



Use of the Personality Assessment Inventory (PAI) in Forensic and Correctional Settings: Evidence for Concurrent Validity

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Abstract

The Personality Assessment Inventory (PAI; Morey, 1991) is a relatively new personality assessment showing much promise in forensic and correctional settings. The present review examines correlations and effect sizes from a list of studies ($n = 17$) utilizing the PAI in these areas in order to provide concurrent validity with other psychological measures in the categories of (1) mental and personality disorders, (2) psychopathy, (3) violence potential, (4) suicide potential, and (5) feigning, malingering, or defensiveness. The study indicated that the PAI does evidence moderate correlations in forensic and correctional settings, as well as demonstrate significant concurrent validity with a number of measures currently used in these areas. The PAI appears to have promise as a measure of personality functioning in the forensic and correctional domains.

Keywords: PAI; Forensic; Prison; Correction

INTRODUCTION

Early research on personality and criminal behavior used a variety of methods, and particularly the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1940) was being used in a number of settings by the 1960s, including corrections. In 1989, the MMPI-2 (Hathaway & McKinley, 1989) was published to make amends for the conceptual and psychometric problems facing the original MMPI (as the fields of psychopathology and personality theory advanced). Since then, numerous studies have shown a significant difference between offender personalities and various comparison groups, with the overwhelming majority of studies utilizing the MMPI or one of its versions (e.g., Quinsey, Arnold, & Pruesse, 1980; Goeke, Tosi, & Eshbaugh, 1993; Megargee, Mercer, & Carbonell, 1999; Osberg &

Harrigan, 1999). More recently, however, there has been increased use of other instruments, including the Personality Assessment Inventory (PAI, Morey, 1991). Studies have also employed the California Personality Inventory (CPI) (Baxter, Motiuk, & Fortin, 1995), the Antisocial Personality Questionnaire (APQ) (Blackburn & Fawcett, 1999a,b), the Million Clinical Multiaxial Inventory (MCMI) (Chantry & Craig, 1994; Blackburn, 1996), the Multidimensional Personality Questionnaire (MPQ) (Krueger, Schmutte, Caspi, Moffitt, Campbell, & Silva, 1994), and of course the PAI (Morey, 1991).

Forensic and correctional settings now use personality tests for a variety of reasons. There are three broad forensic areas that utilize assessments: (1) competence; (2) criminal responsibility; and (3)

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risk assessment. Within each area, more narrowly focused questions can be answered, such as testing for competency to stand trial or to represent themselves, aiding in diagnosing and providing appropriate treatment, classifying inmates within correctional institutions, and assessing future behavior. The court system uses personality tests to evaluate psychopathological conditions such as schizophrenia or bipolar disorder that may have affected an individual's behavior at the time of the offense. It may also be able to identify those who are faking a disorder to support an insanity plea. Correctional facilities and other criminal justice departments, such as parole and sex offender assessment boards, use personality assessments to determine violence and suicide potential, treatment probability, and the likelihood of recidivism (Edens, Cruise, & Buffington-Vollum, 2001).

Over the last decade, the PAI has been gaining popularity as an assessment that can address these issues. Two of the major reasons it is showing promise over the MMPI are that it is shorter than the MMPI-2 (344 items compared to 567 items) and the PAI requires only a fourth grade reading level. As many inmates have a low education and literacy level, a fourth grade reading level makes the PAI more comprehensible for a greater number of offenders. Also, the PAI's Antisocial and Aggression scales add to its popularity since these are two key areas of concern in forensics. However, the PAI is still a relative infant in the field of personality research, particularly within corrections, and although it shows immense potential as a notable rival to the revered MMPI, there is still much exploration to be done on the matter.

*The Personality Assessment Inventory:
Development of the PAI.*

The test contains 344 items comprising 22 nonoverlapping full scales that cover the criteria: (1) the stability and importance within the conceptualization and nosology of a mental disorder; and (2) the significance in contemporary clinical practice (Morey, 1991, 1998). The reliability of the PAI was determined by examining internal consistency and test-retest stability. Internal consistency reliability was established in terms of coefficient alpha with median alphas for the full scales of .81, .82, and .86 for the normative, college, and clinical samples, respectively (Morey, 1991, p. 85). The mean interitem correlations were

also calculated for each of the sample populations. Because most of the constructs measured by the PAI are fairly broad, interitem correlations that are too high may "actually limit the validity of a measure of broad construct" (Morey, 1991, p. 85). Therefore, according to Morey (1991), the interitem correlations roughly around .20 indicate that the "items tap reasonably independent content" and the higher correlations for the subscales, as compared to the full scales, "is expected because the subscales provide a more focused assessment of a specific domain of behavior" (Morey, 1991, p. 85).

Test-retest reliability correlations for a 4-week interval were calculated to be .86 for the 11 full clinical scales with a 95% confidence interval of +/- 6 to 8 *T*-score points (Morey, 1998). Because the PAI is a relatively new assessment instrument, there are few studies that address the reliability with more severe clinical samples. The most critical review of Morey's statistical findings is that of Boyle and Lennon (1994) whose study included 151 normal subjects, 30 subjects diagnosed as alcoholics, and 30 patients with schizophrenia from Australia. Their median test-retest reliability coefficient was .73 and although they state that "the reliability of the PAI is about as claimed in the Professional Manual", they expect the coefficients to be .80 or higher since no treatment occurred between the two testing occasions (p. 181). However, they also state that their sample of patients with alcohol dependence and schizophrenia may have been undergoing withdrawal or taking antipsychotic medications that would possibly affect their scores. Their alpha coefficients "were mostly quite high", with a median of .83, which suggests "the possibility of rather narrow scales, with excessive item redundancy" (p. 182). However, Morey's alpha coefficients were just as high and he claims this indicates that the PAI items for the same scale indicate the same construct (Morey, 1991, p. 85).

A study by Boone (1998) of 111 psychiatric inpatients supported Morey's internal consistency reliability findings. Boone also states that "on the basis of their internal consistency reliability, standard error of measurement, and confidence interval, the PAI full scales and the constructs they represent can be interpreted with some assurance" (1998, p. 843).

Morey (1998) does not use, or encourage the use of, two-point codes such as those used by the MMPI

because they do not take into consideration the uniqueness of the other underlying subscales. He also suggests useful sources of information when making a diagnosis from the PAI to include the diagnostic group mean profiles (which will be discussed below), actuarial functions, and DSM-IV criteria.

Summary

The development and introduction of the PAI shows much promise and many advantages over its counterpart, the MMPI-2. It is logically structured, clearly designed, easy for subjects to complete and examiners to score, offers straight-forward interpretation, and most importantly, it is based on contemporary issues and psychopathology (White, 1993). However, because it is such a new assessment instrument, there is still much research that needs to be done to verify Morey's findings and to bring it up to the level of acceptance given the MMPI-2 in any field of study.

METHOD

This study was a comprehensive analysis of studies and journal articles with reference to the PAI within forensic and correctional settings. In an extensive search of PsychInfo, ProQuest Direct, and the National Criminal Justice Reference Service (NCJRS), twenty-four studies were found that included the keywords of "forensic", "correctional", "prison", "inmate", "offender", or "criminal" along with "Personality Assessment Inventory" or "PAI". The only exclusionary criterion was that there had to be empirical data to analyze from the study, which excluded two articles that were solely reviews of the PAI and offered no additional quantitative findings.

Categories

Although all of the studies involved are relevant to the forensic or correctional field, they could be categorized in one or more of the five following areas: mental or personality disorders, psychopathy, violence potential, suicide potential, and feigning, malingering, or defensiveness. The groups were determined by reviewing each article and identifying the focus of the study based on the key constructs and scales it measured. After tabulating the focus of each study, the above categories were generated. For example, the studies that examined psychological disturbance, anxiety disorders, personality disorders and major mental disorders

were categorized into the mental and personality disorders area. Studies assessing psychopathic personality traits were categorized as psychopathy. Included in the psychopathy category were studies that used any measures of antisocial personality since this is a key marker in psychopathy. Studies that addressed violence and aggression in inmates were categorized as violence potential and those that concentrate on suicidal risk were categorized as suicide potential. Finally, those studies evaluating defensiveness, feigning, malingering, positive dissimulation, and negative impression were categorized into the feigning, malingering, or defensiveness area.

Participants

While the majority of the articles' subjects were male inmates, three studies solely involved female inmates (Salekin, Rogers, Ustad, & Sewell, 1998; Salekin, Rogers, & Sewell, 1997; Smith, 1994) and one study involved juvenile offenders (Hoekstra, 2000). One study (Fals-Stewart & Lucente, 1997) involved both men and women with the majority (76%) of the participants being men. Nine of the studies include male offenders with mental health issues (Atkins, 1999; Douglas, Hart, & Kropp, 2001; Dunham, 2001; Edens, Hart, Johnson, Johnson, & Olver, 2000; Rogers, Sewell, Cruise, Wang, & Ustad, 1998; Rogers, Ustad, & Salekin, 1998; Wang, 1998; Wang & Diamond, 1999; Wang, Rogers, Giles, Diamond, Herrington-Wang, & Taylor, 1997), two include sex offenders (Edens et al., 2000; Edens, et al., 2000), one includes suspected drug and alcohol users in the criminal system (Fals-Stewart & Lucente, 1997), and one includes the scores of death row inmates relevant to competency to represent themselves in court (Cunningham & Vigen, 1999). Five studies evaluated the validity of the PAI in the correctional and forensic areas (Atkins, 1999; Cashel, 1994; Douglas, et al., 2001; Rogers, Ustad & Salekin, 1998; Salekin, et al., 1997).

Other Measures

Several measures were used in comparison with the PAI; the Barrett Impulsiveness Scale (BIS; Barratt, 1994), the Bus-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992), the Overt Aggression Scale (OAS; Yudofsky, Silver, Jackson, Endicott, & Williams, 1986), the Hare Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995), the Hare Psychopathy Checklist - Revised (PCL-R; Hare, 1991), the Personality

Disorder Examination (PDE; Loranger, 1988), the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), the Referral Decision Scale (RDS; Teplin & Swartz, 1989), the Schedule of Affective Disorders and Schizophrenia (SADS; Spitzer & Endicott, 1978a), the Schedule of Affective Disorders and Schizophrenia--Change Version (SADS-C; Spitzer & Endicott, 1978b), the Structured Interview of Reported Symptoms (SIRS; Rogers, Bagby, & Dickens, 1992), and the Suicide Probability Scale (SPS; Cull & Gill, 1982). Many studies also used recidivism rates and the respective institutions' disciplinary reports in comparison with PAI scores.

Procedures

The current study offers an all-inclusive look at published journal articles and studies that involved the PAI and criminal offenders since the PAI's introduction. A quantitative analysis was conducted by calculating a correlation coefficient (r ; Kazdin, 1998) and effect size (ES; Kazdin, 1998) for each

study with each variable concurrently evaluated. The use of these two statistical measures was chosen because they quantify the strength of the association between two variables and present the magnitude of the relationship, regardless of statistical significance. Although many of the studies compared assessments that test similar constructs, and therefore theoretically should demonstrate relatively high ES and r scores, some studies measured the relationship between different constructs such as recidivism and aggression where a smaller ES and r findings may still be clinically significant (Meyer, Finn, Eyde, Kay, Moreland, Dies, Eisman, Kubiszyn, & Reed, 2001). This study will utilize Kazdin's (1998, p. 361) classification of small, medium, and large effect sizes representing .20, .50, and .80, respectively. The formulas found in Table 1, as found in Kazdin (1998), were used for the calculations. For those studies and articles where computing a correlation and effect size was mathematically impossible, a qualitative analysis of the information is presented.

Table 1
Formulas used to Calculate Effect Size and Correlations

$$ES = \sqrt{\frac{2t}{df}}$$

$$r = \sqrt{\frac{t}{t + df}}$$

$$r = \sqrt{\frac{X^2(1)}{N}}$$

$$ES = \sqrt{1 - r^2}$$

Note. ES = effect size; t = t statistic; r = correlation coefficient; df = degrees of freedom; X^2 = chi square; N = sample size.

Note. From *Research Design in Clinical Psychology* (3rd ed.) (p. 378), by A. E. Kazdin, 1998, Needham Heights, MA: Allyn & Bacon. Copyright 1998 by Allyn & Bacon.

In addition to calculating the ES and r scores for each comparison, a grand mean ES and r score was calculated for several conditions including the

categories listed above, population, other measures used, each PAI scale and subscale measured, recidivism, and disciplinary infractions.

Reliability

After an initial analysis was performed, a second rater was used to substantiate the coding of each data point into one of the five categories (mental and personality disorders, psychopathy, violence potential, suicide potential, and feigning, malingering, and defensiveness). The second examiner held a Master's degree in Psychology and was trained prior to coding a random sample of the data outcome. The second examiner performed a blind coding of a random 10% ($n = 56$) of the 557 points of data outcome. The percentage was determined by dividing the number of agreements by the total number of data points examined, multiplied by 100. Level of agreement by the second rater was determined to be 93%.

Hypothesis

The questions this review attempted to answer were: (1) is the PAI a valid instrument for use in correctional and forensic settings? (2) how well does the PAI test for the following as compared to other available assessments: mental and personality disorders, psychopathy, violence potential, suicide potential, and feigning, malingering, or defensiveness? This researcher's hypothesis was that the PAI will demonstrate significant concurrent validity in the forensic arena with other measures of similar constructs, and it may also prove to be more useful and efficient because of its wide range of applicability. If this is the case, one practical application is that it would not only limit the amount of time an inmate has to spend during the correctional intake process (where individuals may be resistant to begin with), but it could also save the institution time and money by not having to pay for a variety of assessments and the staff to administer and evaluate them.

RESULTS

In order to calculate ES and r scores, each point of data (including correlation coefficients, t and Z scores, and effect sizes) in the studies that used a PAI scale or subscale in comparison was pulled and added to the outcome. During this procedure, there were seven studies that were ultimately thrown out because the data included in those studies did not lend to the calculation of an ES and r score (Carriere, 1994; Cunningham & Vigen, 1999; Dunham, 2001; Reinhardt & Rogers, 1998; Rogers, Sewell, Cruise, Wang, & Ustad, 1998; Smith, 1994; and Wang & Diamond, 1999). The studies by

Carriere (1994) and Smith (1994) were not used because although they both used the PAI with offenders, they tested the effects of a group process rather than of the PAI itself. The study by Reinhardt and Rogers (1998) could not be used because the data produced were a culmination of the PAI, the Structured Clinical Interview of DAM-III-R Disorders (SCID), and the State-Trait Anxiety Inventory (STAI) to measure anxiety and phobia levels of first-time versus multiple-time inmates. The data obtained from the PAI itself were not specified in the study. Results from the Rogers, et al. (1998) study used archival data from Rogers, Ustad, and Salekin (1998) and Wang, et al. (1997), both of which are currently included in this review, therefore this study was also not included here. Consequently, there are three studies (Cunningham & Vigen, 1999; Dunham, 2001; and Wang & Diamond, 1999) that will be discussed qualitatively in the discussion section of this review. Of the remaining eighteen studies, there were 557 comparisons for which an ES and r score was calculated and are reported in the Table 2. For purposes of this study, effect sizes of .20, .50, and .80 are considered small, medium, and large, respectively (Kazdin, 1998, p. 361).

Categories

Each comparison was coded into one of the five main categories: (1) mental and personality disorders; (2) psychopathy; (3) violence; (4) suicide; and (5) feigning, malingering, and defensiveness. The outcome data were then sorted according to these categories and a grand mean ES and r score was calculated by adding all the individual ES and r scores for each category and dividing by the number of entries for the respective category. Based on this coding procedure, it was determined that there were 142 points of comparisons for the mental and personality disorders category. This category showed the largest correlation with the PAI with a calculated r score of .34 and an effect size of .72.

For each of the categories of psychopathy and violence there were 136 comparisons and the category of suicide had 50 comparison points. Each of these three categories produced a medium strength correlation and effect size. The final category of feigning, malingering, and defensiveness had 93 comparisons and a relatively small effect size of .28 was calculated for this category. There were six comparisons that could not be classified into one of the five categories

because they assessed the validity of the PAI as a whole. All of the r scores and effect sizes for the five categories are shown in Table 3.

Table 2
Correlations and Effect Sizes For Other Categories

Category	r	ES	N
Overall (Includes All Studies)	.26	.539	557
Mental and Personality Disorders	.29	.606	149
Psychopathy	.32	.670	145
Violence Potential	.25	.516	110
Suicide Potential	.28	.583	51
Feigning, Malingering, and Defensiveness	.13	.262	96
Convergent Validity	.47	1.065	3
Discriminant Validity	.34	.723	3
Males (Total)	.23	.473	441
Males (Psychiatric)	.28	.583	218
Males (Sex Offenders)	.35	.747	9
Females	.38	.822	106
Juveniles	.18	.366	5
Recidivism	.25	.516	7
Grade Completed	-.13	-.262	6
Any Disciplinary Infractions (Prison Reports)	.43	.953	3
Physical Aggression (Prison Reports)	.11	.221	9
Verbal Aggression (Prison Reports)	.18	.366	13
Non Aggressive (Prison Reports)	.33	.699	3
Violent Vs. Nonviolent Inmates	.16	.324	5
Suicide Gestures	.20	.408	18
Suicide Risk Assessments	.18	.366	18

Table 3
Correlations and Effect Sizes for PAI Scales

Scale	<i>r</i>	ES	N
Inconsistency (ICN)	.03	.060	19
Infrequency (INF)	.02	.040	19
Negative Impression (NIM)	.45	1.008	24
Positive Impression (PIM)	-.25	-.516	20
Somatic Complaints (SOM)	-.18	-.366	2
Anxiety (ANX)	.18	.366	14
Anxiety-Related Disorders (ARD)	.18	.366	9
Depression (DEP)	.31	.647	22
Mania (MAN)	.36	.772	22
Paranoia (PAR)	.33	.699	24
Schizophrenia (SCZ)	.34	.723	20
Borderline Features (BOR)	.29	.606	24
Antisocial Features (ANT)	.32	.670	168
Alcohol Problems (ALC)	.55	1.317	3
Drug Problems (DRG)	.49	1.124	3
Aggression (AGG)	.28	.583	75
Suicidal Ideation (SUI)	.44	.980	16
Stress (STR)	.18	.366	5
Nonsupport (NON)	.21	.430	3
Treatment Rejection (RXR)	.17	.345	6
Dominance (DOM)	.25	.516	6
Warmth (WRM)	-.20	-.408	6

An overall ES and r score was calculated for the PAI using all the outcome data. This overall effect size was .54 with an r score of .26. Also noted in Table 3 are the grand mean correlations and effect sizes for other categories such as convergent and discriminant validity, recidivism, prison disciplinary reports, and suicidal tendencies. The effect sizes for convergent and discriminant validity were 1.07 and .72 with r scores of .47 and .34, respectively. The correlation between the PAI and recidivism was calculated to be .25 with a medium effect size of .52. An interesting comparison is the inverse correlation between the PAI AGG and ANT scales and grade completed by the inmate with an r score of -.13 and an effect size of -.26. Also producing an inverse correlation with the AGG and ANT scales was the inmate's age at the time of the offense ($r = -.24$, $ES = -.49$). These correlations suggest that the younger, less educated inmates are more likely to be aggressive and exhibit antisocial tendencies.

The correlations for disciplinary reports were broken down to any disciplinary infractions, physical aggression, verbal aggression, and non aggressive infractions with effect sizes of .95, .22, .37, and .70, respectively. Also, the correlation and effect size of violent versus nonviolent prison inmates was calculated to be .16 and .32, respectively. Suicidal tendencies were also broken down into suicidal gestures ($r = .20$, $ES = .41$) and suicide risk assessments ($r = .18$, $ES = .37$).

Correlations with the various populations used in the outcome studies were also calculated. The populations were broken down into total studies using males ($r = .23$, $ES = .47$), male sex offenders ($r = .35$, $ES = .75$), males in psychiatric forensic settings ($r = .26$, $ES = .58$), females ($r = .38$, $ES = .82$), and juveniles ($r = .18$, $ES = .37$). Studies with female inmates showed the highest effect size however, there were only two studies that utilized the female prison population. The one study that examined the PAI with juveniles had the lowest effect size, which is not surprising since the PAI is not designed for use with people under eighteen years old.

PAI Scales

The outcome data were also sorted according to the PAI scale used in the comparisons and grand mean ES and r scores were calculated for each scale. The grand mean was also calculated for all twenty-two

of the PAI scales, with an r score of .22 and an effect size of .45. The r scores for each PAI scale ranged from -.20 on Warmth (WRM) to .55 on Alcohol Problems (ALC). In addition to the Warmth scale, there were two other scales that had negative correlations, Positive Impression (PIM; $r = -.25$) and Somatic Complaints (SOM; $r = -.18$). These data are not terribly surprising as it is not expected that prison inmates would characteristically show a lot of warmth or that they are trying to make a positive impression, especially if they know the assessment is not going to be used in court proceedings. Also not surprising is that DRG and ALC are the two highest correlations, .49 ($ES = 1.12$) and .55 ($ES = 1.32$), respectively, as the majority of people incarcerated also have problems with drugs and alcohol. The grand mean r scores were also calculated for the Rogers Discriminant Function (RDF; $r = .09$, $ES = .18$), Suicide Potential Index (SPI; $r = .24$, $ES = .49$), Malingering Index (MAL; $r = .38$, $ES = .82$), and Mean Clinical Elevation (MCE; $r = .30$, $ES = .63$).

Other Measures

The outcome data were sorted again according to the other measures used in comparison with the PAI and r scores ranged from a meager .02 with the PPI to .68 with the SPS scale. Effect sizes were also calculated and both are reported in Table 4 for each measure. Most of these other measures were coded into two or more of the five main categories, depending on the PAI scale and construct they measured. In order to gain a better understanding of how each measure compares to the PAI in the five categories -- mental and personality disorders, psychopathy, violence potential, suicide potential, and feigning, malingering, or defensiveness -- the data were first sorted according to category and then by the other measure used in the comparison. Within each category, the average r score was calculated for each measure. This step was done in an attempt to clarify the data so the hypothesis of how well the PAI tests for these categories compared to the available assessments could be answered more accurately. The results of these calculations can be found in Table 4. Interestingly enough, many of the calculations only involved one study when broken down to comparing category and other measure, a clear area for possible future research.

For the category of mental and personality disorders, the PAI correlated moderately with many

of the other measures. The correlations between the PAI and the PDE, SADS, SADS-C, and SIRS are of particular interest since these assessments measure the constructs included in this category.

Table 4
Correlations and Effect Sizes for Other Measures

Measure	<i>r</i>	ES	N
PCL-R Factor 2	.43	.953	6
PCL-SV Total	.18	.366	29
PCL-SV Factor 1	.07	.140	4
PCL-SV Factor 2	.21	.430	4
PDE (including subscales)	.44	.980	25
PPI (including subscales)	.02	.040	12
RDS (including subscales)	.28	.583	15
SADS (including subscales)	.34	.723	31
SADS-C (including subscales)	.17	.345	15
SIRS (including subscales)	.09	.181	96
SPS (including subscales)	.68	1.855	2

The correlation with the PDE was the highest with a calculated *r* score of .40 and an effect size of .87. The SADS also correlated highly (*r* = .33, ES = .70), but the SADS-C showed only a modest correlation (*r* = .18, ES = .37). The SIRS produced the lowest, but still significant, correlation with a calculated *r* score of .17 and an effect size of .35. A notable value is the correlation with the PPI in this category. Overall, the correlation is -.23. However, when we separate out the PPI-Stress Immunity scale, a strong inverse correlation is found between this scale and the PAI scales of ANX, ARD, DEP, SOM, and STR, which is expected since someone showing resistance to stressful conditions would not likely have an elevated score on these PAI scales.

The category of psychopathy showed some impressive correlations, particularly with the PPI (*r* = .53, ES = 1.25). With regards to the Psychopathy

Checklists, the PCL-R and PCL-SV both correlated moderately with calculated *r* scores of .28 (ES = .58) and .23 (ES = .47), respectively. Factor 1 and Factor 2 of the PCL-R also correlated quite highly with *r* scores of .36 (ES = .77) and .52 (ES = 1.22),

respectively. The PCL-SV Factors 1 and 2 however, did not score so highly with Factor 1 having a slight correlation of .07 (ES = .14) and Factor 2 proving a bit stronger with a correlation of .21 (ES = .43). The PAI also correlated favorably with the BIS (*r* = .27, ES = .56), BPAQ (*r* = .32, ES = .67), and the PDE (*r* = .47, ES = 1.07), all of which would include qualities found in the psychopathy category. Somewhat surprising was the small correlation with the diagnosis of antisocial personality disorder (*r* = .16, ES = .32), but that could be due to the small number of data points (*n* = 4) available.

The correlations for the category of violence potential ranged from moderate to high. The highest correlation was with the BPAQ ($r = .48$, $ES = 1.09$), followed by the BIS ($r = .31$, $ES = .65$), and finally the OAS ($r = .21$, $ES = .43$).

Not surprisingly, the SPS and the SADS showed strong correlations with the PAI in the suicide potential category. The r score and effect size for the SPS was calculated to be .68 and 1.86, respectively, although there were only two data points available for this calculation. The SADS had only one data point that was categorized in this area and the r score was calculated to be .63 ($ES = 1.62$). The SADS-C had three data points to calculate from but had a lower correlation than its counterpart ($r = .12$, $ES = .24$). The PAI also correlated moderately with the PCL-SV Total ($r = .28$, $ES = .58$) and the RDS ($r = .27$, $ES = .56$) in this category.

Finally, the category of feigning, malingering, or defensiveness produced small correlations overall between the PAI and the SIRS ($r = .06$, $ES = .12$) and the PCL-SV Total ($r = -.09$, $ES = -.18$). However, it must be noted that the PIM scale of the PAI and the SIRS were inversely correlated ($r = -.28$, $ES = -.58$), which is logical because someone who is attempting to fake bad would not score highly on Positive Impression. When the PIM data points are left out of the grand mean, the correlation between the PAI and the SIRS is .18 with an effect size of .37. The NIM scale of the PAI and its Malingering Index correlated quite highly with the SIRS with r scores calculated to be .46 ($ES = 1.04$) and .38 ($ES = .82$), respectively. Although the studies were not testing these scales specifically, the PAI scales of INC and INF showed a low correlation of .03 and .02, respectively. An unusual finding emerged in the variation between the studies by Wang, et al. (1997) and Rogers, Sewell, Cruise & Wang (1998) on these two scales with the SIRS. The reason for this variation is unclear. Both studies used participants referred for mental health services in a correctional setting in Texas. However, the study by Rogers, et al. (1998) had 122 participants whereas Wang, et al. (1997) had 334 PAI profiles (cumulated from archival data) which may have had some effect on the findings.

Qualitative Review

The three studies (Cunningham & Vigen, 1999; Dunham, 2001; and Wang & Diamond, 1999) that required a qualitative review also presented

encouraging results with the PAI. Wang and Diamond (1999) found that “anger, antisocial personality style, and impulsivity are stronger predictors of institutional aggression than are ethnicity and current violent offense” (p. 377). The study took results from the PAI, BIS, and BPAQ, along with data from the prison hospital’s records, and used structural equation modeling to predict institutional aggression among male psychiatric inmates. The PAI’s ANT and AGG subscales were utilized in the factors of physical aggression, verbal aggression, anger, and antisocial personality style, which support the notion of a strong relationship between anger and aggression and between antisocial personality disorder and violence.

The study by Cunningham & Vigen (1999) tested a variety of factors, including the psychological well-being, of death row inmates in Mississippi. The PAI, the Beck Depression Inventory (BDI) and a clinical interview by a psychologist were used to determine psychological functioning. Findings revealed the BDI scores of 82% of tested inmates indicated some degree of depression. On the PAI, 39.3% of inmates scored above the 84 percentile on the Depression scale; 28.6% scored above the 98 percentile. Forty-three percent of inmates were identified as having current symptoms of depression in the clinical interview and 30% showed symptoms of anxiety compared to 32.1% who scored above the 84 percentile on the Anxiety scale of the PAI. Also in the clinical interview, 73% of inmates acknowledged substance abuse or dependence. On the PAI, 35.7% and 60.7% of inmates scored above the 84 percentile on the Alcohol Problems and Drug Problems scale, respectively. Although direct correlations could not be calculated for this study, comparing the results on each measure (BDI, PAI, and clinical interview) demonstrate similar findings for various psychological constructs.

Finally, the study by Dunham looked at the psychometric properties of the PAI with psychiatric prison inmates and its ability in differentiating lethal versus non-lethal suicide attempts within this population. Dunham performed a confirmatory factor analysis to determine goodness-of-fit among the 22 scales of the PAI with the population at hand. His findings show six scales (Infrequency, Positive Impression, Alcohol Problems, Drug Problems, Nonsupport, and Suicidal Ideation) represent good fit between the male psychiatric inmate data and Morey’s (1991) data sets, suggesting the PAI cannot generalize for use with

the mentally ill prisoner population. Dunham went on to establish a revised factor structure using the six scales that showed goodness-of-fit along with five new scales derived from his calculations. It is this new factor structure that Dunham used in determining differences between non-lethal suicide attempts and non-attempters. Dunham found there to be little difference between these two groups which, he goes on to explain, may be a result of ulterior motives such as to be moved to less restrictive or more comfortable housing and the "suicide attempts" of the non-lethal group may be more self-mutilation to gain these ulterior benefits rather than actual attempts at ending their life.

DISCUSSION

A variety of assessments have been used in forensic and correctional settings over the years to measure such items as personality, psychopathy, suicidal tendencies, and recidivism. One of the most recent assessments is the Personality Assessment Inventory (PAI) developed by Morey (1991). As a newcomer in the field, and a possible competitor of the MMPI-2, the PAI has relatively few studies that utilize it in the forensic and correctional settings. Because of the lack of data and the promise the PAI has shown in measuring personality traits, this review intended to collect information from the studies published in order to provide an overview of how the PAI is progressing in this field.

Hypothesis 1

The first hypothesis this review attempted to answer is if the PAI is a valid instrument for use in correctional and forensic settings. Based on the correlations and effect sizes of the available studies, the PAI does show promise in this field. An average r score of .26 and an effect size of .54 for all studies included in this review shows a moderate correlation of the PAI overall within the forensic and correctional arenas. Also encouraging was the moderate correlation between the PAI's AGG and ANT scales and recidivism, suggesting these scales could be used to gauge the chance of an inmate's return to prison. However, there was only one study with females that tested recidivism, so this is an area that should be examined more thoroughly.

Most of the correlations for the PAI scales were not unexpected based on what we already know of the correctional population. A majority of the people in prisons do have drug and alcohol problems and this is supported by the very high correlations with the

ALC and DRG scales of the PAI. They also tend to be reluctant to treatment as the RXR scale of the PAI shows in this review. Another facet of the forensic populace is that as mental health treatment facilities close, the number of mental health inmates increases. Many of the studies in this review tested patients in forensic mental health facilities and medium to large correlations were found on the PAI scales that assess schizophrenia, mania, paranoia, depression, and suicide. Also not surprising are the moderate correlations with Antisocial Features and Aggression, both of which provide important information when considering not only the housing of an individual, but also the treatment interventions that should be used.

Hypothesis 2

The second hypothesis this review considered was how well the PAI tests for the areas of mental and personality disorders, psychopathy, violence and suicide potential, and feigning, malingering, or defensiveness as compared to other available assessments. Overall, the PAI does appear to show evidence of concurrent validity with the other measures used in the included studies. The PAI scales and subscales correlated reasonably with the PDE, SADS, SADS-C, and SIRS in the category of mental and personality disorders. The PAI demonstrated significant correlations with those measures that test for psychopathy, as did the respective measures for violence and suicide potential. The category of feigning, malingering, or defensiveness showed impressive correlations with the PAI's NIM scale and Malingering Index (MAL) with the SIRS along with a strong inverse correlation with the PAI PIM scale.

What may present hesitation are the correlations with the measures that would typically test for another category. For example, one might not expect the PCL-R (which focuses on psychopathy) to correlate quite so highly with the PAI in the category of mental and personality disorders. However, the PAI scales that were used in comparison were Paranoia, Borderline Features, and Mania that could be facets of a psychopathic personality and should be taken into consideration when looking at the correlations of the measures in other categories.

CONCLUSION

Based on the findings of this review, the data on the PAI support its use as a valid instrument in

correctional and forensic settings. It has also shown considerable concurrent validity with several other measures that have been used in this arena and it should be considered an appropriate assessment instrument for use in the forensic field. Although it has shown some promising preliminary findings, only eighteen studies had viable data on the PAI in the areas of interest. Also, many of the correlations, particularly those comparing one of the five categories with other measures, were calculated based on only one study. Future research might involve further comparison of the PAI to these other measures. Additional considerations for future research, other than simply conducting more studies using the PAI in forensic and correctional settings, might include recidivism, drug and alcohol issues, the female prison population and other specialty populations such as sex offenders and mentally ill inmates. Another particularly interesting observation is that the majority of the studies in this review were based in Texas facilities. Since Texas obviously does not have sole custody of this country's criminal population, future studies should be comprised of inmates from other state's correctional and forensic facilities.

Practical use of the PAI in corrections would not only include housing and treatment considerations while incarcerated, but could also be another facet in determining whether an inmate should be granted parole. For instance, an inmate who scores highly on AGG and ANT scales may be more likely to recidivate than an inmate who does not score as high on these scales and can be another aspect in supporting a parole recommendation. Also, inmates could be given the PAI upon incarceration and again when coming up for parole to determine if their likelihood to recidivate has decreased. The PAI could also be used in deciding whether or not an inmate is deemed a sexually violent predator. As more and more states are implementing involuntary commitments for sexually violent predators beyond their completed sentences, the PAI could be a valuable assessment in this area, particularly with its Violence Potential Index. In the clinical and treatment areas, the PAI allows the practitioner to see more clearly what aspects of a diagnosis the client is demonstrating. For example, an inmate who exhibits an extremely aggressive attitude (high AGG-A) but scores low on verbal and physical aggression (AGG-V and AGG-P), would be treated differently than someone who scores very highly on physical aggression as well and that may need to be in a maximum security setting at all times.

REFERENCES

- Atkins, D. G. (1999). Validity of the personality assessment inventory for detecting malingering of psychosis in a prison population. *Dissertation Abstracts International, 60*(4-B) (University Microfilms No. 9925055).
- Barratt, E. S. (1994). Impulsiveness and aggression. In J. Monahan & H. J. Steadman (Eds.), *Violence and mental disorder: Developments in risk assessment*, (pp. 61-80). Chicago: University of Chicago Press.
- Baxter, D.J., Motiuk, L.L. & Fortin, S. (1995). Intelligence and personality in criminal offenders. In Saklofske, D.H. & Zeidner, M. (Eds.) *International Handbook of Personality and Intelligence. Perspectives on Individual Differences* (pp. 673-686). New York, NY: Plenum Press.
- Blackburn, R. (1996). Replicated personality disorder clusters among mentally disordered offenders and their relation to dimensions of personality. *Journal of Personality Disorders, 10*(1), 68-81.
- Blackburn, R. and Fawcett, D. (1999). The antisocial personality questionnaire: An inventory for assessing personality deviation in offender populations. *European Journal of Psychological Assessment, 15*(1), 14-24.
- Boone, D. (1998). Internal consistency reliability of the personality assessment inventory with Psychiatric inpatients. *Journal of Clinical Psychology, 54*(6), 839-843.
- Boyle, G. J. and Lennon, T. J. (1994). Examination of the reliability and validity of the personality assessment inventory. *Journal of Psychopathology and Behavioral Assessment, 16*(3), 173-187.
- Buss, A. H. and Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality and Social Psychology, 63*(3), 452-459.
- Carriere, P. L. (1994). Engaging the violent offender in group treatment: A case study. *Dissertation Abstracts International, 56*(3-B), 1693. (University Microfilms No. 9521382).

- Cashel, M. L. (1994). Assessing defensiveness with the PAI: A cross validation study. *Dissertation Abstracts International*, 32 (5-B), 1477. (University Microfilms No. 1357141)
- Chantry, K. & Craig, R. J. (1994a). MCMI typologies of criminal sexual offenders. *Sexual Addiction and Compulsivity*, 1(3), 215-226.
- Chantry, K. & Craign, R.J. (1994b). Psychological screening of sexually violent offenders with the MCMI. *Journal of Clinical Psychology*, 50(3), 430-435.
- Cull, J. G. and Gill, W. S. (1982). *Suicide Probability Scale*. Los Angeles: Western Psychological Services.
- Cunningham, M. D. and Vigen M. P. (1999). Without appointed counsel in capital post conviction proceedings. *Criminal Justice and Behavior*, 26(3), 293-321.
- Douglas, K. S., Hart, S. D., and Kropp, P. R. (2001). Validity of the personality assessment inventory for forensic assessments. *International Journal of Offender Therapy and Comparative Criminology*, 45(2), 183-197.
- Dunham, J. D. (2001). Analysis of the personality assessment inventory among male mentally ill prison inmates. *Dissertation Abstracts International*, 62(5-B), 2482. (University Microfilms No. 3015735).
- Edens, J. F., Cruise, K. R., and Buffington-Vollum, J. K. (2001). Forensic and correctional applications of the personality assessment inventory. *Behavioral Sciences and the Law*, 19, 519-543.
- Edens, J. F., Hart, S. D., Johnson, D. W., Johnson, J. K., and Olver, M. E. (2000). Use of the personality assessment inventory to assess psychopathy in offender populations. *Psychological Assessment*, 12(2), 132-139.
- Fals-Stewart, W., and Lucente, S. (1997). Identifying positive dissimulation by substance-abusing individuals on the personality assessment inventory: A cross-validation study. *Journal of Personality Assessment*, 68(2), 455-469.
- Goeke, R.K., Tosi, D.J. & Eshbaugh, D. M. (1993). Personality patterns of males felons in a correctional halfway house setting: An MMPI typological analysis. *Journal of Clinical Psychology*, 49(3), 413-422.
- Hare, R. D. (1991). *The Hare Psychopathy Checklist - Revised*. Toronto: Multi-Health Systems.
- Hart, S. D., Cox, D. N., and Hare, R. D. (1995). *Manual for the Screening Version of the Psychopathy Checklist (PCL:SV)*. Toronto: Multi-Health Systems.
- Hathaway, S. R. and McKinley, J. C. (1940). A Multiphasic Personality Schedule (Minnesota): I. Construction of the schedule. *Journal of Psychology*, 10, 249-254.
- Hathaway, S. R. and McKinley, J. C. (1989). *MMPI-2 Manual for Administration and Scoring*. Minneapolis: University of Minnesota Press.
- Hoekstra, W. R. (1998). Utility of the personality assessment inventory in adolescents: Discrimination ability with violent versus nonviolent offending incarcerated juveniles. *Dissertation Abstracts International*, 60(8-B), 4226. (University Microfilms No. 9944089).
- Kazdin, A. E. (1998). *Research Design in Clinical Psychology* (3rd Ed.). Needham Heights, MA: Allyn & Bacon.
- Krueger, R. F., Schmutte, P. S., Caspi, A., Moffitt, T. E., Campbell, K., and Silva, P. A. (1994). Personality traits are linked to crime among men and women: Evidence from a birth cohort. *Journal of Abnormal Psychology*, 103(2), 328-338.
- Lilienfeld, S. O. and Andrews, B. P. (1996). Development and preliminary validation of a self report measure of psychopathic personality traits in no criminal populations. *Journal of Personality Assessment*, 66, 488-524.
- Loranger, A. W. (1988). *Personality Disorder Examination (PDE) Manual*. Yonkers, NY: DV Communications.

- Maris, R., Berman, A., Maltsberger, J. T., and Yufit, R. I. (1992). *Assessment and prediction of suicide*. New York: Guilford.
- Megargee, E.I., Mercer, S.J. & Carbonell, J.L. (1999). MMPI2 with male and female state and federal prison inmates. *Psychological Assessment, 11*(2), 177-185.
- Meyer, G.J., Finn, S.E., Eyde, L.D., Kay, G.G., Moreland, K.L., Dies, R.R., Eisman, E.J., Kubiszyn, T.W., and Reed, G.M. (2001). Psychological testing and psychological assessment: A review of evidence and issues. *American Psychologist, 56*(2), 128-165.
- Morey, L. C. (1991). *Personality Assessment Inventory*. Odessa, FL: Psychological Assessment Resources, Inc.
- Morey, L. C. (1996). *An Interpretive Guide to the Personality Assessment Inventory (PAI)*. Odessa, FL: Psychological Assessment Resources, Inc.
- Morey, L. C. (1998). Teaching and learning the personality assessment inventory (PAI). In I. B. Weiner (Series Ed.) & L. Handler & M. J. Hilsenroth (Vol. Eds.), *Personality and Clinical Psychology Series. Teaching and Learning Personality Assessment* (pp. 191-214). New Jersey: Lawrence Erlbaum Associates.
- Osberg, T.M. & Harrigan, P. (1999). Comparative validity of the MMPI2 Weiner-Harmon Subtle-obvious scales in male prison inmates. *Journal of Personality Assessment, 72*(1), 36-48.
- Quinsey, V. L., Arnold, L. S., and Pruesse, M. G. (1980). MMPI profiles of men referred for pretrial psychiatric assessment as a function of offense type. *Journal of Clinical Psychology, 36*(2), 410-417.
- Reinhardt, V and Rogers, R. (1998). Differences in anxiety between first-time and multiple-time inmates: A multicultural perspective. *Journal of American Academy of Psychiatry Law, 26*(3), 375-382.
- Rogers, R., Bagby, R. M., and Dickens, S. E. (1992). *Structured Interview of Reported Symptoms (SIRS) and Professional Manual*. Odessa, FL: Psychological Assessment Resources.
- Rogers, R., Sewell, K. W., Cruise, K. R., Wang, E. W., and Ustad, K. L. (1998). The PAI and feigning: A cautionary note on its use in forensic-correctional settings. *Assessment, 5*(4), 399-405.
- Rogers, R., Ustad, K. L., and Salekin, R. T. (1998). Convergent validity of the personality assessment inventory: A study of emergency referrals in a correctional setting. *Assessment, 5* (1), 3-12.
- Salekin, R. T., Rogers, R., and Sewell, K. W. (1997). Construct validity of psychopathy in a female offender sample: A multitrait-multimethod evaluation. *Journal of Abnormal Psychology, 106*(4), 576-585.
- Salekin, R. T., Rogers, R., Ustad, K. L., and Sewell, K. W. (1998). Psychopathy and recidivism among female inmates. *Law and Human Behavior, 22* (1), 109-128.
- Smith, V. E. (1994). The experience of women who are aggressive: An analysis of incarcerated women from a gestalt therapy theory perspective. *Dissertation Abstract International, 56* (1-B), 537. (University Microfilms No. 9514705).
- Spitzer, R. L. and Endicott, J. (1978a). *Schedule of Affective Disorders and Schizophrenia*. New York: Biometric Research.
- Spitzer, R. L. and Endicott, J. (1978b). *Schedule of Affective Disorders and Schizophrenia - Change Version*. New York: Biometric Research.
- Teplin, L. A. and Swartz, J. (1989). Screening for severe mental disorder in jails: The development of the Referral Decision Scale. *Law and Human Behavior, 13*, 1-18.
- Wang, E. W. (1998). The use of structural modeling techniques to predict violence potential in mentally ill male prisoners. *Dissertation Abstracts International, 59* (7-B), 3719. (University Microfilms No. 9841395).
- Wang, E. W., and Diamond, P. M. (1999). Empirically identifying factors related to

- violence risk in corrections. *Behavioral Sciences and the Law*, 17, 377-389.
- Wang, E. W., Rogers, R., Giles, C. L., Diamond, P. M., Herrington-Wang, L. E., and Taylor, E. R. (1997). A pilot study of the personality assessment inventory (PAI) in corrections: Assessment of malingering, suicide risk, and aggression in male inmates. *Behavioral Sciences and the Law*, 15, 469-482.
- Yudofsky, S. C., Silver, J. M., Jackson, W., Endicott, J., and Williams, D. (1986). The Overt Aggression Scale for the objective rating of verbal and physical aggression. *American Journal of Psychiatry*, 143, 35-39.
- References of Articles Used in Meta-Analysis**
- Atkins, D. G. (1999). Validity of the personality assessment inventory for detecting malingering of psychosis in a prison population. *Dissertation Abstracts International*, 60 (4-B). (University Microfilms No. 9925055).
- Cashel, M. L. (1994). Assessing defensiveness with the PAI: A cross validation study. *Dissertation Abstracts International*, 32(5-B), 1477. (University Microfilms No. 1357141).
- Cashel, M.L., Rogers, R. Sewell, K., and Martin-Cannici, C. (1996). The Personality Assessment Inventory (PAI) and the detection of defensiveness. *Assessment*, 2(4), 333-342.
- Douglas, K. S., Hart, S. D., and Kropp, P. R. (2001). Validity of the personality assessment inventory for forensic assessments. *International Journal of Offender Therapy and Comparative Criminology*, 45(2), 183-197.
- Edens, J.F., Buffington_Vollum, J.K., Colwell, K.W., Johnson, D.W., and Johnson, J.K. (2002). Psychopathy and institutional misbehavior among incarcerated sex offenders: A comparison of the Psychopathy Checklist – Revised and the Personality Assessment Inventory. *International Journal of Forensic Mental Health*, 1(1), 49-58.
- Edens, J. F., Hart, S. D., Johnson, D. W., Johnson, J. K., and Olver, M. E. (2000). Use of the personality assessment inventory to assess psychopathy in offender populations. *Psychological Assessment*, 12(2), 132-139.
- Edens, J. F., Poythress, N. G., and Watkins, M. M. (2001). Further validation of the psychopathic personality inventory among offenders: Personality and behavioral correlates. *Journal of Personality Disorders*, 15(5), 403-415.
- Fals-Stewart, W., and Lucente, S. (1997). Identifying positive dissimulation by substance-abusing individuals on the personality assessment inventory: A cross-validation study. *Journal of Personality Assessment*, 68(2), 455-469.
- Fernandez, E. C. (1998). Detecting malingering in a federal pretrial sample. *Dissertation Abstracts International*, 59(10-B), 5575. (University Microfilms No. 9910359).
- Hill, C. D. (1997). Prediction of aggressive and socially disruptive behavior among forensic patients: A validation of the psychopathy checklist - screening version. *Dissertation Abstracts International*, 58(3-B), 1553. University Microfilms No. 9727784).
- Hoekstra, W. R. (1998). Utility of the personality assessment inventory in adolescents: Discrimination ability with violent versus nonviolent offending incarcerated juveniles. *Dissertation Abstracts International*, 60(8-B), 4226. (University Microfilms No. 9944089).
- Rogers, R., Sewell, K. W., Ustad, K. L., and Reinhardt, V. (1995). The referral decision scale with mentally disorder inmates. *Law and Human Behavior*, 19(5), 481-492.
- Rogers, R., Ustad, K. L., and Salekin, R. T. (1998). Convergent validity of the personality assessment inventory: A study of emergency referrals in a correctional setting. *Assessment*, 5 (1), 3-12.
- Salekin, R. T., Rogers, R., and Sewell, K. W. (1997). Construct validity of psychopathy in a female offender sample: A multitrait-multimethod evaluation. *Journal of Abnormal Psychology*, 106(4), 576-585.
- Salekin, R. T., Rogers, R., Ustad, K. L., and Sewell, K. W. (1998). Psychopathy and recidivism among female inmates. *Law and Human Behavior*, 22 (1), 109-128.

- Wang, E. W., Rogers, R., Giles, C. L., Diamond, P. M., Herrington-Wang, L. E., and Taylor, E. R. (1997). A pilot study of the personality assessment inventory (PAI) in corrections: Assessment of malingering, suicide risk, and aggression in male inmates. *Behavioral Sciences and the Law, 15*, 469-482.
- Wang, E. W. (1998). The use of structural modeling techniques to predict violence potential in mentally ill male prisoners. *Dissertation Abstracts International, 59* (7-B), 3719. (University Microfilms No. 9841395).