HHS Public Access

Author manuscript

Personal Disord. Author manuscript; available in PMC 2019 May 01.

Published in final edited form as:

Personal Disord. 2018 May ; 9(3): 207–216. doi:10.1037/per0000249.

Using Latent Variable- and Person-Centered Approaches to Examine the Role of Psychopathic Traits in Sex Offenders

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Abstract

The current study employed both latent variable- and person-centered approaches to examine psychopathic traits in a large sample of sex offenders ($N = 958$). The offenders, who had committed a range of sexual crimes, had been assessed with the Psychopathy Checklist-Revised (PCL-R; Hare, 2003). Structural equation modeling results indicated that the four-factor model of psychopathy (Hare, 2003; Neumann, Hare, & Newman, 2007) provided good representation of the dimensional nature of psychopathic traits across the sample of offenders, and that the PCL-R factors significantly predicted sexual crimes. In particular, the Affective and Antisocial psychopathy factors each predicted sexually violent crimes. Latent profile analysis results revealed evidence for a 4-class solution, with the subtypes showing distinct PCL-R facet profiles, consistent with previous research. The four subtypes were validated using sexual crime profiles. The prototypic psychopathy subtype (high on all four PCL-R facets) evidenced more violent sexual offenses than did the other subtypes. Taken together, the results demonstrate how variable- and person-centered approaches in combination can add to our understanding of the psychopathy construct and its correlates.

Keywords

psychopathy; sexual offender; latent-variable approach; person-centered approach; PCL-R facet profiles

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Psychopathy has an enormous impact on the criminal justice and mental health systems. The international standard for the assessment of psychopathy is the *Psychopathy Checklist-Revised* (PCL-R; Hare, 2003). Its widespread use has contributed substantially to the advancement of theory and empirical research on the psychopathy construct. Multiple studies with diverse populations (e.g., forensic psychiatric patients, substance abusers, offenders) have generated extensive evidence of the reliability and validity of the PCL-R and its derivatives.

The PCL-R is a revision of an early 22-item scale described by Hare (1980) and later referred to as the Psychopathy Checklist (PCL; detailed discussions are available in Hare, 1991, Appendix; Hare, 2003, Appendix A). The PCL-R is a 20-item construct rating scale based on traditional clinical conceptualizations of psychopathy (e.g., Cleckley, 1976; Karpman, 1955), and on the wealth of empirical findings and insights generated by many researchers over the years (Hare, 2016, in press). Exploratory (EFA) and confirmatory (CFA) factor analyses of many large data sets strongly indicate that the PCL-R measures a superordinate factor of psychopathy underpinned by four correlated first-order factors or latent facets (Hare, 2003; Neumann et al., 2007; Neumann, Hare, & Pardini, 2015; Neumann, Vitacco, & Mokros, 2016). These facets are as follows: *Interpersonal* (glibness/superficial charm, grandiose sense of self-worth, pathological lying, conning/manipulative); *Affective* (lack of remorse or guilt, shallow affect, callous/lack of empathy, failure to accept responsibility for own actions); *Lifestyle* (need for stimulation/proneness to boredom, parasitic lifestyle, lack of realistic long-term goals, impulsivity, irresponsibility); and *Antisocial* (i.e., poor behavioral controls, early behavior problems, juvenile delinquency, revocation of conditional release, criminal versatility). Two additional items (promiscuous sexual behavior and many short-term relationships) contribute to the total score, but do not load on any of the factors.

It is possible to use these four factors to model a higher-order two-factor model (Hare & Neumann, 2008), consistent with the two-factor model of the PCL (Harpur, Hakstian, & Hare, 1988), and the early two-factor model of the PCL-R (Hare et al., 1990). The labels for these two correlated factors were *Factor 1* (F1; Selfish, callous, and remorseless use of others) and *Factor 2* (F2; Chronically unstable and antisocial lifestyle; social deviance). This two-factor model has had a large influence on the conceptualization of psychopathy and empirical research over the last few decades. In the four-factor model the original Factor 1 comprises the Interpersonal and Affective facets, and Factor 2 comprises the Lifestyle and Antisocial facets.

Whereas some psychopathic features reflect covert antisocial tendencies (e.g., deceptive manipulation), others are more overtly antisocial (e.g., physical aggression; see Neumann, Vitacco, et al., 2016). Psychopathy is associated with increased violence in both community (Neumann & Hare, 2008) and forensic samples (Hare, 2003; Porter & Woodworth, 2006) and covaries with violent (Kennealy, Skeem, Walters, & Camp, 2010; Olver, Neumann, Wong, & Hare, 2013) and general recidivism (Douglas, Vincent, & Edens, 2006). Additionally, there are theoretical and empirical links between psychopathy and sexual aggression (Knight & Guay, 2006, in press; Mokros, Osterheider, Hucker, Nitschke, 2011).

At the person-centered level, individuals who score high on psychopathic traits are overrepresented in samples of sexual offenders (Knight & Guay, 2006, in press).

Evaluation and validation of the four-factor model is extensive across various demographics and with multiple measures designed for the study of psychopathy (Neumann et al., 2015). It has proven particularly informative in variable-centered approaches, such as structural equation modeling (SEM), which provides information (i.e., item discrimination, extremity, and latent association parameters) across large samples of individuals relevant for understanding the relation between PCL-based traits and significant external correlates (Neumann, Vitacco, et al., 2016). These include violence (Neumann & Hare, 2008), aggression (Hill, Neumann, & Rogers, 2004), externalizing psychopathology (Neumann & Pardini, 2014), criminal behavior (Neumann & Pardini, 2014; Vitacco, Neumann, & Pardini, 2014), sexual offending (Brown, Dargis, Mattern, Tsonis, & Newman, 2015; Knight & Guay, 2006, in press), and sadism (Mokros et al., 2011; Robertson & Knight, 2014), along with physiological (Welker, Lozoya, Campbell, Neumann, & Carré, 2014), and neurobiological correlates (Baskin-Sommers, Neumann, Cope, & Kiehl, 2016). Researchers using the four-factor model have identified differential patterns in the latent variable associations between the four PCL-based facets and external correlates, providing a more nuanced understanding of psychopathy (Neumann, Johansson, & Hare, 2013; Neumann, Vitacco, et al., 2016).

Notwithstanding its importance, the variable-centered approach does not address research questions about the manifestations of psychopathic traits on a person-by-person basis, but instead focuses on the psychopathic traits themselves collected *across individuals*. Another perspective is to examine how such traits function *within individuals*. Although the total PCL-R score is the basis for the assessment of the psychopathy syndrome, different patterns of scores across the four PCL-R facets may identify individuals with similar total scores but unique facet profiles. To explore varying profiles of psychopathic traits and to identity potential subtypes of individuals who exhibit distinct profiles, recent studies have applied latent profile analysis (LPA) to the four facets of PCL-R (Lehman et al., 2014; Mokros et al., 2015; Neumann, Mokros, et al., 2016). The results suggest that consistent and meaningful facet profiles emerge from LPA of different samples (Neumann, Vitacco, et al., 2016). Delineation of psychopathy variants and other latent profiles is of considerable importance in both research and clinical practice. Subtypes characterized by unique patterns of PCL-R facets can be linked with different etiological and external correlates, as well as risk profiles (Lehman et al., 2014, Neumann, Vitacco, et al., 2016).

Historically, prior to the emergence of sophisticated analytic tools such as SEM and LPA, clinicians suggested there were two broad subtypes of psychopathy. Based largely on clinical case studies, primary (or essential) and secondary (or symptomatic) psychopathy were proposed to represent two theoretically important subtypes of psychopathy. It is noteworthy that both Arieti (1963) and Karpman (1955) proposed a further distinction within primary psychopathy, hypothesizing complex versus simple and passive/parasitic versus aggressive/predatory variants, respectively. The distinction between primary and secondary psychopathy has garnered empirical support (Poythress et al., 2010; Skeem, Johansson, Andershed, Kerr, & Louden, 2007), and more recently, strong evidence for the

two variants of primary psychopathy has been provided (Mokros et al., 2015). In the two studies that applied model based cluster analysis to the PCL-R facet scores (Poythress et al., 2010; Skeem et al., 2007) clusters corresponding to primary and secondary psychopathy differed in the patterns of their PCL-R facet scores and trait anxiety. Although the primary subtype showed lower trait anxiety and higher Interpersonal and Affective scores in both studies, Skeem et al. (2007) found that the primary subtype also had increased Lifestyle scores compared to the secondary subtype, whereas Poythress et al. (2010) found that the Lifestyle scores for the primary subtype were lower. It is important to note that these two studies, and most other subtyping studies, have various sample selection and methodological issues (Neumann, Vitacco, et al., 2016), which limit their ability to identify clear common patterns across them. In contrast, using LPA and a systematic approach to assessing psychopathic features, Mokros et al. (2015) identified three latent classes in a sample of over 1,400 adult male offenders with high PCL-R scores (27 and above). Two latent classes corresponded to the two variants of primary psychopathy (a passive/parasitic subtype with high Interpersonal facet scores, and an aggressive/predatory subtype with high Antisocial facet scores; both primary subtypes displayed high Affective and Lifestyle facet scores). A third subgroup had a very low Affective score and represented a (non-psychopathic) “sociopathic” subtype. Mokros et al. (2015) replicated these findings in a second independent sample.

In using LPA to uncover variants and subtypes, a key issue involves sample selection. Specifically, investigators must decide whether to analyze extreme cases within a given sample (individuals with the PCL-R score above a certain cut-off) or to include the entire sample (Neumann, Vitacco, et al., 2016). Although the former has its advantages (e.g., identifying variants of primary psychopathy), it generally requires very large samples to permit selection of a reasonably large sample of extreme cases (Mokros et al., 2015). In contrast, use of the entire sample provides an opportunity to subtype a variety of cases (including psychopathic from non-psychopathic cases), and to conduct ‘near neighbor’ comparisons that may be particularly informative (e.g., identifying subtypes that have different etiological or treatment implications). As outlined below, recent LPA findings obtained from several large samples (Hare et al., in press; Neumann, Vitacco, et al., 2016) have provided consistent evidence for the existence of four latent classes when the entire sample is examined.

Although the two factors of psychopathy (Interpersonal/Affective and Antisocial/Impulsive) have been shown to constitute different paths in etiological models of sexually aggressive behavior (Knight & Sims-Knight, 2003, 2004, 2011), to contribute independent variance in the typological differentiation among sex offenders (Knight, 2010; Knight & King, 2012), and to have separable roles in the prediction of recidivism among sex offenders (Knight & Thornton, 2007; Parent, Guay, & Knight, 2011), their role in sexually aggressive behavior has largely been studied measuring psychopathy as an overarching construct. Moreover, the finer differentiation of the construct into its facets has been ignored and requires increased empirical scrutiny.

Although some research has suggested that “sexual psychopaths” are categorically different from other sexual offenders (Harris, Rice, Hilton, Lalumiére, & Quinsey, 2007; Porter,

Campbell, Woodworth, & Birt, 2001), other taxometric research of sex offenders (Walters, Knight, Looman, & Abracen, 2016) has been consistent with the overwhelming consensus in the literature (e.g., Edens, Marcus, Lilienfeld, & Poythress, 2006; Guay, Rusio, Knight, & Hare, 2007; Marcus, Lilienfeld, Edens, & Poythress, 2006; Walters et al., 2007) that psychopathy and its traits are distributed as dimensions even among sex offenders.

The finding that psychopathy, at least as measured by the behavioral and self-report assessments currently used, is distributed as a dimension and does not constitute a categorical difference from normality does not invalidate person-centered approaches of studying its relation to sexual aggression. Indeed, the only empirically validated typologies of sex offenders (Knight, 2010; Knight & King, 2012) were generated from a combination of person-centered and variable-centered approaches. The finding of the essential dimensionality of distribution simply changes our conceptualization of a type from a categorical difference to a location of a group in multidimensional space. In considering differences on profiles of subcomponents, the person-centered approach is a way of allowing the exploration of the dynamics among these components in their relation to sexually aggressive behavior. Like the dimensional study of facets, little attention has been given to the study of the subtypes of psychopathy among sex offenders.

In the present study we combined latent variable- and person-centered approaches in the analysis of a sample of 958 adult sex offenders. Using SEM, we modeled the PCL-R Interpersonal, Affective, Lifestyle, and Antisocial factors and their associations with sexual crime variables. Based on previous modeling research, we expected that there would be a differential pattern of associations among the PCL-R factors and types of sexual crimes. In particular, we expected that both the PCL-R Affective and Antisocial factors would predict violent criminal sexual acts, in-line with previous research. In addition, using the four PCL-R facets for classification, we calculated LPA on the entire sample and examined the relations between the resulting latent subtypes and sexual crime variables. Based on the existing empirical and theoretical literature (Neumann, Vitacco, et al., 2016), we expected four PCL-R facet subtype profiles to emerge: (a) a prototypic psychopathy subtype with high scores on all four PCL-R facets, (b) a callous-conning subtype with elevated Interpersonal and Affective facet scores, (c) a sociopathic subtype with elevated Lifestyle and Antisocial facet scores, and (d) a general sex offender subtype with relatively low scores on all four PCL-R facets. Furthermore, we anticipated that the LPA subtypes would display different patterns of sexual crimes, thus linking the PCL-R subtypes with specific sexual offending profiles. We expected that the prototypic subtype would display the highest rate of violent sexual crimes.

Method

Participants and Procedures

The participants in the present study were 958 adult male sexual offenders pooled from two samples. Sample 1 consisted of 561 offenders (91% White) evaluated at the Massachusetts Treatment Center (MTC) for Sexually Dangerous Persons in Bridgewater, MA, during the period 1959 to 1984. All have been convicted of violent or repeated sexual offenses, and 252 were eventually committed. Sample 2 comprised 397 offenders from the MTC and from

several inpatient and outpatient treatment centers and forensic institutions in Minnesota, New Jersey, and Massachusetts (3 were outpatient, 174 from prisons, and 220 civilly committed). Here, 68.9% of the participants were Caucasian, 17.1% African American, 4% Hispanic, 4% Native American, less than 1% Asian, and 4.6 % of other races or not disclosed.

Most of the participants in the pooled sample were incarcerated offenders or inpatients, many of whom were repeat offenders. The mean age at the time of assessment for the pooled sample was 37.83 (*SD* = 11.46). The mean number of serious sexual offense convictions was 2.49 (*SD* = 2.13) as adults and .24 (*SD* = .79) as juveniles. The Institutional Review Board at Brandeis University and each participant institution provided approval for the research. Detailed descriptions of the procedures used in the original data collection are available for Sample 1 (Knight & Thornton, 2007) and for Sample 2 (Robertson & Knight, 2014).

Measures

Psychopathy Checklist: Revised (PCL-R)—The PCL-R contains 20 items, each rated on a 3-point scale (0, 1, 2) according to the extent to which an item description matches the individual. Total scores can vary from 0 to 40, reflecting the degree to which an individual matches the prototypical conception of psychopathy. Raters, trained by a Darkstone certified PCL-R expert, scored the PCL-R from extensive clinical and criminal records, which included psychosocial histories, official court and police records, and treatment notes. The training emphasized the importance of assessing psychopathic features outside of the context of criminal behavior. For dual coded cases, the average of the two raters was used. Intra-class correlation coefficient (ICC) on the total PCL-R score for 177 dual coded files from Sample 1 was .87, and .89 for 35 dual coded files from Sample 2. In the pooled sample 8% of the participants had a total PCL-R score of 25 or above. The internal consistency (alpha) of the total score was .85. The alphas for the Interpersonal, Affective, Lifestyle, and Antisocial facets were .68, .69, 67, and .70, respectively. Because alpha is influenced by scale length and is not solely a measure of item homogeneity and unidimensionality (Schmitt, 1996), we also calculated mean inter-item correlations (MICs) for each facet. MIC was .32 for Interpersonal, .35 for Affective, .28 for Lifestyle, and .33 for Antisocial, indicating that each facet was homogeneous and unidimensional.

Sexual Crime Behavior Factors—The archival files contained extensive information on the crime scene behavior in offenders' sexual crimes. Raters who rated crime behaviors were specifically trained to evaluate crime data, and were not involved in psychopathy assessment. A principle component analysis with both VARIMAX and OBLIMIN rotation yielded four scales (see Robertson & Knight, 2014). The *Violence* scale assessed the mean severity of expressive aggression before, during, and after the sexual assault, injury requiring medical attention, sadistic assault breasts and/or genitals, and stabbing. The *Physical Control* scale measured the mean number of instances of blindfolding and/or gagging and tying up the victim. The *Sexual Behavior* scale assessed the mean number of instances of performing cunnilingus on the victim, victim masturbating the offender, and the victim performing fellatio on the offender. Finally, the *Paraphilic* scale measured the mean number of instances of exhibitionism and voyeurism.

Results

The aggregate sample of 958 participants had a mean PCL-R total score of 15.25 (*SD* = 6.84). Summed facet mean scores were as follows: Interpersonal (*M* = 2.01, *SD* =1.94), Affective (*M* = 3.52, *SD* = 2.03), Lifestyle (*M* = 3.88, *SD* = 2.25), and Antisocial (*M* = 3.58, *SD* = 2.62). Two percent of the sample met or exceeded the traditional PCL-R cut-score (≥ 30) for psychopathy, 31% had a score between 18 – 29, and 67% had a score below 18. The ranges of the facet scores were comparable for the two samples, but the means were lower in Sample 1, suggesting lower overall level of psychopathy among the MTC group.

Variable-Centered (CFA/SEM) Results

A SEM approach was employed for conducting variable-centered analyses, given its methodological rigor (e.g., modeling error separate from common variance, unambiguous specification of item-to-factor relations), and capacity to provide evidence of construct validity (Strauss & Smith, 2009). The Mplus program (Muthén & Muthén, 1998–2011) was used for all model analyses. Using a conventional confirmatory factor analytic (CFA) approach we set the PCL-R items to load onto their respective facets: Interpersonal (items 1, 2, 4, 5), Affective (6, 7, 8, 16), Lifestyle (3, 9, 13, 14, 15) and Antisocial (10, 12, 18, 19, 20) to examine evidence for the four-factor model in the sample of sex offenders. Consistent with previous modeling studies on the structure of the PCL-R (Neumann, Vitacco, et al., 2016), the four-factor model yielded an acceptable fit, CFI = .90, RMSEA = .06. All items loaded significantly on their respective factors and the factor correlations were strong and significant (*p*'s < .01 – .001). Figure 1 displays the standardized model parameters. These results provide evidence that the model adequately represents the dimensional nature of the four psychopathic domains in this sample.

Next, a SEM was conducted to examine the predictive effects of the latent PCL-R psychopathy facets using the empirically derived sexual crime scales as the criterion variables. The SEM resulted in acceptable model fit (CFI = .90, RMSEA = .07), and as expected, both the Affective and Antisocial PCL-R facets significantly predicted the Violence scale (*p*'s < .001). These same facets also predicted the Behavior Control scale (Affective *p* = .058, Antisocial *p* = .03). In addition, the Antisocial facet negatively predicted the Sexual Behavior scale (*p* = .051), whereas the Interpersonal facet predicted the Paraphilic scale (*p* < .01). Figure 2 displays the standardized structural predictive parameters. When age was included in the SEM, the results were substantively unchanged. Consistent with previous research, only the Lifestyle (*r* = −.13, *p* < .001) and Antisocial (*r* = −.10, *p* < .01) facets were significantly correlated with age. Age had a modest effect in predicting the Paraphilic scale (.15, *p* < .01).

Person-Centered (LPA) Results

We conducted Latent profile analysis (LPA) using the four PCL-R facets as indicators to determine the optimal number of subtypes within the total sample. The LPA approach is a variant of latent class analysis based on observed continuous rather than categorical variables and serves to identify homogeneous subgroups within a sample through maximum likelihood (ML) estimation. Because the PCL-R facets differ in number of items each

comprises, and to facilitate comparisons across facets, we used mean item facet scores both for input to the LPAs and for displaying the results (e.g., for the Interpersonal facet, PCL-R items [1+2+4+5]/4; for the Antisocial facet, [10+12+18+19+20]/5). Such mean item ratings clearly communicate the average item rating that each subtype received for each facet. The summed PCL-R facet scores can be computed by multiplying a mean item value by the number of items for a given facet.

Table 1 shows the LPA model fit results. The LPA analyses indicated that the four-class solution was the best model for allocating cases to subtypes, with high classification accuracy (.83 – .91). The five-class solution did not provide a substantially better model fit, and had slightly lower classification accuracy than did the four-class solution. Consistent with our previous research (Neumann, Vitacco, et al., 2016) and current expectations, the four subtypes conformed to the prototypic (C1), callous-conning (C2), sociopathic (C3), and general offender (C4) profiles. Figure 3 displays the PCL-R mean facet item scores for the four subtypes. For descriptive purposes, we provide the PCL-R total score for each subtype as follows, prototypic (M = 25.65, SD = 3.42), callous-conning (M = 16.82, SD = 3.38), sociopathic (M = 17.93, SD = 3.39), and general offender (M = 9.38 SD = 3.49).Because the basis of the LPA was the facet scores, it is not surprising that there was a significant subtype effect for the PCL-R total score, $F(3,951) = 939.92$, $p < .001$, and all posthoc subtype comparisons were significant (p's < .001). Similarly, there were significant subtype effects for each of the four facets (Interpersonal $F(3,950) = 696.34$, $p < .001$; Affective $F(3,953) = 102.55$, $p < .001$; Lifestyle $F(3,954) = 190.12$, $p < .001$; Antisocial $F(3,954) = 801.36$, $p < .001$), as well as all posthoc comparisons (p's < .05 – .001), indicating maximal separation and thus good classification of the subtypes.

External Validity—The four subtypes were validated using the sexual crime scores as dependent measures. It is worth noting that the two samples did not show statistically significant differences on the sexual crime behavior scales. One-way ANOVAs with post-hoc (Tukey HSD) follow-up analyses were used to determine how the subtypes differed on these variables. A graphic display of the results is presented in Figure 4. As expected, there was a significant subtype effect for the Violence scale, $F(3,848) = 17.29$, $p < .001$. Post-hoc follow-up analyses revealed that the prototypic subtype (C1) showed more violence in their sexual crimes than all three of other subtypes (C2–C4) (p's < .01 – .001). There was a significant subtype effect for the Sexual Behavior scale, $F(3,765) = 4.69$, $p < .01$, with posthoc analyses indicating general sex offenders (C4) engaged in more sexual behavior than did the sociopathic (C3) offenders ($p < .01$), and perhaps more than prototypic (C1) offenders ($p = .071$). Although a significant subtype effect was present for the Physical Control scale $F(3,854) = 2.92$, $p < .05$), the posthoc analyses only revealed a trend level difference, which suggested the prototypic subtypes (C1) tended to display more physical control during sexual crimes than did the general sex offenders (C4) ($p = .06$). The subtype effect for the Paraphilic scale fell slightly short of significance ($F[3,708] = 2.53$, $p = .056$), with the posthoc analyses suggesting the callous-conning (C2) subtypes engaged in more paraphilic acts compared to the sociopathic (C3) offenders ($p < .05$). Lastly, there was a subtype effect for age ($F(3,930) = 8.52$, $p < .001$), with posthoc comparisons showing the C2

(callous-conning) subtype was slightly older (M = 41.51, SD = 11.22) than the three other subtypes (range 35 – 37; p's < .01 – .001).

Discussion

Consistent with previous research on the PCL-R and its derivatives (Neumann et al., 2015), the results of the current study demonstrated that the four-factor model of psychopathy was able to represent the dimensional nature of the construct among sex offenders. Although the overall rate of clinical threshold psychopathy (PCL-R score ≥ 30) was not very high in the current sample, the varying expressions of psychopathic traits were captured by the four-factor model. Thus, in keeping with previous research (Krstic, Knight, & Robertson, 2016; Mokros et al., 2011), the current findings indicated that the psychopathic trait domains can be used for conceptualizing the personalities of sex offenders.

In addition, three of the four PCL-R facets made significant contributions in predicting the sexual crime variables, with the Affective and Antisocial facets showing the greatest predictive strength in accounting for violent sexual acts. This finding is similar to the study by Vitacco and colleagues (2005), in which these same facets predicted future violent behavior among civil psychiatric outpatients living in the general community. Neumann and Pardini (2014) also found that the Affective facet was a strong positive predictor of externalizing psychopathology. Olver, Lewis, and Wong (2013) reported that the Affective facet correlated negatively with therapeutic change, which also mediated the relation between positive change and violent recidivism. Relatedly, Schimmenti, Passanisi, and Caretti (2014) found that child sex abusers presented with very high Affective facet scores. Although it is common to find that the Antisocial facet has significant predictive power in accounting for violence (e.g., Kennealy et al., 2010; Olver, Neumann, et al., 2013), the pattern of results suggests that the Affective facet also plays an important role in understanding violent behavior. Interestingly, Hoppenbrouwers, Neumann, Lewis, and Johannson (2015) recently found that the PCL-R Affective facet was inversely associated with self-reported behavior inhibition in two large samples of offenders from different cultures, suggesting that reduced inhibition, callous affect, and a broad propensity for antisociality, reveals a potent risk profile for violent behavior.

It should also be noted that the Antisocial facet had a negative relation with sexual behavior performed during the offenses, which may clarify why previous researchers using the two-factor model of the PCL-R have reported mixed results about psychopathy and aspects of sexual offending (Brown & Forth, 1997; Porter et al., 2001). Such a pattern is to be expected if the four PCL-based facets have differential associations with sexual offending. Alternatively, because the sexual crime constitutes an event with temporal constraints, the proclivities of individuals high on certain factors might limit the amount of time they devote to other behaviors. The results suggest that those high on antisociality devote a considerable amount of time to violent and controlling behavior, and consequently they may have less time available during the assault for more extensive sexual activity.

Noteworthy is the positive association of the Interpersonal facet with the paraphilias crime-scene factor. As summarized in Knight and Guay (in press), aspects of psychopathy, but

most consistently the Machiavellian components, have been found to correlate with various aspects of sexual behavior and fantasies, (e.g., Knight & Sims-Knight, 2003, 2004, 2011; Kastner & Sellbom, 2012). Further research with the four-factor model will be needed to clarify and validate the links between various aspects of sexual offending and psychopathy. Variable-centered results only provide information on variable associations, and not necessarily about individuals who are disinhibited, callous, overtly antisocial, and potentially sex offenders. The person-centered approach can help to elucidate the mechanisms that might be responsible for these covariations.

A person-centered approach is precisely what is needed for examining profiles of individuals who present with psychopathic traits. In the current study the LPA results indicated that a four-class solution was the best fitting model, and these results are consistent with other recent LPA research with large offender samples (Neumann, Vitacco, et al., 2016). As hypothesized, a prototypic psychopathy subtype (C1) emerged and these sexual offenders had elevations on all four of the PCL-R facets, as well as the highest PCL-R total score of all subtypes. In addition, the prototypic cases had higher Violence scale scores in their sexual crimes than did the other subtypes. The prototypic subtype offenders were the only cases with elevations on both the Affective and Antisocial facets, the same factors that predicted sexual violence in the SEM analyses. That is, a high score on each of these domains is associated with the greatest risk for sexual violence. None of the other subtypes had sexual violence scores as high as those of the prototypic subtype. Taken together, the results reveal that individuals elevated on all four PCL-R facets possess the greatest risk for violence, even though it is often the case that variable-centered studies primarily highlight the predictive power of Factor 2 (i.e., Lifestyle and Antisocial factors) for assessing and understanding violence risk. As such, the SEM and LPA results in combination help to provide a deeper understanding of the nature of psychopathic personality and the risks it poses.

In contrast, the callous-conning subtype, which was characterized by high Factor 1 and low Factor 2 scores, had the highest paraphilic factor scores, suggesting the possibility that the high sexualization might be more related to the affective and interpersonal characteristic of psychopathy, rather than to disinhibitory psychopathology and externalizing behavior. The fact that the general offender subtype engaged in the greatest amount of sexual behavior is consistent both with the hypothesis that sexual offending is more about sexual behavior than violence or control for those low on all aspects of psychopathy.

Although PCL-R total scores relate to the super-ordinate psychopathy factor, we recognize that the four first-order facets often display a pattern of differential associations with various external correlates (e.g., Neumann, Johansson, et al., 2013). In other words, the variable-centered results provide information on how the psychopathy facets are linked to critical external correlates collected across large samples of individuals, but they do not tell us about specific types of offenders and the particular risks they may pose or about the dynamic nature of certain facet profiles. Nevertheless, the variable-centered analyses set the stage for person-centered analysis. Specifically, the current and previous SEM studies show that the four first-order facets represent clear and strong unidimensional domains (Neumann et al., 2015). We can use these domains to subtype individuals without ambiguity, in contrast to previous subtyping approaches discussed in both the psychopathy and sex offender

literature. In this way, we can gain a more accurate understanding of what it means when individuals are elevated on specific PCL-R facets. For instance, the callous-conning subtype (C2) presented with a profile of elevations on the Interpersonal and Affective facets (i.e., Factor 1), and relatively lower Lifestyle and Antisocial facets scores (i.e., Factor 2). Furthermore, the SEM results indicated that the Interpersonal facet was the only unique predictor of the Paraphilic scale. These two pieces of information map on to the finding that the C2 subtype showed a higher paraphilic crime score than did the other subtypes with different PCL-R facet profiles. We also can see how the SEM and LPA results map on to one another with respect to the general sex offender subtype (C4). The SEM results revealed that the Antisocial facet negatively predicted the Sexual Behavior crime scale, whereas the C4 subtypes presented with the lowest Antisocial facet scores and the highest level of nonparaphilic sexual behavior in their offenses.

In other LPA research with psychopathic offenders who present with extreme PCL-R scores, we found evidence for two variants of primary psychopathy, with each variant displaying a unique profile of facet scores and differential levels of overt aggressive antisociality (Mokros et al., 2015). Thus, the results from Mokros and colleagues (2015) and the current study suggest that future variable-centered studies examining which psychopathy factors predict recidivism should also determine whether the sample employed contains a mixture of various subtypes. The current study did not classify offenders based on the nature of the crimes committed (Brown et al., 2015) nor did it employ the rapist typology created by Knight and Prentky (1990; Knight, 2010). Future studies using our methodology can clarify if (C1) prototypic psychopathic offenders have more diverse victim profiles, similar to the “mixed offender” subtype of sexual offenders, and if these C1 offenders are the “opportunistic,” “pervasively angry,” and “overt sadistic” categories of rapists, all of whom manifest high levels of psychopathic traits. This would provide more clarity for linking the broader literature on psychopathy subtyping with sexual offender subtyping.

We propose that the PCL-based instruments (PCL-R, PCL:SV, PCL:YV, SRP, B-Scan 360) provide an opportunity for other investigators to conduct systematic person-centered analyses. These instruments have survived sophisticated statistical analyses and have the same latent variable structure (Neumann et al., 2015). Unlike other psychopathy scales (Neumann, Uzieblo, Crombez, & Hare, 2013), there is little ambiguity about the underlying structure of the PCL-based instruments. This makes them particularly useful for LPA analyses across a wide spectrum of community, organizational, and forensic contexts.

The current results help to advance our understanding of psychopathic traits in sex offenders, but there are some study elements in need of consideration. First, the data for the current study are derived from file reviews, and perhaps various aspects of personality pathology are more difficult to rate from file information. The sophisticated statistical analyses used in the current study are, however, in-line with other studies based on file review, and all provide strong evidence for the viability of such studies (Bolt, Hare, Vitale, & Neumann, 2004; Olver, Neumann, et al., 2013). Second, the current study is based on male sex offenders and may not generalize to females with psychopathic traits, and who may commit sexual offenses. Nevertheless, the evidence continues to grow that demonstrates that psychopathic features can be comparability assessed in females (Neumann et al., 2015).

In conclusion, using both the SEM and LPA approaches in combination provided for a better understanding of the role of psychopathy in sexual offending. The SEM results revealed that both the Affective and Antisocial psychopathy facets predict violent sexual criminal behavior in this large sample of sex offenders. Moreover, the PCL-R facets provided the basis for subtyping the sex offenders, resulting in four distinct subtypes with unique facet profiles and covariations in sexual offense behavior. The sex offenders with elevations on all four facets presented with the highest level of sexual violence.

Acknowledgments

Contract grant sponsor: National Institute of Mental Health; contract grant numbers: R01- MH32309- 07, R01- MH54263; contract grant sponsor: National Institute of Justice; contract grant numbers: 94- IJ- CX- 0031, 94- IJ- CX- 0049. Robert Hare receives royalties from the sale of the PCL-R and its derivatives.

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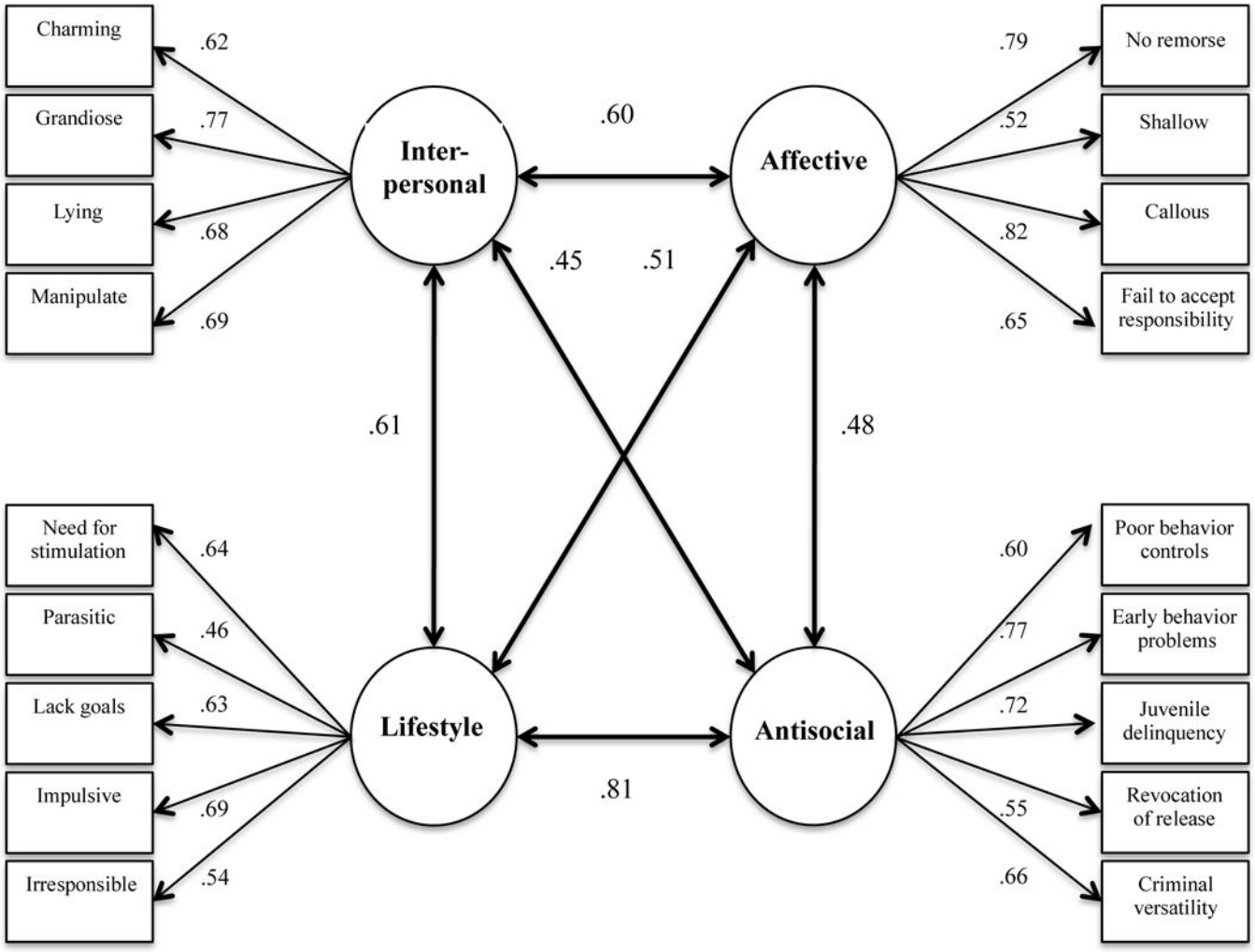

Figure 1.
Confirmatory Factor Analysis Results: Four-factor PCL-R Model of Psychopathy

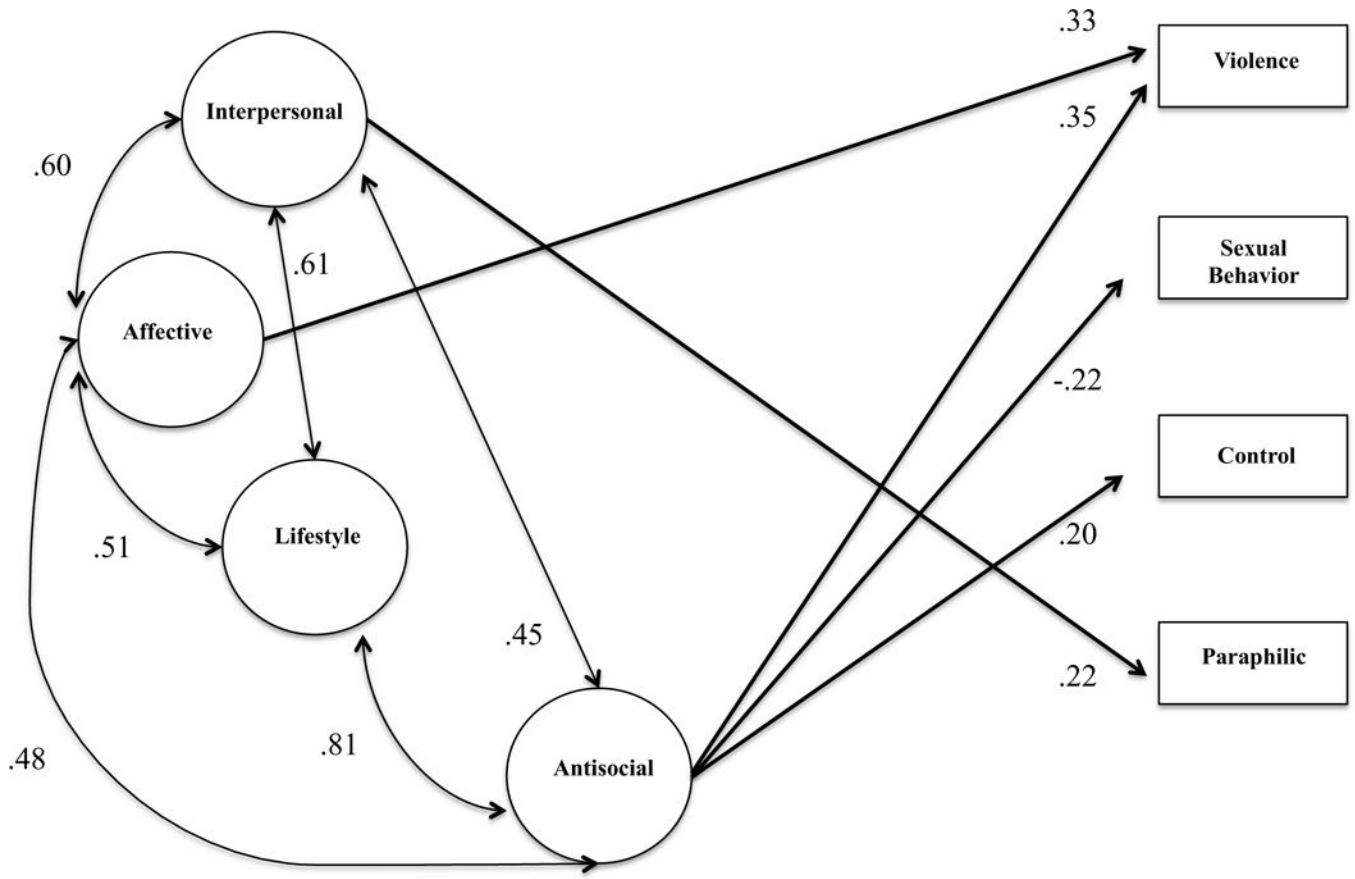

Figure 2. Structural Equation Modeling Results: PCL-R Factors Predicting Sexual Crime Scales

Note. The Affective factor also showed a trend (p = .058) in positively predicting Control

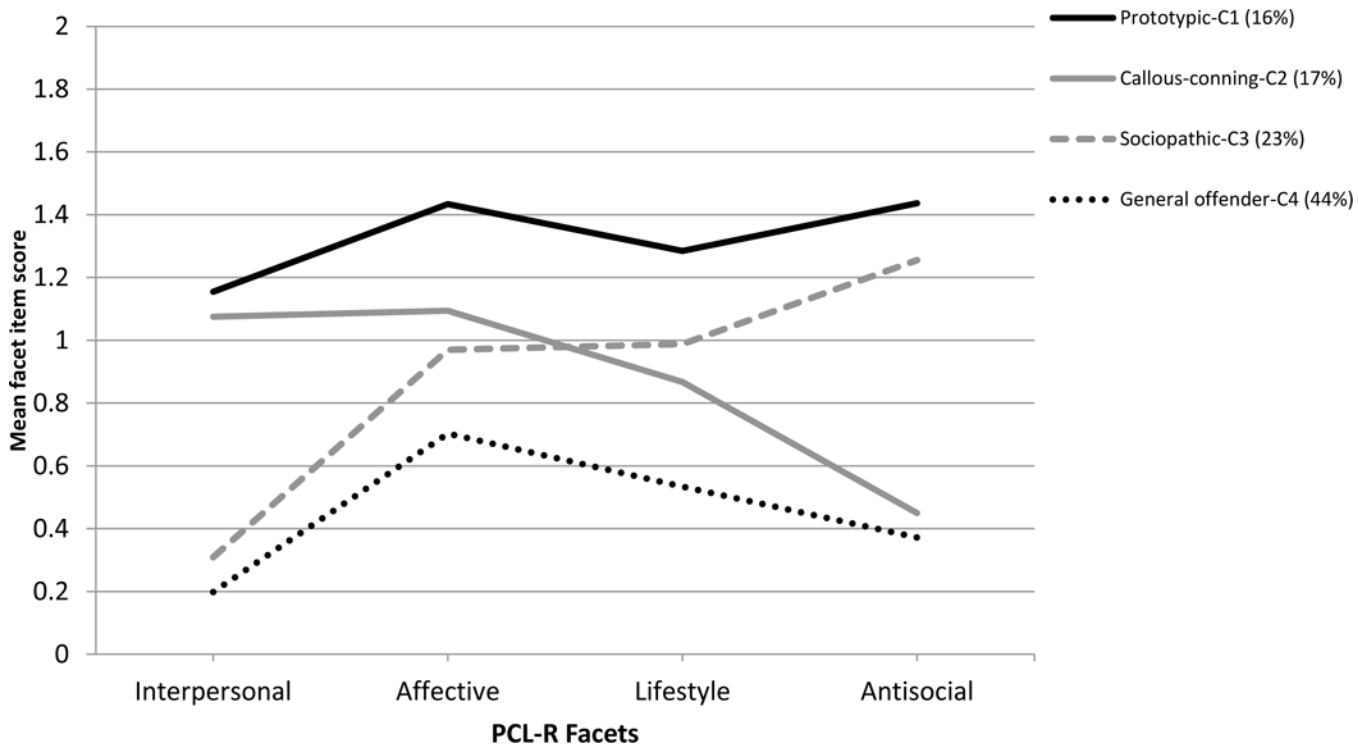

Figure 3.
Latent Profile Analysis Results: PCL-R Mean Item Facet Score Profiles by Subtype

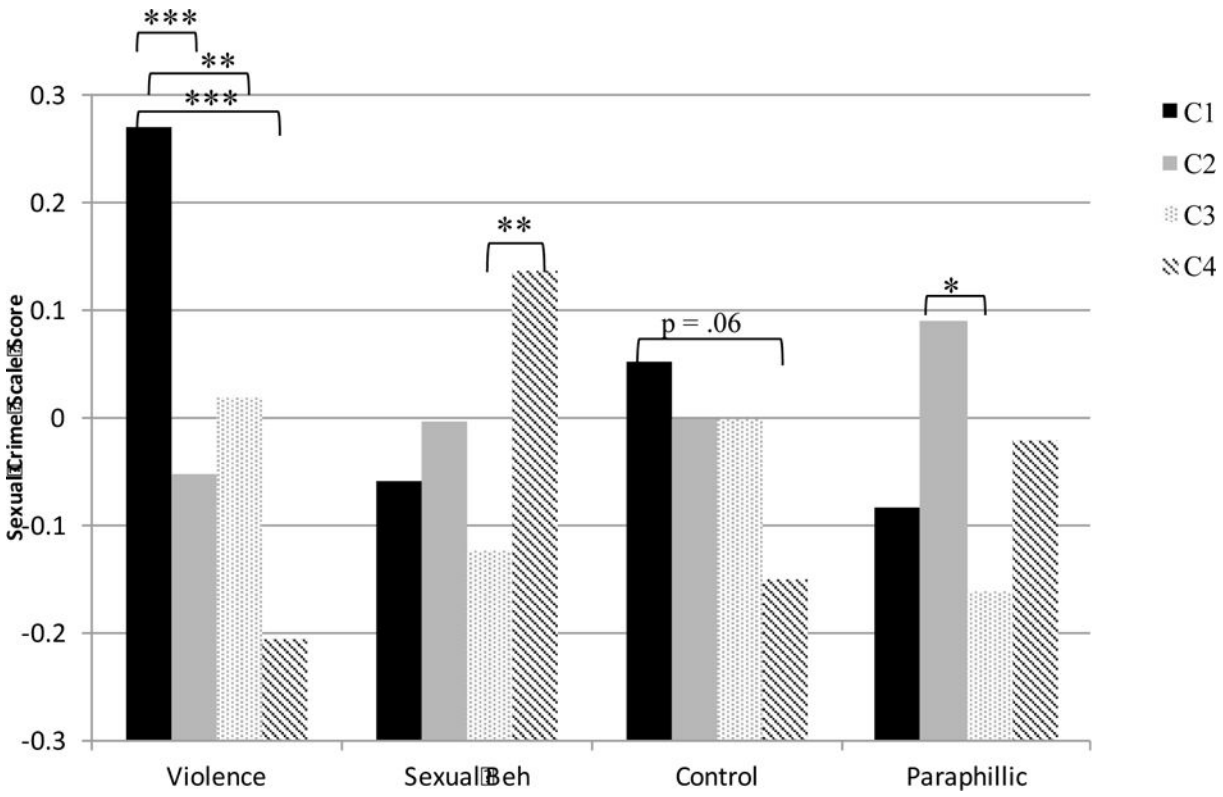

Figure 4. External Validation Results: Sexual Crime Scores as a Function of Subtype

Notes. C1 = Prototypic, C2 = Callous-conning, C3 = Sociopathic, C4 = General offenders. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 1

Latent Profile Analysis (LPA) Results

Model Fit / Latent Class Solution	1	2	3	4	5
Log-Likelihood	−8255.67	−7963.27	−7914.31	−7808.47	−7786.60
No. of Free Parameters	8	13	18	23	28
BIC	16566.26	16015.78	15952.19	**15774.83**	15765.41
Classification Accuracy	–	.89–.92	.79–.92	**.83–.91**	.73–.89

Bold = best fitting model

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