

The P-psychopathy continuum: Facets of Psychoticism and their associations with
psychopathic tendencies

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Highlights

- An examination of psychopathy related facets in EPQ-R Psychoticism (P)
- Confirmatory Factor Analyses of the 2, 3 and 4 factor models of psychopathy in P
- support the 4 factor model over 2 factor model, but 3 factor model had best fit
- P-facets show predicted divergent associations with psychopathy related traits
- linked to high psychopathy, impulsivity and aggression, and low empathy

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Abstract

Eysenck proposed that psychopathy is at the extreme end of the Psychoticism (P) personality dimension (Eysenck & Eysenck, 1976). This study examined (i) whether psychopathy-relevant P items of the EPQ-R can form psychometrically valid facets that map onto the conceptualization of the two-, three- or four-factor models of psychopathy using confirmatory factor analysis (N=577) in a normal population; and (ii) whether those P-facets have criteria-related validity in associations with self-reported primary and secondary psychopathy, impulsivity (subsample N=306), and measures of trait empathy and aggression (subsample N=212). The four-factor model incorporating affective, interpersonal, impulsive, and antisocial facets of P was superior to the two-factor model; however, the three-factor conceptualization excluding the antisocial P-facet was the best fit. The facets show predicted divergent associations with primary and secondary self-reported psychopathy and trait measures. Findings are discussed in light of Eysenck's P-psychopathy continuity hypothesis and the applicability of facet approaches to the prediction of psychopathic and antisocial tendencies.

Keywords: Psychoticism, Psychopathy, Continuity Hypothesis, facet approach,
Confirmatory factor analysis

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1. Introduction

A growing literature conceptualizes psychopathy at the extreme end of a continuum along normal personality functioning (Edens, Marcus, Lilienfeld, & Poythress, 2006). Accordingly, assessments of levels of psychopathic traits in abnormal *and* normal populations may be appropriate to study psychopathy fully (Hare & Neumann, 2008). Eysenck's continuity hypothesis states that psychopathological disorders represent extreme ends of normal personality, with Psychoticism (P) proposed as a predisposition to criminality, psychopathy and schizophrenia (Eysenck & Eysenck, 1976). Individuals scoring high on P are impersonal, emotionally indifferent, and lacking empathy and remorse. Their behavioral deficits are reflected in impulsivity, recklessness, and antisociality (Eysenck, 1992). Whilst the P-continuity hypothesis for schizophrenia has been directly tested across normal, forensic, and clinical populations (Eysenck, 1992; but see also Van Kampen, 1993), the P-psychopathy relationship has not been investigated to the same extent and little is known of the role of P in predicting psychopathic tendencies in normal populations (Lynam & Derefinko, 2006). Nevertheless, high levels of P have been linked to deficits similar to those seen in psychopathic populations (Corr, 2010). Moreover, it has been suggested that P may be multidimensional, comprising facets that assess variants of psychopathic tendencies, for example, primary and secondary psychopathy (Heym, 2009 in Corr, 2010). However, to date, no work has examined the structure of P in relation to psychopathy. Therefore, the aims of the current paper are to (i) identify P-facets that map onto the three main factor models of psychopathy; and (ii) examine the associations of P-facets with self-reported psychopathy and psychopathy-related traits (empathy, impulsivity, and aggression) in normal populations.

1.1. Psychopathy and its components

Psychopathy is a disorder broadly associated with reduced affective capacity and impaired behavioral control (Hare, 2003). Three main models of psychopathy have been offered. First, the two-factor model proposes primary and secondary psychopathy variants with distinct trait correlates, mechanisms, and etiologies (Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). Primary psychopathy is associated with deficits in *affective-interpersonal style* – including superficial charm, callousness, lack of empathy and guilt. Secondary psychopathy is defined by *unstable and antisocial behavior*, associated with impulsivity, recklessness and aggression. This structure has been supported by factor analytic studies of the Psychopathy Checklist-Revised (PCL-R; Hare, Harpur, Hakstian, Forth, Hart & Newman, 1990) and self-reported psychopathy in non-clinical/non-criminal populations (Levenson, Kiehl, Kent, Fitzpatrick & Cory, 1995).

Second, Hare (2003) proposed a four-factor model of the PCL-R, dividing primary psychopathy into (i) deficits in affective (e.g., callous affect) and (ii) interpersonal style (e.g., manipulation); and secondary psychopathy into (iii) impulsive/unstable (e.g., irresponsibility) and (iv) antisocial lifestyle (e.g., criminal behaviors). Third, Cooke and Michie (2001) proposed a three-factor model excluding the antisocial lifestyle items from secondary psychopathy. Subsequently, whether the fourth PCL-R factor should be conceived as a central component of psychopathy or merely as an outcome measure of the other psychopathic traits is debatable (Hare & Neumann, 2010; Skeem & Cooke, 2010). Findings have demonstrated support for the three- and four-factor models over the two-factor model in adolescent offenders, but the debate on the structure of psychopathy between three and four factors hinges on researchers' conceptualization of the construct (Jones, Cauffman, Miller & Mulvey, 2006); therefore, the current study will examine all three proposed models of psychopathy.

1.2. The P-psychopathy continuity hypothesis

P has been associated with various affective, cognitive and behavioral deficits as seen in primary and secondary psychopathy (Corr, 2010). For instance, P-associated reduced affective empathy (Richendoller & Weaver, 1994), guilt and remorse (Fox, De Koning & Leicht, 2003) is akin to the conceptualization of primary psychopathy, whereas P-related impulsivity and antisocial style (Eysenck, 1992) are akin to secondary psychopathy. However, previous research found associations of P only with overall and secondary psychopathy in male prison inmates (Hare, 1982; Shine & Hobson, 1997), and it was argued that P may only reflect antisocial aspects of secondary psychopathy (Hare, 1982). However, Heym and Lawrence (2010) showed that raised levels of P in normal populations were associated with reduced anxiety and punishment sensitivity – a hallmark of primary psychopathy, *and* increased impulsivity similar to secondary psychopathy; suggesting that P taps into aspects of both primary and secondary psychopathy in normal populations. Such inconsistent findings may be explained by a multi-faceted nature of P.

1.3. Multi-faceted nature of P

In the EPQ-R (Eysenck, Eysenck, & Barratt, 1985), P items are associated with a wide range of traits tapping into the different psychopathologies along the continuum. Consequently, the P scale contains items unrelated to the conceptualization of psychopathy. Recent studies have found up to twice the prediction of variance in antisocial behavior using a facet rather than domain approach, arguably because conceptually relevant facets may have higher criteria-related validity than the broader personality dimensions due to primary trait specific variance they carry (Levine & Jackson, 2004; Paunonen & Ashton, 2001). Therefore, identifying psychopathy-specific facets of P may be more useful in examining affective, cognitive and behavioral deficits in primary and secondary psychopathic tendencies.

1.4. Aims and Hypotheses

This study identifies and evaluates facets of P in the EPQ-R that map onto the two-, three-, and four-factor models of psychopathy and examines their validity (i) in terms of the associations with self-reported psychopathy, trait empathy, impulsivity, sensation seeking, and aggression in normal populations; and (ii) by comparing associations of both P and psychopathy with impulsivity and sensation seeking. Although there are already various self-report measures of psychopathy (Hicklin & Widiger, 2005), many studies, particularly large cohort studies, do not use those, but *do* employ the EPQ-R to assess general personality. Thus, identifying these P-facets would not only address the P-psychopathy continuity hypothesis from a theoretical perspective, but permit the examination of more specific psychopathic traits in such studies.

To examine the association of P-facets with self-reported psychopathy, the current study uses the Levenson Self-Reported Psychopathy Scale (LSRP; Levenson et al., 1995) as a criterion measure. The LSRP has been used extensively to examine psychopathic tendencies in normal populations and has construct validity with the PCL-R in offenders (Poythress, et al., 2010). It is hypothesized that the P-facets will map onto the primary and secondary LSRP factors.

Impulsivity and sensation seeking have been associated with Psychoticism and secondary psychopathy (Eysenck & Eysenck, 1976; Skeem et al.; 2003). Therefore, it is hypothesized that the secondary facets of P and self-reported secondary psychopathy are more strongly linked to measures of impulsivity and sensation seeking.

Deficits in affective empathy form a central concept in primary psychopathy (Hare, 1998) and similarly reduced empathetic responsiveness is linked to high P scorers

(Richendoller & Weaver, 1994). It is therefore hypothesized that the primary facets of P will be negatively associated with affective empathy.

While secondary psychopathy is associated with impulsive-reactive aggression, driven by affective (anger) and cognitive (hostility) aggression components, primary psychopaths exhibit greater levels of instrumental aggression (Hart & Hare, 1997). Therefore, whilst both primary and secondary facets of P are expected to be associated with overt (verbal and physical) trait aggression, only secondary facets of P will be more specifically associated with affective and cognitive aggression.

2. Method

2.1. Participants

In total, 577 undergraduates were recruited from the University of [omitted for masked review] via lectures and a participant pool (mean age = 20.69; SD = 3.45; 390 females/158 males; 29 not specified). This full sample was used for the factor analysis of the P items. A sub-sample of 306 undergraduates (mean age = 19.66; SD = 2.34; 225 females/51 males; 30 not specified) completed the self-reported psychopathy and impulsivity measures. A second sub-sample of 212 undergraduates (mean age = 21.58; SD = 3.97; 134 females/78 males) completed measures of trait aggression and empathy. The study was approved by the Ethics Committee.

2.2. Measures

EPQ-R P scale (Eysenck, Eysenck & Barrett, 1985) comprises 32-items with yes/no answer format. The P scale tends to have low reliabilities ($\alpha=.36-.91$; Caruso et al., 2001), but shows good psychometric properties (Barrett, Petrides, Eysenck & Eysenck, 1998).

Levenson Self-Reported Psychopathy Scale (LSRP; Levenson et al., 1995) was used to assess primary psychopathy and secondary psychopathy scored on a Likert-type scale (1 = *disagree strongly*, 5 = *agree strongly*). Levenson et al. (1995) reported reliabilities of .82 for the primary scale and .63 for the secondary scale, and it has been found to correlate with the PCL-R (Brinkley et al., 2001).

IPIP Impulsive Recklessness scale (IPIP-IMP; Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger & Gough, 2006) was used to assess trait impulsivity scored on a Likert-type scale (1 = *very true for me*; 4 = *very false for me*). This scale has good reliability ($\alpha=.72$; Goldberg et al., 2006).

Impulsive-Sensation Seeking (ImpSS) was assessed using the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ-III; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993) scored on a Likert-type scale (1 = *very false for me*; 4 = *very true for me*). Reliability of this scale has ranged between .74 and .82 (Zuckerman et al., 1993).

Buss and Perry's Aggression Questionnaire (BPAQ; Buss & Perry, 1992) was used to assess trait aggression, scored on a Likert-type scale (1 = *extremely uncharacteristic of me*; 5 = *extremely characteristic of me*), measuring: physical aggression, verbal aggression; anger and hostility. The scales have shown good reliabilities ($\alpha = .72-.85$; Buss & Perry, 1992).

Davis' Interpersonal Reactivity Index (IRI; Davis, 1983) was used to assess cognitive (perspective-taking) and affective empathy (empathic concern), and scored on a Likert-type scale (1 = *does not describe me very well*; 5 = *describes me very well*). The scales have shown a reliability of .72 and .70, respectively (Davis, 1983).

For all scales scores were calculated such that higher scores indicate greater propensity towards the respective construct.

2.3. Statistical Analyses

Confirmatory factor analysis (CFA) was used to examine the statistical fit of the two-, three-, and four-factor models of the P-items (as the two- and four-factor models comprise the same items, model fit is directly comparable, whereas the three-factor model excludes facet 4). In addition, to test whether P-based psychopathy is uni-dimensional, two one-factor models comprising all items from the (i) two-/four-factor models, and (ii) three-factor model were also specified. Scoring for P is dichotomous, so models were estimated using a weighted least squares estimator (WLSMV) in *MPlus* 6, with items defined as ordered categorical variables. Model fit was assessed using the χ^2 -value, the Root Mean Square Error of Approximation (RMSEA), the Weighted Root Mean Square Residual (WRMR), the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). A model with a RMSEA below .05, CFI and TLI approaching .96 and a WRMR approaching or less than 1.0 indicates a good fit of the data (Hu & Bentler, 1999). Full information maximum likelihood (FIML) was used to handle missing data (0.2 to 1.7%).

3. Results

3.1. Identifying Theoretically Relevant P Items

The first and last authors separately identified psychopathy related items on theoretical and face validity grounds, and mapped these independently onto content relating to affect/empathy and regard for others [facet 1]; interpersonal relations [facet 2]; impulsivity/recklessness [facet 3]; and rule breaking/antisocial behavior [facet 4]. Ambiguous, psychosis relevant and zero-variance items were excluded (14 of 32 items). The raters independently agreed on the categorization of 14 items (77.8%; Kappa=.70; CIs=0.448-0.952), and on a further 4 items after joint discussion. Accordingly, 18 items were retained: four items (facet 1) assessed empathic responsiveness, four items (facet 2) assessed social relationships and interactions, five items (facet 3) assessed impulsive and irresponsible

behavior, and five items (facet 4) assessed willingness to break rules and norms (see Table 2 for item content). For the two-factor model, facets 1 and 2 were combined to form the primary psychopathy factor, and facets 3 and 4 combined to form the secondary psychopathy factor. For the three-factor model, facets 1, 2 and 3 were kept as individual factors and the fourth facet (rule-breaking) was excluded.

3.2. Confirmatory factor analysis

The four-factor model showed adequate fit (see Table 1). The two-factor model was a worse fit than the four-factor model (χ^2 difference test = 37.37, $p < .0001$) and the two unidimensional models also fitted the data poorly. However, the three-factor model showed a good fit to these data. A Heywood case was identified (item 5: standardized loading = 1.05) when running the three-factor model. To correct for this, the loading was fixed to unity (Dillon, Kumar, & Mulani, 1987), but model fit statistics, loadings and error terms did not alter significantly indicating that the Heywood case is most likely caused by sampling fluctuations. The standardized factor loadings (McDonald & Ringo Ho, 2002) for the three-factor model are given in Table 2 (loadings for the four-factor model can be obtained from the first author). All items loaded significantly on their target factors.

Although the results show the three-factor model to be the best fit, suggesting that the fourth factor may be better conceptualized as a behavioral outcome (Skeem & Cooke, 2010), we present the results of subsequent analyses for total P scores (including all 32 items) and the four-factor model to enable comparison of associations across the theoretical three- and four-factor models, with the four-factor model subsuming the three-factor model by omission of P-antisocial, which was also included as outcome measure.

***** INSERT TABLES 1 AND 2 HERE *****

2.3. Descriptive Statistics and Zero-order Correlations of the P-facets

Table 3 shows the descriptive statistics, scale reliabilities and zero-order correlations. To reduce skew, P and its facet scales were Lg10 transformed. However, all variables remained slightly skewed apart from P-impulsive which normalized. Therefore, in subsequent analyses the results from the skewed scale scores were considered significant at $p = .01$ or less (Kirk, 1981). The internal reliabilities were good for total P whereas the Cronbach's alphas for the other facets were low, ranging from .36 to .59 (mean inter-item correlations were adequate).

***** INSERT TABLE 3 HERE *****

3.4. Zero-order Correlations of the P-facets with criteria measures

Table 4 shows the descriptive statistics and scale reliabilities of the criteria measures and zero-order correlations of P and its facets with criteria measures. Zero-order correlations of the LSRP factors with the criteria measures are also shown for comparison (for subsample I). The internal reliabilities were good ranging from .68 to .88, but slightly lower for LSRP-secondary (.63).

Subsample I: As predicted, P-empathy showed the largest positive correlation with primary LSRP, and P-impulsivity with secondary LSRP. Overall P was correlated with all the trait measures, however, while P-impulsivity and P-rule-breaking facets were consistently moderately to strongly positively correlated with impulsivity and impulsive-sensation seeking, the P-empathy and P-interpersonal facets were either unrelated or only weakly associated with impulsivity. Similar associations were observed for the LSRP, although primary LSRP was also moderately associated with the impulsivity measures.

Subsample II: While overall P was positively associated with overt aggression and negatively with empathic concern, only P-empathy, P-impulsivity and P-rule-breaking were positively associated with physical aggression; whereas verbal aggression was only linked to P-interpersonal and P-rule-breaking. P-interpersonal was also negatively associated with hostility, and together with P-impulsivity, weakly with anger. Only P-empathy and P-interpersonal facets were associated with reduced empathic concern and P-empathy with reduced perspective taking.

***** INSERT TABLE 4 HERE *****

4. Discussion

This is the first study to examine facets of EPQ-R P that map onto the three main models of psychopathy. In line with Hare (2003) the results showed that the four-factor model was a better fit than the two-factor model; however, the three-factor was the best fit suggesting that the antisocial factor is not central, but may be conceptualized as a behavioral outcome or correlate of the psychopathic core traits (Skeem & Cooke, 2010). Alternatively, the behavioral items of facet 4 may be interpreted as behavioral expressions of an underlying trait relevant to the overall construct of psychopathy. As both the four- and three-factor models showed moderate to good fit and are not directly comparable statistically, a conclusion cannot be drawn with certainty, and therefore which of these should be adopted remains a theoretical debate (Jones et al., 2006).

While there was no evidence for a broad two-factor distinction between primary and secondary psychopathy, it could still be argued that facets 1 and 2, and facets 3 and 4 are naturally in concordance with the nature of primary and secondary psychopathy, respectively. Following this, theoretically meaningful associations between the P-facets and psychopathy,

empathy, impulsivity, and aggression were observed. Akin to primary psychopathy, the P-empathy facet was associated with reduced empathy. Conversely, both P-impulsivity and P-rule-breaking facets, like secondary LSRP, were associated with increased trait impulsivity and sensation seeking, akin to secondary psychopathy. However, while both primary P-facets showed only few significant associations with impulsivity, as predicted by theoretical conceptions of primary psychopathy (Skeem et al., 2003), primary LSRP showed significant associations with all impulsivity associated measures. Both P-interpersonal and P-impulsivity facets were linked to increased verbal aggression; however, their associations with anger and hostility were in opposite directions. This distinction may reflect the notion of instrumental aggression in primary and impulsive-reactive aggression in secondary psychopathy (Hart & Hare, 1997).

The findings support the notion that psychopathic tendencies are a constellation of traits that can be measured in non-forensic populations (Hare & Neumann, 2008) using P and its facets, which mirror the three- (or four-) factor model of psychopathy (Heym, 2009 in Corr, 2010). While the findings generally support Eysenck's P-psychopathy continuity hypothesis, the differential associations of the P-facets with criterion measures suggest that they may be more useful in predicting primary and secondary psychopathic tendencies than overall P. Specifically, the associations of primary P traits with reduced empathy may explain inconsistencies in the literature concerning how global P is linked to primary psychopathy (Hare, 1982; Heym & Lawrence, 2010), and questions the broad association of the higher-order dimension P with primary psychopathy. Moreover, the opposite associations of the P-facets with affective and cognitive components of aggression may explain the lack of associations of overall P with anger or hostility in the current and previous research (Wood & Newton, 2003).

Nevertheless, the low reliabilities and inter-item correlations of the facets and practical implications for their use should be acknowledged. In order to adjust correlations for measurement error, structural equation modeling may be employed assessing associations using the latent facet constructs. Indeed the pattern of associations presented in Table 4 remains when these correlations are assessed for the latent factors as for zero-order associations, despite low reliabilities of the facets. Moreover, future studies should aim to replicate the current findings in psychopathic and forensic populations, and to test the predictive validity of the facets with behavioral data. The distinction of P-facets may provide researchers with a viable starting point for such undertaking.

References

- Barrett, P.T., Petrides, K.V., Eysenck, S.B.G., & Eysenck, H.J. (1998). The Eysenck personality questionnaire: an examination of the factorial similarity of P, E, N, and L across 34 countries. *Personality and Individual Differences*, 25, 805-819.
- Brinkley, C. A., Schmitt, W. A., Smith, S. S., & Newman, J. P. (2001). Construct validation of a self-report psychopathy scale: Does Levenson's self-report psychopathy scale measure the same constructs as Hare's psychopathy checklist—revised? *Personality and Individual Differences*, 31, 1021–1038.
- Buss, A.H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, 63, 452-459.
- Caruso, J.C., Witkiewitz, K., Belcourt-Dittloff, A., & Gottlieb, J.D. (2001). Reliability of scores from the Eysenck Personality Questionnaire: A reliability generalization study. *Educational and Psychological Measurement*, 61, 675-689.
- Cooke, D. J. & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment* 13, 171–188.
- Corr, P.J. (2010). The Psychoticism-psychopathy continuum: A model of core neuropsychological deficits. *Personality and Individual Differences*, 48, 695-703.

- Davis, M.H. (1983). Measuring individual differences in empathy: evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*, 113-126.
- Dillon, W. R. Kumar, A., & Mulani, N. (1987). Offending estimates in covariance structure analysis: Comments on the causes and solutions to Heywood cases. *Psychological Bulletin*, *101*, 126-135.
- Edens, J.F., Marcus, D.K., Lilienfeld, S.O., & Poythress, N.G. (2006). Psychopathic, not psychopath: Taxometric evidence for the dimensional structure of psychopathy. *Journal of Abnormal Psychology*, *115*, 131–144.
- Eysenck, H.J. (1992). The definition and measurement of psychoticism. *Personality and Individual Differences*, *13*, 757-785.
- Eysenck, H.J., & Eysenck, S.B.G. (1976). *Psychoticism as a dimension of Personality*. London: Hodder & Stroughton.
- Eysenck, S.B.G., Eysenck, H.J., & Barratt, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences*, *6*, 21-29.
- Fox, S., DeKoning, E., & Leicht, S. (2003). The relationship between attribution of blame for a violent act and EPQ-R sub-scales in male offenders with mental disorder. *Personality and Individual Differences*, *34*, 1467-1475.
- Goldberg, L.R., Johnson, J.A., Eber, H.W., Hogan, R., Ashton, M.C., Cloninger, C.R., & Gough, H.C. (2006). The International Personality Item Pool and the future of public-domain personality measures. *Journal of Research in Personality*, *40*, 84-96.
- Hare, R.D. (1982). Psychopathy and the personality dimensions of psychoticism, extraversion and neuroticism. *Personality and Individual Differences*, *3*, 35.
- Hare, R.D. (1998). Psychopathy, affect and behaviour. In: D.J. Cooke, A.E. Forth and R.D. Hare (Eds), *Psychopathy: Theory, Research and Implications for society* (pp. 105–137). Dordrecht, The Netherlands: Kluwer.
- Hare, R.D. (2003). *The Psychopathy Checklist – Revised manual*. Toronto, Ontario, Canada: Multi-Health System.

- Hare, R.D., Harpur, T.J., Hakstian, A.R., Forth, A.E., Hart, S.D., & Newman, J.P. (1990). The revised psychopathy checklist: Reliability and factor structure. *Psychological Assessment*, 2, 338.
- Hare, R.D., & Neumann, C.S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology*, 4, 217-246.
- Hare, R.D., & Neumann, C.S. (2010). The role of antisociality in the psychopathy construct: comment on Skeem and Cooke (2010). *Psychological Assessment*, 22, 446-454.
- Hart, S.D., & Hare, R.D. (1997). Psychopathy: Assessment and association with criminal conduct. In D.M. Stoff, J. Maser, & J. Breiling (Eds.), *Handbook of Antisocial Behavior* (pp. 22-35). New York: Wiley.
- Heym, N., & Lawrence, C. (2010). The role of Gray's revised RST in the P-psychopathy continuum: The relationships of Psychoticism with a lack of fear and anxiety, and increased impulsivity. *Personality and Individual Differences*, 49, 874-879.
- Hicklin, J., & Widiger, T.A. (2005). Similarities and differences among antisocial and psychopathic self-report inventories from the perspective of general personality functioning. *European Journal of Personality*, 19, 325-342.
- Hu, L., & Bentler P.M. (1999). Cutoff criteria for fit indexes on covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Jones, S., Cauffman, E., Miller, J.D., & Mulvey, E. (2006). Investigating different factor structures of the psychopathy checklist: youth version: confirmatory factor analytic findings. *Psychological Assessment*, 18, 33-48.
- Kirk, R. (1981). *Experimental design: Procedures for the behavioral sciences*. Pacific Grove, CA: Brooks/Cole.
- Levenson, M.R., Kiehl, Kent A., Fitzpatrick, & Cory M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology*, 68, 151-158.
- Levine, S.Z., & Jackson, C.J. (2004). Eysenck's theory of crime revisited: factors or primary scales? *Legal and Criminological Psychology*, 9, 135-152.

- Lynam, D. R., & Derefinko, K. J. (2006). Psychopathy and personality. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 133-155). New York: Guilford Press.
- McDonald R. P., & Ringo Ho, M. H. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7, 64-82.
- Paunonen, S.V., & Ashton, M.C. (2001). Big five factors and facets and the prediction of behaviour. *Journal of Personality and Social Psychology*, 81, 524-539.
- Poythress, N.G., Lilienfeld, S.O., Skeem, J.L., Douglas, K.S., Edens, J.F., Epstein, M., & Patrick, C.J. (2010). Using the PCL-R to help estimate the validity of two self-report measures of psychopathy with offenders. *Assessment*, 17, 206-219.
- Richendoller, N.R., & Weaver, J.B. (1994). Exploring the links between personality and empathic response style. *Personality and Individual Differences*, 17, 303-311.
- Shine, J., & Hobson, J. (1997). Construct validity of the Hare Psychopathy Checklist, revised, on a UK prison population, *The Journal of Forensic Psychiatry*, 8, 546-561.
- Skeem, J.L., & Cooke, D.J., (2010). Is criminal behaviour a central component of psychopathy? Conceptual directions for resolving the debate. *Psychological Assessment*, 22, 433-445.
- Skeem, J.L., Poythress, N., Edens, J.F., Lilienfeld, S.O., & Cale, E.M. (2003). Psychopathic personality or personalities? Exploring potential variants of psychopathy and their implications for risk assessment. *Aggression and Violent Behavior*, 8, 513-546.
- Van Kampen, D. (1993). The 3DPT dimensions S, E, and N: A critical evaluation of Eysenck's psychoticism model. *European Journal of Personality*, 7, 65-105.
- Wood, J., & Newton, A.K. (2003). The role of personality and blame attribution in prisoners' experiences of anger. *Personality and Individual Differences*, 34, 1435-1465
- Zuckerman, M., Kuhlman, D.M., Joireman, J., Teta, P & Kraft M.H. (1993). A comparison of the three structural models for the personality: The big three, the big five, and the alternative five. *Journal of Personality and Social Psychology*, 66, 747-768.

The P-psychopathy continuum and facets of P

Table 1*Goodness of fit indices for one-, two-, three- and four-factor models of P facets*

Model	χ^2	df	<i>p</i> <	CFI	TLI	WRMR	RMSEA	CI s
1-factor (13 items)	134.13	65	.001	.81	.78	1.13	.043	.033-.054
1-factor (18 items)	340.95	135	.001	.78	.75	1.42	.051	.045-.058
2-factor	268.31	134	.001	.86	.84	1.23	.042	.034-.049
3-factor	84.94	63	.05	.94	.93	0.87	.025	.007-.034
4-factor	222.23	129	.001	.90	.88	1.08	.035	.027-.043

Note: n=577; Cut-off values for well-fitting models: CFI/TFI = .96; WRMR < 1.00; RMSEA = .05; CFI = comparative fit index; TLI = Tucker-Lewis index; WRMR = Weighted Root Mean Square Residual; RMSEA = root-mean-square error of approximation; CI = Confidence intervals for RMSEA.

The P-psychopathy continuum and facets of P

Table 2

Confirmatory factor analysis: Standardized coefficients for the factor loadings of the three-factor model

Item	Factor 1	Factor 2	Factor 3
	P- empathy	P- inter- personal	P- impul- sive
upset you to see a child or an animal suffer ^R	1.00		
enjoy hurting people	0.75		
feel very sorry for an animal caught in a trap ^R	0.66		
enjoy practical joke that sometimes can really hurt people	0.58		
take much notice of what people think ^R		0.65	
try not to be rude to people ^R		0.60	
good manners very important ^R		0.53	
enjoy cooperating with others ^R		0.42	
generally look before you leap ^R			0.81
stop to think things over before doing anything ^R			0.68
worry you if you know there are mistakes in your work ^R			0.42
like to arrive at appointments in plenty of time ^R			0.43
gone against your parents' wishes			0.25
Items of fourth facet (P-rule-breaking):			
should people always respect the law ^R			
take drugs which may have strange or dangerous effects			
prefer to go your own way rather than act by the rules			

The P-psychopathy continuum and facets of P

more easy going about right and wrong than most people

better to follow society's rules than to go your own way^R

Note: superscript R denotes reverse scored items

The P-psychopathy continuum and facets of P

Table 3*Descriptive Statistics, reliability and correlations between P and P-facet scales*

Scales	Descriptive Statistics			Zero-order Correlations			
	alpha (MIC)	Mean	SD	P- total	P- affec- tive	P- inter- personal	P- impul- sive
P total	.71	5.67	3.66	-			
P-empathy	.52 (.21)	0.29	0.63	.373**	-		
P-interpersonal	.36 (.12)	0.41	0.70	.418**	.215**	-	
P-impulsive	.43 (.13)	1.19	1.13	.632**	.191**	.158**	-
P-rule-breaking	.59 (.22)	1.88	1.48	.726**	.125**	.217**	.369**

Note: N=577; MIC = mean inter-item correlation; ** $p < .01$. Correlations among P-facets are based on correlations among latent traits derived from *Mplus* to account for reliability concerns for the P-facets.

The P-psychopathy continuum and facets of P

Table 4:*Descriptive Statistics, Reliability and correlations for three- and four-factor models of P*

Scales	Descriptive Statistics			Zero-order Correlations								
	alpha	M	SD	P total ^t	3 and 4 Factor Models				LSRP total	LSRP- primary	LSRP- second- ary	
					P- empathy	P- inter- personal ^t	P- impul- sive ^t	P- rule- breaking				
Subsample I (N=306)												
P-rule-breaking	.58	1.73	1.45	.726**	.153**	.121*	.400**	1				
LSRP-total	.77	3.11	0.62	.460**	.327**	.181**	.368**	.274**	1			
LSRP-primary	.75	2.97	0.61	.363**	.336**	.138*	.270**	.217**	.922**	1		
LSRP-secondary	.63	3.33	0.36	.455**	.194**	.187**	.399**	.270**	.772**	.466**	1	
IPIP-IMP	.74	2.69	0.54	.438**	.121*	.129*	.557**	.382**	.373**	.237**	.451**	
ZKPQ-ImpSS	.88	2.32	0.48	.498**	.221**	.129*	.473**	.489**	.290**	.171**	.383**	
Subsample II (N=212)												
P-rule-breaking	.66	1.93	1.56	.699**	.103	.316**	.351**	1	-	-	-	

The P-psychopathy continuum and facets of P

BPAQ-physical ^t	.80	18.99	6.92	.323**	.202**	.012	.222**	.218**	-	-	-
BPAQ-verbal	.68	14.31	3.82	.281**	.118	.207**	.160*	.249**	-	-	-
BPAQ-anger ^t	.77	16.69	5.29	.049	-.040	-.147*	.140*	.067	-	-	-
BPAQ-hostility	.79	21.04	6.46	-.010	-.064	-.270**	.077	-.089	-	-	-
IRI-EC	.68	26.71	3.92	-.239**	-.305**	-.198**	-.099	-.094	-	-	-
IRI-PT ^t	.77	25.07	4.87	-.029	-.220**	-.033	-.049	.048	-	-	-

Note: superscript t denotes transformed variables; P = psychoticism; LSRP = Levenson self-reported psychopathy;

IMP = impulsivity; ImpSS = impulsive-sensation seeking; BPAQ = Buss & Perry aggression questionnaire; EC =

empathic concern; PT = perspective taking; * $p < .05$; ** $p < .01$. Analyses were also ran looking at the associations

between latent P facets and the validating scales. The pattern of results reported remained the same, with the exception

that the two associations with anger are lost.