

The Validity of the Psychopathic Personality Inventory—Revised in a Community Sample

Katarzyna Uzieblo, Bruno Verschuere, Eva Van den Bussche and Geert Crombez

Assessment 2010 17: 334 originally published online 29 December 2009

DOI: 10.1177/1073191109356544

The online version of this article can be found at:

<http://asm.sagepub.com/content/17/3/334>

Published by:



<http://www.sagepublications.com>

Additional services and information for *Assessment* can be found at:

Email Alerts: <http://asm.sagepub.com/cgi/alerts>

Subscriptions: <http://asm.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://asm.sagepub.com/content/17/3/334.refs.html>

>> [Version of Record](#) - Aug 2, 2010

[OnlineFirst Version of Record](#) - Dec 29, 2009

[What is This?](#)

The Validity of the Psychopathic Personality Inventory–Revised in a Community Sample

Assessment
17(3) 334–346
© The Author(s) 2010
Reprints and permission: <http://www.sagepub.com/journalsPermissions.nav>
DOI: 10.1177/1073191109356544
<http://asmnt.sagepub.com>



Katarzyna Uzieblo,¹ Bruno Verschuere,² Eva Van den Bussche,³ and Geert Crombez²

Abstract

Research on the Psychopathic Personality Inventory–Revised (PPI-R) has revealed two factors: Fearless Dominance, and Self-Centered Impulsivity. This study examined the validity of these PPI-R factors in a community sample ($N = 675$). First, confirmatory factor analyses did not support the two-factor structure. Second, the PPI-R factors showed good convergent and discriminant validity with two other self-report measures of psychopathy, that is, the Youth Psychopathic Traits Inventory and Levenson’s Self-Report of Psychopathy. Third, PPI-R factors exhibited good external validity in relation to various theoretically relevant correlates. The results indicate that the PPI-R factors have good convergent, discriminant, and external validity, but confirmatory factor analysis raises concerns about the robustness of the two-factor structure.

Keywords

psychopathy, self-report measures, validity, community, Psychopathic Personality Inventory–Revised, Levenson’s Self-Report Measure for Psychopathy, Youth Psychopathic Traits Inventory

The Psychopathy Checklist–Revised (PCL-R; Hare, 2003) is a well-established instrument for psychopathy in common use with forensic populations. Appropriate use of this measure requires supporting information from both records and clinical interview. Despite the PCL-R’s good psychometric properties, the need for additional information limits its use to institutionalized populations. To overcome this restriction, self-report measures of psychopathy have been developed, which have the added advantages of also being economical and able to solve the problem of judgment bias (Mikton & Grounds, 2007).

Several self-report measures for psychopathy are available. A promising measure is the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) and its revised version (PPI-R; Lilienfeld & Widows, 2005). Initial studies on the psychometric characteristics of the original PPI have reported evidence for its usefulness. The PPI consists of eight subscales, each assessing a distinct psychopathic trait (Lilienfeld & Andrews, 1996). Exploratory factor analyses with the PPI revealed that seven of the eight subscales can be organized into two higher order factors: (a) Fearless Dominance (PPI-I) assessing the affective–interpersonal traits and consisting of the subscales “fearlessness,” “stress immunity,” and “social potency”; (b) Impulsive Antisociality (PPI-II), assessing behavioral–lifestyle traits and consisting of the subscales “impulsive nonconformity,” “blame

externalization,” “Machiavellian egocentricity,” and “carefree nonplanfulness.” The eighth subscale, the “cold-heartedness” scale, did not load on either PPI-factor and is now regarded as a separate factor (PPI-III; Coldheartedness; Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Benning, Patrick, Hicks, Blonigen, & Krueger, 2003).

As might be expected of good psychopathy instruments, the PPI total score is positively related to antisocial behavior (Edens, Poythress, Lilienfeld, & Patrick, 2008), substance abuse, and fearfulness (Lilienfeld & Andrews, 1996). The convergent and discriminant validity of the PPI-factors is supported by their relations with the corresponding factors of the PCL-R (Berardino, Meloy, Sherman, & Jacobs, 2005) and other self-report measures of psychopathy (Benning, Patrick, Salekin, & Leistico, 2005). Furthermore, the PPI-factors are correlated with theoretically relevant constructs of psychopathy. PPI-I is related to antisocial behavior (Benning et al., 2003), low fear and anxiety (Patrick,

¹University College Lessius, Antwerp, Belgium

²Ghent University, Ghent, Belgium

³University of Leuven, Leuven, Belgium

Corresponding Author:

Katarzyna Uzieblo, Department of Applied Psychology, University College Lessius, Sanderusstraat 45, Antwerp 2018, Belgium
Email: kasia.uzieblo@lessius.eu

Edens, Poythress, Lilienfeld, & Benning, 2006), and low behavioral inhibition (Uzieblo, Verschuere, & Crombez, 2007). PPI-II is mainly associated with institutional maladjustment (Edens et al., 2008), externalizing behavior (Benning et al., 2003), high anxiety (Patrick et al., 2006; Uzieblo et al., 2007), and fun seeking behavior (Uzieblo et al., 2007). Less is known about the validity of the third PPI-factor (Benning et al., 2003), because it is often discarded from the statistical analyses.

The Current Study

The PPI was recently revised by Lilienfeld and Widows (2005). The revision involved the shortening of the instrument from 187 to 154 items, increasing the readability of the PPI, and a reformulation of culturally specific idioms. Because the PPI-R does not include items assessing antisocial behavior, the second factor was named "Self-Centered Impulsivity" instead of "Impulsive Antisociality."

We investigated the two-factor structure of the PPI-R using confirmatory factor analyses. It is reasonable to assume that the results regarding the PPI-R will parallel those of the original PPI. Initial results regarding the validity of the PPI-R factors are promising, but need further corroboration. The first aim of this study was to investigate the factor structure of the PPI-R using confirmatory factor analysis. Second, we investigated the convergent and discriminant validity of the PPI-R factors. Finally, we explored the external validity of the PPI-R factors.

The PPI-R factor structure. We expected a two-factor structure similar to the one obtained with the original PPI (Benning et al., 2003; Benning, Patrick, Blonigen, et al., 2005; Benning, Patrick, Salekin, et al., 2005) and to the one obtained by the developers of the PPI-R (Lilienfeld & Widows, 2005).

The convergent and discriminant validity. We tested the convergent and discriminant validity of the PPI-R factors by relating the PPI-R factors to factors of two other self-report psychopathy measures, that is Levenson's Self-Report of Psychopathy (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) and the Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002).¹ The LSRP contains two factors. The Primary Psychopathy factor (LSRP-I) assesses the affective–interpersonal traits of psychopathy. The Secondary Psychopathy factor (LSRP-II) assesses behavioral–lifestyle traits of psychopathy (Levenson et al., 1995). The YPI displays a three-factor structure, consisting of an Interpersonal factor (YPI-I), an Affective factor (YPI-II), and a Lifestyle factor (YPI-III; Andershed et al., 2002). Although the YPI was designed to be used with adolescents (i.e., <18 years), the YPI has also been successfully used with older participants (Forsman, Larsson, Andershed, & Lichtenstein, in press; Kansi, 2003). In the

present study, convergent validity was examined by computing associations among corresponding factors from the three self-report psychopathy measures. Discriminant validity was examined by computing associations among the noncorresponding factors. We expected that the former associations would be significantly larger than the latter associations.

External validity. To investigate the external validity of the PPI-R factors, a broad range of external variables relevant to the construct of psychopathy were included. We first examined whether the PPI-R factors exhibit similar relations to these variables as previously established with the most widely used psychopathy instrument, the PCL-R. Factor analytical work with the PCL-R originally revealed a two-factor model of psychopathy: An affective–interpersonal factor (PCL-R: F1) and a social deviance factor (PCL-R: F2; Harpur, Hare, & Hakstian, 1989).² PCL-R: F2 is associated with antisocial behavior such as delinquent and aggressive behavior (Hare, 2003), and alcohol and drug abuse (Reardon, Lang, & Patrick, 2002). With regard to antisocial behavior, we focused on minor violations of societal norms (e.g., animal abuse and fare-dodging) instead of actual delinquent behavior, because these are expected to be more prevalent in a community sample.

Second, a series of external correlates were included which are of theoretical and clinical importance. A lack of anxiety in psychopathy has received much attention in the literature (Cleckley, 1976; Lykken, 1995). PPI studies confirm the negative association between PPI-I and anxiety, but indicate a positive relation between PPI-II and anxiety (Benning et al., 2003; Uzieblo et al., 2007). We were also interested in the relationship between the psychopathy factors and some less researched variables, in particular, empathy and the experience of friendships. The relations of the PPI-R factors with empathy components (i.e., affective and cognitive empathy) were explored. Low affective empathy is associated with both affective–interpersonal (Mahmut, Homewood, & Stevenson, 2008) and behavioral–lifestyle traits (Jolliffe & Farrington, 2004). A deficit in affective empathy might enable psychopathic individuals to repeatedly inflict harm to others. To successfully manipulate others, a good comprehension of the affective states of others (high cognitive empathy) can be expected in psychopathic individuals (Hare, 2003). This would imply high cognitive empathy in psychopathy. Second, case studies suggest that individuals with psychopathic traits have an indifferent attitude toward relationships (see e.g., Hare, 2003). We wanted to investigate this clinical finding by examining whether PPI-R factor-scores are related to an indifferent perception and disregard of relationships. Third, there is increasing evidence that psychopathy is characterized by an underactive behavioral inhibition system (BIS) and/or by an overactive behavioral activation system (BAS; Arnett,

1997; Gorenstein & Newman, 1980). Previous research indicates that the affective–interpersonal traits are mainly associated with low BIS and high BAS, and the behavioral–lifestyle traits with high BAS (Ross, Benning, & Adams, 2007; Uzieblo et al., 2007).

Based on previous research and the aforementioned clinical and theoretical insights, the following hypotheses were formulated. First, it was expected that PPI-R-I would be related to low anxiety, low affective empathy, high cognitive empathy, an indifferent perception of relationships, low BIS, and high BAS. Second, PPI-R-II was expected to be associated with antisocial behavior, high anxiety, low affective empathy, and high BAS. Finally, it was hypothesized that PPI-R-III would be mainly related to low affective empathy.

Method

Participants

A total of 713 volunteers were recruited from the community. Following recommendations of Lilienfeld and Widows (2005), 5.33% participants were excluded because of an atypical score on the Inconsistent Responding 15 scale (1.68%), on the Inconsistent Responding 40 scale (2.24%), or on both Inconsistent Responding scales (1.40%). The final sample consisted of 675 participants (62.50% male; $M = 32.99$ years, $SD = 13.92$, range = 16–73). The majority of the participants had a Belgian nationality (99.6%). Most of the participants' native language was Dutch (99%).

Measures

The PPI-R (Lilienfeld & Widows, 2005) is a 154-item self-report measure of psychopathic personality features. The items are answered using a 4-point Likert-type scale (1 = *false*, 2 = *mostly false*, 3 = *mostly true*, and 4 = *true*). The items are grouped into eight subscales, seven of which can be organized into a two-factor higher order structure, based on previous principal factor analysis in a large community/college sample ($N = 985$): The Fearless Dominance Factor (PPI-R-I), including the subscales Stress Immunity, Social Influence, and Fearlessness; The Self-Centered Impulsivity factor (PPI-R-II), including the subscales Rebellious Nonconformity, Blame Externalization, Machiavellian Egocentricity, and Carefree Nonplanfulness. A third factor that emerged, the Coldheartedness factor (PPI-R-III), consists solely of the subscale with the same name and it did not load on the other PPI-R factors (Lilienfeld & Widows, 2005). Following Benning et al. (2003), these factor scores were calculated by averaging the mean of the standardized subscale scores.

The PPI-R also contains three validity scales: (a) The Deviant Responding Scale, assessing if the participant is

malingering, responding randomly, or is experiencing difficulty comprehending the instructions or the items; (b) the 15- and 40-item pair Inconsistent Responding Scales, assessing whether the participant is answering inconsistently in response to the items; and (c) the Virtuous Responding Scale, detecting positive impression management. Following the recommendations of the authors of the PPI-R, participants with an atypical score on the “Inconsistent Responding 15” Scale (i.e., ≥ 17) and on the “Inconsistent Responding 40” scale (i.e., ≥ 45) should be excluded from the analyses.

We used the authorized Dutch translation of the PPI-R (Uzieblo, Verschuere, Jellicic, et al., 2006). This translation was based on the Functional Assessment of Chronic Illness Therapy (FACIT, 2006) procedures and guidelines for translation.

Internal consistencies of all psychopathy measures included in this study are presented in a table in the Results section.

The LSRP (Levenson et al., 1995) is a 26-item self-report measure of both the personality traits and the behavioral traits of psychopathy. Items are scored on a 4-point Likert-type scale (1 = *strongly disagree*, 2 = *disagree somewhat*, 3 = *agree somewhat*, 4 = *strongly agree*). Previous principal components analyses with 487 undergraduates revealed a two-factor structure: The Primary Psychopathy factor (LSRP-I), assessing the callous/manipulative lifestyle associated with psychopathy and the Secondary Psychopathy factor (LSRP-II) assessing behavioral problems associated with psychopathy (Levenson et al., 1995). Levenson et al. reported acceptable to good coefficient alphas. The Dutch translation of the LSRP (Uzieblo, Verschuere, & Crombez, 2006) was used in the present study. This translation was based on the FACIT guidelines (2006).

The YPI (Andershed et al., 2002) is a 50-item self-report measure of psychopathic traits. Items are scored on a 4-point Likert-type scale (1 = *does not apply at all*, 2 = *does not apply well*, 3 = *applies fairly well*, 4 = *applies very well*). The YPI consists of 10 subscales, which are grouped into three factors as shown by previous exploratory factor analyses using a sample of 1186 adolescents: an Interpersonal factor, Grandiose-Manipulative (YPI-I), consisting of the subscales Dishonest Charm, Grandiosity, Lying, and Manipulation; an Affective factor, Callous-Unemotional (YPI-II), consisting of the subscales Remorselessness, Unemotionality, and Callousness; and a Lifestyle factor (YPI-III), Impulsive-Irresponsible, consisting of the subscales Thrill-Seeking, Impulsivity, and Irresponsibility (Andershed et al., 2002). Previous studies demonstrated good internal consistency of the YPI. We used the authorized Dutch translation (Das, de Ruiter, & Harreveld, 2002).

Hollingshead's (1975) system was used as index for socioeconomic status (SES). This system was applied to

code the occupational and the educational status of the participant and his or her partner. Occupations were coded from 1 (e.g., farm laborer, menial, or service workers) to 9 (e.g., higher executive proprietor of a large concern, major professional). Educational level was coded from 1 (e.g., less than 7 years of schooling) to 7 (e.g., graduate, professional training). These scores are assigned to each participant based on the information given by them. Next, the occupational and the educational scores are weighted to obtain a single score (range = 8–66). Higher SES scores are indices for a higher SES. Participants with homemaking or school as main activity, or who receive social assistance, could not be categorized (12.4%), and therefore did not receive a SES score.

The *Empathy Quotient* (EQ; Baron-Cohen & Wheelwright, 2004) is a 60-item self-report measure of empathy. Responses are given on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Based on a principal components analysis, Lawrence, Shaw, Baker, Baron-Cohen, and David (2004) distinguish three factors: the Cognitive Empathy factor assessing the comprehension of others' affective states, the Emotional Reactivity factor assessing the tendency to react emotionally to others' mental states, and the Social Skills factor assessing the spontaneous use of social skills and intuitive social understanding. Previous studies demonstrated good internal consistency for the EQ total score and its factors (Baron-Cohen & Wheelwright, 2004; Lawrence et al., 2004). The authorized Dutch translation, following FACIT translation guidelines (2006), is used in the present study (De Corte, Uzieblo, Buysse, & Crombez, 2006).

Internal consistencies of all self-report measures for the external variables included in this study are described in a table in the Results section.

The *Friendship Questionnaire* (FQ; Baron-Cohen & Wheelwright, 2003) is a 35-item self-report measure assessing the style of relating to others. Each item is a statement or question about friendship (e.g., "How interested are you in the everyday details [e.g., their relationships, family, what's currently going on in their lives] of your casual friends' lives?"). Participants have to indicate to what extent these statements apply to them. High scores indicate that the participants enjoy intimate, empathic friendships, are interested in others, and consider friendship as valuable for its own sake. The authors report a good internal consistency. We used the authorized Dutch translation (Uzieblo, De Corte, Crombez, & Buysse, 2006), which respected the FACIT guidelines (2006).

The *State-Trait Anxiety Inventory* (STAI-T; Spielberger, 1983) is a 20-item self-report measure assessing a stable (trait) tendency to anxiety. Spielberger (1983) reported high internal consistency and a good test–retest reliability. We used the authorized Dutch translation, which exhibited

good internal consistency in previous studies (e.g., Van der ploeg, Defares, & Spielberger, 1980).

The *Behavioral Inhibition and Behavioral Activation Scales* (BIS/BAS; Carver & White, 1994) is a 20-item self-report measure. Items are answered using a 4-point response scale, ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). This measure consists of a 4-factor structure. The BIS scale assesses the tendency to experience negative affect or behavioral inhibition when threat cues are present, whereas the BAS assesses the tendency to experience strong positive affect or behavioral approach when incentive cues are present. The latter is comprised of three subscales: Fun Seeking assessing the impulsive search of pleasure; Drive assessing the motivation to pursue goals; and Reward Responsiveness assessing the tendency to respond with positive affect in the context of desired events or cues of possible future reward. Adequate internal consistencies and test–retest reliability have been reported for the four BIS/BAS scales (Carver & White, 1994). The Dutch version of the BIS/BAS scales was used. This version exhibits satisfactory psychometric properties (Franken, Muris, & Rassin, 2005).

The *Alcohol Use Disorders Identification Test* (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) is a 10-item self-report questionnaire for the identification of hazardous alcohol consumption. The first eight items are answered on a 5-point Likert-type scale (from 0 = *never* to 4 = *4 or more times a week*, for the first question; from 0 = *1 or 2* to 4 = *10 or more*, for the second question; from 0 = *never* to 4 = *daily or almost daily*, for Items 3 to 8). The last two questions are answered with false/true response categories. The AUDIT-total score has demonstrated a high internal consistency (Allen, Litten, Fertig, & Barbor, 1997) and test–retest reliability (Babor et al., 2001). We administered the Dutch version of the AUDIT (Babor et al., 2001).

The *Drug Abuse Screening Test* (DAST-10; Skinner, 1982) is a 10-item self-report measure for drug abuse. Items are answered with true–false response categories. Recent studies reveal good psychometric properties of the DAST-10 (e.g., Yudko, Lozhkina, & Fouts, 2007). The Dutch version of the DAST was applied (Verschuere, Uzieblo, & Crombez, 2006a).

Self-Reported Minor Delinquent Behaviors (Verschuere, Uzieblo, & Crombez, 2006b) was developed for the present study to detect the frequency of minor criminal behaviors. The questionnaire consists of seven minor violations (e.g., "Have you ever sold illegal drugs?", "Have you ever mistreated an animal?"). Items are scored on a 5-point Likert-type scale (0 = *never*, 1 = *once*, 2 = *twice*, 3 = *three times*, 4 = *more than three times*). The total score (maximal score = 28) was obtained by adding up all item-scores.

The *Buss–Durkee Hostility Inventory–Dutch Version* (BDHI-D; Lange, Hoogendoorn, Wiederspalm, & de Beurs, 1995) is an adapted version of the original Buss–Durkee

Hostility Inventory (BDHI; Buss & Durkee, 1957) consisting of 40 items assessing hostility and the tendency toward aggressive behavior with true–false response categories. Principal component analyses yielded three factors: Indirect Aggression assessing suppressed hostility, Direct Aggression assessing overt aggressive behavior and verbal aggression, and Social Desirability. Good internal consistencies for the BHDI-D have been reported (Meesters & Muris, 1996).

Procedure

The participants were recruited through a snowball sampling technique: Eight undergraduate students contacted participants among their acquaintances. These participants provided a new series of participants, who in turn provided another series of volunteers, and so on. Thus, this technique relies on appointments from initial participants to produce additional participants. This technique is in common use (Atkinson & Flint, 2001) and is considered economical, efficient, and effective (Snijders, 1992).

All participants received a letter explaining the study. The study was approved by the Ethical Committee of Ghent University and written informed consent was obtained from all participants. There was no reward for participation. In total, 79% of all spread questionnaires were completed. Information about those who declined to participate was not available.

Missing Data

With regard to the self-report measures, data from scales with more than 20% missing data were omitted from analyses (see also, Lilienfeld & Widows, 2005): 0.4% of PPI-R-I, LSRP-I, LSRP-II, and YPI-III; 0.6% of YPI-I and YPI-II; 0.7% of STAI-T and FQ; 0.1% of BIS, BAS Reward and BAS Fun; 0.3% of BAS Drive and BAS; 1.8% of DAST-10; 4.2% of Indirect Aggression, Direct Aggression, and Social Desirability. The randomness of missing data was tested with Little's MCAR (missing completely at random) test (Little & Rubin, 1989). These analyses revealed that the missing data of all self-report measures were random (all $\chi^2_s > 2.07$, all $ps > .10$), except the missing data of two measures, namely the BIS/BAS scale, $\chi^2(19) = 41.42$, $p < .01$; and the FQ, $\chi^2(2048) = 2555.31$, $p < .01$. Comparison of the analyses using imputed data with the analyses using listwise deletion showed no meaningful differences.

Data from scales with less than 20% missing data were prorated on basis of the mean for completed items (see also Lilienfeld & Widows, 2005).

Confirmatory Factor Analyses

Confirmatory factor analyses were performed to determine whether the two-factor structure of the PPI-R as proposed

by Lilienfeld and Widows (2005) could be replicated. The confirmatory factor analyses were performed with AMOS 16.0 (Arbuckle, 1995-2007). The fit of the model was estimated with the maximum likelihood algorithm, while allowing the latent variables to correlate. In line with theoretical recommendations (Bollen & Long, 1993; Byrne, 2001), several fit indices were used to assess the model fit: χ^2 , χ^2/df (CMIN/df), the root mean square error of approximation (RMSEA), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), and the comparative fit index (CFI; for an overview, see Bollen & Long, 1993). A nonsignificant χ^2 value and a CMIN/df value within the 2:1 or 3:1 range indicate an acceptable model (Carmines & McIver, 1981; Marsh, Balla, & McDonald, 1988). Values of RMSEA up to .08, GFI and CFI $> .90$, and AGFI $> .85$ indicate proper fit (Browne & Cudeck, 1993; Hu & Bentler, 1991; Jöreskog & Sörbom, 1984).

Confirmatory factor analyses were performed on subscale level instead of on item level, because our current sample was too small to perform factor analyses on item level (Bentler & Chou, 1987). In the CFA model, the PPI-R factors, PPI-R-I, and PPI-R-II, were indicated by their subscales. The latter served as manifest variables, whereas the PPI-R factors were considered as latent first-order factors. The PPI-R factors were allowed to correlate in both models.

Correlational Analyses

Correlations were analyzed with SPSS 12.0 (SPSS, 2006) at a significance level of .01.

Results

Psychopathy Factors and Descriptive Statistics

Means, standard deviations, and internal consistencies (Cronbach's alphas) of PPI-R, LSRP, and YPI total and factor scores are presented in Table 1. Consistent with psychopathy literature, males demonstrated higher total scores on the PPI-R, the LSRP, and the YPI than females. This gender difference was found for all factors, except for the behavioral–lifestyle factors of the PPI-R and the LSRP. On the latter factor, the gender difference was in the opposite direction.³

Confirmatory Factor Analyses

Table 2 displays the standardized loadings of the subscales on the PPI-R factors. The subscale Blame Externalization displayed a low factor loading on PPI-R-II and the subscale Stress Immunity also exhibited a low factor loading on PPI-R-I. Satisfactory factor loadings of .30 or higher were obtained for the remaining PPI-R subscales.

Table 1. Means, Standard Deviations, Internal consistencies, Independent *t* tests, and Effect Sizes (Cohen's *d*) of the PPI-R, the LSRP, and the YPI, and Their Factor Scores for the Total Sample, the Male and the Female Subsample

	Cronbach's α	Total Sample			Males			Females			<i>t</i>	<i>d</i>
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>		
PPI-R-total	.91	675	276.96	34.38	422	283.00	34.30	253	266.87	32.12	6.06**	.48
Fearless-dominance	.91	675	109.17	19.84	422	113.31	19.29	253	102.26	18.84	7.27**	.58
Self-centered impulsivity	.89	675	135.16	21.01	422	135.39	21.43	253	134.79	20.31	.36	.03
Coldheartedness	.79	675	32.62	6.58	422	34.30	6.44	253	29.82	5.82	9.07**	.72
LSRP-total	.81	672	48.99	9.19	420	49.71	9.44	252	47.79	8.64	2.63**	.21
Primary psychopathy	.79	672	30.07	6.63	420	31.13	6.75	252	28.30	6.04	5.47**	.44
Secondary psychopathy	.69	672	18.92	4.42	420	18.58	4.45	252	19.49	4.45	-2.6*1	-.20
YPI-total	.91	672	86.13	17.18	420	89.63	17.33	252	80.31	15.27	7.28**	.56
Grandiose-manipulative	.91	671	31.05	8.50	419	32.10	8.51	252	29.29	8.20	4.20**	.33
Callous-unemotional	.79	671	26.25	5.86	419	28.22	5.65	252	22.96	4.59	13.16**	1.00
Lifestyle	.83	672	28.92	7.14	420	29.45	7.37	252	28.05	6.66	2.46*	.20

Note: PPI-R = Psychopathic Personality Inventory-Revised; LSRP = Levenson's Self-Report for Psychopathy; YPI = Youth Psychopathic Traits Inventory.
p* < .05. *p* < .01.

Table 2. Confirmatory Factor Analysis of the PPI-R Two-Factor Structure

Subscale	PPI-R-I	PPI-R-II
Stress immunity	.30	
Social influence	.44	
Fearlessness	.82	
Rebellious nonconformity		.94
Blame externalization		.18
Machiavellian egocentricity		.51
Carefree nonplanfulness		.39

Note: PPI-R-I = Fearless Dominance; PPI-R-II = Self-Centered Impulsivity. All factor loadings were significant.

Confirmatory factor analysis shows for all fit indices that the two-factor structure achieved a poor fit, $\chi^2 = 376.39$ (15), *p* < .01; CMIN/*df* = 26.10; RMSEA = .19 (.18; .21); GFI = .87; AGFI = .77; CFI = .67.^{4,5}

Convergent and Discriminant Validity of the PPI-R Factors

All PPI-R factors were intercorrelated: PPI-R-I was correlated with PPI-R-II, *r* = .20, *p* < .01, and with PPI-R-III, *r* = .34, *p* < .01, and PPI-R-II was correlated with PPI-R-III, *r* = .09, *p* < .05. Because of these correlations, both zero-order and partial correlations were reported following the recommendations of Lynam, Hoyle, and Newman (2006). Partial correlations permit an investigation of the unique variance of each PPI-R factor by controlling for the influence of the remaining two PPI-R factors (see Benning et al., 2003; but see Lynam et al., 2006).

Table 3 depicts the interrelations of the PPI-R factors with the factors of the LSRP and the YPI. PPI-R-I exhibited positive associations with LSRP-I and YPI-I. However, it

was also approximately equally associated with the affective factor of the YPI (YPI-II) as with its behavioral factor (YPI-III). When controlling for PPI-R-II and PPI-R-III, PPI-R-I did not correlate with LSRP-I, and PPI-R-I became equally associated with YPI-I and YPI-III, and only to a lesser extent with YPI-II.

PPI-R-II was most strongly related to the corresponding factors of the LSRP and YPI (LSRP-II and YPI-III). Nevertheless, PPI-R-II also showed substantial correlations with the affective-interpersonal factors of the LSRP (LSRP-I) and the YPI (YPI-I and YPI-II). The same pattern of correlations was found after controlling for PPI-R-I and PPI-R-III.

PPI-R-III was related to the affective-interpersonal factors of the LSRP (LSRP-I) and the YPI (YPI-I and YPI-II); it was not associated with the behavioral-lifestyle factors of the LSRP (LSRP-II) and the YPI (YPI-III). After controlling for PPI-R-I and PPI-R-II, PPI-R-III was also most strongly associated with the affective-interpersonal factor of the LSRP (LSRP-I) and the affective factor of the YPI (YPI-II). However, the correlation between PPI-R-III and YPI-I did not remain significant, and PPI-R-III became negatively related to YPI-III.

Interrelations Between the PPI-R Factors and the Criterion Variables^{6,7}

The zero-order correlations of the PPI-R factors with age, SES, and the criterion variables are presented in Table 4. There were negative relations between PPI-R-I and age, Emotional Reactivity, trait anxiety, BIS, and Indirect Aggression. In addition, PPI-R-I was positively related to Cognitive Empathy, Social Skills, BAS, BAS-reward, BAS-Drive, BAS-Fun, alcohol and drug use, and self-reported minor delinquent behavior. After controlling for the remaining

Table 3. Pearson and Partial Correlations of the PPI-R Factors With the LSRP and YPI Factors

	PPI-R-I		PPI-R-II		PPI-R-III	
	Zero Order	Partial	Zero Order	Partial	Zero Order	Partial
LSRP-I	.24 ^{a**}	.02	.49 ^{b**}	.49 ^{**}	.43 ^{**}	.42 ^{**}
LSRP-II	-.09 ^{a,b*}	-.30 ^{**}	.68 ^{**}	.71 ^{**}	-.01	.01
YPI-I	.41 ^{a,b**}	.33 ^{**}	.51 ^{b**}	.48 ^{**}	.20 ^{**}	.06
YPI-II	.34 ^{b**}	.18 ^{**}	.30 ^{b**}	.26 ^{**}	.47 ^{**}	.41 ^{**}
YPI III	.35 ^{a,b**}	.33 ^{**}	.70 ^{b**}	.69 ^{**}	.05	-.14 ^{**}

Note: PPI-R-I = Fearless Dominance; PPI-R-II = Self-Centered Impulsivity; PPI-R-III = Coldheartedness; LSRP-I = Primary Psychopathy; LSRP-II = Secondary Psychopathy; YPI-I = Grandiose-Manipulative; YPI-II = Callous-Unemotional; YPI-III = Lifestyle factor.

a. Differs from the respective correlation with PPI-R-II with $p < .01$.

b. Differs from the respective correlation with PPI-R-III with $p < .01$.

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

Table 4. Internal Consistencies of the Criterion Variables, Pearson's and Partial Correlations for the PPI-R Factors With Age, Socioeconomic Status, the Empathy Quotient Scales, Friendship Questionnaire, Trait Anxiety, BIS/BAS Scales, Alcohol and Drug Use, Self-Reported Minor Delinquency, Direct and Indirect Aggression, and Social Desirability

	Cronbach's α	PPI-R-I		PPI-R-II		PPI-R-III	
		Zero Order	Partial	Zero Order	Partial	Zero Order	Partial
Age	—	-.23 ^{a,b**}	-.16 ^{**}	-.41 ^{b**}	-.38 ^{**}	-.03	.10 [*]
Socioeconomic status	—	.05 ^{a,b}	.07	-.16 ^{b**}	-.19 ^{**}	.04	.02
Empathy total score	.83	-.03 ^b	.18 ^{**}	-.29 ^{b**}	-.31 ^{**}	-.47 ^{**}	-.49 ^{**}
Cognitive empathy	.84	.23 ^{a,b**}	.33 ^{**}	.01 ^b	-.02	-.19 ^{**}	-.21 ^{**}
Emotional reactivity	.72	-.17 ^{b**}	.04	-.23 ^{b**}	-.24 ^{**}	-.59 ^{**}	-.57 ^{**}
Social skills	.48	.26 ^{b**}	.31 ^{**}	-.17 ^{b**}	-.22 ^{**}	-.03	-.15 [*]
Friendship questionnaire	.65	.01 ^b	.16 ^{**}	-.01 ^b	.00	-.39 ^{**}	-.41 ^{**}
Trait anxiety	.92	-.52 ^{a,b**}	-.57 ^{**}	.34 ^{b**}	.55 ^{**}	-.29 ^{**}	-.18 ^{**}
BIS	.76	-.48 ^{a,b**}	-.28 ^{**}	-.06 ^b	.10	-.39 ^{**}	-.22 ^{**}
BAS	.73	.31 ^{a,b**}	.32 ^{**}	.18 ^{b**}	.08	-.09 [*]	-.14 [*]
BAS-reward	.56	.10 ^{b**}	.17 ^{**}	.07 ^b	.01	-.20 ^{**}	-.18 ^{**}
BAS-drive	.62	.23 ^{a**}	.29 ^{**}	-.04	-.11	.02	-.02
BAS-fun	.65	.34 ^{b**}	.27 ^{**}	.34 ^{b**}	.23 ^{**}	-.03	-.12 [*]
Alcohol use	.85	.21 ^{b**}	.05	.24 ^{b**}	.26 ^{**}	.07	-.03
Drug use	.60	.10 ^{a,b**}	-.02	.33 ^{b**}	.42 ^{**}	.04	-.02
Minor delinquency	.60	.30 ^{a,b}	.21 ^{**}	.43 ^{b**}	.44 ^{**}	.14 ^{**}	.01
Indirect aggression	.78	-.32 ^{a,b**}	-.42 ^{**}	.46 ^{b**}	.57 ^{**}	-.18 ^{**}	-.12 [*]
Direct aggression	.15	.05 ^{a,b}	-.12 ^{**}	.42 ^{b**}	.43 ^{**}	.13 ^{**}	.12 [*]
Social desirability	.34	-.05 ^{a,b}	.08	-.37 ^{b**}	-.42 ^{**}	-.07	-.08

Note: PPI-R-I = Fearless Dominance, PPI-R-II = Self-Centered Impulsivity; PPI-R-III = Coldheartedness; Friendship = Friendship Questionnaire;

BIS = Behavioural Inhibition Scale; BAS = Behavioral Activation Scale; BAS-Reward = Reward Responsiveness; BAS-Fun = BAS Fun Seeking.

a. Differs from the respective correlation with PPI-R-II with $p < .01$.

b. Differs from the respective correlation with PPI-R-III with $p < .01$.

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

PPI-R factors a few notable changes were seen in the correlation pattern: PPI-R-I was positively associated with the total scores on the Empathy Quotient and the Friendship Questionnaire and negatively with Direct Aggression. In addition, PPI-R-I was no longer associated with Emotional Reactivity and alcohol and drug use.

PPI-R-II was negatively associated with age, SES, the EQ total score, Emotional Reactivity, Social Skills and

Social Desirability, and positively with trait anxiety, BAS, BAS-Fun, alcohol and drug use, self-reported minor delinquent behavior, and both Indirect and Direct Aggression. With regard to PPI-R-II, a similar pattern of associations remained when controlling for the remaining PPI-R factors. The one exception was the relation between PPI-R-II and the BAS scale which became nonsignificant after partialling.

PPI-R-III exhibited negative associations with the EQ total score, Cognitive Empathy, and Emotional Reactivity. Negative relations between PPI-R-III and the friendship scale, trait anxiety, BIS, BAS-Reward, and Indirect Aggression, were also observed. PPI-R-III was positively associated with Direct Aggression and self-reported minor delinquent behavior. Most associations between PPI-R-III and the criterion variables were preserved when partialling out PPI-R-I and PPI-R-II. However, in contrast to the zero-order correlations, partial correlations displayed a positive relation of PPI-R-III with age, a negative relation with Social Skills and BAS-Fun, and a nonsignificant relation with minor delinquent behavior.

Discussion

This study examined the validity of the PPI-R factors. The results can be readily summarized. First, we were unable to find evidence for the two-factor higher-order structure of the PPI-R as proposed by Lilienfeld and Widows (2005) in our confirmatory factor analysis. Second, results indicated good convergent and discriminant validity of the PPI-R factors. Third, the external validity of the PPI-R factors was good: the factors were related with a variety of clinically and theoretically relevant criterion variables.

Factor Structure of the PPI-R

Consistent with PPI-findings (Martin, Halder-Sinn, Funsch, & Rindfleisch, 2008; Neumann, Malterer, & Newman, 2008), the confirmatory factor analysis of the PPI-R subscales revealed an inadequate fit. There may be several reasons for this. First, some authors have raised concerns about the usefulness of confirmatory analytic techniques in testing the structure of personality measures (Church & Burke, 1994; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996), in part because several studies obtained an inadequate fit with personality measures. However, some recent papers revealed an adequate fit with personality measures (Gustavsson, Eriksson, Hilding, Gunnarsson, & Ostensson, 2008; Svindseth et al., 2009). Additionally, no evidence has been found for the original PPI-structure when using *exploratory* factor analyses either (Neumann et al., 2008). Second, when taking into account previous PPI findings, accumulating evidence suggests that the current instrument needs improvement. The original factor structure of Benning et al. (2003) only accounts for 30% to 45% of the variance of the PPI (Eisenbarth & Alpers, 2007; Martin et al., 2008), and the PPI subscales exhibit cross-loadings on the PPI-factors (Neumann et al., 2008). It may well be that an alternative structure will result in a better model fit (see Maesschalck, Vertommen, & Hooghe, 2002; Neumann et al., 2008). Further research is warranted to explore the PPI-R structure at

item level and to fine tune the PPI-R structure using exploratory analyses. To accomplish this, a large sample is required (see Bentler & Chou, 1987).

We also note that, in contrast to previous PPI studies (Benning et al., 2003), the PPI-R factors in the present study were correlated. However, this does not necessarily counter the notion of the PPI-R factors being orthogonal factors as proposed by Benning et al. (2003). Instead, as argued above, it is probably related to the PPI-R subscale structure. Cross-loadings of the PPI-R subscales could underlie the correlations among the factors, as found in previous PPI studies (Neumann et al., 2008).

Convergence and Discriminant Validity

The present results suggest a satisfactory convergent and discriminant validity of the PPI-R factors. One particular finding needs further consideration. Overall, the behavioral–lifestyle factors displayed better convergence than the affective–interpersonal factors. It is possible that there is large variety in how measures assess the affective–interpersonal features of psychopathy. There are at least two explanations. First, it may well be easier to set criteria for antisocial behavior than for personality-based criteria, given that the latter are mainly inferential (Cloninger, 1978). Second, the items that assess the affective–interpersonal traits were grounded in different theoretical conceptualizations of psychopathy. As a result, different instruments may measure different aspects of the affective–interpersonal psychopathy construct: PPI-R-I may well focus on the absence of fear and of stress reactivity, PPI-R-III on lack of empathy and guilt, LSRP-I on the lack of empathy, and YPI-II on the lack of guilt, remorse, and empathy, and on shallow affect. Further research should focus on the development of a more comprehensive measure covering the distinct affective and interpersonal psychopathy traits more broadly.

External Validity of the PPI-R Factors

Our findings support the external validity of the PPI-R factors. As is the case for the affective–interpersonal factor of the PCL-R (PCL-R: F1), PPI-R-I was positively related to indices of antisocial behavior, such as alcohol use and delinquent behavior (Harpur et al., 1989; Verona, Patrick, & Joiner, 2001). Additionally, PPI-R-I was associated with enhanced cognitive empathy and social skills, and with low emotional reactivity. This is in line with the finding that high scorers on the respective PPI-R factor exhibit a tendency to exploit others (Benning, Patrick, Blonigen, et al., 2005; Benning, Patrick, Salekin, et al., 2005). It can be hypothesized that the ability to properly perceive the affective states of others and to be socially skilled enhances a

successful exploitation and manipulation of others (see also, Book, Quinsey, & Langford, 2007). In line with previous PPI research (Benning et al., 2003; Uzieblo et al., 2007), PPI-R-I was negatively related to anxiety. In contrast to PCL-R: F1 (Hale, Goldstein, Abramowitz, Calamari, & Kosson, 2004; Schmitt & Newman, 1999), both PPI-I and PPI-R-I seem to access some anxiety symptoms (Benning et al., 2003; Lilienfeld & Widows, 2005). In contrast to what case studies suggested (Cleckley, 1976), no empirical evidence was found for a relationship between PPI-R-I scores and the perception on friendships. PPI-R-I was related to low inhibition, high fun seeking behavior, and a high motivation to pursue goals, replicating previous PPI-research (Uzieblo et al., 2007). Finally, PPI-R-I was only associated with low indirect aggression. Indeed, individuals with affective–interpersonal psychopathic traits do not exhibit the tendency to suppress feelings of hostility and negativity (Verona et al., 2001).

Comparable with the social deviance factor of the PCL-R (PCL-R: F2), PPI-R-II was positively associated with both anxiety (Hale et al., 2004; Vitale, Smith, Brinkley, & Newman, 2002) and indices of antisocial behavior (substance use, minor delinquent behavior, and aggression), and negatively correlated with age and SES (Harpur et al., 1989; Harpur & Hare, 1994). In addition, individuals with higher scores on PPI-R-II exhibit a reduced ability to react with one's own distress when observing suffering in others (Jolliffe & Farrington, 2004; Robinson, Roberts, Strayer, & Koopman, 2007) and to use appropriate social skills (Dodge et al., 2003). As found in previous PPI research (Uzieblo et al., 2007), the behavioral–lifestyle traits were mainly associated with high fun seeking behavior. Finally, scores on PPI-R-II were associated with enhanced suppressed hostility.

Although zero-order and partial correlations showed notable similarity, following partialling some relations between psychopathy factors and criterion variables were uncovered, enhanced (suggesting suppressor effects), or even abolished. These changes were more pronounced with factors measuring affective–interpersonal traits of psychopathy, resulting in a few relations hard to fit within the nomological network of psychopathy. As Lynam et al. (2006) noted, the zero-order correlations are of most interest for clinicians who mostly if not solely rely on the actual factor scores. However, of theoretical interest is the observation that mainly the factors measuring affective interpersonal traits of psychopathy appear instable: They show less convergence than behavioral–lifestyle factors and their place within the nomological network appears to shift after partialling. Further research should unravel suppressor effects of the PPI-R factors to enhance our knowledge regarding this assessment measure and the general conceptualization of psychopathy.

The Coldheartedness Factor: Should It Stay or Should It Go?

We have unclear results about the distinctiveness of the Coldheartedness factor. Although including the Coldheartedness factor in the confirmatory factor analysis did not result in an adequate model fit, it was related to PPI-R-I and to the factors of the YPI and the LSRP assessing affective, interpersonal traits of psychopathy. Furthermore, PPI-R-III exhibited meaningful relations with external variables in the present study, extending findings regarding its placement within the nomological network of psychopathy. PPI-R-III was associated not only with low affective empathy, as first hypothesized, but also with low cognitive empathy, indicating a general diminished empathic ability. Interestingly, instead of PPI-R-I, PPI-R-III appeared to be associated with little enjoyment of friendships. Given that individuals scoring high on PPI-R-III are callous (Lilienfeld & Widows, 2005) and exhibit low sentimentality (Benning et al., 2003), it is not surprising that friendships are of little value. PPI-R-III was also related to low trait anxiety, low BIS, low reward seeking behavior, high minor delinquent behavior, and low indirect and high direct aggression. In sum, PPI-R-III seems to tap unique propensities in comparison with PPI-R-I, which are related to psychopathy. With respect to the latter statement, it is interesting to note that PPI-R-I was mainly related to the interpersonal YPI factor, whereas PPI-R-III was mainly associated with the affective YPI factor. Hence, PPI-R-III seems to tap certain distinct affective and interpersonal traits of psychopathy, demonstrating its value as a psychopathy factor. Researchers should include Coldheartedness in future work.

Limitations and Conclusions

There are some limitations to be considered. First, our sample was not randomly selected or matched on characteristics, such as gender and SES. The latter hampered proper comparisons across these characteristics. Second, we only used self-report measures. Notwithstanding these limitations, the present study can be regarded as accumulating evidence for the meaningful locations of the PPI-R factors within the nomological network of psychopathy. In all, the PPI-R is a promising tool to assess the affective–interpersonal and behavioral–lifestyle traits of psychopathy in noninstitutionalized populations. But the present study also revealed and confirmed some important problematic issues with the PPI-R factor structure. Therefore, the PPI-R needs factor structure improvement, starting at item level.

Acknowledgments

The authors would like to thank E. Bekaert, M. Bertelee, M. Crabbe, C. Degrande, K. Embo, V. Muylle, T. Van der Auwera

for their contribution in collecting data, and Dr. David Bernstein and Prof. Dr. Christopher Eccleston for their valuable comments on the article.

Declaration of Conflicting Interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research and/or authorship of this article:

Research Foundation–Flanders (FWO; doctoral fellowship to Katarzyna Uzieblo and postdoctoral fellowships Bruno Verschuere and Eva Van den Bussche).

Notes

1. Although the final PPI factor solutions as suggested by Benning et al. (2003) did not include the Coldheartedness factor, one can state that Coldheartedness is at least theoretically related to psychopathy. Hence, PPI-R-III is retained in the analyses regarding the convergent, discriminant, and external validity of the PPI-R factors.
2. More recent research indicates that a three-factor (Cooke & Michie, 2001) or four-factor solution provides the best fit (Vitacco, Rogers, Neumann, Harrison, & Vincent, 2005). Despite these recent findings, current knowledge regarding the PCL-R is still mainly based on the two-factor conceptualization of the PCL-R.
3. When controlling for possible age and socioeconomic status effects, similar results emerged.
4. Although beyond the scope of the current study, the invariance of the PPI-R structure across gender was examined, revealing an instable two-factor structure, $\chi^2 = 363.66$ (41), $p < .01$; CMIN/ $df = 43.52$; RMSEA = .14 (.12; .15); GFI = .88; AGFI = .74; CFI = .67. Further information is available on request.
5. Because the question remains whether the Coldheartedness factor should be retained in the PPI-R structure, we also tested a second model. In this model, the three PPI-R factors served as latent variables. The subscales of PPI-R-I and PPI-R-II functioned as manifest variables. Because PPI-R-III only retains one subscale, the items of PPI-R-III served as manifest variables. All factors were allowed to correlate. This model achieved an inadequate fit, $\chi^2 = 1710.55$ (227), $p < .01$; CMIN/ $df = 7.54$; RMSEA = .10 (.09; .10); GFI = .81 AGFI = .77; CFI = .58.
6. When controlling for possible age, gender, and socioeconomic status effects, similar results emerged.
7. Correlations between LSRP, YPI, and external variables were not included in the present study, because these analyses fell beyond the scope of the current study. This information can be obtained on request.

References

- Allen, J. P., Litten, R. Z., Fertig, J. B., & Barbor, T. (1997). A review of research on the alcohol use disorders identification test

(AUDIT). *Alcoholism: Clinical and Experimental Research*, 21, 613-619.

- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: Initial test of a new assessment tool. In E. Blaauw & L. Sheridan (Eds.), *Psychopaths: Current international perspectives* (pp.131-158). The Hague, The Netherlands: Elsevier.
- Arbuckle, J. L. (1995-2007). *Amos 16.0 update to the Amos user's guide*. Chicago: SPSS.
- Arnett, P. A. (1997). Autonomic responsivity in psychopaths: A critical review and theoretical proposal. *Clinical Psychology Review*, 17, 903-936.
- Atkinson, R., & Flint, J. (2001). Accessing hidden and hard-to-reach populations: Snowball research strategies. *Social Research Update*, Issue 33. Retrieved November 18, 2009, from <http://sru.soc.surrey.ac.uk/SRU33.pdf>
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *The alcohol use disorders identification test (AUDIT): Guidelines for use in primary care* (2nd ed.). Retrieved July 3, 2006, from http://www.who.int/substance_abuse/publications/alcohol/en/index.html
- Baron-Cohen, S., & Wheelwright, S. (2003). The Friendship Questionnaire: An investigation of adults with Asperger syndrome or high-functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, 33, 509-517.
- Baron-Cohen, S., & Wheelwright, S. (2004). The Empathy Quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, 34, 163-175.
- Benning, S. D., Patrick, C. J., Blonigen, D. M., Hicks, B. M., & Iacono, W. G. (2005). Estimating facets of psychopathy from normal personality traits. A step toward community epidemiological investigations. *Assessment*, 12, 3-18.
- Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological Assessment*, 15, 340-350.
- Benning, S. D., Patrick, C. J., Salekin, R. T., & Leistico, A. M. R. (2005). Convergent and discriminant validity of psychopathy factors assessed via self-report. A comparison of three instruments. *Assessment*, 12, 270-289.
- Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, 16, 78-117.
- Berardino, S. D., Meloy, R. J., Sherman, M., & Jacobs, D. (2005). Validation of the Psychopathic Personality Inventory on a female inmate sample. *Behavioral Sciences and the law*, 23, 819-836.
- Bollen, K. A., & Long, J. S. (Eds.). (1993). *Testing structural equation models*. Newbury Park, CA: Sage.
- Book, A. S., Quinsey, V. L., & Langford, D. (2007). Psychopathy and the perception of affect and vulnerability. *Criminal Justice and Behavior*, 34, 531-544.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing*

- structural equation models (pp. 136-162). Newbury Park, CA: Sage.
- Buss, A. H., & Durkee, A. (1957). An inventory for assessing different kinds of hostility. *Journal of Consulting Psychology, 21*, 343-349.
- Byrne, B. M. (2001). *Structural equation modelling with AMOS: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum.
- Carmines, E., & McIver, J. (1981). Analyzing models with unobservable variables: Analysis of covariance structures. In G. Bohrnstedt & E. Borgatta (Eds.), *Social measurement: Current issues* (pp. 65-115). Beverly Hills, CA: Sage.
- Carver, C. S., & White, T. L. (1994). Behavioural inhibition, behavioural activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*, 319-333.
- Church, A. T., & Burke, P. J. (1994). Exploratory and confirmatory tests of the Big Five and Tellegen's three- and four-dimensional models. *Journal of Personality and Social Psychology, 66*, 93-114.
- Cleckley, H. (1976). *The mask of sanity*. St. Louis, MO: Mosby.
- Cloninger, C. R. (1978). The link between hysteria and sociopathy: An integrative model of pathogenesis based on clinical, genetic, and neurophysiological observations. In H. S. Akiskal & W. L. Webb (Eds.), *Psychiatric diagnosis: Exploration of biological predictors* (pp. 189-218). New York: Spectrum.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment, 13*, 171-188.
- Das, J., de Ruiter, C., & Harreveld, J. (2002). *Authorized Dutch Translation of the youth psychopathic traits*. Retrieved November 18, 2009, from http://www.oru.se/templates/oruExtNormal_9670.aspx
- De Corte, K., Uzieblo, K., Buysse, A., & Crombez, G. (2006). *Authorized Dutch translation of the empathy quotient*. Retrieved November 18, 2009, from http://www.autismresearchcentre.com/tests/eq_test.asp
- Dodge, K. A., Lansford, J. E., Burks, V. S., Bates, J. E., Pettit, G. S., Fontaine, R., et al. (2003). Peer rejection and social information-processing factors in the development of aggressive behavior problems in children. *Child Development, 74*, 374-393.
- Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Patrick, C. J. (2008). A prospective comparison of two measures of psychopathy in the prediction of institutional misconduct. *Behavioral Sciences & Law, 26*, 529-541.
- Eisenbarth, H., & Alpers, G. W. (2007). Validierung der deutschen Übersetzung des Psychopathy Personality Inventory (PPI). *Zeitschrift für Klinische Psychologie und Psychotherapie* [Journal for Clinical Psychology and Psychotherapy], *36*, 216-224.
- Forsman, M., Larsson, H., Andershed, H., & Lichtenstein, P. (in press). Persistent disruptive childhood behavior and psychopathic personality in adolescence: A twin study. *British Journal of Developmental Psychology*.
- Franken, I. H. A., Muris, P., & Rassin, E. (2005). Psychometric properties of the Dutch BIS/BAS-Scales. *Journal of Psychopathology and Behavioral Assessment, 27*, 25-30.
- Functional Assessment of Chronic Illness Therapy. (2006). *Recommended guidelines and procedures for translation*. Retrieved January 6, 2006, from <http://www.facit.org/about/welcome.aspx>
- Gorenstein, E., & Newman, J. P. (1980). Disinhibitory psychopathology: A new perspective and a model for research. *Psychological Review, 87*, 301-315.
- Gustavsson, J. P., Eriksson, A. K., Hilding, A., Gunnarsson, M., & Ostensson, C. G. (2008). Measurement invariance of personality traits from a five-factor model perspective: multi-group confirmatory factor analyses of the HP5 inventory. *Scandinavian Journal of Psychology, 49*, 459-467.
- Hale, J. R., Goldstein, D. S., Abramowitz, C. S., Calamari, J. E., & Kosson, D. S. (2004). Psychopathy is related to negative affectivity but not to anxiety sensitivity. *Behaviour Research and Therapy, 42*, 697-710.
- Hare, R. D. (2003). *The Hare Psychopathy Checklist-Revised*. Toronto, Ontario, Canada: Multi-Health Systems.
- Harpur, T. J., & Hare, R. D. (1994). Assessment of psychopathy as a function of age. *Journal of Abnormal Psychology, 103*, 604-609.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment, 1*, 6-17.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished working paper. Yale University, New Haven, CT.
- Hu, L., & Bentler, P. M. (1991). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Jolliffe, D., & Farrington, D. P. (2004). Empathy and offending: A systematic review and meta-analysis. *Aggression and Violent Behavior, 9*, 441-476.
- Jöreskog, K. G., & Sörbom, D. (1984). *LISREL: Analysis of linear structural relationships by the method of maximum likelihood*. Mooresville, IN: Scientific Software.
- Kansi, J. (2003). The Narcissistic Personality Inventory: Applicability in a Swedish population sample. *Scandinavian Journal of Psychology, 44*, 441-448.
- Lange, A., Hoogendoorn, M., Wiederspalm, A., & de Beurs, E. (1995). *BDHI-Dutch: Buss-Durkee Hostility Inventory. Handleiding, verantwoording en normering van de nederlandse Buss-Durkee Agressievragenlijst* [Manual, accountability and standards of the Dutch Buss-Durkee Aggression Questionnaire]. Amsterdam: Swets Test Services.
- Lawrence, E. J., Shaw, P., Baker, D., Baron-Cohen, S., & David, A. S. (2004). Measuring empathy: Reliability and validity of the Empathy Quotient. *Psychological Medicine, 34*, 911-919.
- Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutionalized population. *Journal of Personality and Social Psychology, 68*, 151-158.

- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment, 66*, 488-524.
- Lilienfeld, S. O., & Widows, M. R. (2005). *Psychopathic Personality Inventory-Revised: Professional manual*. Lutz, FL: Psychological Assessment Resources.
- Little, R. J. A., & Rubin, D. B. (1989). The analysis of social science data with missing values. *Sociological Methods and Research, 18*, 292-326.
- Lykken, D. T. (1995). *The antisocial personalities*. Hillsdale, NJ: Lawrence Erlbaum.
- Lynam, D. R., Hoyle, R. H., & Newman, J. P. (2006). The perils of partialling: Cautionary tales from aggression and psychopathy. *Assessment, 13*, 328-341.
- Maesschalck, C., Vertommen, H., & Hooghe, A. (2002). Psychometric characteristics of the Psychopathic Personality Inventory in a Dutch-speaking population. *International Journal of Testing, 2*, 169-198.
- Mahmut, M. K., Homewood, J., & Stevenson, R. J. (2008). The characteristics of non-criminals with high psychopathy traits: Are they similar to criminal psychopaths? *Journal of Research in Personality, 42*, 679-692.
- Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin, 103*, 391-410.
- Martin, B. A., Halder-Sinn, P., Funsch, K., & Rindfleisch, H. (2008). Die deutsche version des Psychopathic Personality Inventory (PPI) [The German version of the Psychopathic Personality Inventory]. *Diagnostica, 54*, 16-29.
- McCrae, R. R., Zonderman, A., Costa, P. T., Jr., Bond, M. H., & Paunonen, S. V. (1996). Evaluating replicability of factors in the Revised NEO Personality Inventory: Confirmatory factor analyses versus Procrustes rotation. *Journal of Personality and Social Psychology, 70*, 552-556.
- Meesters, C., & Muris, P. (1996). The relationship between hostility and perceived parental rearing behaviour: A study of male myocardial infarction patients and healthy controls. *Personality and Individual Differences, 21*, 271-281.
- Mikton, C., & Grounds, A. (2007). Cross-cultural clinical judgement bias in personality disorder diagnosis by forensic psychiatrists in the UK: A case-vignette study. *Journal of Personality Disorders, 21*, 400-417.
- Neumann, C. S., Malterer, M. B., & Newman, J. P. (2008). Factor structure of the Psychopathic Personality Inventory (PPI): Findings from a large incarcerated sample. *Psychological Assessment, 20*, 169-174.
- Patrick, C. J., Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity of the Psychopathic Personality Inventory two-factor model with offenders. *Psychological Assessment, 18*, 204-208.
- Reardon, M. L., Lang, A. R., & Patrick, C. J. (2002). An evaluation of relations among antisocial behavior, psychopathic traits, and alcohol problems in incarcerated men. *Alcoholism—Clinical and Experimental Research, 26*, 1188-1197.
- Robinson, R., Roberts, W. L., Strayer, J., & Koopman, R. (2007). Empathy and emotional responsiveness in delinquent and non-delinquent adolescents. *Social Development, 16*, 555-579.
- Ross, S. R., Benning, S. D., & Adams, Z. (2007). Symptoms of executive dysfunction are endemic to secondary psychopathy: An examination in criminal offenders and noninstitutionalized young adults. *Journal of Personality Disorders, 21*, 384-399.
- Schmitt, W. A., & Newman, J. P. (1999). Are all psychopathic individuals low-anxious? *Journal of Abnormal Psychology, 108*, 353-358.
- Skinner, H. A. (1982). The Drug Abuse Screening Test. *Addictive Behaviors, 7*, 363-371.
- Snijders, T. (1992). Estimation on the basis of snowball samples: How to weight. *Bulletin Methodologie Sociologique, 36*, 59-70.
- Spielberger, C. D. (1983). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- SPSS. (2006). SPSS for Windows, Version 12.0 [Computer software]. Chicago: Author.
- Svindseth, M. F., Sorebo, O., Nottestad, J. A., Roaldset, J. O., Wallin, J., & Dahl, A. A. (2009). Psychometric examination and normative data for the Narcissistic Personality Inventory 29 item version. *Scandinavian Journal of Psychology, 50*, 151-159.
- Uzieblo, K., De Corte, K., Crombez, G., & Buysse, A. (2006). *Authorized Dutch Translation of the "Friendship Quotient."* Retrieved November 17, 2009, from <http://www.autismresearchcentre.com/tests/default.asp>
- Uzieblo, K., Verschuere, B., & Crombez, G. (2006). *The authorized Dutch translation of the Levenson's Self-Report of Psychopathy*. Unpublished manuscript.
- Uzieblo, K., Verschuere, B., & Crombez, G. (2007). The Psychopathic Personality Inventory: Construct validity of the two-factor structure. *Personality and Individual Differences, 43*, 657-667.
- Uzieblo, K., Verschuere, B., Jelicic, M., Rossi, G., Maesschalck, C., & Crombez, G. (2006). *Authorized Dutch translation of the "Psychopathic Personality Inventory-Revised."* Lutz, FL: Psychological Assessment Resources.
- Van der ploeg, H. M., Defares, P. B., & Spielberger, C. D. (1980). *Handleiding bij de Zelfbeoordelvingsvragenlijst: een Nederlandse bewerking van de Spielberger State Trait Anxiety Inventory* [Manual for the Self-Assessment Questionnaire: a Dutch adaptation of the Spielberger State Trait Anxiety Inventory]. Lisse, The Netherlands: Swets & Zeitlinger.
- Verona, E., Patrick, C. J., & Joiner, T. E. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology, 110*, 462-470.
- Verschuere, B., Uzieblo, K., & Crombez, G. (2006a). *Dutch translation of the Drug Abuse Screening Test (DAST-10)*. Unpublished manuscript.

- Verschuere, B., Uzieblo, K., & Crombez, G. (2006b). *Self-report measure for minor delinquent behaviour*. Unpublished manuscript.
- Vitale, J. E., Smith, S. S., Brinkley, C. A., & Newman, J. P. (2002). Reliability and construct validity of the Psychopathy Checklist-Revised in female offenders. *Criminal Justice and Behavior, 29*, 202-231.
- Vitacco, M. J., Rogers, R., Neumann, C. S., Harrison, K. S., & Vincent, G. (2005). A comparison of factor models on the PCL-R with mentally disordered offenders: The development of a four-factor model. *Criminal Justice and Behavior, 32*, 526-545.
- Yudko, E., Lozhkina, O., & Fouts, A. (2007). A comprehensive review of the psychometric properties of the Drug Abuse Screening Test. *Journal of Substance Abuse Treatment, 32*, 189-198.