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The Personality Assessment Inventory-Antisocial Features (Psychopathy) Scale: Model Fit and Convergent and Discriminant Validity

Kimberly M. Sokolowski[1] · Blair D. Batky[1] · Jaime L. Anderson[2] · Andrea L. Glenn[1] · Randall T. Salekin[1]

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Abstract

The present study examined the factor structure of the Personality Assessment Inventory Antisocial Features scale (PAI-ANT) in a non-forensic sample of 1257 undergraduate students. One to four-factor models were tested using exploratory factor analysis (EFA), with a four-factor solution exhibiting the best fitting model (Bentler 1995). Next examined was the convergent and discriminant validity of the PAI-ANT. Results indicated that the PAI-ANT four-factor model was significantly related to measures of general personality, pride, impulsivity, and attachment. Comparisons between the original three-factor model (as proposed by Morey 2007) and our derived four-factor model showed that both models generally had the expected pattern of relations for their respective factors although mixed findings were found for the sensation seeking and risk-taking scales. Findings for these scales indicated that individuals could crave excitement and also have some positive characteristics. The current findings suggest that the four-factor model of the PAI is the best way to interpret the PAI psychopathy scale, but that some caution is needed in interpreting the sensation seeking and risk-taking scales.

Keywords Psychopathy · Community · PAI · Factor analysis · Antisocial

The PAI Antisocial features scale was one of the first modern conceptualizations of psychopathy to be placed within a multi-scale inventory (PAI-ANT; Morey 2007). Over the past two decades, studies have shown that the PAI has strong psychometric properties and clinical utility (Morey 1991, 2007). The PAI manual states that the PAI-Antisocial scale (PAI-ANT) is designed for use in both clinical and forensic settings and is based on the psychopathy models outlined by Cleckley (1941), Hare (1991), and Robins (1966) that are reflected in its three subscales titled Egocentricity, Stimulus Seeking, and Antisocial Behavior.

To date, several studies have investigated whether the PAI-ANT is valuable for assessing psychopathy in forensic populations (see Caperton et al. 2004; Douglas et al. 2007; Edens et al. 2000; Kucharski et al. 2008; Salekin 2008; Salekin et al. 1997) as well as whether it can predict a variety of external variables including incident reports (Edens et al. 2000; Walters 2007a; Walters 2007b), recidivism (Boccaccini et al. 2010; Salekin et al. 1998; Walters and Duncan 2005), institutional misconduct (see Buffington-Vollum et al. 2002; Caperton et al. 2004; Hopwood et al. 2008; Skopp et al. 2007), and suicidal ideation (Douglas et al. 2008). Meta-analytic data has also revealed that the PAI-ANT scale is consistently a small to medium predictor of misconduct (Gardner et al. 2015). Assessing psychopathy in forensic samples is particularly valuable since psychopathy and criminal behavior appear to be closely intertwined (DeLisi 2016; Leistico et al., 2008). In particular, DeLisi (2016) posits that criminal behavior directly stems from the problematic traits observed in psychopathy, such as narcissism, callousness, and poor self-regulation.

Despite some validity data amassing for the PAI-ANT in forensic samples, there is little information on the scale's utility in community settings (Salekin et al. 2001; see also Benning et al. 2005). One prior study using the undergraduate sample employed in the present study used IRT to demonstrate that the PAI-ANT items are generally informative in assessing psychopathy (Tsang et al. 2018). The relative absence of research on the PAI-ANT in non-forensic samples

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✉ Randall T. Salekin
rsalekin@ua.edu

[1] Department of Psychology, University of Alabama, Box 870348, Tuscaloosa, AL 35487, USA

[2] Sam Houston State University, Huntsville, TX, USA

is a significant drawback for two reasons. First, the measure is frequently used in the community as it offers a succinct way to examine broadband psychopathology while at the same time assessing pernicious traits reflective of psychopathy. Without studies on its structure and convergent and discriminant validity within this context, it is difficult to know whether it is an adequate measure of psychopathic traits in non-incarcerated samples. Second, given that psychopathy is purportedly linked to negative outcomes, it is important to examine the scale's specific connection with harmful and unsafe behaviors within the community. Although DeLisi (2016) argues that "successful" psychopathy (i.e. psychopathy in the absence of significant criminal behavior) may not exist, he states that more research is needed on successful manifestations of psychopathy. Some empirical work (e.g. Persson and Lilienfeld 2019) has also suggested that individuals can be high in psychopathic traits, particularly those associated with boldness, and not engage in significant antisocial behavior. Furthermore, some individuals high in psychopathy may be effective at not getting caught for antisocial acts, and even milder manifestations of antisocial behavior can be problematic for society (Shaw and Pease 2002). Therefore, it is important to assess psychopathy in community as well as forensic samples.

The Current Study

The present study had two primary aims. The first aim was to examine the factor structure of the PAI-ANT, with particular emphasis on whether the optimal factor structure adheres to the existing structure. In particular, we were interested in determining whether the resulting factor structure of the PAI-ANT would adhere to the four-factor psychopathy model proposed by Hare (1980, 2003), the existing three-factor structure, or a simpler one or two- factor structure. Therefore, one to four-factor models were examined. The second aim of the study was to test the convergent and discriminant validity of the PAI-ANT scale using commonly linked extra-test variables (e.g. antisocial and risky driving behavior). Based on previous research in community and forensic settings, it was expected that Morey's (2007) three-factor model reflected in the PAI-ANT subscales would fit the data well. However, one, two, three, and four factors were tested to determine optimal model fit. If an alternative model emerged, then we aimed to make comparisons between the original three-factor model (Morey 1991) and the alternative model with respect to the convergent and discriminant external correlates.

Hypotheses regarding correlates of the factors derive from both theory and research on psychopathy (e.g., Cleckley 1941; Hare 1991/2003). As far as interpersonal features of psychopathy, Cleckley (1941/1955) argued that although people with psychopathic traits exhibit selfish and unkind behaviors, they are superficially charming, intelligent, poised (lacking in nervousness), and have a social ease about them. Empirical work has also indicated that psychopathy may be related to higher emotional intelligence (e.g., Glass and Newman 2006; 2006). Therefore, for the three-factor model, it was expected that the Egocentricity subscale would be positively associated with pride, blame externalization, and GPA and that it would be negatively associated with interpersonal relationship quality, Agreeableness, and social responsibility.

Because the Egocentricity subscale, much like Factor 1 of the PCL, combines interpersonal and affective items, it was also expected that scale would be related to constructs reflecting affective deficits. It was therefore predicted that the Egocentricity scale would be negatively correlated with guilt and emotional self-awareness. Although psychopathy has historically been thought to encompass deficient affect, some modern work has suggested that psychopathy is associated with heightened experiences of spitefulness and contempt for others (Garofalo et al. 2019). Other theoretical work also suggests that psychopathic individuals are poorly attached to others (Bowlby 1982; Frodi et al. 2001), and it was thus hypothesized that Egocentricity would be correlated with detachment from others. Finally, psychopaths have been described as failing to follow any specific life plan (Cleckley 1941/1955; Hare 2003), and prior empirical work has suggested that low Conscientiousness is robustly related to psychopathy (e.g. Vize et al. 2016; Vize et al. 2018). Therefore, the Egocentricity subscale was predicted to be negatively associated with Conscientiousness.

Further, psychopathic individuals are often described as demonstrating behavioral deficits such as unpredictable and erratic conduct, antisocial acts (Hare 2003), and sensation seeking behavior (Cleckley 1941; Hare 1991/2003). As previously described, psychopathy is also closely related to antisocial behavior (DeLisi 2016; Leistico et al., 2008). Therefore, because the Stimulus Seeking subscale appears related to impulsive and risky behaviors observed in psychopathy, it was expected that this scale would be negatively correlated with impulse control and Conscientiousness and positively associated with risky driving. Willingness to take risks could also potentially reflect low anxiety and a lack of conformity to societal norms, and the Stimulus Seeking scale was thus anticipated to correlate negatively with Neuroticism and positively with stress tolerance and Openness. Finally, with respect to the Antisocial Behavior subscale, it was hypothesized that this scale would be associated with characteristics of "unsuccessful" psychopaths (Cleckley 1941/1955) and would be negatively correlated with Conscientiousness, Agreeableness, social responsibility, emotional intelligence, impulse control, interpersonal relationship quality, and GPA, and positively associated with risky driving and antisocial behavior.

With regard to the four-factor model, one of the main differences from the three-factor model is that the Egocentricity

factor is parsed into two separate factors: one that was believed to tap arrogance and deceit (Manipulation) and another that taps affective deficits (Affective). The remaining two factors were similar to the second and third factor of the three-factor model and are titled Risk-Taking and Antisocial Behavior. Thus, the expected relations are much the same, except the Manipulation factor was expected to correlate positively with pride and blame externalization and to correlate negatively with interpersonal relationship quality, Agreeableness, and Conscientiousness. In contrast, the Affective factor was expected to be negatively related to guilt, emotional self-awareness, and social responsibility. With regard to the Risk-Taking subscale, it was expected that there would be negative correlations with Neuroticism, Conscientiousness, and impulse control, and positive correlations with stress tolerance, Openness, and risky driving. Finally, it was hypothesized that the Antisocial Behavior subscale would be negatively correlated with Conscientiousness, Agreeableness, social responsibility, emotional intelligence, impulse control, interpersonal relationship quality, and GPA and would be positively associated with risky driving and antisocial behavior. While the focus of the paper is on the factors of the PAI, correlations with the total score were also included in the tables for descriptive purposes.

Method

Participants

Data were collected from 1257 undergraduate introductory psychology students (378 men, 869 women, and 10 individuals who did not identify with either gender or who did not report their gender identity). Participants were recruited from a subject pool at a large Southeastern university who received credit in the course for their participation. Several studies have been published with this data set (e.g., Lee and Salekin, 2010; Lester et al. 2013; Salekin et al. 2014; Tsang et al. 2018), but none that focus on the PAI. The participants ranged in age from 17 to 51 years old with the vast majority being young adults (M = 19.32, SD = 2.31). A waiver of parental consent was obtained for 17-year-old participants, and informed consent was obtained directly from these participants. The majority of the sample was Caucasian (81.5%), followed by African American (10.9%), Hispanic (1.4%), Asian (1.4%), Indian (0.3%), participants identifying their race as "other" (1.9%), and participants who did not report their race (2.5%). All questionnaires were completed in one session that lasted approximately 2-3 hours.

Measures

Personality Assessment Inventory-Antisocial Scale (PAI-ANT; Morey 2007) The PAI is a multi-scale self-report inventory consisting of 344 items. One scale on the measure is the Antisocial scale which consists of 24 items and has three subscales tapping Egocentricity, Sensation Seeking, and Antisocial Behavior. In addition, the scale addresses other characteristics such as adventuresomeness and low empathy. Each subscale contains eight items, and the items from the PAI Antisocial features scale are embedded within the broader 344 items. This measure is written at a fourth-grade reading level to help ensure that it is comprehendible to its respondents. The PAI-ANT scores demonstrate a reasonable amount of internal consistency with the PAI manual (Morey 2007) reporting Cronbach's α ranging from .84-.86. The Pearson correlation for the test-retest reliability of the ANT scale is .89 over a 4-week period. The scores have also demonstrated validity in a number of studies (Morey 2007).

Interpersonal Adjectives Scale Revised—Big Five (IASR-B5; Trapnell and Wiggins 1991) The IASR-B5 assesses personality through the use of a 124-item adjective list. Participants rate how well each adjective applies to them on an 8-point scale (1 being *extremely inaccurate* to 8 being *extremely accurate*). Originally the scale contained 64 items, and an additional 60 items were later added to broaden the scale to assess Conscientiousness, Openness to Experience, and Neuroticism. In previous studies, Cronbach's α for the subscale scores ranged from .76 to .87 (Trapnell and Wiggins 1991).

Test of Self-Conscious Affect-3rd Edition (TOSCA-3; Tangney et al. 2000) The Test of Self-Conscious Affect is a scenario-based measure that measures pride, detachment, proneness to shame, and guilt externalization. The test consists of 16 specific scenarios that are rated on a 5-point scale. Participants read several different possible responses to a situation and are asked to rate how likely they are to give each listed response. Response options range from not likely to very likely (1 being *not likely* to 5 being *very likely*).

Emotional Quotient Inventory (EQ-i; Bar-On 1997) The EQ-i is a 133-item self-report questionnaire that measures emotional intelligence. It consists of five different scales: Interpersonal, Intrapersonal, Stress Management, Adaptability, and a General Mood scale. Each of these is composed of various subscales for a total of 15 subscales. The EQ-i scores evidence good reliability, with the Cronbach's α for the subscales ranging from .70 to .89 in previous studies (Bar-On 1997).

Measure of Attachment Qualities (MAQ; Carver 1997) The MAQ is a 14-item self-report questionnaire that assesses four different attachment styles. Participants are asked to respond based on their own attachment styles on a 4-point rating scale (1 being *disagree a lot* to 4 being *agree a lot*). The four attachment styles assessed include Ambivalence-Merger, Ambivalence-Worry, Avoidance, and Security.

Risky Driving Risky driving was measured by 77 items combining the RoadSafe Auckland Annual Driving Survey (RoadSafe Auckland 2000) and the *Year 10* (i.e. 9th grade) student driving survey outlined by Harré et al. (2000). The instrument measures driving attitudes and behaviors, including items related to drinking and driving, wearing a seatbelt, and speeding, to name a few. In addition to reporting their attitudes about driving, participants were also asked to report their own driving behaviors in these areas. While the questionnaire also included items regarding the participants' driving experience, driving education, and opinions about the safety of their local roads, these items were not included. For the purposes of this study, only the risky driving attitude and behavior items were included in the calculation of the total Risky Driving score. Item scores were summed to create an overall total scale score; higher scale scores indicate riskier driving attitudes and behavior.

Antisocial Behavior Previous antisocial behavior was measured using six "yes-or-no" questions. Participants indicated whether they had ever been 1) accused of academic misconduct, 2) in trouble with the law, 3) arrested off campus, 4) arrested on campus, 5) in a jail or detention center, or 6) in prison. Additionally, for every item endorsed, participants were asked to report the number of times and the reason(s) (i.e., offense(s) committed) that led them to that specific situation (e.g. why they were in jail). Participants who reported being detained in jail, detention, or prison were asked to note their length of detainment. Mullins-Nelson et al. (2006) employed these same questions and noted positive correlations with psychopathy between .33 and .40 for men, and between .02 and .19 for women in a separate sample.

Current Academic Achievement Current academic achievement was defined as the participants' self-reported current grade point average. The inclusion of this variable served the purpose of providing a direct observation of performance and an indirect approximation of intelligence.

Data Analysis

Basic descriptive statistics were utilized to examine the characteristics of the data. Exploratory factor analyses (EFA) were used to examine the factor structure of the scale and whether a one, two, three, or four-factor model for psychopathy fit the data best. Data were analyzed for the total sample as well as each gender independently. We were particularly interested in testing the models proposed by Morey (1991) and Hare (2003). Model fit was evaluated using Confirmatory Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). CFI and TLI values of .90-.95 and RMSEA values of .05-.08 are indicative of acceptable fit. Correlational analyses were employed to examine basic relations between psychopathy and external study variables. Multiple linear regression analyses were then employed to simultaneously examine the relation between variables thought to be conceptually relevant to psychopathy, such as certain personality characteristics, academic achievement, emotional intelligence, attachment styles, risky driving behavior, and antisocial behavior. Missing data points were excluded from the analyses.

Results

Descriptive Statistics

The descriptive statistics for each measure are presented in Table 1. As can be seen, there appears to be a reasonable amount of dispersion for each of the study variables. For the original three-factor model, Cronbach's α for the three subscales ranged from .66 to .78. As the scales are relatively short (consisting of 8 items each), and Cronbach's α is often low for shorter scales (Streiner 2003), mean inter-item correlations were also calculated. Mean inter-item correlations were all in the acceptable range for the subscales and fell between .21 and .31.

Model Analyses

Exploratory factor analyses (EFAs) were conducted using M*plus* 7.0 (Muthén and Muthén 1998) in order to evaluate the factor structure of the PAI-ANT scale. As Hopwood and Donnellan (2010) have discussed, it is common for personality inventories, such as the PAI, to exhibit poor model fit in more statistically stringent analyses (i.e. confirmatory factor analysis [CFA]). Even widely-used personality inventories where clear hypotheses exist for their factor structures do not appear to have acceptable fit when using CFA (Hopwood & Donellan, 2010). Moreover, although a four-factor structure perhaps seems most plausible for the PAI, we were interested in testing one through three-factor models to determine the optimal factor structure in this sample. Therefore, EFA was primarily used to examine the factor structure of the scale, but CFAs were also conducted for comparison purposes (see Supplementary Material). One, two, three, and four-factor models were evaluated to determine the best fitting model.

The fit indices for the models are presented in Table 2. RMSEA values of .05 to .08 are considered acceptable fit, as well as CFI and TLI scores of .90 to .95. In order to create scales based on these factors, items were retained if they loaded greater than .40 on a given factor. Items that crossloaded were not retained unless their primary loading was at least .20 greater than their secondary loading. A .20 threshold is a slightly more liberal threshold for factor loading differences than what is traditionally recommended (Costello and

Table 1 Descriptive Statistics for Self-Report Measures

Scale	Mean	SD	N
PAI-E Egocentricity	5.48	3.80	1244
PAI-S Stimulus Seeking	8.15	4.72	1242
PAI- A Antisocial	7.52	5.21	1239
PAI-Ant Total Score	21.11	11.30	1245
IASR-B5[b] Neuroticism	38.56	10.22	1236
IASR-B5 Conscientiousness	38.29	10.56	1236
IASR-B5 Openness	37.44	10.65	1236
IASR-B5 Extraversion	40.15	11.62	1231
IASR-B5 Agreeableness	38.19	9.92	1231
MAQ[c] Avoidance	9.35	3.26	1253
MAQ Ambivalence-Worry	7.18	2.61	1253
MAQ Ambivalence-Merger	5.91	2.17	1253
MAQ Security	10.70	1.59	1253
EQ-i[d] Total Score	424.08	58.23	1066
EQ-i Emotional Self-Awareness	29.03	5.37	1040
EQ-i Assertiveness	24.36	4.61	1042
EQ-i Self-Regard	33.00	7.03	1034
EQ-i Self-Actualization	35.07	5.807	1040
EQ-i Independence	23.77	4.73	1051
EQ-i Empathy	31.58	5.12	1032
EQ-i Interpersonal Relationship	41.73	5.81	1028
EQ-i Social Responsibility	40.24	6.49	1024
EQ-i Stress Tolerance	30.70	5.87	1041
EQ-i Impulse Control	31.66	6.46	1043
TOSCA[e] Shame	45.77	9.44	1253
TOSCA Detachment	31.91	5.96	1253
TOSCA Guilt	61.91	9.03	1253
TOSCA Externalization of Blame	39.02	8.31	1253
TOSCA Alpha Pride	19.51	3.52	1253
TOSCA Beta Pride	19.95	3.24	1253
Risky Driving Questionnaire Total Score	118.12	23.61	949
Grade Point Average (GPA)	3.12	0.55	1144
Antisocial Behavior Total Score	.73	1.68	1196

[a] Personality Assessment Inventory Total Score (i.e., total of items included in the three factor model); [b] Interpersonal Adjective Scales-Big Five Version; [c] Measure of Attachment; Qualities; [d] Emotional Quotient Inventory; [e] Test of Self-Conscious Affect-Version 3

Osborne 2005). However, this threshold was chosen given that it was often theoretically and conceptually clear whether an item corresponded best to one factor versus another. Cronbach's α for the scales in the four-factor model ranged from .57 to .81, and the mean inter-item correlations ranged from .32 to .50.

As can be seen in Table 2, the four-factor model was the best fitting model in these analyses and the only model that rendered acceptable model fit (TLI = .894, CFI = .929, RMSEA = .050). A similar pattern emerged when conducting CFAs (see Supplementary Material). Therefore, a four-factor

Table 2 Exploratory Factor Analysis (EFA) Model Fit Indices

	One Factor	Two Factor	Three Factor	Four Factor
CFI	.669	.782	.872	.929
TLI	.638	.737	.830	.894
RMSEA	.093	.079	.064	.050
Men Only				
CFI	.580	.726	.850	.922
TLI	.540	.670	.799	.884
RMSEA	.095	.081	.063	.048
Women Only				
CFI	.669	.783	.867	.922
TLI	.637	.739	.823	.885
RMSEA	.094	.080	.066	.053

model was considered the optimal factor structure for this scale and will be used in subsequent analyses. Additionally, because the three-factor model is the predetermined structure derived for the PAI, and since it has subscales for measuring those factors (Morey 1991), we examine the correlates for the three-factor model and the best fitting factor model, which is the four-factor model. Model parameters for the four-factor model are shown in Table 3.

Correlations

Pearson product-moment correlations were used to examine the relations between the three and four-factor models of the PAI and external nodes. We also utilized correlation analyses to examine the total scores for the PAI-ANT. The results are exhibited in Table 4 for the three-factor model and Table 5 for the four-factor model. Given the large number of correlations, we focus on those correlations that are above .30, representing a moderate effect (Hemphill 2003). In general, correlations were in the hypothesized direction, although there were also unexpected relations.

As hypothesized, the Egocentricity scale from the three-factor model was negatively correlated with Agreeableness (-.44), Social Responsibility (-.40), Guilt (-.32), Emotional Self-Awareness (-.25), Conscientiousness (-.20), and Interpersonal Relationship Quality (-.17). The predictions that Egocentricity would be positively correlated with Detachment (.27) and Externalization of Blame (.27) were also supported. However, contrary to the hypotheses, Egocentricity was not associated with Pride (.03) and had a very small negative correlation with GPA (-.07). Although we did not hypothesize a relationship between Egocentricity and Risky Driving, a moderate positive correlation (.34) also emerged between these scales.

With regard to the four-factor model, the Manipulation scale (similar to the Egocentricity scale but absent affective items and more specifically capturing grandiosity and

Table 3 Exploratory Factor Analysis (EFA) Four Factor Solution

	Factor One (Manipulation)	Factor Two (Affective)	Factor Three (Risk-Taking)	Factor Four (Antisocial)
Retained PAI Items				
Takes advantage of others	**.658**	.274	.330	.272
Does things to benefit self	**.501**	.228	.385	.255
Talks way out of things	**.469**	.232	.341	.182
Doesn't stay in relationships long	.225	**.829**	.234	.161
Dislikes being committed to one person	.295	**.791**	.268	.171
No desire to "settle down"	.277	**.536**	.277	.189
Does wild things	.350	.265	**.888**	.410
Does dangerous things	.321	.230	**.800**	.347
Wild behavior at times	.383	.309	**.693**	.464
Takes dares	.267	.226	**.559**	.200
Never takes risks	.110	.126	**.461**	.322
Never in trouble with law	.149	.170	.268	**.609**
Never stolen	.381	.136	.252	**.598**
Good behavior at school	.286	.269	.380	**.486**
Never expelled or suspended	.143	.129	.252	**.464**
PAI Items not Retained				
Gets away with things	.601	.262	.528	.366
Lies frequently	.522	.162	.302	.465
Illegal activity	.308	.202	.469	.629
Property damage	.309	.172	.415	.568
Looks after self	.378	.241	.146	.064
Steals money	.373	.092	.129	.203
Breaks promises	.360	.250	.203	.168
Leaves places when tired of them	.338	.301	.352	.197
Drives fast	.210	.145	.394	.144

Factor loadings of at least moderate magnitude (>.40) are underlined, and items that were retained on a particular factor are bolded. Items that were retained appear first followed by those that did not load on any factor or crossloaded to the extent that they were not retained. Items were considered to crossload if the difference between the primary and secondary loading was less than .20

manipulation) demonstrated the hypothesized positive correlations with TOSCA Pride scales (albeit, minimal at .06 and .08) and Externalization of Blame (.24) and the hypothesized negative correlations with Interpersonal Relationship Quality (-.13), Agreeableness (-.44), and Conscientiousness (-.16). Although not hypothesized, moderate negative correlations also emerged between the Manipulation scale and Social Responsibility (-.34), Impulse Control (-.34), and Guilt (-.32), and a moderate positive correlation emerged with Risky Driving (.32). Consistent with predictions, the Affective scale was negatively related to Guilt (-.18), Emotional Self-Awareness (-.26), and Social Responsibility (-.25). However, this scale had a moderate positive correlation with Avoidant Attachment (.39) and a moderate negative correlation with Secure Attachment (-.35) that were not hypothesized.

As predicted, the Stimulus Seeking subscale was positively correlated with Risky Driving (.51) and Openness (.09) and negatively correlated with Impulse Control (-.38), Conscientiousness (-.33), and Neuroticism (-.10). Contrary to prediction, there was not a correlation between Sensation Seeking and Stress Tolerance (.01). Although hypotheses were not made for associations between Stimulus Seeking and Agreeableness and Social Responsibility, moderate negative correlations emerged for these scales (-.38 and -.31, respectively). The corresponding factor in the four-factor model, Risk-Taking, also exhibited the predicted positive correlations with Risky Driving (.37) and Openness (.09) as well as the predicted negative correlations with Neuroticism (-.12), Conscientiousness (-.32), and Impulse Control (-.35). However, there was a null relationship between Risk Taking and Stress Tolerance (.03), and although it was not hypothesized, a moderate negative correlation also emerged with Agreeableness (-.37).

Finally, the data supported predictions that the Antisocial subscale in the three-factor model would be positively

Table 4 Correlations Between Total and Factor Scores of the PAI-ANT for the Total Sample and Measures of Relevant External Correlates

Scale	PAI-ANT E[c]	PAI-ANT SS[a]	PAI-ANT A[b]	PAI-ANT Total[d]
PAI-ANT E	--	**.50****	**46****	
PAI-ANT SS	--	--	-- .	--
PAI-ANT A	--	**.56****	--	--
PAI-ANT T	**.76****	**.85****	**.85****	
IASR-B5[e] Neuroticism	-.01	-.10**	-.01	-.05
IASR-B5 Conscientiousness	-.20**	**-.33****	**-.35****	**-.37****
IASR-B5 Openness	-.01	.09**	.06*	.06*
IASR-B5 Extraversion	-.15**	-.09**	-.19**	-.18**
IASR-B5 Agreeableness	**-.44****	**-.38****	**-.44****	**-.51****
MAQ[f]-Avoidance	.29**	.13*	.13**	.21**
MAQ-Ambivalence-Worry	.13**	.07**	.15**	.14**
MAQ-Ambivalence-Merger	.15**	.12**	.17**	.18**
MAQ-Security	-.20**	-.13**	-.12**	-.17**
EQ-i[g] Total	-.25**	-.20**	**-.32****	**-.31****
EQ-i Self-Awareness	-.25**	-.16**	-.21**	-.25**
EQ-i Assertiveness	-.04	.02	-.04	-.03
EQ-i Self-Regard	-.07*	-.04	-.14**	-.10**
EQ-i Self-Actualization	-.21**	-.16**	-.23**	-.24**
EQ-i Independence	-.05	-.01	-.06	-.05
EQ-i Empathy	-.27**	-.16**	-.27**	-.28**
EQ-i Interpersonal Relationships	-.17**	-.09**	-.21**	-.19**
EQ-i Social Responsibility	**-.40****	**-.31****	**-.42****	**-.46****
EQ-i Stress Tolerance	-.02	.01	-.12**	-.06
EQ-i Impulse Control	**-.36****	**-.38****	**-.46****	**-.49****
TOSCA[h]-Shame	-.08**	-.13**	-.17**	-.16**
TOSCA-Detachment	.27**	.22**	.23**	.29**
TOSCA-Guilt	**-.32****	-.26**	**-.35****	**-.38****
TOSCA-Externalization of Blame	.27**	16**	.19**	.25**
TOSCA-Alpha Pride	.03	-.00	-.01	.01
TOSCA-Beta Pride	.03	.01	.02	.02
Risky Driving	**.34****	**.42****	**.41****	**.48****
GPA[ff]	-.07*	-.16**	-.19**	-.18**
Antisocial Behavior	.16**	.23**	**.42****	**.34****

Correlations greater or equal to 0.30 are shown in boldface

[a] Personality Assessment Inventory-Antisocial Features Stimulus Seeking subscale; [b] Personality Assessment Inventory-Antisocial Features Antisocial Behavior subscale; [c] Personality Assessment Inventory-Antisocial Features Egocentricity subscale; [d] Personality Asessment Inventory-Antisocial Features Total score; [e] Revised Interpersonal Adjective Scales-Big Five Version; [f] Measure of Attachment Qualities; [g] Emotional Quotient Inventory; [h] Test of Self-Conscious Affect

*$p < .05$. **$p < .01$

correlated with Risky Driving (.50) and Antisocial Behavior (.43) and would be negatively correlated with Conscientiousness (-.35), Agreeableness (-.44), Emotional Intelligence (-.32), Social Responsibility (-.42), Impulse Control (-.46), GPA (-.19), and Interpersonal Relationship Quality (-.21). A moderate negative association also emerged between the Antisocial scale and Guilt (-.35). As predicted, the corresponding Antisocial Behavior scale in the four-factor model was negatively associated with Conscientiousness (-.32), Agreeableness (-.35), Social Responsibility (-.39), Emotional Intelligence (-.29), Impulse Control (-.37), Interpersonal Relationship Quality (-.22), and GPA (-.19). The Antisocial Behavior scale also had the expected positive correlations with Antisocial Behavior (.44) and Risky Driving

Table 5 Correlations between factor scores of the PAI for the total sample and measures of relevant external correlates

Scale	PAI[a] F1 Manipulation	PAI F2 Affective	PAI F3 Risk-Taking	PAI F4 Antisocial Behavior
PAI F1 (Manipulation)	--	--	--	--
PAI F2 (Affective)	**0.31**.**	--	--	--
PAI F3 (Risk-Taking)	**0.44****	0.29**	--	--
PAI F4 (Antisocial Behavior)	**0.30****	0.23**	**0.41****	--
ASR-B5[b] Neuroticism	-0.03	-0.03	-0.12**	-0.03
IASR-B5 Conscientiousness	-0.16**	-0.19**	**-0.32****	**-0.32****
IASR-B5 Openness	0.05	-0.02	0.09**	0.00
IASR-B5 Extraversion	-0.09**	-0.12**	-0.06*	-0.21**
IASR-B5 Agreeableness	**-0.44****	-0.24**	**-0.37****	**-0.35****
MAQc Avoidance	0.12**	**0.39****	0.06*	0.14**
MAQ Ambivalence-Worry	0.09**	0.08**	0.05	0.11**
MAQ Ambivalence-Merger	0.13**	0.04	0.10**	0.14**
MAQ Security	-0.05	**-0.35****	-0.07*	-0.17**
EQ-i[d] Total Score	-0.18**	-0.18**	-0.16**	-0.29**
EQ-i Self-Awareness	-0.15**	-0.26**	-0.11**	-0.20**
EQ-i Assertiveness	0.02	-0.08*	0.04	-0.06
EQ-i Self-Regard	-0.03	-0.06	-0.02	-0.14**
EQ-i Self-Actualization	-0.14**	-0.18**	-0.11**	-0.24**
EQ-i Independence	-0.02	0.01	-0.00	-0.03
EQ-i Empathy	-0.21**	-0.17**	-0.14**	-0.28**
EQ-i Interpersonal Relationship	-0.13**	-0.12**	-0.04	-0.22**
EQ-i Social Responsibility	**-0.34****	-0.25**	-0.28**	**-0.39****
EQ-i Stress Tolerance	0.03	-0.04	0.03	-0.12**
EQ-i Impulse Control	**-0.34****	-0.20**	**-0.35****	**-0.37****
TOSCAe Shame	-0.12**	-0.03	-0.14**	-0.16**
TOSCA Detachment	0.27**	0.12**	0.18**	0.12**
TOSCA Guilt	**-0.30****	-0.18**	-0.25**	**-0.33****
TOSCA Externalization of Blame	0.24**	0.13**	0.13**	0.14**
TOSCA Alpha Pride	0.08**	-0.04	-0.02	-0.11**
TOSCA Beta Pride	0.06*	-0.01	-0.01	-0.07*
Risky Drivingf	**0.32****	0.22**	**0.37****	**0.33****
Antisocial Behavior Total Score[g]	0.14**	0.09**	0.24**	**0.44****
Grade Point Average (GPA)	-0.07**	-0.05	-0.15**	-0.19**

Correlations greater or equal to 0.30 are shown in boldface

[a] Personality Assessment Inventory; [b] Revised Interpersonal Adjective Scales-Big Five Version [c] Measure of Attachment Qualities; [d] Emotional Quotient Inventory; [e] Test of Self-Conscious Affect-Version 3; [f] Risky Driving Questionnaire Total Score

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

(.33). Finally, although it was not hypothesized, a moderate negative correlation with Guilt (-.33) emerged.

With the exception of the Antisocial factors, which had similar correlations with external correlates for both the three and four-factor model, the correlations aligned more closely with the hypotheses for the four-factor than for the three-factor model. Although there were several unpredicted correlations for the scales in the four-factor model, these correlates do not appear highly surprising or necessarily inconsistent with the hypotheses. For example, although a negative correlation between Risk Taking and Agreeableness was not hypothesized, it does not appear theoretically problematic that Risk Taking would correlate with low Agreeableness.

Considering that the sample included undergraduate participants who generally had low levels of antisocial behavior, supplementary correlational analyses were also conducted with only the participants falling at the 90th percentile or above on antisocial behavior. The correlations for the three-factor and four-factor models are respectively presented in Table 9 and Table 10. Many of the larger correlations between the

factors and external correlates held when only examining the most severely antisocial participants. This finding suggests that the PAI-ANT scale may be useful in predicting external criteria for participants both higher and lower in antisocial behavior. However, there was some tendency for weaker correlations among the community participants to be further attenuated among the more severely antisocial participants. Psychopathic traits may therefore not be as predictive of some relatively less central outcomes among community individuals who manifest high rates of antisocial behavior.

Regression Analyses

To evaluate the PAI-ANT scale's associations with external correlates while controlling for overlap among the scales, multiple linear regression analyses were conducted. Each of the criterion measures was simultaneously regressed onto the PAI-ANT factors in a linear regression model. The overall three-factor model was significant for each trait and behavior scale examined (see Table 6). The four-factor model also showed highly significant relations and can be seen in Table 7. To provide further clarity regarding the predictive utility of the factor scales, the five highest positive and five highest negative standardized beta coefficients for each factor scale are reported in Table 8. Beta coefficients ranged from -.57 to .36. Beta coefficients .08 or larger in absolute value are significant at the alpha level less than .05. Hemphill's (2003) guidelines were used for the interpretation of effect sizes. These guidelines state that coefficients less than .20 denote small effects, coefficients ranging from .20 to .30 are medium, and coefficients greater than .30 are considered large.

With respect to Egocentricity in the three-factor model, the highest positive beta weight, with a medium effect size, was for predicting EQ-i Interpersonal Relationships. This association was contrary to the prediction that Egocentricity would be negatively related to relationship quality. However, the predicted positive relationships with GPA and Detachment emerged. Additional small, positive effects were also found for Extraversion, MAQ Avoidance, EQ-i Self-Regard, EQ-i Empathy, EQ-i Stress Tolerance, TOSCA Detachment, Risky Driving, and GPA. The Egocentricity scale was associated with the highest negative beta coefficients and medium to large effects for EQ-i Total, IASR-B5 Agreeableness, and EQ-i Social Responsibility. A small negative effect was also found for TOSCA Guilt. The negative associations with Social Responsibility, Agreeableness, and Guilt were expected along with the positive association with Detachment. However, the predicted positive associations with Pride and Blame Externalization did not appear, nor did the hypothesized negative associations with Conscientiousness and emotional self-awareness.

With regard to the four-factor model, the Manipulation scale had the highest positive beta values with medium effect sizes for predicting TOSCA Detachment and TOSCA Externalization of Blame. The Manipulation scale also had small positive associations with TOSCA Alpha Pride, TOSCA Beta Pride, MAQ Ambivalence-Merger, and Risky Driving. The Manipulation scale had a large negative relationship with IASR-B5 Agreeableness and a medium negative relationship with EQ-i Social Responsibility. It also had small negative relationships with TOSCA Guilt, EQ-i Impulse Control, EQ-i Empathy, and EQ-i Interpersonal Relationships. The positive associations with Externalization of Blame and Pride were consistent with hypotheses along with the negative relationships with Agreeableness and interpersonal relationship quality. However, the expected negative association with Conscientiousness did not emerge, and the associations that emerged with other variables were not explicitly predicted.

The Affective scale in the four-factor model was associated with the highest positive beta value for MAQ Avoidance, and it had a small positive beta for Risky Driving. This scale also had the largest negative beta value for MAQ Security, a medium negative association with EQ-i Emotional Self-Awareness, and small negative associations with EQ-i Self-Actualization, EQ-i Social Responsibility, and the EQ-i Total Score. The negative associations with emotional self-awareness and social responsibility were consistent with hypotheses, but the other relationships that emerged were not hypothesized. The predicted negative association with Guilt also did not emerge.

As predicted, the Stimulus Seeking scale in the three-factor model had a moderate positive association with Risky Driving, and the Stimulus Seeking scale negatively predicted IASR-B5 Conscientiousness. Consistent with predictions, a small positive effect also emerged for Openness. The hypothesized associations with Impulse Control, Stress Tolerance, and Neuroticism did not emerge. In the four-factor model, the Risk-Taking scale had the hypothesized positive associations with Risky Driving, IASR-B5 Openness, and EQ-i Stress Tolerance. Small positive associations also emerged for EQ-i Interpersonal Relationships, TOSCA Detachment, and Antisocial Behavior. As far as negative associations, the Risk-Taking scale also had the predicted negative relationship with IASR-B5 Conscientiousness, IASR-B5 Neuroticism, and EQ-i Impulse Control. Small negative associations also emerged with IASR-B5 Agreeableness and EQ-i Problem Solving.

The Antisocial factor in the three-factor model was associated with the highest positive betas and medium to large effect sizes for Antisocial Behavior, EQ-i Empathy, MAQ Ambivalence-Worry, and Risky Driving. The associations with Risky Driving and antisocial conduct were consistent with hypotheses. Although a hypothesis did not exist for the relationship with Empathy, the positive relationship with Empathy was somewhat unexpected. As far as negative

Table 6 Multiple linear regression analyses predicting external correlate scale scores with PAI-ANT factor score

DV	PAI-ANT E		PAI-ANT SS		PAI-ANT AB		Full Model	
	β	*t*	β	*t*	β	*t*	β	*t*
IASR-B5 C	0.00	0.04	**-0.23**	-5.48**	**-0.12**	-3.20**	**-0.15**	-4.51**
IASR-B5 N	-0.03	-0.58	-0.07	-1.51	-0.04	-0.82	-0.05	-1.40
IASR-B5 O	0.00	0.01	**0.10**	2.70**	**0.10**	2.73**	**0.09**	2.83**
IASR-B5 E	**0.12**	2.49**	0.09	1.96*	-0.01	-0.22	0.07	1.90
IASR-B5 A	**-0.22**	-4.80**	**-0.19**	-4.24**	**-0.14**	-3.20**	**-0.22**	-5.82**
MAQ Av	**0.19**	4.72**	**0.08**	2.02*	-0.00	-0.09	**0.10**	2.90**
MAQ AW	0.01	0.35	0.01	0.19	0.36	0.93	0.03	0.73
MAQ AM	0.01	0.16	-0.01	-0.29	0.01	0.15	-0.00	-0.02
MAQ S	-0.02	-0.62	0.03	0.81	0.04	1.03	0.02	0.73
EQ-i T	**-0.57**	-2.40*	-0.11	-0.46	-0.26	-1.16	-0.36	-1.84
EQ-i ESA	-0.02	-0.35	-0.07	-1.20	0.02	0.36	-0.03	-0.58
EQ-i As	0.10	1.77	0.01	0.09	0.09	1.77	0.08	1.69
EQ-i SR	**0.18**	2.75**	0.01	0.20	0.05	0.77	0.09	1.63
EQ-i SA	0.01	0.20	-0.04	-0.54	0.09	1.48	0.03	0.59
EQ-i Ind	-0.04	-0.74	0.03	0.52	0.03	0.51	0.01	0.30
EQ-i Emp	**0.18**	2.69**	**0.17**	2.53**	**0.20**	3.14**	**0.23**	4.07**
EQ-i IR	**0.22**	3.03**	0.11	1.53	0.00	0.04	**0.12**	2.03*
EQ-i Soc	**-0.22**	-2.96**	-0.14	-1.83	**-0.20**	-2.91**	**-0.23**	-3.67**
EQ-i ST	**0.17**	2.34*	0.12	1.63	0.01	0.21	0.11	1.90
EQ-i IC	0.06	0.85	-0.11	-1.67	-0.05	-0.88	-0.05	-0.96
TOSCA S	0.03	0.77	-0.03	-0.64	-0.02	-0.57	-0.01	-0.32
TOSCA D	**0.12**	2.76**	0.04	0.92	0.02	0.53	0.07	1.90
TOSCA G	**-0.13**	-2.96**	-0.06	-1.43	**-0.17**	-4.03**	**-0.15**	-4.07**
TOSCA E	0.02	0.41	0.02	0.53	0.04	0.99	0.03	0.94
TOSCA AP	0.05	1.04	-0.01	-0.25	-0.06	-1.28	-0.02	-0.38
TOSCA BP	-0.02	-0.32	0.03	0.55	**0.11**	2.31*	0.06	1.36
RD	**0.15**	4.01**	**0.21**	5.53**	**0.18**	5.15**	**0.23**	7.21**
GPA	**0.09**	2.60**	0.01	0.18	-0.05	-1.60	0.01	0.29
ASB	0.05	1.40	**0.08**	2.24*	**0.26**	7.96**	**0.17**	5.94**

*$p < .05$. **$p < .01$

relationships, the Antisocial factor was associated with the highest negative beta coefficients in the prediction of EQ-i Social Responsibility and EQ-i Total. The predicted negative associations also emerged for Conscientiousness and Agreeableness. However, there was also an unexpected positive relationship with interpersonal relationship quality, and there were null associations with GPA and Impulse Control.

The Antisocial Behavior factor in the four-factor model demonstrated the hypothesized positive betas for Antisocial Behavior and Risky Driving. Positive associations also emerged with MAQ Ambivalence-Merger, MAQ Ambivalence-Worry, MAQ Avoidance, and TOSCA Externalization of Blame. As predicted, the Antisocial Behavior factor also had a moderate negative relationship to EQ-i Social Responsibility, EQ-i Impulse Control, and EQ-i Total Score. Moderate negative relationships also emerged for EQ-i Empathy and TOSCA Guilt. Although the effects were smaller, the hypothesized negative relationships also emerged for Conscientiousness, Agreeableness, interpersonal relationship quality, and GPA (see Table 8).

In general, the factors from the four-factor model demonstrated greater consistency with hypotheses than the factors from the three-factor model. With regard to evaluating the convergent and discriminant validity of the scales, one can also examine the strength of the monotrait-heteromethod coefficients compared with the heterotrait-heteromethod coefficients in monotrait comparison studies, or alternately examine the number of expected relations compared with the number of unexpected relations and calculate the number of violations. Using the summary table (Table 8), the total number of violations for the Egocentricity scale was four (33%). The total number of violations for the Stimulus Seeking scale was three (25%) and the total number of violations for the Antisocial scale was six (41%). With respect to the four-

Table 7 Multiple Linear Regression Analyses Predicting External Correlate Scale Scores with PAI Factor Scores (Manipulation, Affective, Risk-Taking, Antisocial Behavior): Coefficients

	PAI f1[a] Manipulation		PAI [f2b] Affective		PAI f3[c] Risk-Taking		PAI f4[d] Antisocial Behavior	
Dependent Variable	β	*t*	β	*t*	β	*t*	β	*t*
IASR-B5e Neuroticism	.02	0.61	.00	0.09	**-.14**	-4.04***	.01	0.39
IASR-B5 Conscientiousness	.02	0.78	**-.08**	-2.90**	**-.22**	-6.82***	**-.21**	-7.00***
IASR-B5 Agreeableness	**-.31**	-10.75***	**-.07**	-2.54*	**-.15** -	-4.91***	**-.18**	-6.36***
IASR-B5 Extraversion	-.03	-0.85	**-.09**	-2.85**	.06	1.88***	**-.21**	-6.63***
IASR-B5 Openness	.00	-.04	-.06	-1.42	**.11**	3.02**	.01	.43
MAQf Avoidance	.01	0.36	**.39**	13.89***	**-.09**	-2.89**	**.08**	2.86**
MAQ Ambivalence-Worry	.06	1.87	.04	1.27	-.03	-0.79	**.08**	2.60**
MAQ Ambivalence-Merger	**.09**	2.80**	-.02	-0.56	.02	.64	**.10**	3.19***
MAQ Security	**.07**	2.33*	**-.36**	-12.64***	.05	1.61	**-.13**	-4.49***
EQ-i[g] Total Score	**-.09**	-2.66**	**-.10**	-3.24**	.01	0.22	**-.24**	-7.33***
EQ-i Emotional Self-Awareness	-.05	-1.45	**-.22**	-6.72***	.03	0.91	**-.14**	-4.16***
EQ-i Assertiveness	.04	1.25	**-.10**	-2.92**	**.08**	2.09*	**-.08**	-2.22*
EQ-i Self-Regard	.00	.05	-.04	-1.16	.05	1.49	**-.15**	-4.32***
EQ-i Self-Actualization	-.06	-1.69	-.**12**	-3.84***	.03	0.80	**-.20**	-5.83***
EQ-i Independence	-.02	-0.57	.02	0.52	.01	0.32	-.03	-0.95
EQ-i Empathy	-.**13**	-3.86***	**-.08**	-2.47*	.04	0.99	**-.23**	-6.85***
EQ-i Interpersonal Relationships	**-.10**	-2.79**	**-.07**	-2.17*	**.11**	3.02**	**-.22**	-6.42***
EQ-i Social Responsibility	**-.21**	-6.66***	**-.10**	-3.27***	-.05	1.55	**-.27**	-8.90***
EQ-i Problem Solving	.03	0.74	**-.07**	-2.07*	**-.11**	-3.08**	**-.17**	-5.10***
EQ-i Stress Tolerance	.06	1.65	-.05	-1.49	**.09**	2.38*	**-.16**	-4.63***
EQ-i Impulse Control	**-.19**	-5.81***	-.04	-1.37	**-.16**	-4.79***	**-.24**	-7.75***
TOSCAh Shame	**-.08**	-2.51*	.04	1.45	**-.08**	-2.43*	**-.11**	-3.38***
TOSCA Detachment	**.23**	7.34***	.03	1.08	**.07**	2.04*	.02	0.71
TOSCA Guilt	-.**19**	-6.31***	-.05	1.64	**-.06**	-2.02*	**-.23**	-7.86***
TOSCA Externalization of Blame	**.21**	6.57***	.05	1.76	-.00	-0.04	**.07**	2.18*
TOSCA Alpha Pride	**.14**	4.40***	-.05	-1.79	-.01	-.22	**-.13**	-4.25***
TOSCA Beta Pride	**.10**	2.96**	-.03	-1.11	.00	.10	**-.09**	-2.78**
Reckless Drivingi	**.15**	3.92***	**.08**	2.23*	**.21**	5.50***	**.19**	5.42***
ASB Total Score	-.02	-0.57	-.03	-1.00	**.09**	2.88	**.42**	14.59***
Grade Point Average (GPA)	.02	0.55	.01	0.44	**-.10**	-2.78**	**-.16**	-4.75***

Beta values greater than or equal to 0.08 are in boldface

[a] Personality Assessment Inventory Arrogance factor; [b] Personality Assessment Inventory Callousness factor; [c] Personality Assessment Inventory Sensation Seeking factor; [d] Personality Assessment Inventory Antisocial factor; [e] Interpersonal Adjective Scales-Big Five Version; [f] Measure of Attachment Qualities; [g] Emotional Quotient Inventory; [h] Test of Self-Conscious Affect-Version 3; [i] Risky Driving Questionnaire Total Score

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$

factor model, the total number of violations for the Manipulation scale was two (15%), the total number of violations for the Affective scale was one (15%), the total number of violations for the Risk-Taking factor was two (18%), and the total number of violations for the Antisocial Behavior factor was one (9%). It is important to point out here that a violation does not always signify that the trait is not somewhat theoretically related to the factor. For example, Beta Pride was more highly related to the Antisocial scale (.11) than to the Egocentricity scale (-.02), thereby producing a violation (Bagozzi and Yi 1991; Byrne and Goffin 1993). Similarly, in the four-factor model, interpersonal relationship quality was more strongly related to the Risk-Taking factor (.19) than the Manipulation factor (-.10). As can be seen, these relations violated the convergent discriminant validity expectation that pride would be more highly associated with Egocentricity than with Antisocial Behavior, and that interpersonal relationship quality would be more closely related to the Manipulation scale than the Affective scale. However, neither signifies that the factor should not be correlated at least

Table 8 Highest Positive and Negative Beta Coefficient by Factor for Morey's Three-Factor PAI-ANT Mode

Factor	Scale	β	Effect Size	Scale	β	β Effect Size
Three Factor Model Egocentricity						
	EQ-i[b] Interpersonal Relationships	0.22	M	EQ-i Total	-0.57	L
	MAQ[a] Avoidance	0.19	S	IASR-B5[d] Agreeableness	-0.22	M
	EQ-i Self-Regard	0.18	S	EQ-i Social Responsibility	-0.22	M
	EQ-i Empathy	0.18	S	TOSCA[c] Guilt	-0.13	S
	EQ-i Stress Tolerance	0.17	S	EQ-i Independence	-0.04	S
	Risky Driving	0.15	S			
	Antisocial Behavior	0.05	S			
Sensation Seeking						
	EQ-i Empathy	0.17	S	IASR-B5 Conscientiousness	-0.23	M
	EQ-i Stress Tolerance	0.12	S	IASR-B5 Agreeableness	-0.19	S
	EQ-i Interpersonal Relationships	0.11	S	EQ-i Social Responsibility	-0.14	S
	IASR-B5 Openness	0.10	S	EQ-i Total	-0.11	S
	IASR-B5 Extraversion	0.09	S	EQ-i Impulse Control	-0.11	S
	Risky Driving	0.21	M			
	Antisocial Behavior	0.08	S			
Antisocial						
	MAQ Ambivalence-Worry	0.36	L	EQ-i Total	-0.26	M
	EQ-i Empathy	0.20	M	EQ-i Social Responsibility	-0.20	M
	TOSCA Beta Pride	0.11	S	TOSCA Guilt	-0.17	S
	IASR-B5 Openness	0.10	S	IASR-B5 Agreeableness	-0.14	S
	EQ-i Self-Actualization	0.09	S	IASR-B5 Conscientiousness	-0.12	S
	EQ-i Assertiveness	0.09	S			
	Risky Driving	0.18	S			
	Antisocial Behavior	0.26	M			
Four Factor Model Manipulation						
	TOSCA Detachment	0.23	M	IASR-B5 Agreeableness	-0.31	L
	TOSCA Externalization of Blame	0.21	M	EQ-i Social Responsibility	-0.21	M
	TOSCA Alpha Pride	0.14	S	TOSCA Guilt	-0.19	S
	TOSCA Beta Pride	0.10	S	EQ-i Impulse Control	-0.19	S
	MAQ Ambivalence-Merger	0.09	S	EQ-i Empathy	-0.13	S
				EQ-i Interpersonal Relationships	-0.10	S
	Risky Driving	0.15	S			
	Antisocial Behavior	-0.02	NS			
Affective						
	MAQ Avoidance	0.39	L	MAQ Security	-0.36	L
				EQ-i Emotional Self-Awareness	-0.22	M
				EQ-i Self-Actualization	-0.12	S
				EQ-i Social Responsibility	-0.10	S
				EQ-i Total Score	-0.10	S
	Risky Driving	0.08	S			
	Antisocial Behavior	-0.03	NS			
Risk-Taking	IASR-B5 Openness	0.11	S	IASR-B5 Conscientiousness	-0.22	M
	EQ-i Interpersonal Relationships	0.11	S	EQ-i Impulse Control	-0.16	S
	EQ-i Stress Tolerance	0.09	S	IASR-B5 Agreeableness	-0.15	S
	TOSCA Detachment	0.07	S	IASR-B5 Neuroticism	-0.14	S
				EQ-i Problem Solving	-0.11	S
	Risky Driving	0.21	M			
	Antisocial Behavior	0.09	S			

Table 8 (continued)

Factor	Scale	β	Effect Size	Scale	β	β Effect Size
Antisocial Behavior						
	MAQ Ambivalence-Merger	0.10	S	EQ-i Social Responsibility	-0.27	M
	MAQ Ambivalence-Worry	0.08	S	EQ-i Impulse Control	-0.24	M
	MAQ Avoidance	0.08	S	EQ-i Total Score	-0.24	M
	TOSCA Externalization of Blame	0.07	S	EQ-i Empathy	-0.23	M
				TOSCA Guilt	-0.20	M
	Risky Driving	0.19	S			
	Antisocial Behavior	0.42	L			

S = small effect size. M = medium effect size. L = large effect size. Effect size interpretations are based on Hemphill's (2003) empirical guidelines

[a] Measure of Attachment Qualities; [b] Emotional Quotient Inventory; [c] Test of Self-Conscious Affect-Version 3; [d] Interpersonal Adjective Scales Revised-Big Five Version

somewhat with pride or interpersonal relationship quality. Also, with respect to the Antisocial factor, only Antisocial Behavior and Risky Driving allow for non-violations, and the remaining variables are personality and emotion-related variables with more opportunity to be counted as violations. As mentioned above, correlation coefficients were also examined for those individuals who were the most highly antisocial and the pattern of results was similar to that which was found for the entire sample (see Tables 9 and 10).

Discussion

The recent rise in interest in psychopathy in the major diagnostic systems, as well as the construct's potential to facilitate assessment of individuals who might pose a risk to the community, has sparked further research on test development. Morey arguably introduced what was believed to be a modern conceptualization of psychopathy into the PAI, referred to here as the PAI-ANT scale.[1] Although the PAI-ANT scale has considerable construct validity as presented in the manual and has demonstrated construct validity with forensic samples, it has not been well validated in community samples. As the psychopathy construct gains further interest and possible acceptance in major diagnostic systems, it will be critical for self-report inventories to demonstrate structural, construct, and predictive validity in non-incarcerated samples as well as forensic samples. Because the PAI-ANT purports to be a contemporary measure of psychopathy, examining its structure and construct validity is critical given that the measure is commercially available and frequently used in many clinical and research sites.

[1] It should be noted that although the PAI psychopathy model was contemporary in some ways, some also view the factors to not fit well with the Hare (2003) model. Nonetheless, some viewed as an improvement from other multiscale measures that were less centered on personality traits and potentially more focused on antisocial behavior and family problems.

This study sought to examine the factor structure and elaborate upon the construct validity of the PAI-ANT in an undergraduate sample. The battery of tests also included a measure of antisocial behavior and risky driving. Exploratory factor analysis (EFA) supported a four-factor model, similar to the four-factor model that has been previously outlined by Hare (2003). The other models did not show acceptable fit. Nonetheless, it has been pointed out that both fit criteria and convergent discriminant analyses should be examined for a better understanding of a scale's potential construct validity because fit criteria can be overly stringent for most personality scales (e.g., Hopwood and Donnellan 2010; Smith et al. 2011; Tomarken and Waller 2003; Westen and Rosenthal 2005). Taking these criticisms into consideration, we examined external correlates to make cross-model comparisons for the original three and more recent four-factor model for psychopathy.

Three Factor-Model and Convergent Discriminant Validity

Item level inspection of the three-factor model indicated that the first factor assesses both egocentricity and affective deficits. According to Morey (2007), individuals scoring high on this scale take advantage of others around them, have little-to-no loyalty to others, are unlikely to have remorse or empathy, and place little importance on their role as a parent, student, or employee. This factor roughly taps facets of psychopathy delineated by Cleckley (1941) and Hare (2003) and is similar to the first factor on the PCL (Harpur et al. 1989), which is a combination of interpersonal and affective traits.

The second factor is a sensation-seeking factor, and individuals scoring high on this scale are thought to manifest behavior that is reckless and potentially dangerous to themselves and others. Individuals scoring high on this scale are thought to crave excitement and to become easily bored by routine and convention. This scale most closely parallels the

lifestyle factor of the Hare model (Hare 2003) and would align with items such as proneness to boredom, a need for stimulation, and perhaps impulsivity, as well as aligning with the Cleckley criteria of fantastic and uninviting behavior.

The Antisocial scale is intended to detect individuals who have a history of antisocial acts, who often manifest conduct disorder during adolescence, and who may have been involved in illegal operations and/or engaged in criminal acts involving theft, destruction of property, and physical aggression toward others. The Antisocial scale of the PAI therefore appears most closely linked to the fourth facet in the Hare model for psychopathy (see Hare 2003), which contains items related to juvenile delinquency, revocation of conditional release, and criminal versatility.

Of the three scales, all demonstrated a degree of convergent and discriminant validity. Specifically, the first factor of the

Table 9 Correlations Between Total and Factor Scores of the PAI-ANT for the Total Sample and Measures of Relevant External Correlates For Highly Antisocial Participants

Scale	PAI-ANT E[c]	PAI-ANT SS[a]	PAI-ANT A[b]	PAI-ANT Total[d]
PAI-ANT E	**--**	**.54****		
PAI-ANT SS	--	**--**	**--** .	**--**
PAI-ANT A	**--**	**.56****	**--**	**--**
PAI-ANT T	**.78****	**.86****	**.82****	
IASR-B5[e] Neuroticism	.10	-.02	.05	-.05
IASR-B5 Conscientiousness	**-**.12	-.23**	-.27**	-.26*
IASR-B5 Openness	.07	.08	.08	.09
IASR-B5 Extraversion	-.18*	-.01	-.14	-.13
IASR-B5 Agreeableness	**-.42****	-.08	**-.44****	**-.47****
MAQf-Avoidance	.25**	.03	.05	.13
MAQ-Ambivalence-Worry	.08	-.04	.14	.08
MAQ-Ambivalence-Merger	.05	-.02	.10	.05
MAQ-Security	-.21*	-.08	-.01	-.12
EQ-i[g] Total	-.29**	-.20*	**-.31****	**-.33****
EQ-i Self-Awareness	-.34**	-.14	-.23*	-.28**
EQ-i Assertiveness	-.13	-.01	.01	-.05
EQ-i Self-Regard	-.15	-.04	-.07	-.10
EQ-i Self-Actualization	-.19*	-.07	-.17	-.17
EQ-i Independence	.04	.01	-.06	.00
EQ-i Empathy	-.28**	-.22*	-.28**	**-.32****
EQ-i Interpersonal Relationships	-.27**	-.12	-.22*	-.24**
EQ-i Social Responsibility	**-.41****	**-.40****	**-.41****	**-.50****
EQ-i Stress Tolerance	-.00	-.00	-.01	-.01
EQ-i Impulse Control	**-.34****	**-.38****	**-.47****	**-.49****
TOSCA[h]-Shame	-.01	.01	-.10	-.04
TOSCA-Detachment	-.02	.05	.06	.03
TOSCA-Guilt	**-.32****	**-.31****	**-.35****	**-.40****
TOSCA-Externalization of Blame	-.12	.12	.17*	.17*
TOSCA-Alpha Pride	.12	-.12	-.06	-.12
TOSCA-Beta Pride	.03	-.06	.02	-.06
Risky Driving	**.40****	**.49****	**.43****	**.54****
GPA[ff]	.16	.08	-.05	.07
Antisocial Behavior	.17*	.18*	.21*	.21*

Correlations greater or equal to 0.30 are shown in boldface

[a] Personality Assessment Inventory-Antisocial Features Stimulus Seeking subscale; [b] Personality Assessment Inventory-Antisocial Features Antisocial Behavior subscale; [c] Personality Assessment Inventory-Antisocial Features Egocentricity subscale; [d] Personality Asessment Inventory-Antisocial Features Total score; [e] Revised Interpersonal Adjective Scales-Big Five Version; [f] Measure of Attachment Qualities; [g] Emotional Quotient Inventory; [h] Test of Self-Conscious Affect

*$p < .05$. **$p < .01$

Table 10 Correlations between factor scores of the PAI for the total sample and measures of relevant external correlates for highly antisocial participants

Scale	PAI[a] F1 Manipulation	PAI F2 Affective	PAI F3 Risk-Taking	PAI F4 Antisocial Behavior
PAI F1 (Manipulation)	--	--	--	--
PAI F2 (Affective)	0.25**	--	--	--
PAI F3 (Risk-Taking)	**0.56****	**0.32****	--	--
PAI F4 (Antisocial Behavior)	0.26*	0.15	**0.35****	--
IASR-B5[b] Neuroticism	0.11	-0.03	-0.01	-0.06
IASR-B5 Conscientiousness	-0.23**	0.00	-0.29**	-0.24**
IASR-B5 Openness	0.15	-0.03	0.08	-0.01
IASR-B5 Extraversion	-0.17	-0.09	0.02	-0.18*
IASR-B5 Agreeableness	**-0.48****	-0.11	**-0.34****	**-0.33****
MAQc Avoidance	0.14	**0.36****	-0.06	0.08
MAQ Ambivalence-Worry	0.14	-0.05	-0.03	0.18*
MAQ Ambivalence-Merger	0.10	-0.13	0.01	0.11
MAQ Security	-0.05	**-0.41****	0.02	-0.11
EQ-id Total Score	**-0.31****	-0.07	-0.21*	-0.19*
EQ-i Emotional Self-Awareness	-0.25**	**-0.32****	-0.05	-0.16
EQ-i Assertiveness	-0.03	-0.11	0.04	0.02
EQ-i Self-Regard	-0.14	-0.04	-0.02	-0.01
EQ-i Self-Actualization	-0.20*	-0.07	-0.06	-0.15
EQ-i Independence	-0.01	0.28**	-0.09	-0.01
EQ-i Empathy	-0.29**	-0.10	-0.17	-0.20*
EQ-i Interpersonal Relationship	**-0.30****	-0.10	-0.06	-0.14
EQ-i Social Responsibility	**-0.46****	-0.15	**-0.38****	**-0.30****
EQ-i Problem Solving	-0.05	-0.03	-0.07	-0.09
EQ-i Stress Tolerance	0.06	-0.07	-0.01	-0.04
EQ-i Impulse Control	**-0.40****	-0.10	**-0.43****	**-0.32****
TOSCAe Shame	0.02	-0.01	0.01	-0.13
TOSCA Detachment	0.04	-0.10	0.05	-0.00
TOSCA Guilt	**-0.33****	-0.11	**-0.32****	**-0.30****
TOSCA Externalization of Blame	0.20*	-0.01	0.13	0.11
TOSCA Alpha Pride	-0.03	-0.14	-0.12	-0.05
TOSCA Beta Pride	-0.06	-0.11	-0.07	0.05
Risky Driving[f]	**0.40****	0.15	**0.47****	0.28*
Antisocial Behavior Total Scoreg	0.13	0.12	0.13	0.13
Grade Point Average (GPA)	0.12	0.10	0.04	-0.01

Correlations greater or equal to 0.30 are shown in boldface

[a] Personality Assessment Inventory; [b] Revised Interpersonal Adjective Scales-Big Five Version [c] Measure of Attachment Qualities; [d] Emotional Quotient Inventory; [e] Test of Self-Conscious Affect-Version 3; [f] Risky Driving Questionnaire Total Score

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

model (Egocentricity) was associated with empathy, accurate perception of one's self, stress tolerance, and avoidant attachment styles. This factor was also positively related to establishing satisfying relationships and the ability to relate well with others – characteristics that both Cleckley (1941) and Hare (2003) would see as being associated with the interpersonal and affective features of psychopathy. In addition, Egocentricity was associated with low emotional intelligence, Agreeableness, social responsibility, guilt, self-reliance, and emotional dependency on others. Several of these latter associations describe the Cleckley (1941) psychopath. As Cleckley (1941) referred to the psychopath as demonstrating high self-regard, being egocentric, and being superficially manipulative in relationships while also lacking social responsibility and guilt. Several of the relations, however, do not fit well with theory, such as observing correlations with lower emotional intelligence.

The second factor, Stimulus Seeking, was associated with a lack of Conscientiousness and impulse control,

while being positively associated with risky driving and stress tolerance, as hypothesized. Stimulus Seeking was associated with empathy, relating well with others, building mutually satisfying relationships, Openness, Extraversion, and antisocial behavior. This factor was also negatively associated with Agreeableness, social responsibility, and emotional intelligence. The Stimulus Seeking factor indicates that individuals may report that they have mutually satisfying relationships yet lack social responsibility (i.e. the tendency to identify with and cooperate with others). The negative associations with Conscientiousness and Agreeableness are also consistent with prior work indicating that low levels of these traits are implicated in psychopathy (e.g. Vize et al. 2016; Vize et al. 2018). As mentioned, this factor should map onto Hare's lifestyle dimension. However, this scale appears to have a mix of associations with both adaptive and maladaptive characteristics. This may be because those who crave excitement are more extroverted and open to relations with others. However, it also appears that individuals with this personality style have impulse control problems, have few concerns about society, and see little need to cooperate with others.

The Antisocial factor was associated with risky driving and antisocial behavior as well as negatively associated with emotional intelligence, social responsibility, Agreeableness, and Conscientiousness. Additionally, guilt was negatively associated with this factor. The third factor was also positively associated with empathy, ambivalent attachment, pride, Openness, self-actualization, and assertiveness. It is important to note that the Antisocial factor had the highest associations with reports of antisocial conduct and risky driving. For the majority of the associations, the Antisocial factor appears to resemble Cleckley's (1941) behavioral criteria in his case descriptions and Hare's Factor 2 of psychopathy. This factor maps onto Hare's (2003) description of erratic behavior and antisocial acts, as well as Cleckley's (1941) description of lack of planning and DeLisi's (2016) work suggesting that crime and psychopathy are closely intertwined. Although the model fit was poor for the three-factor model, many of the scales associated with each factor provide some accurate representation of each dimension of psychopathy.

Four-Factor Model and Convergent Discriminant Validity

The four-factor model parses the items into what might be considered more coherent factors, with the first factor representing arrogance and manipulation, the second factor representing affective deficits, the third factor representing lifestyle characteristics, and the fourth factor representing antisocial behavior (Hare 2003). The first factor, Manipulation, had positive associations with detachment, externalization of blame, pride, ambivalent attachment, and risky driving. Low Agreeableness, social responsibility, guilt, impulse control, empathy, and interpersonal relationship quality were also noted for this factor. Most of these associations fit with both Cleckley and Hare's (2003) descriptions of the prototypical psychopath.

The second factor, Affecctive, was linked with avoidant attachment and risky driving and demonstrated negative associations with secure attachment, emotional self-awareness, self-actualization, social responsibility, and overall emotional intelligence. These correlates also represent meaningful relations in terms of the historical models for psychopathy as put forth by Cleckley (1941/1976). Giving and receiving of affection seems unlikely for psychopathic individuals, and although they may view themselves as mutually cooperative, blame externalization and detachment impede this ability. This factor (Affective) does capture some interesting relations that would otherwise be missed with the three-factor model alone (Morey 1991), such as the negative associations with emotional self-awareness, self-actualization, and secure attachment.

The third factor, Risk-Taking, was most highly positively associated with risky driving, Openness, interpersonal relationship quality, stress tolerance, and detachment. This factor was most negatively associated with Conscientiousness, impulse control, Agreeableness, Neuroticism, and social problem solving. Similarly to the three-factor model's Stimulus Seeking factor, the Risk-Taking scale appears to have a mix of both adaptive and maladaptive associations with the extra test characteristics. Thus, individuals scoring high on this factor appear to demonstrate some emotional intelligence and Openness, although they also exhibit lower levels of impulse control and manifest other negative qualities.

The fourth factor, Antisocial Behavior, aside from being most highly linked with antisocial behavior on campus as well as driving-related risk on campus, was associated with ambivalent attachment, avoidant attachment, and externalization of blame. This scale was also negatively associated with social responsibility, impulse control, general emotional intelligence, empathy, and guilt. The bulk of these relations converge with theory. In sum, the Antisocial factor can be viewed as reflecting the Cleckley criteria of "unreliability" and "antisocial behavior," and this factor also taps the types of characteristics that Robins (1966) described when she outlined her criteria for sociopathy in her book *Deviant Children Grown Up*. The scale also aligns to some extent with Karpman's (1941) notion of secondary psychopathy and Hare's (2003) fourth facet of the PCL.

Overall, the four scales appear to index facets of psychopathic personality similar to Hare's (2003) Interpersonal, Affective, Lifestyle, and Antisocial facets. Only the Antisocial scale had a large association with antisocial behavior. In terms of interpretation, the EFA and the convergent and discriminant validity data indicate that the four-factor model

may be the best way to interpret the PAI-ANT. However, in both the three and four-factor models, the Stimulus Seeking scale (three-factor model) and the Risk-Taking factor (four-factor model), may be reflective of both positive and negative attributes. That is, craving excitement may be associated with impulse control problems, lower Conscientiousness, lower Agreeableness, and lower social problem solving ability but also with higher interpersonal relationship quality, stress tolerance, emotional stability, and Openness. Thus, while the scales are generally reflective of the psychopathic personality, the scales could also lead to false positives in the assessment of psychopathy.

The extent to which there should be some positive associations with healthy personality scales has been the subject of some debate. For instance, Seibert et al. (2011) noted that there are differences in the extent to which self-report measures evidence positive associations with healthy adjustment variables (e.g., feelings of well-being). For example, these authors highlighted that the PPI fearless dominance factor (and perhaps boldness; Patrick, 2010) typically evidence positive relations with healthy adjustment scales (extraversion), whereas other psychopathy scales such as the LSRP or the SRP-II do not. The PAI-ANT scales appear to mostly be linked with negative adjustment with the exception of the Stimulus Seeking factor which has mixed representation. It is difficult to know whether this represents the psychopathic person's reporting of perceived positive and negative attributes that might be rated differently by an expert interviewer, or whether they represent true attributes associated with each of the psychopathy facets.

Conclusion

This study indicated that EFA fit statistics and the convergent and discriminant validity data support the four-factor model for the PAI-ANT scale. This model most closely aligns with the Hare four-factor model for psychopathy, which is a well-established model. The current study suggests that the PAI-ANT may be useful in the community and even in university settings. Specifically, the PAI-ANT scales appeared to be linked to personality, emotional intelligence, and affective variables in meaningful ways, as well as being related to real-world risks such as hazardous driving and antisocial behavior. One caveat is that the Risk-Taking scale appears to be associated with mostly negative but also some positive variables more so than the other scales, suggesting that it may be representative of individuals who crave excitement but are not fully psychopathic. As such, some caution is needed with this scale. Nonetheless, the scale could be useful for assessment and treatment recommendations for clinicians assessing individuals from the general community. Given the DSM and ICD consideration of psychopathy as a formal diagnosis, the PAI-ANT may be of some use in the future if making such assessments is deemed clinically useful.

Study Limitations and Future Directions

First, the current study is based on a sample of university students, and this may limit generalizability to the broader community. However, the factor scores still correlated with risky driving practices and some admitted antisocial conduct. Nonetheless, to expand the generalizability of the findings, future research should examine the utility of the PAI for assessing psychopathy in a non-university based, general community sample. Second, the measures used in this study were self-report, which introduces the possibility of inflated coefficients due to shared method variance. Although the individual is likely to be the best resource for information regarding their routine behaviors, thoughts, and feelings, it is also the case that multisource information and possibly clinician-based ratings of psychopathy would further inform community psychopathy studies. Future research should therefore focus on the incorporation of both self- and other-report measures of psychopathy and related constructs as well as laboratory tasks that help make up the nomological net for psychopathy. Finally, future research should consider the administration of the PAI and other psychopathy measures and external correlates across time. Despite these limitations, the current results suggest that the PAI ANT may have some utility as a measure of psychopathy as it is related to a number of personality, affective, and behavioral problems.

Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional review board and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

The article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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