A BIFACTOR APPROACH TO MODELING THE STRUCTURE OF THE PSYCHOPATHY CHECKLIST-REVISED

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Abstract

To date, models of the structure of psychopathy as assessed by the Psychopathy Checklist-Revised (PCL-R) have taken a higher-order approach in which the factors of the PCL-R are modeled as correlated elements of a higher-order psychopathy construct. Here, we propose an alternative structural model of the PCL-R, the bifactor model, which accounts for the covariance among PCL-R items in terms of a general factor reflecting the overlap across all items, and independent subfactors reflecting the unique coherency among particular groups of items. We present examples of how this alternative structural model can account for diverging associations between different subsets of PCL-R items and external criteria in the domains of personality and psychopathology, and we discuss implications of the bifactor model for future research on the conceptualization and assessment of psychopathy.

The dominant assessment instrument in the field of psychopathy research for the past several years has been Hare's (1991, 2003) Psychopathy Checklist-Revised (PCL-R). The PCL-R was developed to assess a unitary psychopathy construct and its 20 items are all intercorrelated. Nonetheless, the instrument also shows evidence of distinctive underlying factors with diverging external correlates (Hare, 2003; Patrick, 2007). Alternative structural models of the PCL-R have been proposed, including two-factor (Harpur, Hakstian, & Hare, 1988; Hare et al., 1990), three-factor (Cooke & Michie, 2001), and four-factor models (Hare, 2003; Hare & Neumann, 2006). These models differ in the number of factors posited, but they all assume that the factors of the PCL-R represent correlated elements (facets) of a higher-order psychopathy construct. Here, we propose an alternative structural model of the PCL-R, the *bifactor model*, which accounts for the covariance among PCL-R items in terms of a general factor reflecting the overlap across all items, along with separate uncorrelated subfactors reflecting the unique coherency among particular subgroups of items. We present examples of how this alternative model can help to elucidate diverging associations between different subsets of PCL-R items and varying external criteria in the domains of personality and general psychopathology, and we discuss implications of the model for further work on the conceptualization and assessment of psychopathy.

THE PCL-R: ORIGINS AND CONTENT COVERAGE

Hare's (1991, 2003) PCL-R was devised to identify individuals within prison or forensic settings who appear psychopathic according to Cleckley's (1976) definition of the syndrome. The original PCL (Hare, 1980) developed out of a global rating system that had been used by Hare and his colleagues for many years in experimental investigations of male offenders. In

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the global diagnostic system, raters familiar with the background and recent behavior of the participant assigned scores from 1–7 to indicate the degree of match to Cleckley's description of the prototypic psychopath (1 = clearly nonpsychopathic; 7 = definitely psychopathic). Interrater reliability for this global rating system was high, but nonetheless, the inherent subjectivity of this approach prompted requests for a more systematic, criterion-based procedure. Hare's strategy in developing the PCL was to identify items from among a large set of candidate indicators that discriminated between individuals assigned low versus high scores on the global rating system. The original version of the PCL consisted of 22 items. Two of these items ("previous diagnosis as a psychopath or similar," and "antisocial behavior not due to alcohol intoxication") were eliminated in the revised PCL (Hare, 1991), and the scoring criteria for the remaining 20 items were modified somewhat. The item labels and scoring criteria remained the same from the first edition of the PCL-R (Hare, 1991) to the second (Hare, 2003).

It is instructive to compare the item content of the PCL-R with Cleckley's original diagnostic criteria for this disorder. Reflecting his characterization of psychopathy as a "Mask of Sanity," Cleckley's (1976) criteria included 4 indicators of positive psychological adjustment (superficial charm and good intelligence, absence of delusions or irrationality, lack of nervousness, and disinclination toward suicide) along with 12 indicators of emotional-interpersonal and behavioral deviancy. In the PCL-R, the emotional-interpersonal and behavioral deviance features described by Cleckley are well represented in, but the positive adjustment indicators are not. Patrick (2006) suggested an explanation for this in terms of the procedures used to select items for the PCL-R. Items were retained if they helped to discriminate between individuals assigned high versus low scores on the Cleckley global rating system, and if they exhibited "good psychometric properties" (Hare, 1980). The latter criterion implies that indicators were chosen if they contributed to the reliability (internal consistency) of the overall instrument as well as helping to discriminate extreme groups. This would have operated to homogenize the final PCL item set: good-discriminating indicators that correlated with many other discriminating indicators would be retained, whereas indicators that correlated with fewer other indicators would be dropped. As a function of this, positive adjustment indicators that failed to coalesce with the larger proportion of (pathologic) indicators would have been selected out. The end result would be an item set more uniformly indicative of deviance and psychological maladjustment than Cleckley's original criterion set.

Consistent with this perspective, overall scores on the PCL-R are substantially correlated with symptoms of antisocial personality disorder (cf. Hare, 2003), which comprise for the most part indicators of behavioral deviance. The personality traits that are related most strongly to overall scores on the PCL-R are traits reflecting aggressiveness and impulsivity—for example, the Agreeableness and Conscientiousness dimensions of the Five Factor Model (negative correlations in each case; Lynam & Derefinko, 2006), and the lower-order Aggression and higher-order Constraint scales of Tellegen's (in press) Multidimensional Personality Questionnaire (positive and negative correlations, respectively; Verona, Patrick, & Joiner, 2001). In addition, total PCL-R scores show significant positive correlations with various behavioral indices of aggression (Hare, 2003) and with measures of alcohol and drug problems (Reardon, Lang, & Patrick, 2002), and weaker positive associations with suicidal behavior (Verona et al., 2001). Moreover, in opposition to Cleckley's description of psychopaths as lacking in anxiety, overall PCL-R scores show negligible relations with measures of trait anxiety (Hare, 2003) and weak positive correlations with Neuroticism as represented in the Five Factor Model (Lynam & Derefinko, 2006).

In summary, the strategy that was used to develop the PCL-R resulted in a set of correlated indicators more uniformly reflective of deviancy and maladjustment than Cleckley's original diagnostic criteria for psychopathy. At the same time, as discussed in the next section, factor

analytic research on Hare's instrument and affiliated validity studies nevertheless indicate that the PCL-R contains distinctive subgroups of items (i.e., factors) that exhibit discriminant validity in their associations with external criterion variables.

DISTINCTIVE FACTORS OF THE PCL-R

Considerable effort has been devoted to formally investigating the factor structure of Hare's PCL-R. The dominant structural model for many years has been the two-factor model (Harpur, Hakstian, & Hare, 1988; Hare, Harpur et al., 1990). In this model, Factor 1 is marked by items reflecting the interpersonal (charm, grandiosity, and deceitfulness/conning) and affective features of psychopathy (absence of remorse, empathy, and emotional depth, and blame externalization). Factor 2 is marked by items describing a chronic antisocial lifestyle, including child behavior problems, impulsivity, irresponsibility, and a lack of long-term goals. Scores on these two PCL-R factors are typically correlated around .5 (Hare, 1991, 2003).

Cooke and Michie (2001) noted that a significant weakness of the two-factor model is its failure to meet conventional criteria for goodness-of-fit within a confirmatory analytic framework. To address this problem, these authors proposed an alternative three-factor model of the PCL-R, in which the items of Factor 1 were parsed into two separate (but correlated) factors: "arrogant and deceitful personality style," marked by charm, grandiosity, deceitfulness, and manipulation; and "deficient affective experience," consisting of absence of remorse or empathy, shallow affect, and failure to accept responsibility. The third "impulsive-irresponsible behavioral style" factor consisted of a truncated version of Factor 2, comprising the five items considered to be most trait-like. Using confirmatory factor analysis, Cooke and Michie demonstrated that this three-factor model did achieve an adequate fit to the data. However, a limitation of this model is that it incorporates only 13 of the 20 items of the PCL-R. More recently, Hare (2003; see also Hare & Neumann, 2006) has advanced a four-factor model that incorporates all but two PCL-R items (sexual promiscuity, numerous marital relationships). In this model, Factor 1 of the original two-factor model is divided into "Interpersonal" and "Affective" facets (mirroring Cooke and Michie's first two factors) and Factor 2 is divided into a "Lifestyle" facet (mirroring Cooke & Michie's third factor) and an "Antisocial" facet (incorporating the remaining four antisocial deviance indicators from Factor 2, plus one additional item, "criminal versatility").

Most of the available data concerning the discriminant validity of these PCL-R item subsets pertains to the factors of the original two-factor model. PCL-R Factors 1 and 2 show markedly different associations with various criterion measures of personality and behavior, particularly when their shared variance is controlled for using partial correlation or hierarchical regression methods. For example, the unique variance in PCL-R Factor 1 (affective-interpersonal features) is negatively associated with measures of trait anxiety (Hicks & Patrick, 2006; Patrick, 1994; Verona et al., 2001), and positively correlated with measures of social dominance (Verona et al., 2001; see also Harpur, Hare, & Hakstian, 1989, and Hare, 1991), and in some work, with achievement (Verona et al., 2001) and trait positive affect (Patrick, 1994). Recently, Hall, Benning, and Patrick (2004) reported that these associations are evident mainly for the "interpersonal" component of Factor 1 (cf. Cooke & Michie, 2001), reflecting charm, grandiosity, deceitfulness, and manipulativeness. These results indicate that the positive adjustment indicators included in Cleckley's conceptualization may be tapped to some extent by the variance in Factor 1 that is unrelated to behavioral deviance—particularly that associated with the interpersonal items of the PCL-R. On the other hand, Factor 2 of the PCL-R shows selective positive associations with measures of alcohol and drug dependence (Smith & Newman, 1990; Reardon et al., 2002) and child symptoms of DSM APD, and markedly stronger associations than PCL-R Factor 1 with adult APD symptoms (Hare, 2003; Verona et al., 2001). Also in contrast with Factor 1, PCL-R Factor 2 shows positive relations with trait

anxiety scales and measures of depression and suicidal tendencies (Hicks & Patrick, 2006; Verona et al., 2001; Verona, Hicks, & Patrick, 2006).

These diverging associations for the factors of the two-factor PCL-R model are striking for two variables that are considered to be facets of a single higher-order construct (e.g., Hare, 1991, 2003). Particularly notable are instances of *cooperative suppression* (Cohen & Cohen, 1975; Paulhus, Robins, Trzesniewski, & Tracy, 2004), in which opposing associations for the two PCL-R factors with criterion measures become stronger once their overlap (covariance) is removed. For example, Hicks and Patrick (2006) reported evidence of suppressor effects in the associations of the two PCL-R factors with varying aspects of negative emotionality— including distress (or general anxiousness), fearfulness, and anger—along with depression. For three of these four criterion variables (emotional distress, fear, depression), cooperative suppressor effects were evident—i.e., correlations for both PCL-R factors increased, in opposing directions, when the two were included simultaneously in a prediction model. For the fourth variable, anger, a crossover suppression effect was found—i.e., when the two PCL-R factors were included together in a prediction model, a reversal occurred in the direction of association for Factor 1 (i.e., from significantly positive to nonsignificantly negative), whereas the association for Factor 2 became somewhat more positive. Moreover, for all four criterion variables, prediction based on the two PCL-R factors together was superior to that based on PCL-R total scores alone.

The occurrence of suppressor effects, and in particular instances of cooperative suppression, strongly suggests that the items of a measurement instrument presumed to index a single broad construct are actually tapping separable, distinctive underlying constructs (Paulhus et al., 2004). The presence of suppressor effects for the two factors of the PCL-R, in particular, fits with Cleckley's original idea that the syndrome of psychopathy reflects the unusual co-occurrence within the same person of tendencies toward psychological resiliency on one hand, and behavioral maladjustment on the other. Thus, despite the fact that PCL items were intended to index a unitary construct, the instrument nevertheless contains subgroups of items that tap distinctive underlying constructs. There is also evidence that these separable components of psychopathy have distinctive etiological underpinnings (Patrick, 2007).

AN ALTERNATIVE STRUCTURAL CONCEPTUALIZATION: THE BIFACTOR MODEL

As described above, the approach that was used to develop the PCL-R favored the emergence of a dominant underlying factor on which all items of the instrument load. Consistent with this, Hare (1980) reported that a principal components analysis of the original PCL yielded evidence of a prominent first factor that accounted for a much larger proportion of the overall variance than other factors. Nevertheless, evidence of additional subordinate factors was found, and as noted, subsequent research has confirmed the presence of distinctive item subsets within the PCL-R.

One approach to structuring the data under circumstances such as this is a higher-order model, in which lower-order factors are modeled as differential elements (facets) of a general factor that permeates the instrument as a whole. This is the approach that has been taken with the two-, three-, and four-factor models proposed in the literature to date. A sample higher-order model, involving six observed measures (v1 to v6) and three factors (f0, f1, and f2), is portrayed in Figure 1 (upper part). As shown, the higher-order model conceptualizes a domain in terms of a general factor (f0) that bifurcates into two distinguishable factors (f1 and f2) that, in turn, are further subdivided into specific scales (v1 to v6). In this model, correlations among the scales (v1 to v6) are accounted for by the two higher-order subfactors (f1 and f2), and the correlation between the subfactors is accounted for by the general overarching factor (f0). If this model provides superior fit to the data, it indicates that the domain being modeled consists

of a single broad, coherent construct that can be broken down into increasingly specific manifestations or facets.

An alternative to structuring the data under these circumstances is to employ a bifactor model (also termed "hierarchical model"; Yung, Thissen, & McLeod, 1999). Although related, the bifactor factor model provides an empirically and conceptually distinct account of the relationship between factors in a multilevel factor model (Yung et al., 1999). The bifactor model approach was initially developed in the context of research on cognitive abilities as an extension of Spearman's two-factor approach (Holzinger & Swineford, 1937). In Spearman's conceptualization of cognitive abilities, all variables are related to a general factor and yet each contains a specific factor. The bifactor approach still assumes a general factor underlying all variables and a specific or unique factor for each, but in addition it includes a number of uncorrelated group factors consisting of two or more variables (Holzinger & Swineford, 1937). Thus, the bifactor, or nested factor, approach differs from the higher-order model approach in that the group variables are not subsumed by the general factor but are uncorrelated and distinct (Gustafsson & Balke, 1993).

The bifactor alternative to the higher-order model depicted in Figure 1 is presented in the lower part of this same Figure. As shown, the bifactor model also posits a broad general factor that saturates each specific scale (f0). However, in contrast to the higher-order model, within the bifactor model this factor does not bifurcate into correlated subfactors. Rather, specific measures are saturated with both the general factor (f0), as well as other specific factors (f1 and f2), and these factors are mutually uncorrelated. If this model provides superior fit to the data, it indicates that the domain being modeled is saturated by a single broad, coherent construct, but that specific scales in the domain (v1 to v6) are also saturated by other specific factors (f1 and f2) that vary independently of the general factor. Thus, in this model, each scale is a measure of the general factor, but some scales also index other more specific constructs that are not correlated with the general factor.

To date, the bifactor model has been employed primarily in the intelligence literature (see, e.g., Gustafsson & Balke, 1993; Carroll, 1993). In this context, the model has been used to argue that a general intelligence factor (*g*) accounts for the correlations among scores on various abilities tests, but that nonoverlapping subfactors remain evident once the influence of the general factor has been removed—reflecting the influence of specific aptitudes, unrelated to *g*, on test performance (Rummel, 1970). However, the bifactor model has been applied quite recently in the psychopathology area. Krueger, Markon, Patrick, Benning, and Kramer (in press) compared the fit of alternative higher-order and bifactor (hierarchical) models in examining the structure of various correlated indicators of externalizing problems. Support was found for a bifactor model in which all indicators loaded on a dominant broad factor, "Externalizing," with particular indicators loading additionally on distinctive Aggression and Addictions subfactors unrelated to the broad Externalizing factor. The implication is that there is a broad underlying factor that contributes to all forms of externalizing behavior, and in addition, there are processes separate from this that contribute to the development of aggressive forms of externalizing behavior on one hand (e.g., physical, relational, destructive aggression), and addictive forms on the other (e.g., alcohol use/problems, drug use/problems).

THE CURRENT STUDY

The current study examined the bifactor approach as an alternative to traditional higher-order approaches to modeling the structure of the PCL-R. Specifically, we evaluated whether the PCL-R could be effectively modeled in terms of a general factor, marked by all items of the instrument, along with specific factors marked by specific item subsets. In addition, to elucidate the nature of constructs underlying these factors, we examined associations for each of the

factors in this model with criterion variables in the domains of normal personality and psychopathology.

METHOD

PARTICIPANTS

Participants were 593 male inmate volunteers recruited from the general population of two prisons: a low-medium security federal prison in Florida (n = 324), and a medium security state prison in Minnesota (n = 269). The total sample had a mean age of 32.3 years (SD = 8.3). The racial and ethnic composition was as follows: 36.0% (n = 215) African-American, 49.3% (n = 295) Caucasian, 11.2% (n = 67) Hispanic, and 2.7% (n = 16) Asian, American Indian, or mixed race. All individuals provided informed written consent prior to participation in the study.

ASSESSMENT

Psychopathy—Ratings for the 20 items of the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003) were assigned on the basis of information from a structured diagnostic interview and a review of prison file records. Interviewers held either a Bachelors or Masters degree in psychology and received specialized training in the use of the PCL-R. Ratings were intermittently checked for observer drift by a third rater. For each PCL-R assessment, a primary rater conducted the interview while a second independent diagnostician viewed a video recording of the interview and performed secondary ratings. All raters reviewed the file information. Items were rated as 0 (does not apply), 1 (applies somewhat), or 2 (definitely applies). Interrater reliability was estimated by intraclass correlation coefficients (ICC; Shrout & Fleiss, 1979). The ICCs for a single rater and the mean of two raters ranged from .75 to .91 and .86 to .95, respectively, for the four PCL-R facet scores. The mean PCL-R total score for overall sample was 23.7 (SD = 7.3).

NORMAL PERSONALITY

Personality test data were available for varying numbers of participants and was assessed using self-report questionnaires for three well-validated structural models of normal personality including: the Emotionality Activity Sociability Impulsivity (EASI) Temperament Survey (n = 180; Buss & Plomin, 1975, 1984), the NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992; n = 303), and the brief form of the Multidimensional Personality Questionnaire (MPQ; Patrick, Curtin, & Tellegen, 2002; n = 380).

EASI Temperament Survey—The EASI is a 25-item inventory that measures four temperament dimensions: Emotionality, Activity, Sociability, and Impulsivity. Emotionality refers to individual differences in sensitivity to negative emotions and the intensity of one's emotional response. Emotionality is measured using three subscales: Distress (general tendency to experience negative emotions), Fearfulness (negative emotion and withdrawal or avoidance to a specific stimulus), and Anger (negative emotion and aggressive response or attitude to transgression). Activity refers to the pace of a person's life, energy level, and engagement in multiple activities. Sociability refers to a person's tendency to seek and enjoy the company and attention of others. Impulsivity refers to the tendency to act without forethought and express versus withhold behavioral responses.

NEO-FFI—The NEO-FFI is a 60-item inventory that measures the "Big Five" dimensions of personality derived from lexical approaches to personality structure and description. Neuroticism measures emotional instability and the tendency to experience feelings of anxiety, worry, and depression. Extraversion measures sociability and proneness to experience positive emotions. Openness refers to a person's comfort and interest in novel experiences and ideas. Agreeableness refers to a person's interpersonal relations and tendency to be trustful,

straightforward, and empathetic as opposed to cynical, manipulative, callous, and hostile. Conscientiousness refers to a person's tendency to plan, organize, and complete tasks in a timely and responsible manner.

MPQ Brief From—The brief form of the MPQ is a 155-item inventory that includes 11 primary trait scales and four higher-order factors. The 11 primary trait scales (and the specific content of each) are as follows: Well-Being, (optimism, enthusiasm, cheerfulness); Social Potency (dominance, attention seeking behavior, and leadership); Achievement (mastery motivation and perfectionism); Social Closeness (sociable and affectionate behavior); Stress Reaction (anxiety, mood instability, and tendency to break down under stress); Alienation (feelings of victimization, blame externalization, and suspiciousness); Aggression (perpetration of violence, willingness to hurt others, and interpersonal hostility); Control (cautious and reflective behavior); Harm Avoidance (avoidance of dangerous activities; preference for routine over risk); Traditionalism (conservative views and lack of rebelliousness); and Absorption (capacity for abstract thought and vivid imagination).

The four higher-order factors of the MPQ are Agentic Positive Emotionality (Agentic-PEM), Communal Positive Emotionality (Communal-PEM), Negative Emotionality (NEM), and Constraint (CON). Agentic-PEM indexes the attainment of well-being through achievement striving and influencing others. Communal-PEM reflects the realization of well-being via interpersonal relationships. NEM is a broad index of negative affect that encompasses stress reactivity, alienation, and aggression. CON serves as an indicator of behavioral restraint, marked by primary traits of control (versus impulsivity), harm avoidance, and traditionalism.

EXTERNALIZING SYNDROMES

Antisocial Personality Disorder (ASPD)—The structured interview included additional questions to assess symptoms of ASPD as defined in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM; American Psychiatric Association, 1987, 1994). The diagnostic criteria for *DSM-III-R* (American Psychiatric Association, 1987) were used to make ratings for the portion ($n = 110$) of the sample assessed before 1994. All other participants were assessed using *DSM-IV* criteria (American Psychiatric Association, 1994), which includes 15 childhood symptoms (i.e., present before age 15) and 7 adult symptoms (i.e., present after age 15). To provide a common metric for the whole sample, raw symptom counts were expressed as the proportion of child or adult criteria met for the version of the *DSM* used in the individual's assessment. ICC's for a single rater and the mean of two raters were .79 and .88 for the adult symptoms, and .91 and .95 for the child symptoms, respectively. To reduce criterion overlap when examining associations with the PCL-R factors, only PCL-R ratings made by the primary interviewer and ASPD symptoms assigned by the secondary rater were included in the analyses.

Alcohol Dependence Scale (ADS)—The ADS ($n = 380$; Skinner & Allen, 1982) consists of 29 items that assess pathological alcohol use and symptoms of alcohol dependence (e.g., "Have you had 'shakes' when sobering up as a result of drinking?"; "Do you carry a bottle with you or keep one close at hand?"). The ADS yields a total score with high scores indicative of severe alcohol dependence.

Short Drug Abuse Screening Test (SDAST)—The SDAST ($n = 560$; Skinner, 1982) is a 20-item self-report questionnaire that measures problems associated with illicit drug use including symptoms of abuse and dependence. The SDAST yields a total score with higher ratings distinguishing individuals with more extreme drug-related problems.

DATA ANALYSIS

First, we conducted an exploratory factor analysis to provide insights into the relationships among the items, which were then used to inform testing of appropriate bifactor models. Second, the goodness of fit of alternative bifactor models was evaluated using confirmatory factor analysis. Our primary goal was to model the interrelationships among all 20 items of the PCL-R. However, to provide a point of comparison, we also compared the fit of higher-order factor models similar to the Cooke and Michie (2001) 13-item, 3-factor model, and Hare's (2003; Hare & Neumann, 2006) 18-item, 4-facet model, against appropriate bifactor models. We did not utilize testlets or item parcels in these models, however, as we sought to model the interrelationships among the item-level constructs rather than combine items to construct facet indicators of broader latent variables.

Model fit was evaluated using the χ^2 fit statistic, the root mean square error of approximation (RMSEA), the standardized root mean residual (SRMR), and the Bayesian Information Criterion (BIC; χ^2—$df \ln N$). The χ^2 and RMSEA are indices of overall model fit, with the RMSEA providing an index of the discrepancy in model fit per degree of freedom. The SRMR is an index of the average discrepancy between the model-estimated statistics and observed sample statistics. RMSEA and SRMR values less than .08 indicate a good fit to the data, while values less than .05 indicate a very good fit. The BIC is an especially sensitive index of model fit that balances overall model fit with parsimony (i.e., number of parameters in the model used to account for the observed data), such that model fit is penalized for the addition of unnecessary parameters. More negative BIC values are indicative of better fit.

Once the best fitting model was identified, we next sought to delineate the descriptive validity of the PCL-R factors by estimating their associations with the measures of the personality trait constructs. We also examined the relations between the PCL-R factors and externalizing syndromes. For these analyses, both the measures of the personality traits and externalizing syndromes were directly incorporated into the confirmatory factor models as this approach provides greater power and less biased parameter estimates than alternative analytic strategies. All confirmatory factor analyses were conducted using *Mplus 3.0* (Muthen & Muthen, 2001) and were fit to the raw data via full-information maximum likelihood, which allows for missing data and yields less biased parameter estimates than listwise or pairwise deletion.

RESULTS

EXPLORATORY FACTOR ANALYSIS

Figure 2 displays the scree plot of an initial exploratory factor analysis. The scree plot shows a clear dominant first factor and includes four factors with eigenvalues greater than 1.00. The ratio of the first to second eigen-value was 6.49 to 1.95, indicative of a common variance that underlies the internal consistency and homogeneity across the 20-items. However, there is also evidence of significant residual and systematic variance that must be incorporated into a structural model of the instrument.

To generate hypotheses for an appropriate bifactor structural model, we examined the residual matrix of item correlations after removing the first factor. Consistent with Cooke and Michie's (2001) analyses of item testlets, there was a clear pattern of residual correlations among the interpersonal items (Glibness/superficial charm, Grandiosity, Pathological lying, and Conning/manipulative). A comparable pattern was also observed among the residual correlations for the affective items (Lack of remorse, Shallow affect, Callous/lack of empathy, and Failure to accept responsibility). Finally, there was some evidence of an impulsivity facet, as the Impulsivity item exhibited significant residual correlations between with the Irresponsibility

and Need for stimulation/proneness to boredom items, although the latter two items were only weakly correlated with each other.

Therefore, we tested two bifactor models. Both models included a General factor that loaded on each item. In addition to the General factor, the first bifactor model included two specific factors, one that loaded on the interpersonal items and another that loaded on the affective items. The second bifactor model included an additional specific factor that loaded on the Impulsivity, Irresponsibility, and Need for stimulation/proneness to boredom items.

CONFIRMATORY FACTOR ANALYSES

Next, we examined the fit of the bifactor models using confirmatory factor analysis. Because models that include different variables cannot be directly compared, we could not provide a direct comparison between bifactor models for the full 20-items of the PCL-R and Cooke and Michie's 13-item (2001) and Hare's 18-item (Hare, 2003; Hare & Neuman, 2006) models. However, to provide a test of the overall utility of the bifactor model, we fit appropriate bifactor models for the 13- and 18-item sets, and compared the fit of the bifactor models to the higher-order factor models that included multiple lower-order factors (e.g., Interpersonal, Affective, Lifestyle, Antisocial) that loaded on a single higher-order factor.

Table 1 provides fit statistics and specific details for the competing factor models of the PCL-R items. Consistent across the results for different item sets is that the bifactor model yields a comparable or slightly improved fit to the data compared with the competing higher-order factor models. Also consistent across all item sets is that a bifactor model incorporating a third specific factor yields a better fit than a bifactor model with only two specific factors. This suggests that the third specific factor accounts for systematic variance that likely relates to important external criteria. Finally, the bifactor model provides an adequate to good fit for all item sets.

Table 2 lists the factor loadings for the final bifactor model for the 20 items of the PCL-R. When examining the pattern of loadings on the General factor the following interpretations are of note. First, the group of items with the highest loadings (i.e., >.50) on the General factor includes items from both the traditional F1 and F2 as well as items from each of the four facets. These results suggest it is this General factor variance that accounts for the internal consistency and homogeneity of the PCL-R items. Second, the items with the highest loadings on the General factor mirror many elements of the *DSM-IV* criteria for ASPD—antisocial behavior before age 15 (Early behavioral problems), aggression and irritability (Poor behavioral controls), failure to conform to social norms with respect to lawful behaviors (Criminal versatility), deceitfulness (Conning/manipulative), lack of remorse (Callous/lack of empathy), irresponsibility (Irresponsibility)—suggesting a close correspondence between the General factor of the PCL-R and ASPD.

The first specific factor was defined by the interpersonal items, in particular the Glibness/superficial charm and Grandiosity items, which had higher loadings on the specific factor than the General factor. Though also loading on the Interpersonal factor, the Pathological lying and Conning/manipulative items had higher loadings on the General factor. The second specific factor loaded on the affective items and was mainly defined by the Lack of remorse item, whose loading on the specific factor was more than twice the magnitude of its loading on the General factor. Failure to accept responsibility also had a higher loading on the Affective factor than on the General factor. The Callous/lack of empathy and Shallow affect items had only modest secondary loadings on the specific factor, with higher loadings on the General factor. Finally, the third specific factor was clearly defined by the Impulsivity item with modest secondary loadings for the Need for stimulation/proneness to boredom and Irresponsibility items.

LOCATING PCL-R FACTORS WITHIN STRUCTURAL MODELS OF NORMAL PERSONALITY

Next, we examined relations between the PCL-R factors derived from the best fitting bifactor model and normal range personality trait constructs by incorporating the self-report personality measures into the structural model of PCL-R items. This analytic strategy has several advantages. First, because the PCL-R factors are modeled as latent variables, the attenuating effects of measurement error are removed, which maximizes the effect sizes with the personality measures. Second, the structural models allow for missing data. This allows us to maximize both the information and sample size, which yields more accurate parameter estimates than listwise or pairwise deletion. Finally, because the PCL-R factors derived from the bifactor model are uncorrelated, it was not necessary to control for their overlapping variance when examining their relations with criterion variables.

Table 3 provides the structural associations between the PCL-R factors and the self-report measures of normal personality traits. The General factor was most strongly related to traits describing a hostile and aggressive interpersonal style including Aggression, Emotionality-Anger, and low Agreeableness. The General factor was also associated with an overall elevation in the experience of and sensitivity to negative emotions as evidenced by significant correlations with Emotionality-Distress, Stress Reaction, Alienation, and Negative Emotionality. The General factor also exhibited significant associations with measures of behavioral disinhibition including Impulsivity, low Control, and low Constraint.

In contrast, the specific Interpersonal factor evinced a very different pattern of relations with the personality variables, specifically, strong and consistent associations with measures of social dominance and low negative emotional reactivity. In terms of social dominance, the Interpersonal factor was strongly related to Extraversion, Social Potency, and Agentic-PEM. The Interpersonal factor was also inversely related to Emotionality-Distress and Fearfulness, Neuroticism, Stress Reaction, and Negative Emotionality. The Interpersonal factor also seems to be associated with a surgent personality style, as evidenced by significant correlations with Conscientiousness and Achievement. Additionally, the Interpersonal factor was associated with a general elevation in the experience of positive emotions as evinced by significant associations with Well-being and Communal-PEM. Finally, the Interpersonal factor also exhibited a significant association with Openness, indicating an ease and interest in novel ideas and experiences, as well as modest but significant associations with Aggression (−) and Control (+) suggestive of a protective factor in regards to antisocial behavior.

The specific Affective factor failed to exhibit a single significant correlation with the measures of normal range personality traits. Either the Affective factor is not well captured by these measures of normal personality traits, or it has little relevance to understanding the individual difference traits typically conceptualized as within the domain of personality.

Finally, the specific Impulsivity factor was strongly, and rather selectively, associated with measures of behavioral disinhibition. The Impulsivity factor was significantly associated with the EASI Impulsivity and Activity scales, low Conscientiousness, low Control, low Harm Avoidance, and low Constraint. The Impulsivity factor was also significantly associated with Stress Reaction. It is important to remember that the General factor and the specific Impulsivity factor are uncorrelated. Therefore, to the extent these factors are correlated with the same criterion (e.g., low Control), each accounts for a different portion of variance. For example, the General factor seems to capture disinhibited aggression whereas the specific Impulsivity factor seems to index an aspect of behavioral disinhibition independent of aggression, involving proneness toward aimless, sensation-seeking activity.

RELATIONS BETWEEN PCL-R FACTORS AND EXTERNALIZING SYNDROMES

Lastly, we examined the relations between the PCL-R factors and externalizing syndromes (see Table 4). We employed the same analytic strategy as the personality variables in that measures of externalizing syndromes were incorporated directly into the structural model of the PCL-R factors. The association between the PCL-R General factor and the total number (i.e., combined adult and child symptoms) of ASPD symptoms approached unity. The General factor was also strongly correlated with both the adult and child symptoms of ASPD as well as with the self-report measures of alcohol and drug dependence. The Interpersonal factor exhibited a significant negative correlation with the self-report measures of alcohol and drug dependence and was unrelated to symptoms of ASPD. The Affective factor exhibited a modest but significant negative correlation with the self-report measure of drug dependence. The Impulsivity factor exhibited moderate and significant correlations with the self-report measures of alcohol and drug dependence. This suggests that the Impulsivity factor indexes a specific risk for substance dependence (and perhaps other addictions such as gambling and addictive sexual behavior) that is independent of the risk conferred by the PCL-R General factor.

To conclude, we also modeled the general risk for externalizing syndromes as a latent variable defined as the covariance among the child and adult symptoms of ASPD, the self-report measures of alcohol and drug dependence, and the MPQ Aggression and Control scales. Figure 3 depicts the parameter estimates for this model. As seen in the figure, the association between the PCL-R General factor and the latent Externalizing variable was unity. The latent Externalizing variable also exhibited a significant but modest negative association with the Interpersonal factor, but was unrelated to the Affective and Impulsivity factors.

DISCUSSION

The findings of the current study, employing data from a sample of close to 600 incarcerated male offenders, provide support for a bifactor structure to the items of the PCL-R. An initial exploratory factor analysis of the item data revealed evidence of a dominant first factor, accounting for over three times as much variance as the next largest factor, supporting the evaluation of alternative higher-order and bifactor models. Standard absolute fit criteria indicated an acceptable fit for the bifactor model in varying item sets, including the 13 items represented in the three-factor model (Cooke & Michie, 2001), the 18 items represented in the four-factor model (Hare, 2003), and the full set of 20 PCL-R items. The version of the bifactor model that provided the best fit to the data was one that included a General factor on which all items of the PCL-R loaded significantly, along with three separate subfactors on which particular subsets of PCL-R items loaded. An index of comparative fit (BIC) indicated equivalent or somewhat better fit for this version of the bifactor model in relation to the alternative, higher-order model.

The items that loaded most strongly on the General factor within this bifactor model were indicators of antisociality and behavioral deviance including early behavior problems, poor behavioral controls, irresponsibility, criminal versatility, juvenile delinquency, and conning/manipulativeness (all loadings >.55). Only three items (glibness/charm, grandiosity, failure to accept responsibility) exhibited loadings of less than .3 on this General factor. The implication is that the items of the PCL-R as a whole are saturated with antisocial deviancy. Consistent with this interpretation, the personality trait correlates of this General factor were those known to be associated with antisocial/externalizing behavior (i.e., anger/aggression, impulsivity/low constraint, and high negative emotionality; e.g., Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Trull, 1992), and scores on this General factor were correlated very highly with overall symptoms of APD. Furthermore, an analysis of the latent association between the General factor of the PCL-R and the Externalizing factor of psychopathology (modeled using indicators of child and adult antisocial behavior, alcohol and drug problems, and disinhibitory personality

traits; cf. Krueger, Hicks, Patrick, Carlson, Iacono, & McGue, 2002) indicated a 1:1 correspondence between the two. Thus, the current results establish a close association between the General factor underlying the items of the PCL-R and an important emerging construct in the broader psychopathology literature (see, e.g., Kendler, Prescott, Myers, & Neale, 2003; Krueger et al., 2002; Krueger, Markon, Patrick, & Iacono, 2005).[1]

In addition to the General factor on which all items of the PCL-R loaded significantly, three other specific factors emerged in the bifactor model. These factors reflect shared variance among particular subsets of items separate from the variance in these items that is related to the General factor (i.e., each of these specific factors was uncorrelated with the General factor). The first of these specific factors was an Interpersonal factor on which glibness/charm and grandiosity loaded to a much greater degree than on the General factor, and on which pathological lying and conning/manipulation showed secondary loadings. The implication is that glibness/charm and grandiosity in particular tap something highly distinct from the General deviancy factor on which most other PCL-R items showed their primary loadings. The personality trait correlates of this Interpersonal factor included indices of anxiety/neuroticism (−), fear (−), dominance (+), extraversion (+), well-being (+), and achievement/ conscientiousness (+). Notably, these personality correlates closely parallel those of the first factor of the self-report based Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), as described by Benning, Patrick, Hicks, Blonigen, and Krueger (2003)—suggesting that the Interpersonal factor of the PCL-R taps something in common with PPI factor 1. Further highlighting its distinctiveness from the General factor of the PCL-R, the Interpersonal factor correlated negatively (albeit weakly) rather than positively with Externalizing.

The second specific factor was an Affective factor on which lack of remorse loaded most strongly (i.e., .80, versus only .38 on the General factor). Failure to accept responsibility also showed its primary loading on this factor (.39, versus .28 on the General factor), with shallow affect and callousness displaying modest secondary loadings. These loadings suggest that this factor reflects deficient feelings of guilt and accountability for one's harmful actions. Interestingly, this factor showed no associations whatsoever with personality trait variables. This could indicate either that the construct underlying this factor falls outside the realm of normal personality traits, or perhaps that it is not based in trait dispositions. This Affective factor also showed negligible association with the Externalizing psychopathology factor.

The third specific factor was one on which the PCL-R impulsivity item loaded somewhat more heavily than it did on the General factor (.50 versus .43), and on which need for stimulation and irresponsibility exhibited modest secondary loadings. Although less well differentiated in terms of its PCL-R item indicators, this Impulsivity factor nonetheless showed robust associations with a number of personality trait variables. Compared with the General factor, this factor was associated minimally with aggression/disagreeablness, and more substantially with impulsivity/low constraint, high activity, and low conscientiousness—suggesting a spontaneous, action-oriented, present-centered style. Although unrelated to APD symptoms, this factor showed significant positive associations with measures of alcohol and drug problems. Thus, its net positive association with Externalizing was somewhat positive, albeit nonsignificant.

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[1]In another recent paper (Patrick, Hicks, Krueger, & Lang, 2005), we examined associations between the factors represented in the PCL-R two-factor model and reported a similar close correspondence between Factor 2 of the PCL-R and the Externalizing psychopathology factor. The data for this prior study were from a subset of participants (N = 219) included in the current investigation. Within the current expanded sample, the correlation between scores on the General factor derived from the bifactor model and scores on traditional Factor 2 was .94 (versus.68 for Factor 1). Thus, the very high association of Externalizing with the General factor of the PCL-R as well as with traditional Factor 2 reflects the fact that the General factor taps the proneness to behavioral deviancy embodied in Factor 2.

The conceptualization that emerges from the bifactor model of the PCL-R is different from that associated with established higher-order models. Whereas higher-order models such as the three- and four-factor models conceive of the PCL-R as measuring alternative instantiations of a coherent underlying construct (psychopathy), the bifactor model conceives of the PCL-R as indexing a conglomeration of distinctively different constructs: a broad construct tapped by all items, along with specific factors tapped by particular subsets of items. The bifactor conceptualization coincides with Lilienfeld and Fowler's (2006) perspective, inspired by recent work on the structure of psychopathy as indexed by the PPI (Benning et al., 2003), of psychopathy as a compound versus a multifaceted trait. Multifaceted traits are those consisting of narrower subtraits that covary as a function of the causal influence of an overarching higher order trait. In contrast, compound traits are "emergent composites of separable, often unrelated, lower-order traits (Lilienfeld & Fowler, 2006, p. 127). Lilienfeld and Fowler argued that the finding of orthogonal Fearless Dominance and Impulsive Antisociality factors (cf. Benning, Patrick, Blonigen, Hicks, & Iacono, 2005) underlying the subscales of the PPI is more consistent with the idea of psychopathy as a compound trait entity.

This conceptualization also appears consistent with Cleckley's characterization of psychopathy as a paradoxical composite of positive adjustment and severe behavioral pathology. In Cleckley's words: "The surface of the psychopath … shows up as equal to or better than normal and gives no hint at all of a disorder within. … Yet he has a disorder that often manifests itself in conduct far more seriously abnormal than that of the schizophrenic" (p. 383). The strategy that was originally used to select items for the PCL-R emphasized the measurement of a unidimensional construct, leading to the exclusion of pure indicators of positive adjustment and the retention of a set of indicators more uniformly reflective of deviancy (Patrick, 2006). The item loadings and aforementioned correlates for the General factor of the PCL-R reflect this broad theme of behavioral deviancy (Externalizing). Nevertheless, particular items of the PCL-R also tap other distinctive constructs. The most striking of these is the Interpersonal factor, which reflects interpersonal surgency and a relative absence of anxiety and fear. This factor appears to tap something of the positive adjustment features of psychopathy emphasized by Cleckley.

The bifactor/compound trait conceptualization provides a framework for reconciling the diverging associations with external correlates that have been noted for different PCL-R item subsets. The most striking instances of this are cooperative suppressor effects—cases where opposing associations for different item subsets with external criterion measures become stronger once their overlap (covariance) is removed. For example, Hicks and Patrick (2006) reported that correlations for the two traditional PCL-R factors with various measures of anxiety, fear, and depression each increased, in opposing directions, when the two factors were included together in a prediction model. This phenomenon is readily understandable in light of the current findings indicating that the PCL-R items tap multiple distinctive constructs with differing external correlates. By removing overlapping variance, purer measures of these distinctive constructs emerge that show clearer relations with relevant criterion measures.

The bifactor/compound trait perspective has important implications for future research on the assessment of psychopathy. From this perspective, it is important to recognize the variegated nature of the psychopathy construct, and develop separate scales for indexing its distinctive components independently of one another. For example, the findings of the current study indicate that a construct of central importance to conceptualization and assessment of psychopathy is the broad Externalizing factor of psychopathology—with which the general Factor of the PCL-R is essentially synonymous. One important objective will be to refine the measurement of this construct. Work of this kind is currently in progress (Krueger et al., 2005; Krueger et al., 2006). Separate from this, research is needed to systematically delineate the Interpersonal, Affective, and Impulsivity factors identified in the current analysis. For

example, the PCL-R contains two relatively specific indicators of the Interpersonal factor (glibness/charm, and grandiosity). These indicators, together with other known personality correlates of the Interpersonal factor (i.e., low anxiety, high dominance, high well-being), provide the foundation for a scale development effort. An iterative, exploratory approach (Tellegen & Waller, 1992) could be used to further delineate the construct and refine its measurement. In this process, positive adjustment features emphasized by Cleckley would be explicitly reintroduced to the assessment of psychopathy.

The bifactor conceptualization also has implications for research on etiologic mechanisms contributing to the syndrome of psychopathy. Whereas a higher-order conceptualizaton implies that there is a unitary, underlying etiologic factor that gives rise to the various affective, interpersonal, and behavioral features of psychopathy, the bifactor perspective implies that there are separate etiologic processes that contribute to the phenotypic expression of psychopathy (cf. Fowles & Dindo, 2006; Patrick, 2001, 2007). For example, recent research indicates that the broad Externalizing factor of psychopathology is substantially heritable (Kendler et al., 2003; Krueger et al., 2002) and that it has distinctive neurobiological correlates (Patrick, Bernat, Malone, Iacono, Krueger, & McGue, 2005). These findings point to a coherent underlying etiology for the Externalizing factor; this same etiologic process would also be expected to underlie the General factor of the PCL-R. On the other hand, it seems likely that a separate etiologic process underlies the Interpersonal component of psychopathy. One potential candidate is a weakness in fear reactivity, which has been demonstrated in relation to Factor 1 of the PCL-R (Patrick, 1994) and also in relation to the Fearless-Dominance factor of the PPI (Benning, Patrick, & Iacono, 2005).

In summary, our aim in this paper has been to introduce an alternative structural model of the PCL-R, the bifactor model, with unique implications for conceptualizing psychopathy. This model encourages a view of psychopathy as a configuration of distinctive traits rather than as a unitary syndrome. We hope that this perspective will contribute to progress in the measurement of psychopathy and elucidation of its underlying etiologic mechanisms.

Acknowledgements

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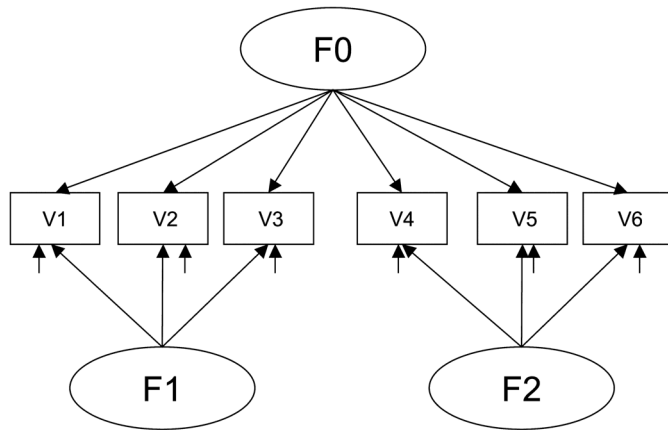## Higher-order Factor Model
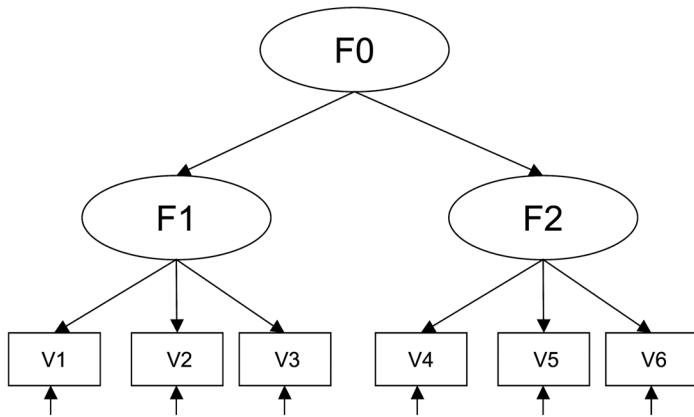
Bi-Factor Model

FIGURE 1.
Depiction of alternative higher-order and bifactor models incorporating six manifest indicators.
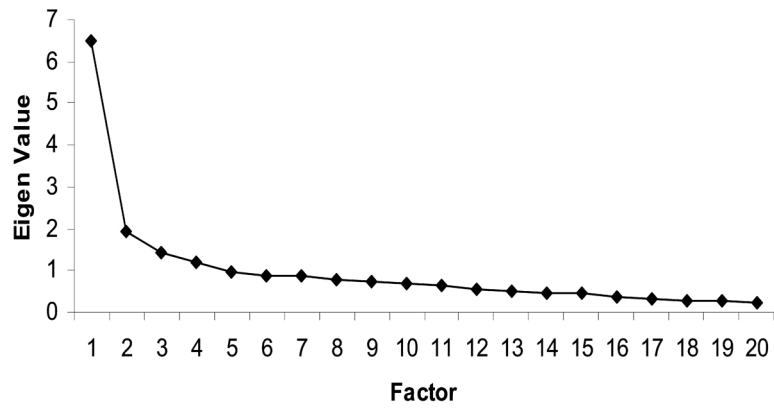
FIGURE 2.
Scree plot for exploratory factor analysis of the 20 PCL-R indicators in the current study sample
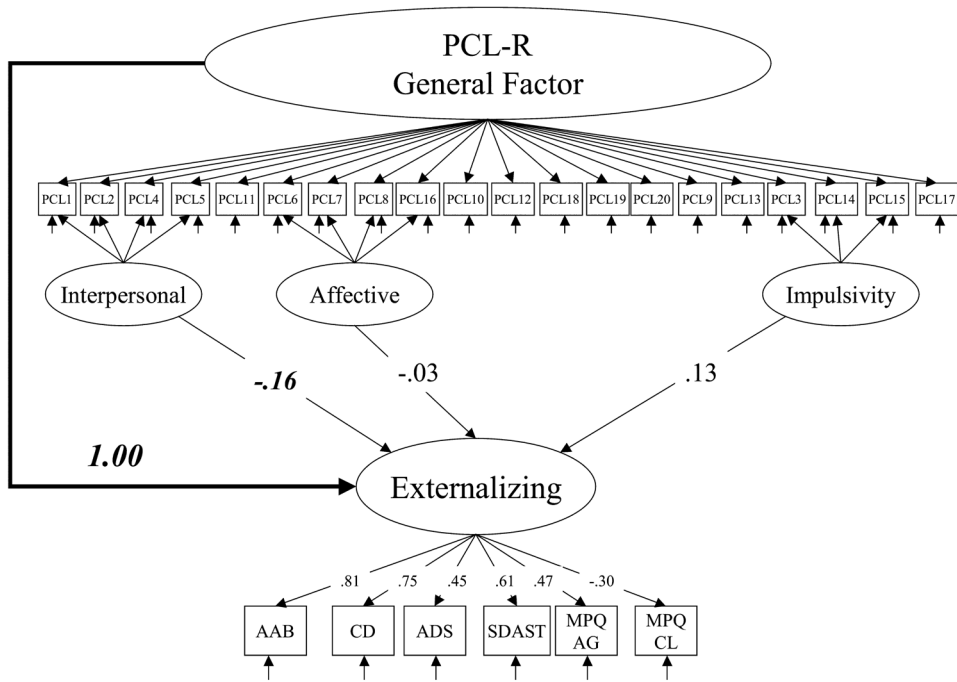($N = 593$).

FIGURE 3.
Structural model of relations between general and specific factors of the PCL-R bifactor model and the latent Externalizing variable. AAB = Adult antisocial behavior (i.e., the adult criteria for antisocial personality disorder); CD = Conduct disorder (i.e., child criteria for antisocial personality disorder); ADS = Alcohol dependence scale; SDAST = Short drug abuse screening test; MPQ AG and CL = Aggression and Control primary scales of the Multidimensional Personality Questionnaire. Structural coefficients in bold and italics are significant at $p < .01$. All factor loadings on the latent Externalizing variable are significant at $p < .01$.

TABLE 1

Goodness of Fit Statistics for Alternative Factor Models of the PCL-R

Model	χ^2	df	RMSEA	SRMR	BIC
13-items					
1 higher-order factor, 3 lower-order factors	308.1	62	.082	.063	−87.8
Bi-factor, 2 specific factors	270.2	57	.079	.064	−93.8
Bi-factor, 3 specific factors	221.4	54	.072	.056	−123.4
18-items					
1 higher-order factor, 4 lower-order factors	571.8	131	.075	.061	−264.7
Bi-factor, 2 specific factors	549.7	127	.075	.060	−261.2
Bi-factor, 3 specific factors	515.9	124	.073	.058	−275.9
20-items					
1 higher-order factor, 5 lower-order factors [*]	620.3	165	.068	.058	−433.3
Bi-factor, 2 specific factors	615.2	162	.069	.057	−419.2
Bi-factor, 3 specific factors	582.8	159	.067	.056	−432.4

Note. $N = 593$. χ^2 = chi square goodness of fit statistic; df = degrees of freedom; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual; BIC = Bayesian information criterion.

[*] For this model, the two sexual behavior items, Promiscuous sexual behavior and Many short-term marital relationships, were used as indicators of a fifth factor that loaded on the higher-order factor.

TABLE 2

Factor Loadings for the Best Fitting Bi-Factor Model for the 20 PCL-R Items

PCL-R Item	General Factor	Interpersonal	Affective	Impulsivity
1. Glibness/superficial charm	.22	.62		
2. Grandiosity	.19	.52		
3. Need for stimulation/Proneness to boredom	.51			.31
4. Pathological lying	.46	.31		
5. Conning/manipulative	.56	.33		
6. Lack of remorse	.38		.80	
7. Shallow affect	.41		.25	
8. Callous/lack of empathy	.53		.24	
9. Parasitic Lifestyle	.51			
10. Poor behavioral controls	.60			
11. Promiscuous sexual behavior	.30			
12. Early behavioral problems	.64			
13. Lack of realistic long-term goals	.34			
14. Impulsivity	.43			.50
15. Irresponsibility	.58			.23
16. Failure to accept responsibility	.28		.39	
17. Many short-term marital relationships	.40			
18. Juvenile delinquency	.57			
19. Revocation of conditional release	.43			
20. Criminal versatility	.57			

Note. $N = 593$. All factor loadings are significant at $p < .05$. All factors are uncorrelated.

TABLE 3

Structural Relations Between PCL-R Factors and Normal Range Personality Traits

Personality Variable	General Factor	Interpersonal	Affective	Impulsivity
EASI				
Emotionality				
Distress	***.31***	***−.36***	−.11	.10
Fearfulness	.16	***−.29***	−.10	−.14
Anger	***.35***	−.17	−.04	.11
Activity	.05	.20	−.04	***.47***
Sociability	−.03	.20	.05	−.01
Impulsivity	***.31***	−.12	.02	***.51***
NEO-FFI				
Neuroticism	.17	***−.40***	−.08	.23
Extraversion	.07	***.42***	.03	−.16
Openness	−.04	***.26***	.01	.08
Agreeableness	***−.33***	.07	−.11	−.18
Conscientiousness	−.19	***.33***	.08	***−.36***
MPQ Primary scales				
Well-being	−.09	***.34***	−.05	−.10
Social Potency	.15	***.46***	−.03	−.01
Achievement	−.10	***.27***	.06	−.05
Social closeness	−.17	.13	−.07	.00
Stress reaction	***.24***	***−.32***	−.01	***.25***
Alienation	***.18***	−.18	.10	.03
Aggression	***.46***	***−.19***	.09	.12
Control	***−.22***	***.18***	−.03	***−.55***
Harm avoidance	−.12	−.03	−.05	***−.42***
Traditionalism	−.10	−.02	.05	−.05
Absorption	.07	.14	.01	.18
MPQ Higher-order Factors				
Agentic-PEM	−.04	***.43***	.02	−.10
Communal-PEM	−.09	***.29***	−.09	−.04
Negative emotionality	***.36***	***−.26***	.09	.16
Constraint	***−.20***	.06	−.02	***−.52***

Note. $N = 593$ for the PCL-R factors and from 180 to 380 for the self-report measures of personality. Relations between the PCL-R factors and personality measures were estimated in a structural equation model framework using full information maximum likelihood which allows for missing data. Coefficients in bold and italics are significant at $p < .01$. EASI = Emotionality Activity Sociability Impulsivity Temperament Survey; NEO-FFI = NEO Five Factor Inventory; MPQ = Multidimensional Personality Questionnaire; PEM = Positive Emotionality.

TABLE 4

Relations Between PCL-R Factors and Externalizing Syndromes

Externalizing Variable	General Factor	Interpersonal	Affective	Impulsivity
ASPD	*.92*	−.08	.01	.02
Adult symptoms	*.83*	−.05	.09	.15
Child symptoms	*.82*	−.10	−.09	−.16
Alcohol Dependence Scale	*.37*	*−.27*	−.14	*.31*
Short Drug Abuse Screening Test	*.59*	*−.16*	*−.18*	*.26*

Note. ASPD = Antisocial Personality Disorder. Coefficients in bold and italics are significant at *p* < .01.