subtypes. This conceptualization allows for the acknowledgment that there are significant phenotypic similarities and comorbidity among primary and secondary psychopathy, while also allowing for a reasonable explanation for findings of divergent correlations for specific traits (e.g., NEM). However, this hypothesis implies that the PCL-R as an assessment measure of global psychopathic traits does not have the specificity to distinguish the two subtypes. For example, Hicks et al. (2004) found through cluster analysis that a group of participants scoring highly on PCL-R items, scores could be categorized into distinct clusters, which appeared to represent the two subtypes of psychopathy. These findings demonstrate that

both of the psychopathy subtypes may be captured by elevated scores on the PCL-R. This indicates that the PCL-R may be a less efficient measure of identifying one group or the other.

Although many limitations have already been discussed, it is important to acknowledge that the present study contains several additional considerations and implications for future research. One potential criticism of this study is that the samples utilized for the derivation and cross validation of the scale were relatively small, particularly after eliminating individuals with invalid MMPI-2 protocols. Small sample sizes may decrease the generalizability of the sample and increase the likelihood of chance results or the introduction of confounding variables. Additionally, the statistical power decreases as a sample size decreases. Thus, it may be beneficial to replicate this study in a larger sample in order to strengthen the current findings. Further, *PAB* should be cross-validated in samples beyond incarcerated men, which will help to clarify the generalizability of the scale.

Additionally, it is worth considering that only single MMPI-2 scales were examined in the current study. Past research has shown some combinations of scales (Selbom et al., 2005; Sellbom et al., 2007) to be effective indicators of both the affective and interpersonal traits and the antisocial behaviors and attitudes. It would be useful to examine *PAB*'s efficacy in comparison to combinations of scales in order to further validate the scale. However, it is possible that the overall lack of success in previous research identifying a single scale indicator of psychopathy could be related to the explanations provided above. That is, that there are two distinct but related subtypes of psychopathy that make it difficult to identify one single MMPI-2 scale. Perhaps using more stringent criterion indicators of psychopathy would clarify many of these issues in future research. It would likely be beneficial for future research to identify patterns of PCL-R scores related to previously identified subtypes of psychopathy in order to

increase the specificity of the instruments. It should be acknowledged that this does not indicate one subtype is more or less important than the other, as they both can have significant consequences for the both the individual and society, but rather that our measurement instruments could be more effective if this issue is clarified. Additionally, future research should focus on using empirical scale development methods with the individual PCL-R factors or facets as opposed to PCL-R total scores.

Conclusions

The current study was somewhat successful in creating an MMPI-2 scale to measure psychopathy, as it is measured by the PCL-R. However, it is unclear whether *PAB* measured primary or secondary variants of psychopathy. *PAB* also outperformed any of the other theoretically related MMPI-2 scales. The identification of items related to psychopathic traits and the development of *PAB* may simplify the process of assessing psychopathy with the MMPI-2. The PCL-R is a reliable and well-validated tool, which is ideal when time, cost, or manpower are not of concern. However, due to the burden of training, time, and the assumption that collateral information that must be available, the PCL-R may not be efficient in many situations, such as when attempting to conduct large-scale research. The MMPI-2 may be an ideal alternative, due to its widespread use and availability. Additionally, it can be administered and scored quickly, making it possible to assess large numbers of people at once. Beyond a research setting, the MMPI-2 can often act as a guide for the direction of future assessment. Perhaps elevations on *PAB* could act a red flag, providing the clinician or evaluator with an indication of possible personality pathology. One common criticism of self-report measures in general, but particularly with regard to psychopathy, is the possibility of deception. Although this concern is valid, due to the deceptive nature of psychopathy, the MMPI-2 is equipped with validity indicators, which

have been highly successful in detecting many variations of deception (e.g. malingering, fake-bad, fake-good, variable responding etc.). Thus, although it is likely that many individuals with psychopathy will be eliminated based on invalid profiles, the possible advances in research and an assessment measure more readily available to clinicians and researchers, it seems benefits outweigh the costs when identifying even a portion of individuals with psychopathy.

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APPENDIX A: CRITERIA INVOLVED IN DSM-IV FIELD TRIALS

DSM-III-R

Conduct disorder

Inconsistent work

Unlawful behavior

Irritable and aggressive

Failure to honor financial obligations

Fails to plan ahead or impulsive

No regard for the truth

Reckless regarding personal safety

Irresponsible parent

Never sustained monogamous relationship

Lacks remorse

ICD-10

Callous unconcern and lack of empathy

Persistent irresponsibility and norm disregard

Incapacity to maintain enduring relationships

Low frustration and aggression threshold

Incapacity for guilt and profit from experience

Proneness to rationalize and blame others

Persistent irritability

PCS (Psychopathy Criterion Set; derived from PCL-R)

Early behavior problems

Adult antisocial behaviors

Impulsive

Poor behavior controls

Lacks remorse

Lacks empathy

Deceitful and manipulative

Irresponsible

Inflated and arrogant self-appraisal

Glib and superficial charm

APPENDIX B: DSM-IV-TR CRITERIA FOR ASPD

A. There is a pervasive pattern of disregard for and violation of the rights of others occurring since age 15 years, as indicated by three (or more) of the following:

   1. Failure to conform to social norms with respect to lawful behaviors as indicated by repeatedly performing acts that are grounds for arrest
   2. Deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure
   3. Impulsivity or failure to plan ahead
   4. Irritability and aggressiveness, as indicated by repeated physical fights or assaults
   5. Reckless disregard for safety of self or others
   6. Consistent irresponsibility, as indicated by repeated failure to sustain consistent work behavior or honor financial obligations
   7. Lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another

B. The individual is at least age 18 years.

C. There is evidence of Conduct Disorder with onset before age 15 years.

D. The occurrence of antisocial behavior is not exclusively during the course of Schizophrenia or a Manic Episode.