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Psychopathy and the Rorschach: A Response to Wood et al. (2010)

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Abstract

Wood et al. (2010) published a meta-analysis in which the authors challenged the utility of the Rorschach Inkblot Test in delineating key differences between psychopathic and non-psychopathic individuals identified by the Psychopathy Checklist-Revised (PCL-R; Hare, 1991/2003). In this article, Gacono et al.'s (2001) five conceptual and four methodological criteria for the evaluation and interpretation of psychopathy/Rorschach literature were employed to provide a detailed review of the approach and procedure used by Wood et al. (2010). We identify and discuss a number of conceptual and methodological problems with the meta-analysis including confusion of the related but distinct terms of diagnosis and assessment, selection of studies, categorical versus dimensional interpretations of data, characterization of PCL-R and Rorschach findings, and meta-analytic methodology. Finally, recommendations for the essential components of well designed and implemented PCL-R and Rorschach studies are provided.

Introduction

In a recent article, "Validity of Rorschach scores for discriminating psychopaths from nonpsychopaths in forensic populations: A meta-analysis" (Wood, Lilienfeld, Nezworski, Garb, Holloway Allen, & Wildermuth, 2010), the authors criticized the Rorschach Inkblot Test's ability to "diagnose" psychopathy and challenged a variety of findings found elsewhere in the literature concerning the performance of psychopathic offenders on the Rorschach (Gacono, 1988; Gacono & Meloy, 1994; Meloy & Gacono, 1992; Gacono, Evans, & Viglione, 2008; Cunliffe & Gacono, 2005). Although Wood et al. (2010) found support for some Rorschach indices' ability to identify key differences between psychopaths and non-psychopaths, they asserted that "the relationship of Rorschach scores to psychopathy appears to be at best weak in both comparative and absolute terms" (Wood et al., 2010, p. 346). Their recent article extends their previous work (Wood et al., 2000; Wood et al., 2003) and contained arguments that fell into two main categories: 1) criticisms directed toward the Rorschach that are actually examples of poor clinical or forensic practice (Meloy, 2008), and, 2) criticisms of the Rorschach based upon an inaccurate understanding of how the instrument is used (Gacono & Evans, 2004). The current article (Wood et al., 2010) is an excellent illustration of the typical conceptual and methodological errors present in some of the psychopathy research literature.

Gacono et al. (2001; see also Gacono & Evans, 2004; Gacono, et al., 2008) recommended five conceptual and four methodological issues useful for understanding, evaluating, and

interpreting psychopathy, and more specifically, Rorschach/psychopathy findings (Gacono et al., 2001; Gacono & Evans, 2004; Gacono, Evans, & Viglione, 2008; Gacono & Gacono, 2006). In this article, the suggestions provided by Gacono and colleagues will be used as a basis to identify and assess the validity and generalizability of the specific studies selected by Wood et al. (2010) for their meta-analysis.

Conceptual Issues in the Assessment of Rorschach/Psychopathy Studies:

1. *Antisocial Personality Disorder* (ASPD; American Psychiatric Association, 1994) and Psychopathy are related but distinct constructs, differing from each other along important historical, theoretical, and definitional lines.
2. Psychopathy may be conceptualized both in dimensional terms (i.e., along a continuum of severity) and in categorical terms (i.e., as a taxon or discrete syndrome), and choosing which approach affects research findings.
3. Psychopathy may manifest in varying forms across various populations (e.g., across gender or throughout development from youth into adulthood.)
4. Personality testing is only one facet of both psychological assessment and diagnosis. It contributes to the assessment of the dimensional aspects of psychopathy, but such testing does not categorically diagnose.
5. The generalizability of a study's findings depends on consideration of the above 4 conceptual issues and should be considered when designing studies, presenting findings, or offering discussion that includes comparison to other studies. Authors must account for confounds related to both their conceptual formulations and their measurement tools.

Seemingly plausible arguments presented by critics of the Rorschach are, in fact, quite biased and hold little weight when viewed in the light of a critical, empirically based analysis (Martin, 2003; Gacono & Evans, 2004; Meloy, 2005). For example, critics may present ASPD, Sociopathy, and Psychopathy as synonymous terms, incorrectly designate lower PCL-R cut scores than what has been recommended in the literature for assigning psychopathy as a category (e.g. PCL-R $\geq$ 30), and equate diagnosis with assessment (Gacono et al., 2001; Gacono & Evans, 2004; Gacono & Gacono, 2006). A careful consideration of the above five principles provides a basis for critically evaluating critics' claims.

Methodological Issues in the Assessment of Rorschach/Psychopathy Findings:

1. Conduct Disorder (CD) and ASPD are comprised of heterogeneous groups of individuals. Studies that treat Psychopathy as a taxon must validate groups with an appropriate measure (e.g. the PCL-R [Psychopathy Checklist-Revised; Hare, 1991/2003] with adults, the PCL: YV [Psychopathy Checklist: Youth Version; Forth, Kosson, & Hare, 2003, or a PCL: YV prepublication – modified version of the PCL-R]) for adolescents and use the accepted cut scores (PCL-R $\geq$ 30).
2. Studies need to account for (control or delineate) the limitations imposed by factors such as gender, sexual deviance, concurrent Axis I psychosis, age, IQ, testing setting, and legal status. These factors can influence the production of certain Rorschach variables.
3. R (number of responses) must be considered. Increased R is found in certain sex offender groups, (Bridges et al., 1998; Gacono et al., 2000), whereas low R is typical among many criminal groups (Viglione, 1999). Thus R can act as a moderator influencing the relationship between Rorschach variables and criterion variables. Research should investigate this hypothesis by controlling for R and examining the

relationship between Rorschach variables and criterion constructs at different levels of R (e.g., R = 14-17, etc.).

4. Response style must be considered (Bannatyne et al., 1999). Variables and styles such as R, Lambda, Extratension, and Introversion can impact the production of certain Rorschach variables (Exner, 1995), contributing to seemingly discrepant findings among studies.

A careful analysis of the methodology of specific studies is essential to avoid being misled by conclusions based on findings that fail to consider these issues. When the studies used in the Wood meta-analysis were evaluated, 8 out 11 (72.7%) did not comply with at least one of these 9 criteria, raising doubts about the validity of their conclusions.

Conceptual Criterion 1: Antisocial Personality Disorder (ASPD; American Psychiatric Association, 1994/2000) and Psychopathy are related but distinct constructs, differing from each other along important historical, theoretical, and definitional lines.

Despite a wealth of published research on psychopathy (Hare, 1991, 2003), clinicians and researchers continue to confuse *sociopathy*, *antisocial personality*, and *psychopathy*, inappropriately viewing them as synonymous terms (Gacono & Meloy, 1994; Millon, Simonsen, Birket-Smith & Davis, 1998). Originating from separate theoretical lines, these constructs manifest empirically measurable and clinically relevant differences that should be acknowledged in both forensic and research settings (Gacono, Nieberding, Owen, Rubel, & Bodholdt, 2001).

Sociopathy (APA, 1952) and Antisocial Personality Disorder (ASPD; APA, 1994) have been used in various editions of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM; 1952, 1968, 1980, 1987, 1994, 2000). Sociopathy, an antiquated term lacking contemporary clinical meaning, was used in the first DSM (APA, 1952) to describe a variety of conditions such as sexual deviation, alcoholism, and *dyssocial* and *antisocial* reactions and was replaced by ASPD as the working nomenclature in the second edition (APA, 1968) and subsequent editions of the manual. Subsequent attempts to refine the diagnosis represented a widening gap between the clinical description of ASPD and psychopathy as evidenced by the former's focus on behavioral descriptions rather than the combination of personality traits and behaviors present in the latter. The differences between the disorders are also reflected in varying base rates (Hare, 2003; 75% of prison inmates with DSM ASPD, compared to a rate of only 20-25% PCL-R or PCL: YV identified psychopaths). Compared to non-psychopathic ASPDs, primary psychopaths (PCL-R $\geq$ 30) begin offending earlier, commit more offenses (Forth et al., 1990; Hare, 2003; Rice & Harris, 1995), commit more violent offenses (even later into life; Rice et al., 1992; Hemphill, Hare, & Wong, 1998), participate in more problematic behaviors when incarcerated (Forth et al., 1991; Hare & McPherson, 1984; Gacono et al., 1995), and are less amenable to treatment (Ogloff et al., 1990; Sreenivasan et al., 2007; Rice et al., 1992; Hemphill, Hare, & Wong, 1998).

Typically, errors occur when authors use diagnoses of conduct disorder and/or antisocial personality disorder for forming independent groups of psychopaths without PCL-R scores, and discuss their findings as though psychopathy were assessed. A related common mistake made by clinicians and some researchers is to apply psychopathy findings to their work or studies with individuals with ASPD, incorrectly attributing the findings with psychopaths to those with ASPD. The inappropriate use of self-report measures (Minnesota Multiphasic Personality Inventory [MMPI, MMPI-2], California Psychological Inventory [CPI], Psychopathy Personality Inventory [PPI]) for defining a group of psychopathic offenders leads to problems since these

instruments more strongly correlate with ASPD, and inferences about "psychopathy" as a taxon cannot be made when scales from these instruments are utilized to define psychopathy (Gacono & Meloy, 2009; Berardino, Meloy, Sherman, & Jacobs, 2005; Miller & Lynam, 2011). Although none of the studies in the Wood et al. (2010) meta-analysis committed this error, confusion concerning the terms was evident in the Wood et al. (2010) narrative. For example, in their introductory comments to their paper, the authors discussed a study by Exner (1969) in which they wrote that the author assessed differences in the frequency of Rorschach Reflection responses in a sample of "psychopaths" (Wood et al., 2010, p. 337). However, the term Exner (1969) actually used to describe the antisocial individuals in the sample was "sociopaths." Since Exner (1969) conducted the study well before the development of either the PCL, the PCL-R or the current description of ASPD, it is impossible to determine if these individuals were actually psychopaths, ASPDs, or neither. Wood et al.'s imprecise thinking about Exner's early study concerning independent variables (i.e., Psychopathy) likely resulted in misinterpretation of dependent variables (i.e., reflection responses).

Conceptual Criterion 2: Psychopathy may be conceptualized both in dimensional (i.e., along a continuum of severity) and categorical terms (i.e., as a taxon or discrete syndrome), and the choice affects methodology, data collection, results, and interpretation.

While the PCL-R construct of psychopathy can be viewed in both dimensional and categorical terms, inferences about the taxon of psychopathy based upon categorical data is problematic. A categorical approach compares the prototypical (PCL-R $\geq$ 30) presentation of psychopathy to individuals at very low levels to emphasize key differences between psychopaths and non-psychopaths. A dimensional approach, on the other hand, examines the construct on a continuum of severity to make inferences about psychopathy level as it relates to specific behaviors. A categorical approach, by design, does not consider the entire variance, while a dimensional one does. A failure to account for the very different findings that result from the two approaches often leads to inaccurate conclusions and mischaracterizations of significant findings (Markon, Chmielewski, & Miller, 2011). This error occurs most often when investigators correlate psychopathy related variables with continuous PCL-R scores, and discuss their findings as though they used the appropriate methods for obtaining data for categorically defining psychopaths (PCL-R $\geq$30). A related error occurs when cut scores are lowered and findings presented as though a significant number of PCL-R $\geq$ 30 individuals were in the sample. The appropriate method for studying a group of psychopaths is to compare an adequate number of PCL-R $\geq$ 30 scorers with those who score below this standard, as originally proposed by Hare (1991) and commonly adopted as the appropriate operationalization of primary psychopathy (see Methodological Criterion 1). A frequently encountered associated problem is the low numbers of actual primary psychopaths present in the sample studied.

In 27% of the studies examined by Wood et al., (2010), a dimensional approach was utilized (See Table 1; Egozi-Profeta, 1999; Ponder, 1999; Darcangelo, 1997) while in others (73% of studies; i.e. Muntz, 1999; Ballard, 2006) a categorical approach was employed. In their selection of studies used in their meta-analysis, Wood et al., (2010) did not distinguish between findings that used one of the two different approaches, and found no significant differences between the categorical and continuous (dimensional) studies. Despite these results, continuous variables are not appropriate when performing a meta-analysis with a majority of categorical variables.

Conceptual Criterion 3: Psychopathy may manifest in varying forms across various (gender, age, offense category, and legal status) samples of populations.

In their book *Science and Pseudoscience in Clinical Psychology*, Lilienfeld, Lynn, and Lohr (2003) correctly pointed out that scientific inference is limited by context, sample population, and empirical methodology, and highlighted the importance of boundary conditions as they relate to scientific findings. Careful consideration of differences across samples (gender, Axis I diagnosis, age, offense category, context, etc.) is necessary to ensure that observed differences are due to specific constructs under study rather than extraneous and confounding variables. This point underscores the need for different population norms for most psychological tests (e.g. MMPI-2; Butcher, J. N., Williams, C. L., Graham, J. R., Archer, R. P., Tellegen, A., Ben-Porath, Y. S., & Kaemmer, B., 1992; Personality Assessment Inventory; Morey, 1991/2007). An additional example can be found in the Psychopathy Checklist: Youth Version (PCL:YV: Forth, Kosson, & Hare, 2003) in which the authors constructed a similar but distinct version of the measure to be used with juveniles. The consideration of possible sampling bias is a core tenet of good test construction in addition to good science. However, empirical studies of how psychopathy manifests across different populations are generally lacking.

This error occurs when results from different sample populations are grouped together and interpreted as a cohesive whole. While there are behavioral similarities among primary psychopaths (PCL-R $\geq$ 30) regardless of population, it is premature to assume that the syndrome is consistent across all populations and clinical settings. For example, in their work on female psychopathy, Cunliffe and Gacono (2005; 2008; forthcoming) discovered that male and female psychopaths differed across a number of important Rorschach dimensions: modulation of affect, self-perception, interpersonal relationships, and reality testing. They provided interview and scoring suggestions for several PCL-R items related to gender-based differences in the presentation of psychopathy. Similar concerns regarding the presentation of psychopathy in female populations have been raised by other investigators as well (Forouzan & Cooke, 2005; Bolt, Hare, Vitale, & Newman, 2004). Additionally, Wood et al. (2010) combined studies that used the PCL-R and the PCL: YV which is an issue of concern since each of the two versions of the psychopathy checklist (PCL-R and PCL: YV), while similar, are not identical instruments. The creation of the youth version (Forth et al., 2003) was predicated on the notion that the expression of psychopathy in adolescence is not identical to that seen in adults. Although more information is needed, the effects of gender, culture, ethnicity, offense category, developmental maturation, and social milieu are expected to be significant moderators of the construct psychopathy.

Nine percent of the studies committed this aggregating error (Ponder, 1999). However, in their meta-analysis, Wood et al. (2010) characterized the various psychopathy studies with different population samples as equivalent. They combined studies of female offenders (Cunliffe, 2002; Cunliffe & Gacono, 2005), adolescents (Ballard, 2006; Loving, 1998; Loving & Russell, 2000; Ponder, 1999; Nassen, 2008; Smith, 1995; Smith et al., 1997) and samples that included psychotic individuals (Welsh, 1999; Siemsen, 1999; Young et al., 2000). Some of the investigators also failed to assess for IQ (Hartmann et al., 2006; Egozi-Profeta, 1999; Nassen, 2008) which in light of recent literature on the relationship between increased psychopathy, lower verbal IQ scores, and violent behavior in criminal populations (Johansson, 2005; Pereira et al., 2008; Nijman, Merckelbach, & Cima, 2009) could affect the validity of psychopathy assessment. Wood et al. (2010) also did not appear to consider the effect these influences might have on PCL-R scores and Rorschach indices across varying levels of psychopathy. In one study

(Siemsen, 1999), the low psychopathy group was described as having high rates of DSM Axis I mood and psychotic disorders, while the high psychopathy group was described as having only DSM Axis II disorders without an Axis I diagnosis. Siemsen (1999) did not control for Axis I disorders and attributed differences between the groups as a function of psychopathy level without considering the effects of major mental illness.

Wood et al.'s (2010) contention that the Gacono & Meloy (1994) studies are not replicable based on the Hartmann et al. (2006) study does not have merit for three reasons: 1) Hartmann et al. (2006) used the screening version of the PCL-R, 2) comparison groups were composed of psychiatric and college samples, and 3) included brief protocols (R< 14). Clearly, psychotic individuals would be expected to score much differently on both the PCL-R and the Rorschach as a function of impairment in perception, mental status, and cognitive capacities (see Gacono & Meloy, 1994 for data on a large sample of individuals with paranoid schizophrenia with ASPD).

Conceptual Criterion 4: **Personality testing is only one facet of both psychological assessment and diagnosis. It contributes to the assessment of the dimensional aspects of Psychopathy.**

Assessment is a multi-faceted and multi-step process by which observations, historical variables, clinical interview, and psychological testing scores are combined to infer diagnosis. It is incumbent upon ethical clinicians and researchers to render a diagnosis based upon multiple sources of information and data. Although psychological testing is helpful in formulating a diagnosis, it never solely defines the diagnostic picture (AERA, APA, and NCME, 1999). Meyer et al. (2001) made precisely this point when they warned about the dangers of mono method bias found in studies critical of the Rorschach as a clinical tool whereby the measure was used as the sole basis of diagnosis and emphasized the importance of the integration of multiple assessment methods in clinical work and research.

Wood et al. (2010) appeared to lack a clear understanding of the differences between testing and assessment when they set forth to challenge the notion that the Rorschach could be used to assess psychopathy. Neither Gacono and Meloy (1994) nor other investigators (apart from Nassen, 2008 and Wood et al., 2010) characterized the Rorschach as a test to diagnose psychopathy. The Rorschach and PCL-R are two very good tests or instruments, among others, which might be used in an assessment battery for a particular purpose (psychological functioning, treatment considerations, or consultation to a court of law). The goal of assessment is to provide descriptions of people with a focus on psychological processes and traits responsible for generating symptoms and/or behaviors related to a specific clinical purpose (Exner, 2003; Gacono & Hutton, 1994).

Although a low percentage (9%) of the individual studies made this conflation of testing and assessment error, a number of examples were found within the Wood et al. (2010) narrative. For example, they assert that Gacono and Meloy (2009) need to substantially revise their claim that the Rorschach can discriminate psychopaths from nonpsychopaths. No such simplistic claim was made. Gacono and Meloy (2009) were well aware of the proper use of the Rorschach when they suggested that the Rorschach contributes to the assessment of psychopathy and provided information about an individual's personality structure:

Although the PCL-R alone suffices to determine the presence or absence of psychopathy – other personality instruments such as the MMPI-2 (Butcher, 2006; Butcher et al., 1989; Hathaway & McKinley, 1951) and Rorschach Inkblot Method (Exner, 2003; Exner & Erdberg,

2005; Rorschach, 1942) add to our clinical understanding of the ASPD diagnosed or psychopathic individual (pgs. 570-571).

Wood et al. (2010) offered "new" insight when they claimed "the greatest value of the Rorschach in criminal assessments is not to discriminate psychopaths from nonpsychopaths but to provide a richer picture of personality dynamics" (pg. 346), a statement that was cited from the same body of work they continuously criticized (e.g., Gacono & Meloy, 2009). This notion was first offered almost 20 years ago by Gacono & Meloy (1994).

Conceptual Criterion 5: The generalizability of a study's findings depends on consideration of the above four conceptual issues, and should be addressed when designing studies, presenting findings, or offering discussion that includes comparison to other studies. Authors must account for confounds related to both their conceptual formulations and their measurement tools.

Although a well-designed study is one that is thoughtful, objective, and uses reliable and valid methods to test a hypothesis or set of hypotheses, a poorly designed study is one that contains biases and disregards the established standards of appropriate research methodology leading to flawed results (see Gacono et al., 2001, 2008). Poorly designed or implemented research studies cannot be compared to more valid findings from methodologically sound ones. Further, theories or research findings based upon faulty data are, by definition, without merit since reliable data forms the bedrock of sound empirical inference.

Lilienfeld et al. (2003) observed and commented on the current unacceptable state of affairs whereby some researchers and clinicians appear to be employing assessment and treatment methods that are not reliable or appropriately validated. The poor methodology employed by Wood et al. (2010) is all the more surprising since Lilienfeld himself is one of the authors of this meta-analysis. Sixty-four percent of the studies (e.g., Heaven, 1988; Darcangelo, 1997; Egozi-Profeta, 1999; Muntz, 1999; Ponder, 1999; Siemsen, 1999; Welsh, 1999; Young et al., 2000; Hartmann et al., 2006; Nassen, 2008) included in the meta-analysis committed this generalizability error. The methodological problems inherent in Egozi-Profeta (1999) were related to performing the PCL-R record review *after* the interview, in violation of the procedure outlined by Hare (2003) in the test manual, and call into question the reliability of the PCL-R scores. Further, the author performed incorrect statistical analyses on Rorschach data, and did not report R or Lambda (see Methodological Criteria 7 & 8 below). A review of Nassen (2008) revealed that methodological errors were evident in the author's failure to assess for low IQ in the sample, an inter-rater reliability assessment based upon only 5 PCL-R interviews, and using ANOVA (a parametric test) with Rorschach variables (non-parametric data; PER, Hd, S, Sum T, Sum Y) when this has been identified as unsuitable for parametric analyses by Viglione (1995). Significant concerns have been identified with the Muntz (1999) data since as many as five Rorschach protocols were being administered within a 6 hour period on a number of occasions during the data collection phase (A. Muntz, personal communication, April, 1998). Further, following a review of Muntz' raw data performed by T. Cunliffe and C. B. Gacono in 1999, it was concluded that due to poor inquiry, the data was unsuitable to be used to score Rorschach protocols (see Cunliffe & Gacono, 2005). Additionally, a review of the Muntz (1999) dissertation revealed that her percent agreement for the Rorschach variables varied from 50 to 97%. Smith (2012) conducted interrater estimates for the Cunliffe and Gacono data and found interrater agreement values between 96.1 and 100% and kappa values between .823 and 1.0 on the same variables used by Muntz (1999). This reveals significant problems with the Muntz

(1999) dissertation, since the poor inquiry and/or inaccurate scoring of the Rorschach data resulted in approximately 33% of the variables she studied being inaccurately assessed (inadequate interrater agreement scores).

Other examples from the meta-analysis include Heaven (1988) which included short Rorschach protocols with R< 14 (see Methodological Criterion 3), thus limiting generalizability to other studies. The Ponder (1999) dissertation included data from a sample of adolescents in which final scores obtained on the PCL:YV were subsequently prorated as a result of the omission of two critical items that corresponded with Factor 1 test items. The Siemsen (1999), Young et al. (2000), and Welsh (1999) studies were conducted with individuals suffering from symptoms of psychosis or a DSM Axis I disorder, most notably psychotic and/or thought disorders, thus raising concerns about the comparison of these studies to those without Axis I illnesses. All of these studies possess significant methodological shortcomings which make generalizability to other well designed studies problematic.

Methodological Criterion 1: CD and ASPD are comprised of heterogeneous groups of individuals. Studies that treat psychopathy as a taxon must validate groups with an appropriate measure (e.g. the PCL-R with adults, the PCL: YV for adolescents [or a PCL: YV prepublication – modified version of the PCL-R]) and use the accepted cut-off scores for research purposes (PCL-R $\geq$ 30).

Although clinically it is best to conceptualize psychopathy as a dimensional construct ranging from lower to higher levels, whereby varying dimensional scores may be related to behavior, a cut-score of PCL-R $\geq$ 30 (Hare, 2003) has been applied as a validated marker for the examination of primary or severe psychopathy comparisons in the empirical literature (2.5 standard deviations above the pooled mean of 22.1). Hence, the higher the score, the greater the confidence the individual being tested is a psychopath and more accurately approximates the psychopathic prototype. When a study does not follow this recommendation, researchers run the risk of using erroneous classifications that result in flawed conclusions and poor generalization to other studies. Twenty-seven percent of the Wood et al. (2010) meta-analysis studies committed this error since studies that failed to adhere to recommended cut-scores were used as a basis for their evaluation of the validity of the Rorschach with psychopathic populations (e.g., Egozi-Profeta, 1999; Ponder, 1999; Hartmann et al., 2006) and findings were discussed as though primary psychopathy was being assessed. For example, in Egozi-Profeta's (1999) study, appropriate cut- scores were used initially to separate groups (27 participants PCL-R < 30 in the moderate group, 17 participants PCL-R $\geq$30 in the severe group); however, they did not use these groups in their correlation but used continuous scores with Rorschach variables instead. Smith et al. (1997) used a modified version of the PCL-R with youths, and while it should be pointed out that the authors used this approach based upon the best information available at the time (prior to the development of the Psychopathy Checklist: Youth Version; Forth et al., 2003), the utilization of this pre-PCL: YV method limits comparisons to current PCL: YV findings. Ponder (1999) did not report the appropriate scores for comparison between groups (we note that no cut-scores for the PCL:YV have been suggested) for the data gathered from the PCL: YV, and Siemsen (1999) designated a PCL-R cut score below (PCL-R $\leq$ 27) the recommended cut score suggested by the test's developer and author (Hare, 1991; 2003). Nassen (2008) employed a cut-score of $\leq$ 27 for the "low" nonpsychopathic group resulting in limited differences between the groups and concluded that the Rorschach was inappropriate for the assessment of psychopathic traits. However, it is not surprising that no differences were found since the difference in PCL-R cut

scores is within the SEM of 3.0 for the measure (Hare, 2003), and that the mean PCL-R score (means for the two groups were not reported) of the sample was 28.7 which suggests limited variance in the low range of psychopathy for comparison. Finally, Hartmann et al. (2006) used the screening version of the PCL-R, rather than the PCL-R itself, as a measure of psychopathy, but did not address the high false positive rate in the PCL:SV research.

A secondary issue involves the scoring of the PCL-R based upon file review without an interview. For example, Darcangelo (1997) did not formally assess for ASPD and the PCL-R (Hare, 1991; 2003) was scored on the basis of file review alone. Although it has been demonstrated that it is possible to conduct PCL-R ratings without an interview (Wong, 1984, 1988; Rice, Harris, & Quinsey, 1990), several investigators have warned about the dangers of this practice (Heilbrun, Warren, & Picarello, 2003; Hare, 2003). File review only scores have been found to regress to the mean (lower PCL-R scores; Grann et al., 1998) and require very comprehensive files (criminal, court, academic, and 3rd party interview).

Methodological Criterion 2: Studies need to account for (control or delineate) the limitations imposed by factors such as gender, sexual deviance, concurrent Axis I psychosis, age, IQ, testing setting, and legal status. These potential confounds can influence the production of certain Rorschach variables.

Good science accounts for factors that may influence research findings, and failure to do so limits generalizability (see Conceptual Criterion 3). Just as psychopathy scores may vary as a function of sample populations, Rorschach responses can be significantly affected by mental illness, IQ, legal status, age, and testing environment. Therefore, a lack of consideration of these limitations may result in erroneous inferences and conclusions which may vary as a function of confounding variables rather than psychopathy.

This error was present in 64 percent of the studies included in the meta-analysis. Wood et al. (2010) did not appear to consider this important methodological issue and used studies that contained these limitations (e.g., Darcangelo, 1997; Egozi-Profeta, 1999; Muntz, 1999; Ponder, 1999; Siemsen, 1999; Welsh, 1999; Young et al., 2000; Hartmann et al., 2006; Nassen, 2008). Darcangelo's (1997) dissertation was based primarily on different subtypes of rapists which Wood et al. (2010) failed to account for. Specifically, this particular population has characteristics that relate directly to personality characteristics found in sexual offenders that also may affect Rorschach indices. Since IQ has been determined to result in constricted Rorschach protocols in addition to its effect upon psychopathy assessment, the inclusion of studies (Hartmann et al., 2006; Egozi-Profeta, 1999; Nassen, 2008) that did not assess for IQ likely affected the meta-analytic results. Hartmann et al. (2006) also used college and psychiatric samples as a comparison group in their study, thus failing to account for how ASPD individuals might present on the measure. Therefore, differences in test scores would likely have been a result of incarceration or other criminally related variables.

Methodological Criterion 3: R (number of responses) must be considered. R can act as a moderator, influencing the relationship between Rorschach variables and criterion variables. Research should investigate this hypothesis by controlling R and examining the relationship between Rorschach variables and criterion constructs at different levels of R (e.g., R = 14-17, etc.).

The number of Rorschach responses (R) relates to the stability and reliability of Rorschach variables (Weiner, 1998; Viglione & Meyer, 2008); invalid protocols (R < 14) should

not be interpreted. As Weiner (1998) observed, R < 14 Rorschach protocols typically do not have enough data for adequate retest reliability. Gacono, Meloy, and Bridges (2000) compared psychopaths to sexual homicide perpetrators and pedophiles and found that the two sexually deviant offender groups produced significantly more responses than the psychopathic group. Conversely, lower R has been observed in violent offenders (Keltikangas-Järvinen, 1982), depressed adolescents (Viglione, Brager, & Haller, 1988), and battered women who kill their abusers (Kaser-Boyd, 1993). A careful consideration of R is essential in comparisons of Rorschach scores across demographic and offender groups.

This error was present in 45 percent of studies included in the Wood et al. (2010) meta-analysis. Some of the studies included did not use an acceptable R ($\geq$ 14) or report the range of R scores (Heaven, 1988; Darcangelo, 1997; Egozi-Profeta, 1999; Ponder, 1999; Siemsen, 1999; Welsh, 1999; Hartmann et al., 2006). Hartmann et al. (2006) used six brief protocols, Egozi-Profeta (1999), Siemsen (1999), Welsh (1999), and Ponder (1998) did not report R, whereas Darcangelo (1997) reported the mean and standard deviation of R but no indication was given of the range of R. Further, Heaven (1988) used three protocols that had less than 14 responses. Although it is acknowledged that R<14 protocols were considered acceptable if accompanied by a Lambda below 1.2 in the past (Exner, 1986), the current standard per the Exner Comprehensive System (Exner, 1993) requires 14 or more responses for validity. Therefore, comparisons of studies before and after 1993 should be approached with caution. We note that the importance of R as a moderating variable has been incorporated into the Rorschach Performance Assessment System (R-PAS) scoring system wherein R has been "optimized" during administration of the test—"push for two, pull after three"-to ensure limited variability (http://www.r-pas.org).

Methodological Criterion 4: Response style must be considered (Bannatyne et al., 1999). Variables and styles such as R, Lambda, Extratensiveness, and Introversiveness can impact the production of certain Rorschach variables (Exner, 1995), contributing to seemingly discrepant findings among studies.

Differing complexity of response style has been implicated in a number of clinical populations including violent, sexual, and juvenile offenders in addition to specific clinical populations such as Attention Deficit Hyperactivity Disorder (ADHD), head injury, Alzheimer's disease, and learning disabilities (Viglione, 1999). The number of responses and Lambda are indicators of task engagement (Viglione & Meyer, 2008) and may vary depending upon the offender group and testing situation. For example, particularly cautious groups such as those incarcerated in maximum security institutions or awaiting trial would be expected to provide less task engagement. It is important to consider varying response style when evaluating Rorschach findings. Wood et al. (2010) included studies that failed to take this into consideration and they themselves did not control for response style in their meta-analysis.

Twenty-seven percent of the studies utilized by Wood et al. (2010) committed this error. For example, Darcangelo (1997), Egozi-Profeta (1999), and Ponder (1999) failed to provide information about Lambda, EB, or Form Rorschach indices in their studies. Gacono et al. (2001) noted that the production of some Rorschach variables are constricted by high Lambda and low IQ . The inclusion of these studies and those that did not assess for IQ combined with Wood et al.'s (2010) failure to consider response style raises significant concern about the validity and generalizability of their findings.

Table 1: Conceptual and Methodological Analysis of Wood et al. (2010) Studies per the Gacono et al. (2001) Criteria

	Conceptual					**Methodological**			
Authors (Year)	ASPD/CD and Psychopathy are different constructs	Psychopathy may be conceptualized both in dimensional/categorical terms and applying one vs. the other to PCL-R scores affects research findings	Psychopathy may manifest differently across gender or from to youth to adulthood	Personality testing is only one facet of both psychological assessment and diagnosis	While methodological limitations inherent to certain Rorschach/Psychopathy studies may limit generalizability to findings from other settings, they no way invalidate the compendium of well-designed studies	Studies that treat Psychopathy as a taxon must validate groups with an appropriate measure and use accepted cut-off scores	Studies need to account for limitations such as gender, sexual deviance, concurrent Axis I psychosis, age, IQ, test setting, and legal status	R (number of responses) must be considered	Response style must be considered
Ballard (2006)	✓	C	✓	✓	✓	✓	✓	X	✓
Cunliffe & Gacono (2005)	✓	C	✓	✓	✓	✓	✓	✓	✓
Darcangelo (1997)	✓	D	✓	✓	X	✓	X	X	X
Egozi-Profeta (1999)	✓	D	✓	✓	X	X	X	X	X

Gacono & Meloy (1994)	✓	C	✓	✓	✓	✓	✓	✓	✓
Hartmann et al (2006)	✓	C	✓	✓	X	X	X	X	✓
Muntz (1999)	X	C	✓	✓	X	✓	X	✓	✓
Ponder (1999)	✓	D	X	✓	X	X	X	✓	X
Young et al. (2000)	✓	C	✓	✓	X	✓	X	✓	✓
Smith et al. (1997)	✓	C	✓	✓	✓	✓	✓	✓	✓
Welsh (1999)	✓	C	✓	✓	X	✓	X	X	✓

✓ = Correctly Assessed, **X** = Incorrectly Assessed, **D** = Dimensional, **C** = Categorical

Each study is assessed on the 9 criteria proposed by Gacono et al. (2001). Eleven studies are represented which accounts for the overlap in data amongst studies. For example Ballard (2006) contains the same population as Loving (1998) and Loving and Russell (2000) therefore only Ballard (2006) was placed in the table. This was subsequently performed with other overlapping data sets such as Cunliffe and Gacono (2005), Gacono and Meloy (1994), Young et al. (2000), Smith et al. (1997) and Welsh (1999).

Discussion

We have identified several problems with Wood et al.'s (2010) approach to discussing the Rorschach assessment of psychopathy in their current meta-analysis. These issues have included: the failure to differentiate between poor clinical practice and presumed weakness in the Rorschach, a lack of understanding of how assessment as a multi-method approach works (Erdberg, 2008), overestimating the capabilities of the Rorschach (resulting in unfair comparisons to outcome criteria), and the frequent presentation of inaccurate information which has resulted in multiple misleading and inaccurate conclusions and inferences.

As mentioned previously, the Wood et al. (2010) article is an extension of their previous work (Wood et al., 2000; 2003) which has been criticized on a number of grounds. For example, Gacono et al. (2001) criticized Wood et al. (2000) and suggested that by selecting methodologically flawed studies as the basis for their condemnation of the Rorschach, the authors had in effect contributed to significant misinformation about the instrument and the empirical Rorschach literature as a whole. Martin (2003) challenged the findings of Wood et al. (2003) and suggested that they had engaged in "selective abstraction" as evidenced by their focus upon 70 non peer-reviewed studies in Exner (1986), while systematically ignoring the findings of the 1,793 peer reviewed studies published between 1977 and 1997. Meloy (2005) wrote that Wood et al. (2003) had engaged in confirmatory bias, an important concept that the authors had themselves warned their readers against in a section of their book. Meloy (2005) wrote that it is surprising, if not disconcerting, to find that the authors' findings and conclusions had been marred by bias of this sort and drew particular attention to the importance of ensuring that scientific opinion and conclusions are based in accurate data and verifiable sources of information rather than preconceived judgments and attitudes. Gacono and Evans (2008) reviewed Wood et al. (2003) and noted that the volume had been written by individuals who did not possess expertise in either assessment or the Rorschach. Further, other investigators (Gacono et al., 2008; Martin, 2003) in the Rorschach field and laypeople alike have commented that the title the authors chose for their book, *What's Wrong with the Rorschach?*, was in itself a singular instance of confirmatory bias and a bold assertion on the part of the authors to highlight information critical of the test to the exclusion of studies that would support its use.

Confirmatory bias significantly compromised the current meta-analysis (Wood et al. 2010), since their preconceived ideas and conclusions (Wood et al., 2000; 2003) affected the selection of studies to be included in the meta-analysis, selection of data in support of their ideas, and the conclusions drawn from their findings. Additionally, this bias on the part of Wood et al. (2010) is all the more surprising since many of these authors have written extensively elsewhere about the problems with clinical judgment and bias (Wood, Nezworski, Lilienfeld, & Garb, 2003; Lilienfeld et al., 2003), and one of them (Garb, 1998) published an entire book on the subject. However, rather than an indictment of them as researchers, it reveals how easy it is to fall prey to sources of bias, even for those who carefully highlight the importance of this concern to clinicians and researchers alike.

The Rorschach is not a measure of psychopathy per se, but rather is best used as one of a number of measures in the assessment of individuals identified as psychopathic via the PCL-R (Gacono & Meloy, 2009). Despite Wood et al.'s (2010) oversight and misunderstanding of this important distinction, the authors found significant evidence for a number of Rorschach variables and their relationship to psychopathy: Ag Potential, Sum T, COP=0, Personal Responses, and Reflection Responses. Wood et al. (2010) indicated that they obtained the largest significant differences for Ag Potential—the perception of aggression about to occur (Gacono & Meloy,

1994), and also cited that Ballard (2006) and Hartmann et al. (2006) found a sizeable relationship between psychopathy and Ag Potential. The construct validity of AgPot as a discriminator between psychopathic and nonpsychopathic samples is supported by evidence that male psychopaths are more predatorily violent than nonpsychopathic criminals (Cornell et al., 1995), and a significant and strong relationship between psychopathy and sadism (Raine & Sanmartin, 2001). Both of these relations were theorized in early Rorschach literature (Gacono & Meloy, 1994) and psychopathy theory (Meloy, 1988), and have received subsequent validation (Meloy, in press; Holt et al., 1999). However, as we note, due to conceptual and methodological problems with Wood et al. (2010), these meta-analytic findings should be interpreted with caution.

Another important issue present in the Wood et al. (2010) meta-analysis concerns the high degree of inaccurate statements, careless mistakes, and misinformation. The authors wrote that Gacono and his colleagues used the original Psychopathy Checklist (PCL; Hare, 1980) in some studies and the PCL-R in others and incorrectly cited Gacono (1990), and Gacono and Meloy (1991, 1992) when they asserted that the authors had used the "original version or the revised version of the Hare Psychopathy Checklist" (Wood et al., 2010, p. 337). This statement is incorrect, since the early Gacono studies used a pre-publication edition of the PCL-R and not the PCL. Although Gacono and his colleagues used a prepublication edition of the PCL-R provided by the test's author, no changes were made to the test manual before it was published in its current form in 1991. In addition, Wood et al. (2010) misquoted Meloy and Gacono (2000) by cutting off the last part of their quote which included the word ASPD (selective abstraction) and cited the wrong page number in their article (pg 236 vs. 237). Although misidentifying the PCL-R pre-publication edition as the PCL in the Gacono and Meloy studies may seem to be a minor point and somewhat picayune, the distinction is an important one since the PCL lacks the reliability of the PCL-R and few psychopathy studies have utilized it, thus limiting the generalizability. PCL findings to other studies that utilized the PCL-R including those used in the Wood et al. (2010) meta-analysis.

Wood et al. (2010) cite Meloy and Gacono (2000): "we have validated the use of the Rorschach as a sensitive instrument to discriminate between psychopathic and nonpsychopathic subjects" (p. 337). They conclude from this quote that Meloy and Gacono (2000) contend that the "Rorschach allows a more refined understanding of criminal personality than does the PCL-R" (pg. 337). At no point did Meloy and Gacono (2000) relay the latter message. In fact, they have been careful to clearly delineate the PCL-R as the only truly reliable and valid measure of psychopathy as this quote from Gacono and Meloy (2009) illustrates: "The only published reliable and valid method to date for arriving at a psychopathic 'designation (taxon)' with adult patients is the PCL-R (Hare, 1991, 2003)" (p. 569). Further, Gacono and Meloy (2009) commented extensively on the integration of the PCL-R with other assessment measures in order to gain a better understanding of underlying personality functioning:

> "Combined with findings from the Rorschach (which accesses personality structure and functioning) and the MMPI-2 (which measures conscious self-report of psychopathology and its distortion), these instruments provide both discriminant and convergent data and allow for a more incisive and individualized understanding of antisocial and psychopathic patients" (p. 577).

After misinterpreting Gacono and Meloy's (2009) assertion that the Rorschach may be used to gain a deeper understanding of psychopathy, Wood et al. (2010) stated in their concluding remarks: "It is also possible that the greatest value of the Rorschach in criminal

assessments is not to discriminate psychopaths from nonpsychopaths but to provide a richer picture of personality dynamics" (p. 346). However, when Gacono and Meloy (2009) and Wood et al. (2010) are compared, they come to the same conclusion first advanced by Gacono and Meloy (1994) almost twenty years ago.

Wood et al. (2010) discussed the work of Robert Lindner (1946, 1950) and suggested that Lindner had maintained that the Rorschach could be used to diagnose psychopathy: "Robert Lindner (1946, 1950) author of *Rebel Without a Cause: The Hypnoanalysis of a Criminal Psychopath*, proposed that several distinctive Rorschach responses are diagnostic of psychopathy" (p. 337). However, a review of Lindner's work reveals a much different characterization, since although he was utilizing the Rorschach as a dependent measure to *assess* psychopathic and nonpsychopathic groups, he was not attempting to *diagnose* psychopathy as an independent variable with the Rorschach. Although Lindner (1943; 1946; 1950) was working prior to the advent of the PCL-R (Hare, 1991; 2003), he developed a psychopathic diagnostic checklist of 31 symptoms ("symptom-complex" reflective of psychopathy; Lindner, 1943, 1946) based upon the literature available at the time. As they did with the work of Gacono, Meloy, and others (Gacono, 1990; Gacono & Meloy, 1992, 1994, 2009; Cunliffe & Gacono, 2005, 2008), Wood et al. (2010) mischaracterized the work of Lindner as an attempt to use the Rorschach as a measure of the independent variable, psychopathy. Lindner (1943) actually wrote that "The 'sign' approach, perhaps a technique of value with other disorders, is valueless for psychopathy" (pg. 90). Additionally, Lindner (1943) stressed the notion of dimensionality as important in the assessment of psychopathy and identified five important domains--superficiality, avoidance, explosiveness, incompleteness, and egocentricity—to be considered in the measurement of the syndrome. Lindner (1943) concluded that these five features together "form a constellation basic to psychopathic personality, reflecting through the Rorschach the essence of the disorder" (pg. 92).

The PCL-R and DSM-IV-TR are diagnostic tools, whereas the Rorschach Inkblot Method is an assessment tool to be used as one of a number of measures within a multi-faceted process of assessment toward the designation of a diagnosis. Wood et al. (2010) confuse the separate but related clinical tasks of *assessment* and *diagnosis*. *Webster's 3rd International Dictionary* (1986) defines the word *assess* as "to analyze critically and judge definitively the nature, significance, status or merit of" (p. 131) and *diagnosis* as "the art or act of identifying a disease from its signs and symptoms" (p. 662). Further, *The Standards for Educational and Psychological Testing* (AERA, APA, and NCME, 1999) define *assessment* as "any systematic method of obtaining information from tests and other sources, used to draw inferences about characteristics of people, objects, or programs" (p. 172). The "inference" in this definition is the diagnosis. Additionally, the Standards (1999) define diagnostic and intervention decisions as "decisions based upon inferences derived from psychological test scores as part of an assessment of an individual that lead to placing the individual in one or more categories [diagnosis]" (p. 175). As noted by Gacono (2000):

> "Assessment is a *process* of deduction, selective inquiry, and also inference…rooted in a knowledge of developmental psychology, personality and individual differences, statistics and measurement, with knowledge of limits (e.g. in prediction), cognitive science, ethics, abnormal psychology including dynamics and defenses… Assessment forms the cornerstone of the 'forensic mind-set'---one that is data based, utilizing test data, observation, interviewing, and

> multi-sources of substantiated historical information in forming, testing, and modifying hypotheses… Assessment is a multifaceted, ongoing, interactive process" (p. 194-195).

Therefore, assessment does not equal psychological testing and/or diagnosis but rather, is a multifaceted process of observation of which testing is one of the component parts that forms the basis of diagnostic or taxonomic determinations. The distinction between the two terms is clear: diagnosis is the final taxonomic decision based upon multiple observations or assessments, whereby test scores are most correctly viewed as a component or set of data points to be considered within the overall process of evaluation or assessment. Although often incorrectly viewed as synonymous, the distinction between psychological testing, diagnosis, and assessment is an important one.

Although much has been achieved in the study of psychopathy over the past century, it remains a complex and multi-faceted area of inquiry that requires careful, empirically based consideration in order to guard against sources of bias and mischaracterization of findings measured across multiple populations, settings, and gender. A clear understanding of the construct is a prerequisite for avoiding the type of confusing descriptions evidenced in some of the comments and assertions made by Wood et al. (2010). As delineated above, the PCL-R (Hare, 1991; 2003) has been found to be a robust tool for the assessment of the construct of psychopathy. The measure is a semi-structured interview whereby individuals are rated across 20 items, on a three point ordinal scale based upon a detailed record review followed by a clinical interview. A core tenet of psychological testing is the advent of structured procedure in order to enhance reliability, particularly in the case of interview data. Therefore, in order to use the PCL-R reliably and competently, significant knowledge and training in psychopathy is necessary, in addition to training and knowledge of psychological testing.

It is a core truth of psychometric theory and scientific methodology that in order for comparisons to be made across samples and findings, a strict adherence to procedures outlined in a test's manual is of paramount importance (Allen & Yen, 2001; McDonald, 1999; DeVellis, 2003). In many instances, studies included in the Wood et al. (2010) analysis (i.e. Darcangelo, 1997, Egozi-Profeta, 1999), the procedure delineated by Hare (1991, 2003) was not followed. For example, in the Egozi-Profeta's (1999) dissertation, a record review was performed after the interview. The use of the measure in this fashion causes significant problems since a central dimension of the psychopathy construct is manipulative and deceitful behavior. Although expedient for those administering the PCL-R, the effect of this incorrect method is likely to reduce or possibly inflate PCL-R scores. As identified on numerous occasions by Garb (1998) in his influential book, *Studying the Clinician: Judgment Research and Psychological Assessment*, clinical judgment is a central problem in the accuracy and validity of interview data as evidenced by the need for standardized procedures to increase reliability. It appears that Wood et al. (2010) did not consider the importance of selecting studies that had administered the PCL-R appropriately. Specifically, 7 of 11 (64%) studies contained within the meta-analysis did not identify the level of training for individuals conducting the PCL-R. In their analysis, Wood et al. (2010) were careful to highlight this disparity across training levels of investigators conducting the individual studies. However, they elected to include them despite their concerns about the adequacy of the training these investigators received, or if they were, in fact, competent to be using the measure (similar concerns were found for training in the Rorschach as well). The authors were also critical of doctoral-student raters in the PCL-R data and the preponderance of

non-peer reviewed dissertations in the psychopathy/Rorschach literature, yet used many of them [73% of Wood et al. (2010) studies] as the basis of their meta-analysis.

Reliability of assessment forms the basis of ethical and competent test use and interpretation, since a measurement that is lacking in reliability must, by definition, also be invalid (DeVellis, 2003). Of the 11 Rorschach studies included in the meta-analysis, 4 did not include an assessment of inter-rater agreement (Gacono & Meloy, 1994; Egozi-Profeta, 1999; Welsh, 1999; Young et al., 2000), 4 used a percent agreement method (Muntz, 1999; Ponder, 1999; Smith et al., 1997; Cunliffe & Gacono, 2005), 2 (Darcangelo, 1999; Hartmann et al., 2006) used intra-class correlations, and 1 (Ballard, 2006) used Cohen's kappa. The preferred method of inter-rater reliability with the Rorschach is Cohen's kappa (Cohen, 1968) for categorical comparisons (Uebersax, 1987). However, it is unclear how Wood et al. (2010) compared the results across these different methods of inter-rater reliability assessment, and it appears that they deemed these methods as equivalent despite their previous criticism of percent agreement, which was based on their faulty presentation of how percent agreement is actually calculated (Wood et al., 2003). Moreover, 5 of 11 (45%) of the studies used in the Wood et al. (2010) meta-analysis did not report inter-rater reliability with the PCL-R (Gacono & Meloy, 1994; Egozi-Profeta, 1999; Welsh, 1999; Young et al., 2000; Hartmann et al., 2006).

Finally, the application of statistical procedures in the analysis of Rorschach findings was a significant problem in a number of studies (i.e. Egozi-Profeta, 1999; Nassen, 1999). Specifically, the majority of Rorschach variables need to be analyzed with non-parametric statistics since comparisons across intervals of data points are not normal (equally distributed). In some cases, the variables are ratios varying from zero; and in others, the variables vary above cut scores. However, in the present analysis, Wood et al. (2010) did not appear to appreciate the nature of the variables and how they might vary. The inappropriate use of statistical procedures to evaluate research findings in a number of the individual studies significantly affect the results of the meta-analysis and further, the results reported within these individual investigations should not be taken as indicative of a problem with the measure, but rather may vary as a function of the error present within inadequately designed and implemented studies.

If the adolescent, psychotic, and female samples are removed-- since it is incorrect to assume that the construct of psychopathy is uniform across these very different samples-- the number of studies to be considered in the meta-analysis is reduced to 5 different samples (Gacono & Meloy, 1994; N =82; Darcangelo, 1997; N = 40; Egozi-Profeta, 1999; N = 44; Hartmann et al., 2006; N = 40; Nassen, 2008; N = 97) with a total N of 303 participants. Although there is no consistently agreed upon minimum number of studies for inclusion in a meta-analysis identified in the literature, an N of 5 is unlikely to yield reliable results. Meta-analyses with small sample sizes are likely to yield unstable estimates (Borenstein et al., 2009; Hunter & Schmidt, 2004) and vary as a function of the representativeness of the samples selected. Secondly, the outcome of a meta-analysis is directly linked to the reliability and validity of the individual studies on which it is based (Hunter & Schmidt, 2004). As pointed out by Wood et al. (2010), the problem of unstable estimates was a significant problem with a number of specific Rorschach variables (COP, AgPast, AgPotential, and AgContent) and it was acknowledged that these estimates of effect size for the aggression factor scores were calculated from 2 studies. Although a detailed analysis of Wood et al.'s (2010) meta-analytic methodology is beyond the scope of our article, significant problems exist: small number of studies, low number of total participants (N=303; after recalculation to control for duplication and sample bias), poor selection of studies, and the absence of a power analysis whereby the variance in

effect size across studies is compared. This is particularly important since the number of effects and related analyses contained within this meta-analysis require more power than is present given the low number of studies and participants.

As previously outlined, the Wood et al (2010) meta-analysis is not based upon a large enough study pool (k), particularly when the inappropriate studies are removed. If studies with non-psychotic male psychopaths (adolescent, female, and psychopathic samples removed due to differences in the independent variable, psychopathy, across groups) are considered in isolation, differences between these studies and the values presented by Wood et al. (2010) emerge. Although the validity of a comparison of the Wood et al. (2010) studies and our amended list of 5 samples cannot be considered robust given the small number of samples, some interesting results were found. We recalculated the mean validity coefficients for the 18 nondichotomous Rorschach variables assessed by Wood et al (2010) across the aforementioned 5 samples. We set a criterion of a minimum value of k=3 (none of the variables were based upon k > 3) for comparison. Of the 18 variables, only 8 possessed a large enough k value (Sum Y, Reflections, AG, AG Past, AG Pot, Sum T, CF, and PER; see table 1) to be included, 3 had a value of k=2, and 8 had a value of k=1 . With the exception of AG Past, the mean coefficient values for all the variables considered increased; most notably PER, Reflections, and Sum T in which large differences were observed. Although the k value of 3 is questionable as the basis for reliable interpretation, it does suggest that amalgamating psychopathy samples without considering age, gender, and diagnosis does produce different results. Further, it is possible that a greater k value across other variables may have produced disparate results as well.

Table 2

Mean Validity Coefficients of Nondichotomous Rorschach Variables

Rorschach Nondichotomous Variable	Wood et al. (2010) *N*=11	Corrected Sample (Male Psychopaths) *N*=5
Sum Y	.064	.094
Reflections	.066	.171
AG	-.059	-.025
AG Past	.239	.219
AG Pot	.232	.233
AG Cont	.087	.097
Sum T	.159	.300

PER	.115	.242

However, the results of the Wood et al. (2010) meta-analysis are problematic for a much more mundane reason. If the methodology of the remaining studies selected by Wood et al. (2010) is further evaluated (see Table 1) as we suggest in the present article, the number of appropriate samples is reduced to 1 (Gacono & Meloy, 1994) with a total N of 82. Obviously, a meta-analysis based upon one sample is inappropriate and not a meta-analysis at all but rather a review of previous work.

Hunter & Schmidt (2004) outlined the necessary components of a meta-analytic study: author, date, sample size, standardized effect score, subject characteristics, diagnostic conditions (scope, duration, severity), strength of study design, and individual study methodological concerns. In the case of missing information about the respective studies to be used in a meta-analysis, the authors highlighted the need to make attempts to contact original authors to ensure the completeness of the study descriptions in order to give the reader a full understanding of the characteristics and strengths/weaknesses of the studies selected. Wood et al. (2010) did not report a number of the descriptors identified by Hunter & Schmidt (2004; standardized effect score, diagnostic conditions, strength/weakness of study design, and individual study methodological concerns) and did not contact any of the three senior authors of the present article (T. Cunliffe., C. B. Gacono, and J. Meloy) who were frequently cited within the meta-analysis. Although reliability is a reflection of the degree to which variation in a phenomenon may be attributed to true score, validity is related to the meaning of the test scores and findings. Validity forms the basis of Hunter and Schmidt's (2004) comments concerning the importance of ensuring that reliable, valid, and methodologically sound studies are selected for inclusion in a meta-analysis. Although the results reported by Wood et al. (2010) appear mathematically sound (equations used as intended), the issue lies in the validity (i.e. meaning) of the application of these techniques to methodologically flawed studies as was done by the authors of this meta-analysis.

Summary and Conclusions

Significant conceptual and methodological concerns with the present meta-analysis limit the findings. First, Wood et al. (2010) appeared to consider diagnosis and assessment as synonymous terms, which they are not. Second, the authors attempted to incorrectly compare studies across multiple populations including adult females, adult males, adolescents, and severely mentally ill as though the construct of psychopathy was uniform across these different populations. Third, the authors did not appreciate the importance of dimensional versus categorical interpretations of psychopathy scores, nor eliminate studies in which a cut-score below 30 (following the convention originally adopted by Hare in 1991 and widely held as the standard in psychopathy research of primary psychopathy) as indicative of the taxonomic category of psychopathy. Finally, the authors mischaracterized the PCL-R and Rorschach findings and engaged in confirmatory bias, evidenced by their poor selection of studies and written statements within the text of their article.

Although the goal of assessing Rorschach findings within psychopathic populations is very commendable and worthy of investigation, an analysis of this sort appears to be premature given the low number of well designed, methodologically sound studies combining the PCL-R and Rorschach. As delineated above, many of the studies selected for this meta-analysis contained a number of conceptual and methodological errors (see Table 1) which limited the

power and validity of the results reported by Wood et al. (2010). This also clearly highlights the necessity of well designed studies that include the following components: 1) adequate training, administration, and interpretation of both the PCL-R and the Rorschach, 2) appropriate PCL-R cut scores for categorical assessment or adequate Ns if a dimensional perspective is to be used, 3) clear delineation between ASPD and psychopathy, 4) non-parametric analyses for most Rorschach variables, 5) appropriate sample comparisons, 6) clear operationalization of constructs to be evaluated, 7) careful study selection for inclusions in the meta-analysis, 8) adequate reporting of individual study characteristics, and 9) unwillingness to conduct a meta-analysis if number of acceptable studies is insufficient.

The march of science is long and arduous, and sound research designs applied to sufficiently large, homogeneous, and independent samples by different researchers are mandatory before a null hypothesis is accepted as the truth. In our view, the suggestion by Wood and his colleagues it is not supported by their investigations or data. It is clear that although balanced analysis of the reliability and validity of any test is warranted, methodological problems inherent in many of the studies in the psychopathy/Rorschach literature limit the ability to definitively assess the test's reliability and validity in relation to the psychopathy construct.

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