The PCL-R family of psychopathy measures: Dimensionality and predictive utility of the PCL-R, PCL: SV, PCL: YV, SRP-III, and SRP-SF

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Introduction

Although there is no consensus among researchers and clinicians as to what constitutes psychopathy, the description of the disorder which has received the most widespread acceptance is the one proposed by Cleckley (1941). In his publication entitled *Mask of sanity*, Cleckley suggested psychopathy to be composed of 16 traits, including egocentricity, lack of insight into the emotions of others, deficiency in emotional reactions, and no feelings of remorse or regret. In more recent publications, researchers attempted to group Clecleyan traits into latent factors, which resulted in the identification of four psychopathy dimensions representing interpersonal (e.g., deceitfulness, superficial charm, grandiosity), affective (e.g., lack of empathy, remorse, or guilt), lifestyle (e.g. impulsivity, irresponsibility), and behavioral (e.g., social deviance, criminality) features (Hare & Neumann, 2008). The characterization of psychopathy reflecting these four latent domains, has served as the foundation for creating the Psychopathy Checklist (PCL; Hare, 1980), its updated version, the Psychopathy Checklist – Revised (PCL-R; Hare, 1991, 2003), as well as its progeny - the Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995), the Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003), and the different versions of the Self-Report Psychopathy Scale – the SRP (Hare, 1985), SRP-II (Williams & Paulhus, 2004), and SRP-III[1] (Paulhus, Neumann, & Hare, 2016).

The PCL-R and its derivatives are the dominant assessment of psychopathy in research and clinical practice, and studies examining the measures' construct validity, dimensionality, and predictive utility are abundant. However, as recently noted by Boduszek and Debowska (2016) in a critical evaluation of factor analytic research using the PCL-R and

[1] This version is also referred to as the SRP-IV and SRP: 4.

SRP-III, findings regarding the underlying factor structure of the scales are inconsistent, which has been explained by methodological and conceptual limitations of prior research. Further, many published empirical investigations focused on *confirming* rather than *validating* the measures, warranting further scrutiny of the PCL-R family of psychopathy assessment. The purpose of this chapter is to summarize extant knowledge and critically evaluate research into construct validity, dimensionality, and predictive utility of the PCL-R, PCL: SV, PCL: YV, and SRP-III (including its abbreviated version, the Self-Report Psychopathy Scale – Short Form [SRP-SF]).

PCL-R

The PCL-R (Hare, 1991, 2003), is a 20-item scale completed by a trained clinician based on interviews and case history information. All items are rated on a 3-point scale (0 = *does not apply*, 1 = *applies to a certain extent*, 2 = *definitely applies*) and hence scores range from 0 to 40. The instrument was first developed and validated using data from North American samples of male offenders and forensic psychiatric patients, but its reliability and validity was later tested among more diverse samples, including offenders from different cultural backgrounds (e.g., Grann, Långström, Tengström, & Kullgren, 1999), adolescent offenders (e.g., Forth & Burke, 1998; Forth & Mailloux, 2000), female offenders (e.g., Salekin, Rogers, & Sewell, 1997), and substance abusers (e.g., Rutherford, Cacciola, Alterman, & McKay, 1996). Despite the scale's multidimensionality (see below for details), a cut-off point of 30 calculated based on the total PCL-R score has been suggested for diagnosing psychopathy (Hare & Neumann, 2008).

Researchers generally agree that the scale is multidimensional in nature, but consensus has not been reached as to how many facets best represent the PCL-R ratings. Most frequently, the PCL-R scores were proposed to be captured by two-, three-, four-, or bi-factor models. The two-factor solution, proposed by Hare (1991), is composed of two distinct

yet correlated dimensions - factor 1 (interpersonal/affective) and factor 2 (lifestyle/antisocial). Factor 1 incorporates eight scale items (charming, grandiose, lying, manipulate, no remorse, shallow, callous, and fail to accept responsibility), whereas factor 2 consists of 10 items (need for stimulation, parasitic, lack goals, impulsive, irresponsible, poor behavior controls, early behavior problems, juvenile delinquency, revocation of release, criminal versatility) (Harpur, Hakstian, & Hare, 1988; Harpur, Hare, & Hakstian, 1989; Krstic *et al*., 2017). The disproportion between the two factors in the number of items included, has led to suggestions that the PCL-R is too heavily weighted towards behavioral expressions of psychopathy (Boduszek & Debowska, 2016; Patrick, 2007). In addition, two PCL-R items (promiscuous sexual behavior and many short-term marital relationships) do not load on any of the factors and are usually excluded from factorial analyses of the measure (Krstic *et al*., 2017). They do however contribute towards the calculation of the total PCL-R score, but the logic behind this approach remains unclear.

The two-factor model presented above was found to be a statistically superior representation of the data in a number of studies. For example, in McDermott *et al*.'s (2000) research using exploratory factor analysis (EFA), this solution was reported as the best representation of the PCL-R scores obtained from a sample of 326 male offenders incarcerated in a prison in southern Wisconsin. However, within this same study, a one-factor model was found superior in grasping the PCL-R ratings among 620 (n = 442 men, n = 178 women) substance-dependent patients, suggesting that the scale may not work the same across samples drawn from different populations or the two sexes. In another study with offenders, Medina, Valdés-Sosa, García, Almeyda, and Couso (2013) suggested a two-factor model (interpersonal/affective and antisocial). As detailed earlier, promiscuous sexual behavior and many short-term marital relationships items did not load on any of the identified factors. These findings, however, should be tempered by the fact that a small sample size was

used (124 Cuban violent offenders), only one possible factorial solution was tested, and fit statistics for the model were not reported. Further, Hildebrand, de Ruiter, de Vogel, van der Wolf (2002), demonstrated the supremacy of a two-factor model in a sample of 107 Dutch psychiatric patients (n = 98 men, n = 9 women). Interestingly, the best-fitting model was not the two-factor model proposed by Hare (1991) but a modified two-factor model where item 14 (impulsivity) was allowed to load on both PCL-R facets. Although Hildebrand *et al*. (2002) tested seven alternative PCL-R solutions, most of them were not guided by theoretical considerations (e.g., two- and three-factor solutions with post hoc modifications, models with correlated errors of measurement), and it appears that the researchers were searching for a statistically rather than a conceptually superior representation of data. Of note, empirical research demonstrated that only factor 1 items function equivalently well across race and gender (e.g., Bolt, Hare, Vitale, & Newman, 2004; Cooke, Kosson, & Michie, 2001). Poor generalizability of factor 2 was reported for substance-dependent patients (McDermott *et al*., 2000) and antisocial traits were found to decline over time (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006; Gill & Crino, 2012).

The four-factor conceptualization of psychopathy is underpinned by the following correlated facets: interpersonal (including four items: charming, grandiose, lying, manipulate), affective (four items: no remorse, shallow, callous, fail to accept responsibility), lifestyle (five items: need for stimulation, parasitic, lack goals, impulsive, irresponsible), and antisocial (five items: poor behavior controls, early behavior problems, juvenile delinquency, revocation of release, criminal versatility) (Hare, 2003; Hare & Neumann, 2006). While this model is presented as the best model for the PCL-R scores in some of the most recent scholarship in the area, many of those studies do not test alternative factorial solutions (e.g., Krstic *et al*., 2017; León-Mayer, Folino, Neumann, & Hare, 2015; Mokros *et al*., 2011; Neumann, Hare, & Johansson, 2013; Neumann, Hare, & Pardini, 2014; Zwets, Hornsveld,

Neumann, Muris, & van Marle, 2015), even if fit statistics for the four-factor model are not satisfactory or when correlations between the four factors are very high (e.g., Mokros *et al*., 2011; Zwets *et al*., 2015). Further, in Neumann, Hare, and Newman's (2007) study within three large samples drawn from prisons and forensic psychiatric hospitals, two models were assessed, including a correlated four-factor model and a hierarchical model with four first-order factors and one second-order factor. The researchers reported that the former model provided a better fit to the data, but comparisons between models were not made and fit statistics were reported only for the four-factor solution.

Based on 13 PCL-R items, Cooke and Michie (2001) argued for a three-factor hierarchical model, incorporating interpersonal (deceitful interpersonal style), affective (deficient affective experience), and behavioral (impulsive and irresponsible behavioral style) dimensions. This three-factor solution omits items referring to criminal/antisocial behavior, which, as the authors suggest, may be a correlate of psychopathy rather than its integral part (Skeem & Cooke, 2010a, b). Cooke *et al*. (2001), Cooke, Michie, Hart, and Clark (2005b), and Johansson, Andershed, Kerr, and Levander (2002) found a three-factor or hierarchical three-factor model with 13 items to be the best model fit for the data, whereas the same models with testlets were reported as the best factorial solutions in six other studies (Cooke & Michie, 2001; Cooke, Michie, Hart, & Clark, 2005a; Cooke, Michie, & Skeem, 2007; Vitacco, Rogers, Neumann, Harrison, & Vincent, 2005b; Weaver, Meyer, Van Nort, & Tristan, 2006; Weizmann-Henelius *et al*., 2010). However, this prior research is not free from limitations. In particular, the first problem pertains to repeated use of one data set for similar purposes. For example, Cooke and Michie (2001, study 4) and Cooke *et al*. (2005a, 2007) used the same sample of Scottish male prisoners, whereas Cooke *et al*. (2005a) and Cooke *et al*. (2005b) employed a sample of North American male adult and psychiatric offenders (N = 2,067). Second, the use of testlets with short scales, where there is no need to reduce the

indicator-to-factor ratio, has been noted as questionable and it has been advised that the technique should be avoided when examining the factor structure of the PCL-R (Boduszek & Debowska, 2016).

Some recent factor analytic work examined the utility of bi-factor models in grasping the PCL-R's dimensionality. Bi-factor modeling views covariation among observable indicators to be explained by both general factors and grouping/specific factors which, unlike in hierarchical models, exist at the same conceptual level. Flores-Mendoza, Alvarenga, Herrero, and Abad (2008), who assessed seven competing solutions, argued for the superiority of the bi-factor model with two specific factors and one general factor. However, in this particular study, the general and grouping factors had similar factor loadings and the researchers did not indicate what effect this may have on the subsequent use of the PCL-R in applied settings. Moreover, three of the scale items evidenced non-significant loadings and were removed from the model. In another study among 593 American male inmates, a bi-factor model with one general and three grouping (interpersonal, affective, and impulsivity) factors evidenced the best fit of the data. Although models with 13, 18, and 20 scale items were tested, the best-fitting model included the full set of 20 items (Patrick, Hicks, Nichol, & Krueger, 2007). This indicates that bi-factor modeling may be a viable alternative to traditional confirmatory factor analysis (CFA) techniques, which allows for obtaining satisfactory results whilst modeling all PCL-R items. Thus, the inclusion of bi-factorial conceptualizations as comparison models has been recommended in all future PCL-R factor analytic research (Boduszek & Debowska, 2016).

Psychopathy, as indexed by the PCL/PCL-R, was noted to predict general and violent recidivism (Hart, Kropp, & Hare, 1988; Serin, 1996; Serin & Amos, 1995; Serin, Peters, & Barbaree, 1990) and sexual reoffending (Furr, 1993; Olver & Wong, 2015; Quinsey, Rice, & Harris, 1995; Rice, Harris, & Quinsey, 1990), which urged Rice and Harris (1995) to propose

that the instrument should be used in clinical and legal decision-making. Using a sample 81 Canadian offenders, Serin (1996) reported that the PCL-R factor 1 (interpersonal/affective) was a better predictor of violent recidivism than factor 2 (lifestyle/antisocial), but a growing body of evidence reveals that the PCL-R's predictive efficiency for crime is largely affected by factor 2 rather than factor 1 scores (Olver & Wong, 2015; Salekin *et al*., 1997; Skeem & Mulvey, 2001). In considering that factor 2 embeds criminal behavior this is unsurprising, and indicates that the usefulness of the PCL-R in criminal justice settings may be attributable almost entirely to criminal history items (Polaschek, 2015). Yang, Wong, and Coid (2010), in a meta-analysis of predictive accuracy of the PCL-R, found that factor 2 (effect size = 0.61) outperformed factor 1 (effect size = 0.22) in predicting violent outcomes. While total PCL-R score was a fairly good predictor of recidivism (effect size = 0.55), its predictive efficacy was comparable with violence prediction instruments. Based on these findings, the authors concluded that factor 1, i.e., the core personality features of psychopathy, is not associated with violence. Walters (2012), in turn, found that three PCL-R factors (interpersonal, affective, and lifestyle) failed to predict general and violent recidivism beyond the contributions of age and past criminal history among 198 Canadian prisoners. In a study with 48 violent female offenders from Finland, Weizmann-Henelius, Virkkunen, Gammelgård, Eronen, and Putkonen (2015) established that the PCL-R does *not* predict the risk of violent reoffending in females, although violent recidivists tended to score higher on total PCL-R, as well as antisocial behavior and lifestyle facets than non-violent recidivists. The PCL-R total and factor scores have also been correlated with non-criminal external criteria. For example, factor 1 (interpersonal) and factor 4 (antisocial) facets were significantly positively associated with low anxiety and fearlessness (Neumann *et al*., 2013). Interestingly, Medina *et al*. (2013) found some theoretically unexpected correlations between the PCL-R facets and external measures. Specifically, the PCL-R total score as well as factor 1 (interpersonal/affective) and

factor 2 (lifestyle/antisocial) scores formed significant negative correlations with physical aggression, verbal aggression, anger, and hostility. These findings combined suggest that the PCL-R's predictive usefulness requires further assessment among a variety of samples.

PCL: SV

To enable quicker and less demanding psychopathy assessment in civil psychiatric populations, Hart *et al*. (1995) developed the PCL: SV, which can be used for screening for the presence of psychopathic traits. PCL: SV is a 12-item measure composed of two parts: part 1 consists of six items intended to reflect PCL-R factor 1 (interpersonal/affective), whereas the remaining six items in part 2 correspond with PCL-R factor 2 (lifestyle/antisocial). Most items are based on a subset of PCL-R items which were shortened and simplified. PCL: SV item 5 (lacks empathy) was derived by collapsing and simplifying two similar PCL-R items - 7 (shallow affect) and 8 (callous/lack of empathy). PCL: SV items tapping onto antisocial behavior dimension, in turn, were modified to enable administration without access to formal criminal record. All scale items are measured on a 3-point scale (0 = *does not apply*, 1 = *applies to a certain extent*, 2 = *definitely applies*) and so scores range from 0 to 24. A cut-off score of 18 was proposed for possible psychopathy, but a more comprehensive follow-up assessment is recommended for individuals scoring 18 or above. Even though not all PCL: SV items were found to be parallel to their PCL-R equivalent, the scale was dubbed an efficient abbreviated version of the PCL-R (Cooke, Michie, Hart, & Hare, 1999).

PCL: SV dimensionality research is guided by the same theoretical considerations as the one focusing on the PCL-R. In one of the earliest investigations, Forth, Brown, Hart, and Hare (1996) examined reliability and validity of the PCL: SV among 75 male and 75 female Canadian undergraduate students recruited for three independent studies. Sample 1 (25 males, 25 females) and 2 (25 males, 25 females) consisted of participants drawn from the general

student population. Sample 3 (25 males, 25 females) were participants selected from a sample of 1,831 students with increased scores on Conduct Disorder (CD). Although participants who met the criteria for CD (n = 38) scored significantly higher than those who did not (n = 112) on total PCL: SV, the influence of part 2 items (i.e., those referring to antisocial behavior) on this difference was not investigated. Based on EFA, Forth *et al*. suggested a one-factor solution for both male and female participants, but the authors found the results difficult to interpret, especially for the female sample. Additionally, only nine items among men and five items among women had factor loadings above 0.4. In spite of these issues, it was concluded that the measure "can be used reliably with males and females in a nonforensic setting" (p. 540).

Latent structure of the PCL: SV was also investigated using CFA techniques. Hart *et al*. (1995) found a two-factor model to be acceptable (goodness-of-fit index [GFI] = 0.94) and superior to a unidimensional model. Rogers *et al.* (2000), in turn, argued for a higher-order factor solution for scores derived from a combined sample of female offenders and male forensic psychiatric patients. Although the robust comparative fit index (CFI) was below the acceptable value of 0.90 (Bentler, 1995), the fit of the model was not compared with theoretically feasible competing solutions. Further, two-, three-, and four-factor models indicated acceptable fit to the scores from 149 inpatients within a maximum security psychiatric hospital, but the four-factor solution showed best overall fit (Hill, Neumann, & Rogers, 2004). Three- and four-factor models provided an acceptable fit to the data from 257 Lithuanian prisoners (Žukauskienė, Laurinavičius, & Čėsnienė, 2010).

Several studies assessed construct validity of the PCL: SV using data retrieved from 1,136 patients from the MacArthur Violence Risk Assessment Study. For example, Skeem and Mulvey (2001) identified a two-factor solution as the best yet imperfect (corrected CFI = 0.89; Satorra & Bentler, 1988) representation of the data. In a subsequent study, Skeem,

Mulvey, and Grisso (2003) assessed eight alternative models, including the traditional two-factor model and three-factor models based on all 12 items and, as suggested by Cooke and Michie (2001), after deleting three behavioral items (poor behavioral controls, adolescent antisocial behavior, and adult antisocial behavior). Offering an acceptable and the most parsimonious model fit was a 9-item non-hierarchical three-factor model composed of arrogant/deceitful style (three items: superficial, grandiose, deceitful), deficient affective experience (lacks remorse, doesn't accept responsibility, lacks empathy), and impulsive-irresponsible lifestyle (impulsive, irresponsible, lacks goals) dimensions. The model was found factorially invariant across the two sexes and race (White vs. non-White). Finally, Vitacco, Neumann, and Jackson (2005a) reported adequate fit statistics for three- and four-factor models, based on 9 and 12 items respectively.

In considering inconsistent results with respect to the PCL: SV dimensionality, it may be that traditional CFA techniques are insufficient to explain the complexity of psychopathy as captured by the measure. To address this important methodological issue, Boduszek, Dhingra, Hyland, and Debowska (2015) compared ten theory-informed models of the PCL: SV, including four alternative confirmatory bi-factor models, among the above-mentioned sample of civil psychiatric patients recruited as part of the MacArthur Violence Risk Assessment Study. Results indicated that a bi-factor model comprised of two general factors of psychopathy (interpersonal/affective, lifestyle/antisocial) and four subordinate factors (interpersonal, affective, lifestyle, antisocial) was a good and the most parsimonious fit to the data based on all fit indices. All items evidenced statistically significant factor loadings on the two general factors, and all factor loadings were above 0.4. Since factor loadings were poorer on the four subordinate factors compared with the general factors, it was suggested that the PCL: SV scoring scheme should be based on the latter. This solution, although not tested in previous PCL: SV scholarship, was consistent with Hare's (1991) two-factor

representation of psychopathy. Correlated two-, three-, and four-factor models most frequently tested in prior research, were rejected as poor approximations of the data. This further demonstrates the superiority of modeling multidimensional structures existing at the same conceptual level in this specific context. It is recommended that bi-factor solutions are further tested among more diverse populations, and using other psychopathy measures derived from the PCL-R (see Hyland, 2015 for a guide to confirmatory bi-factor modeling).

As in PCL-R research, relationships between PCL: SV total and factor scores and external criteria were explored to gain an insight into the measure's predictive value. Forth *et al*. (1996) tested the association between PCL: SV total scores and Antisocial Personality Disorder. These correlations were statistically significant for both male and female participants, but the contribution of PCL: SV antisocial behavior items towards this result was not examined. Skeem and Mulvey (2001), in turn, suggested increased PCL: SV scores to be a relatively strong predictor of violence, however the instrument's predictive efficiency, even though still statistically significant, was substantially reduced after controlling for additional criteria reflecting antisocial behavior and personality disorders. Additionally, when controlling for all PCL: SV dimensions in a four-factor model, only the antisocial behavior facet significantly correlated with criminal activity among Lithuanian offenders (Žukauskienė *et al.*, 2010). Skeem *et al*. (2003) found total PCL: SV and antisocial behavior factor scores to be predictive of future violence, yet this predictive power was reduced when three items pertaining to criminality were deleted from the total measure score. Boduszek *et al*. (2015) demonstrated that factor 2 (lifestyle/antisocial), but not factor 1 (interpersonal/affective), formed significant positive correlations with neuroticism, Barratt Impulsiveness Scale – Cognitive, and anxiety-depression; and negative correlations with openness and conscientiousness. Both factor 1 and 2 associated significantly positively with the number of violent acts and crime against property, but not with crime against people. All reported

correlations were weak. Aggression among psychiatric patients with scores above the cut-off point for psychopathy, in turn, was predicted by interpersonal and antisocial psychopathy dimensions (Hill *et al*., 2004). These findings indicate that caution should be taken when using the PCL: SV as a violence risk assessment tool.

PCL: YV

Diagnosing personality disorders among youngsters is a controversial issue, due to the malleability of personality prior to reaching adulthood and stigmatizing effects such a diagnosis may entail (Freeman & Reinecke, 2007; Miller, Muehlenkamp, & Jacobson, 2008). On the other hand, some researchers argued that assessing psychopathy in youths might be useful for risk assessment and case management of juveniles who offend (Corrado, Vincent, Hart, & Cohen, 2004). One of the concerns with respect to examining "fledgling" psychopathy (Lynam, 1996), however, is the applicability of assessment tools designed specifically for adults to adolescent samples. To exemplify, Rogers *et al*. (2000) applied the PCL: SV to a sample of 120 male adolescents, but three out of 12 items could not be rated. Two of these items inquired into adult behavior and relationships. The third item (relied excessively on family), in turn, could not be classed as pathological. To address these issues and enable reliable assessment of psychopathic traits among youths aged between 12 and 18 years, Forth *et al*. (2003) developed the PCL: YV. The measure is completed by a trained professional based on an interview with the youth and collateral information (such as court records, interview with parents). The measure consists of 20 items indexed on a 3-point scale (0 = *does not apply to the youth*, 1 = *applies to a certain extent*, 2 = *applies to the youth*). Scores vary from 0 to 40, with higher scores indicating increased levels of psychopathic characteristics. In contrast to the PCL-R, there is not cut-off point for the PCL: YV to diagnose psychopathy. PCL: YV was designed to reflect two PCL-R factors: factor 1 (interpersonal/affective) consists of 8 items and factor 2 (lifestyle/antisocial) consists of 9

items. Three items (11, 17, and 20) do not appear in the factor scores but are used to calculate total score.

Although the PCL: YV was modeled after the PCL-R, researchers have sought to determine the factor structure of the instrument independently to enable its effective use. Jones, Cauffman, Miller, and Mulvey (2006) examined the structure of the PCL: YV among serious adolescent male (n = 1,170) and female (n = 184) offenders enrolled in the Pathways to Desistance study. Using CFA, four alternative models were tested, two of which provided a good model fit (three- and four-factor models). Both solutions, however, included additional parameters representing error covariation between item 1 (impression management) and 2 (grandiose sense of self-worth), as well as between item 18 (serious criminal behavior) and 20 (criminal versatility). Correlating errors of measurement is a serious methodological limitation which could have led to improved statistical performance of both solutions. In another study, Neumann, Kosson, Forth, and Hare (2006) reported that an 18-item four-factor model and a 13-item three-factor model provided satisfactory fit to the data retrieved from a sample of male adolescents incarcerated in North America and a sample of male adolescents from the UK, but some of the fit indices were below the acceptable range (e.g., CFI = 0.83 and the root mean square error of approximation [RMSEA] = 0.09 for the four-factor model in the UK sample). The only model that evidenced good factor structure across the two groups was a four-factor parceled model. Acceptability of three- and four-factor models was also reported among mixed-gender (Salekin, Brannen, Zalot, Leistico, & Neumann, 2006) and male adolescent offenders (Vitacco, Neumann, Caldwell, Leistico, & Van Rybroek, 2006), yet these findings should be tempered by the use of very small samples (N = 130 in Salekin *et al*., 2006 and N = 122 in Vitacco *et al*., 2006).

It has been demonstrated that some PCL: YV items function differently among male and female youths and hence generalizing psychopathy models identified with males to

female samples appears problematic (Tsang *et al.*, 2015). In spite of this, the focus in psychopathy research has been predominantly on men and the PCL: YV factor analytic work with female populations is scarce. Of the rare studies, Kosson *et al*. (2013) assessed the suitability of one-, two-, three-, and four-factor models among a combined sample of 646 adolescent girls from Europe and North America who originally participated in 14 independent studies. The sample included incarcerated girls and those from less restrictive settings (short-term detention, community probation, clinic). Comparably to the above-cited research with boys, only three- and four-factor models evidenced adequate model fit in the full sample, the North American subsample (n = 285), and the subsample of girls from less restrictive settings (n = 277). Interestingly, only the three-factor model, i.e., the one excluding criminal items, yielded an acceptable fit in the European and incarcerated subsamples, suggesting that psychopathic characteristics may be expressed differently across cultures and settings. Sevecke, Pukrop, Kosson, and Krischer (2009), on the other hand, could not identify a single model which would adequately capture PCL: YV scores retrieved from girls.

Vitacco *et al*. (2006) tested an association between the three- and four-factor models of the PCL: YV and a single factor of instrumental aggression, using structural equation modeling (SEM). Results indicated that the four-factor model accounted for 20% of variance in the external criterion. The interpersonal psychopathy facet was positively associated with instrumental aggression, whereas antisocial behavior facet – negatively. Further, the three-factor model of the PCL: YV, i.e., the model without items referring to criminality, accounted for 8% of the variance for instrumental aggression, with the lifestyle psychopathy facet forming the only significant positive relationship with instrumental aggression. Since different psychopathy dimensions were associated with instrumental aggression in these two analyses, more studies among larger samples are warranted to corroborate the findings. With a similar focus on criminal and aggressive behaviors, Corrado, McCuish, Hart, and DeLisi

(2015) demonstrated that chronic offending is *not* related to interpersonal and affective psychopathy symptoms as measured by the PCL: YV. In a three-year follow-up investigation, the PCL: YV was found to predict recidivism, but its predictive power was due primarily to the behavioral psychopathy characteristics. PCL: YV did not predict violent or non-violent recidivism for girls. These findings ought to be considered by professionals who rely on the PCL: YV for violence risk assessment.

Apart from violence and recidivism, PCL: YV scores were associated with a range of external criteria. For example, in a small sample ($N = 67$) of Dutch female adolescents admitted to a secure treatment institution, increased PCL: YV factor 1 (interpersonal/affective) scores were inversely associated with health concerns, low self-esteem, and anxiety. Factor 2 (lifestyle/antisocial) scores, in turn, were positively related to anger, conduct problems, proneness to alcohol and drug problems, and psychological immaturity (Das, de Ruiter, & Doreleijers, 2008). In another empirical study with female adolescents recruited from an Illinois correctional facility for youth offenders ($N = 80$), total PCL: YV score was positively correlated with total number of charges and infractions, number of violent infractions, conduct disorder, attention-deficit/hyperactivity disorder (ADHD), and anxiety. Further, associations between four PCL: YV dimensions and behavioral and emotional functioning have been recently investigated among male ($n = 40$) and female ($n = 40$) adolescents incarcerated in Victoria, Australia. Two behavioral PCL: YV facets were related with delinquent and aggressive behaviors. ADHD was associated with affective deficits among girls. Item-level analyses revealed that seven of the 20 PCL: YV items, including “lack of remorse” and “callous/lack of empathy”, significantly correlated with ADHD, suggesting that the PCL: YV may be identifying girls with ADHD as opposed to core psychopathic personality traits. Additionally, heightened scores on affective, lifestyle,

and antisocial PCL: YV dimensions formed significant positive correlations with self-harming behaviors among girls but not among boys (Strand, Luebbers, & Shepherd, 2016).

SRP-III and SRP-SF

Clinician-administered psychopathy measures, despite requiring extensive resources, may be of value in applied settings, such as prisons and forensic hospitals, because they eliminate the problem of response bias. Such measures, however, are not practical for use with subclinical samples, due to lack of clinical history data for participants from the general population (Lilienfeld & Fowler, 2007). To address this issue, Hare and colleagues created a self-report version of the PCL(-R), the SRP. The first edition of the SRP (Hare, 1985), consisting of 29 items, failed to adequately address the core features of a psychopathic personality, such as callousness and dishonesty (Lilienfeld & Fowler, 2007). The SRP-II included 60 items, 31 of which formed the core of the scale and aligned with the two factors of the PCL-R (Williams & Paulhus, 2004). In a validation study within a forensic sample, Hare (2003) reported a moderate correlation between the SRP-II and PCL-R ($r = 0.54$). The latest version of the measure, the SRP-III (Paulhus *et al*., 2016) consists of 64 items measured on a five-point Likert scale. Paulhus *et al*. also developed a shortened, 29-item form of the scale (SRP-SF) to reduce administration time.

Factor analytic work tested one-, two-, three-, four-, and bi-factor models of the SRP-III and SRP-SF among student, community, and forensic populations. Mahmut, Menictas, Stevenson, and Homewood (2011) and Neal and Sellbom (2012) adopted an inquisitive approach to SRP-III factor structure assessment, testing four models in an Australian community sample ($N = 500$) and eight models in a North American college student sample ($N = 602$) respectively. Both studies found the four-factor model composed of interpersonal manipulation (IPM), callous affect (CA), erratic lifestyle (ELS), and antisocial behavior (ASB) to be the best fit for the data. Mahmut *et al*. (2011), however, before proceeding to

CFA, dropped 24 SRP-III items with loadings less than 0.30 in the EFA, rendering the results incomparable with other similar research. In five other studies, the SRP-III and SRP-SF scores demonstrated a good fit for the four-factor model, however, no competing model solutions were assessed (Declercq, Carter, & Neumann, 2015; Gordts, Uzieblo, Neumann, Van den Bussche, & Rossi, 2017; León-Mayer *et al*., 2015; Neumann *et al.*, 2014; Neumann, Schmitt, Carter, Embley, & Hare, 2012). Debowska, Boduszek, Kola, and Hyland (2014), Gordts *et al*. (2017) as well as Neal and Sellbom (2012) failed to find an appropriate model fit when using all 64 SRP-III items as indicators. To reduce model complexity, the researchers employed the parceling technique/testlets[2], which improved the overall model fit. Gordts *et al*. (2017) and Neal and Sellbom (2012) suggested the four-factor parceled model as the best fit for the data. Debowska *et al*. (2014), who used a Polish version of the SRP-III, included a bi-factor conceptualization of psychopathy with two general factors (interpersonal/affective and lifestyle/antisocial) and four grouping factors (IPM, CA, ELS, and ASB) and, after having examined eight competing solutions, found it to be a statistically superior representation of the data. Since standardized factor loadings were significantly stronger for the grouping factors than for the general factors, the Polish SRP-III was suggested to be measuring four primary factors of psychopathy and two hidden factors.

An important limitation identified in studies utilizing the SRP-SF pertains to the number of scale items used. While the original SRP-SF consists of 29 items, some researchers have reduced the number of indicators. For example, Gordts *et al*. (2017) used a 28-item scale. Neumann *et al*. (2014) utilized a 19- and 26-item (but the figure provided suggests the inclusion 18 items only) SRP-SF, without explaining which scale items were excluded. Neumann *et al*. (2012) analyzed the factor structure of an experimental 19-item version of the SRP. This lack of consistency significantly undermines the generalizability of

[2] The terms "parcels" and "testlets" are normally used interchangeably (Reeve & Lam, 2005).

research findings and the reliability of the measure. More recently, Debowska *et al*. (2017) tested the construct validity, factor structure, and factorial invariance of the 29-item SRP-SF, using data from 730 UK and U.S. inmates (sample 1) and 2,506 UK students (sample 2). From among seven models, the one with two factors (interpersonal/affective and lifestyle/antisocial) while controlling for four grouping factors (CA, IPM, ELS, and ASB) best represented the underlying structure of the scale in both samples. Nonetheless, the solution was factorially *variant* for the two groups, indicating that the measure cannot be used in the same way with student and offender populations. This was suggested to be due to inclusion of the criminal/antisocial items. Dotterer *et al*. (2016) found a bi-factor solution with one general and four grouping factors to provide the best approximation to the 29-item SRP-SF scores within a sample of 2,554 young adults (a model with two general factors was not tested). This model was factorially invariant across gender, but some scale items worked differently among men and women. Unexpectedly and in opposition to unacceptably low fit indices (the Tucker-Lewis index [TLI] = 0.88, CFI = 0.89 for the total sample), the authors also stated that a correlated four-factor model "showed good fit to the data" (p. 1).

Research has assessed correlations between SRP-III/SF factors and external criteria. SRP-III-IPM factor was found to be positively associated with aggression, drinking, bullying, blame externalizing, alienation, relational and physical aggression, fraud, narcissism; and negatively correlated with impression management, deception, honesty, and agreeableness. SRP-III-CA facet formed significant positive correlations with drinking, anxiety, avoidance, verbal and physical bullying, as well as callous/unemotional traits; and negative correlations with impression management, deception, empathy, agreeableness. SRP-III-ELS was positively related with aggression, three bullying dimensions (verbal, social, physical), boredom proneness, excitement seeking, disconstraint, general externalizing behavioral style, alcohol and drug problems, extraversion, and openness; and negatively with impression

management, deception, planful control, agreeableness, and conscientiousness. Lastly, SRP-III-ASB associated positively with physical bullying, destructive aggression, theft, as well as alcohol and drug problems; and negatively with impression management and deception (Debowska *et al*., 2014; Gordts *et al*., 2017; Freeman & Samson, 2012; Neal & Sellbom, 2012; Seibert *et al*., 2011). While most of these associations were in the expected direction, some were atheoretical, such as the negative correlation between IMP and impression management, or the positive relationship between CA and anxiety. Further, despite some very high correlations between the SRP-III factors (up to 0.88 between IPM and CA; Debowska *et al*., 2014), the differential predictive validity of the different dimensions was mostly weak to moderate in the above-cited studies (see Boduszek & Debowska, 2016).

IPM as indexed using SRP-SF, correlated positively with social bullying, criminal offenses, internalizing, externalizing, maternal mortality rate (MMR), infant mortality rate (IMR), fertility rate, and pathogen levels; and negatively with gross domestic product per capita (GDPpc), progressive sex-role ideology, and body mass index (BMI). SRP-SF-CA factor associated positively with avoidance, verbal and physical bullying, criminal offenses, externalizing, and internalizing. SRP-SF-ELS formed significant positive correlations with bullying (verbal, social, physical), criminal offenses, internalizing, externalizing, and cultural masculinity. SRP-SF-ASB created positive links with physical bullying, MMR, IMR, and fertility rate; and negative with progressive sex-role ideology and BMI (Gordts *et al*., 2017; Neumann *et al*., 2012; Neumann & Pardini, 2014). The choice of some of those correlates, however, is unclear from the theoretical perspective (e.g., MMR, IMR, fertility rate, GDPpc). Of importance, in Gordts *et al*.'s (2017) study corresponding SRP-III and SRP-SF facets formed some differing associations with external variables. For example, SRP-III-IPM, but not SRP-SF-IPM, correlated significantly with the Adolescent Peer Relations Instrument – Social Target subscale (Parada, 2000). The SRP-III-CA associated positively and SRP-SF-

CA associated negatively with the Adolescent Peer Relations Instrument – Verbal Target subscale, but these correlations were statistically non-significant. This can indicate that the two versions of SRP do not measure the same construct.

Concluding Remarks

Although the PCL-R and its derivatives are the most frequently used psychopathy assessment tools in both research and practice, the instruments' construct and predictive validity have been recently challenged (Boduszek & Debowska, 2016; Cooke & Michie, 2001; Skeem & Cooke, 2010a, b). In considering that the PCL-R is often equated with the concept that it contends to measure and the significant role it plays in criminal justice settings, such methodological limitations may distort our understanding of psychopathy and subsequently lead to ill-informed decisions affecting the lives of people being assessed. In light of the above and for as long as the PCL-R dominates the realm of psychopathy measurement, it is of paramount importance that *critical* reviews of research into the PCL-R family of psychopathy measures with suggestions for surmounting all identified limitations are regularly conducted and published.

Based on the review of studies presented herein, all PCL-R-based measures are characterized by multidimensionality. However, there is a lack of consensus among researchers as to the model structure that best represents the instruments' scores. Studies conducted among student, community, offending, adult, youth, and mixed-gender or exclusively male/female populations from a number of different cultural settings suggest that the scales' scores can be captured by two-, three-, four-, bi-factor, and hierarchical models. While the correlated four-factorial model seems to be identified as the best solution most frequently, especially in research using the PCL-R and SRP-III, it was oftentimes the case that only this particular model was tested, rendering comparisons between competing, theoretically-sound models impossible (e.g., Declercq *et al*., 2015; Gordts *et al*., 2017; Krstic

et al., 2017; León-Mayer *et al*., 2015; Mokros *et al*., 2011; Neumann *et al*., 2013, 2014; Zwets *et al*., 2015). One interesting recent innovation in factor analytic literature looking at the PCL-R and its derivatives is the inclusion of bi-factor models, which have been demonstrated to be superior in capturing the instruments' scores (e.g., Boduszek *et al*., 2015; Debowska *et al*., 2014; Dotterer *et al*., 2016; Flores-Mendoza *et al*., 2008), even when all PCL-R scale items are modeled, including those traditionally regarded as not belonging to any latent factor (e.g., Patrick *et al*., 2007). Of importance, despite the multifaceted nature of the PCL-R, the cut-off point used to diagnose psychopathy relies on the total instrument score, hence assuming variations in trait intensity (quantitative differences) but not in the constellation of psychopathic traits (qualitative differences) across individuals. A recent statistical study into the validity of this approach, revealed in excess of 8.5 million different response combinations that amounted to the score of 30, and over 14.2 million that amounted to 30 or more. This suggests that "applying cut scores on this measure results in imprecise quantifications of psychopathy" (Balsis, Busch, Wilfong, Newman, & Edens, 2017, p. 1). Additionally, the inclusion of criminality items in total score calculations could have led to an overestimation of psychopathy in offending samples. Therefore, it is recommended that future research seeks to address this issue, possibly by excluding all behavioral items, which may be an outcome of psychopathic personality traits. Offering promising alternative to traditional cut-off points are person-centered statistical techniques (such as latent profile/class analysis), which have the power to reveal patterns of co-occurrence between different psychopathic traits and establish how the resultant psychopathy profiles predict external criteria, such as aggression or re-offending (Boduszek, Debowska, & Willmott, 2017).

Other limitations identified in the extant research include the use of parceling procedure with short scales (e.g., Cooke & Michie, 2001; Cooke *et al*., 2005a, 2007; Vitacco *et al*., 2005b; Weizmann-Henelius *et al*., 2010), correlating errors of measurement (e.g.,

Hildebrand *et al*., 2002; Jones *et al*., 2006), dropping scale items based on statistics rather than theoretical considerations (e.g., Mahmut *et al*., 2011), use of small samples (e.g., Das *et al*., 2008; Medina *et al*., 2013; Salekin *et al.*, 2006; Vitacco *et al*., 2006), repeated use of the same sample for similar purposes (e.g., Cooke *et al*., 2005a, b, 2007; Cooke & Michie, 2001), and descriptions/recommendations which do not follow on from/match study results (e.g., Dotterer *et al*., 2016; Forth *et al*., 1996). All future research should aim to surpass these problems, whereas publishers ought to be more accepting of research highlighting issues with respect to the PCL-R family of psychopathy measurement, in an effort to challenge the status quo of psychopathy research and promote knowledge development.

Finally, the instruments' factor scores have been associated with various external criteria. Although many studies reported total PCL-R and its derivatives' scores to be prognostic of aggression, violence, and recidivism, the instruments' predictive power for these constructs is substantially reduced when crime-related items are removed from their scoring (e.g., Olver & Wong, 2015; Polaschek, 2015; Salekin *et al*., 1997; Skeem & Mulvey, 2001; Yang *et al*., 2010; Žukauskienė *et al.*, 2010). As such, using PCL-R total scores in applied settings to make decisions regarding release from prison and/or length of detention appears seriously flawed.

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