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# Treatment Responsiveness of Replicated Psychopathy Profiles

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Theory and accumulating data suggest systematic heterogeneity among offenders with psychopathic traits. Several empirical investigations converge on the nature of subtypes, but little is known about differences in treatment responsivity. We have used the 4-facet model of the Psychopathy Checklist–Revised (PCL-R) to provide a framework for detecting subtypes. The present study used the full range of PCL-R scores in a sample of male violent offenders ( $N = 190$ ) to replicate subtypes found in a partly overlapping sample by Neumann, Vitacco, and Mokros (2016), using Latent Profile Analysis (LPA), and subsequently to examine potential differences in treatment responsivity. Four subtypes emerged. Within the prototypical psychopathic group, the distinction between intent-to-treat and completers was crucial. Prototypical psychopathic offenders were significantly more likely to drop out, but completers appeared to proceed through the different phases of treatment in much the same way as the other groups. Clearly, more research is needed to elucidate treatment interfering mechanisms and their associated patient characteristics, particularly for the prototypical psychopathic group. Developing therapeutic strategies to improve treatment compliance is a necessary step in the development of specialized treatment programs for these difficult patients.

### **Public Significance Statement**

Among offenders treated in a high-security forensic psychiatric hospital, three subtypes with psychopathic traits were identified: one prototypical and two moderately psychopathic profiles. Drop-out is a major issue for the highly psychopathic group, whereas those who remain appear to proceed through treatment in much the same way as one of the less severe profiles. More research is needed to understand treatment-interfering mechanisms as well as patient characteristics associated with success in this difficult group.

*Keywords:* psychopathy, offenders, subtypes, treatment

Psychopathy is a clinical syndrome characterized by a pathological personality style that is interpersonally deceptive, affectively cold, behaviorally reckless, and often overtly antisocial (Hare & Neumann, 2010). Whereas prevalence of psychopathy in society is estimated at less than 1%, in criminal justice settings it is quite high. For example, according to Hare (1996), psychopathic offenders make up from 15% to 25% of prison populations in the United States. In forensic psychiatry, psychopathy is a highly relevant syndrome because of its association with criminal and

violent behavior (Leistico, Salekin, DeCoster, & Rogers, 2008; Hare & Neumann, 2008). With regard to treatment of psychopathic offenders aimed at reducing recidivism, surprisingly little is known, considering the high estimated costs for society (e.g., Kiehl & Hoffman [2011] estimated the cost of psychopathy at 460 billion dollars in the United States per year). An early retrospective study by Rice, Harris, and Cormier (1992) suggested that treated psychopaths reoffended at a higher rate than nontreated psychopaths. Although it was noted that the therapeutic community involved in this study was an inappropriate and possibly iatrogenic treatment program (Polaschek & Daly, 2013; Reidy, Kearns, & DeGue, 2013), it appears to have ‘set the tone.’ Arguably, pessimism dominated the field, even though several reviews concluded that there were, in fact, not enough well designed studies to come to a conclusion about the effect of treatment on the criminal behavior of psychopaths (Salekin, 2002; D’Silva, Duggan, & McCarthy, 2004).

Without question, psychopathic offenders are difficult to treat. When compared with nonpsychopaths, psychopaths are less mo-

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tivated, show less treatment compliance, are more often involved in institutional misconduct, and have higher rates of drop-out (Ogloff, Wong, & Greenwood, 1990; Wong & Hare, 2005). However, a handful of more recent studies are more encouraging. In a series of studies with adolescent offenders scoring high on the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003), Caldwell and colleagues found that treatment was associated with less institutional misbehavior, and relatively slower and lower rates of violent recidivism (Caldwell, Skeem, Salekin, & Van Rybroek, 2006; Caldwell, McCormick, Umstead, & Van Rybroek, 2007). Olver and Wong (2009) reported on the therapeutic response of adult sex offenders in an intensive, high risk program. Although psychopathy was (again) found to be a strong predictor of drop-out, those psychopaths who remained in treatment and made progress on risk-related treatment targets were less likely to recidivate violently. In a study from the same research group with violent offenders scoring high on psychopathy, the association between improvement on risk-related treatment goals and reductions in violent recidivism was replicated (Lewis, Olver, & Wong, 2013).

There is almost no research comparing psychopathic offenders who do and do not recidivate. Early studies showed that a substantial portion of psychopaths is not reconvicted. For example, even with a follow-up of 8 years in the community, 20% to 30% of the psychopaths in a study by Serin and Amos (1995) remained free of a reconviction (for more examples, see Wong & Burt, 2007). Wong and Burt compared a group of psychopaths who recidivated with one or more violent offenses, with a group of psychopaths who did not recidivate, with a follow-up of 5 years after discharge from treatment. There was no significant difference between the two groups in mean scores on the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003). However, the non-recidivating group did have significantly lower ratings on several problem areas identified by the Violence Risk Scale (VRS; Wong & Gordon, 2006). Wong and Burt conclude that psychopathic offenders differ in criminogenic needs that should be targeted in treatment, and therefore should not be seen as a homogenous group.

The acknowledgment of the heterogeneity among offenders with psychopathic traits, along with the finding that some psychopaths do seem to desist after treatment, raises the question whether treatability of psychopathy should be investigated in a more nuanced light. Two interrelated questions emerge: Is it possible to reliably identify individuals with specific psychopathic profiles? And, second, are some subtypes more treatable than others?

Theories of psychopathic variants or subtypes have quite a long history. According to Hervé (2007), Partridge first commented on possible subtypes with unique developmental pathways in a study published in 1928, but most modern authors cite Karpman (e.g., Karpman, 1929, 1946), who developed a theory of psychopathic subtypes from 1929 onward. Karpman (1946) made the distinction between primary and secondary psychopathy and described two forms of the primary subtype, that is, an aggressive/predatory and a passive/parasitic type resulting in three subtypes (i.e., two primary and one secondary subtype). Several clinicians have since elaborated on Karpman's work (e.g., Arieti, MacCord & MacCord; see Hervé, 2007 for a review). A common thread is that primary psychopathy is thought to be more hereditary whereas secondary psychopathy is considered influenced by adverse early environ-

mental factors. With respect to treatability, Karpman (1946) theorized that the primary subtypes are basically untreatable whereas the secondary subtype may be considerably more likely to benefit from therapy. Both hypotheses about the differences between primary and secondary psychopathy (regarding heritability and treatability) are echoed by others (e.g., Skeem, Johansson, Andershed, Kerr, & Loudon, 2007) but seem never to have been empirically validated.

Systematic empirical research is of more recent origin. Over the past decade or so, several attempts have been made to use person-centered analytic approaches (e.g., cluster analysis, latent profile analysis) to derive subtypes among psychopathic offenders (e.g., Hicks, Markon, Patrick, Krueger, & Newman, 2004; Skeem et al., 2007). However, this research has yielded inconclusive findings as variation in mix of assessments, sample types, and psychopathy selection methods hampers accumulation of knowledge (Neumann et al., 2016). Moreover, this research has offered few clues with regard to treatment response.

Several more recent investigations have employed the four-facet model of the PCL-R (Hare, 1991, 2003) in a systematic approach to subtyping offenders. The PCL-R is probably the most widely used instrument to diagnose psychopathy, in research as well as clinical practice. The PCL-R has shown favorable psychometric properties in a large number of forensic samples (Hare, Neumann, & Mokros, 2015), and has been particularly useful in assessing problematic treatment responsiveness and in predicting recidivism. That said, the PCL-R is not uncontroversial in the field. Critics question whether the PCL-R accurately captures the underlying construct of psychopathy (i.e., a defining feature, as it is in the PCL-R), or whether it should be seen as (merely) a behavioral consequence of having a psychopathic personality (see e.g., Cooke & Michie, 2001). Nevertheless, the widespread use of the PCL-R has resulted in the accumulation of a large body of replicable findings, and the empirical support of the four-facet model (Hare & Neumann, 2006, 2008) offers one possible avenue toward uncovering psychopathic profiles or subtypes (Hervé, 2007; Mokros et al., 2015; Neumann et al., 2016).

Using the PCL-R, Mokros et al. (2015) conducted a latent profile analysis on a very large sample of 1451 offenders scoring 27 or higher. Three latent classes were found, which the authors named *manipulative*, *aggressive*, and *sociopathic*. These appear to be similar to Karpman's two primary and secondary psychopathic subtypes. The authors suggested that the manipulative and aggressive subtypes are phenotypic variations of the 'true,' primary psychopath, whereas the sociopathic type could be a secondary variation. The manipulative and aggressive variants both scored high on the affective and lifestyle facets. However, the manipulative group scored especially high on the interpersonal facet and relatively low on antisocial behavior, and vice versa for the aggressive variant. The authors comment that these two subtypes seem to differ primarily in the way they achieve their goals; one more through deception and manipulation, the other more through violent and intimidating behavior. The sociopathic variant scored (relatively) lower on the interpersonal facet and affective facet, but was high on the lifestyle and antisocial facets.

Another important study reported on model-based cluster analysis in 314 offenders scoring 25 or higher on the PCL-R (Olver,

Sewall, Sarty, Lewis, & Wong, 2015). Olver et al. identified two clusters (subtypes): one scoring very high on the interpersonal and affective facets of the PCL-R, mean scores 5.92 ( $SD = 1.06$ ) and 6.75 ( $SD = 0.80$ ), respectively, and high on the other two facets, mean scores 7.17 ( $SD = 1.31$ ) and 7.25 ( $SD = 1.40$ ), respectively (called 'primary' by the authors); and another subtype scoring comparatively lower on the interpersonal facet, mean score 3.77 ( $SD = 1.17$ ), but very high on the antisocial facet, mean score 8.57 ( $SD = 1.00$ ), and high on the affective and lifestyle facets, mean scores 5.67 ( $SD = 1.03$ ) and 7.37 ( $SD = 1.19$ ), respectively. The authors referred to this latter subtype as 'secondary' psychopathy. Note that the terms 'primary' and 'secondary,' which originally referred to separate developmental pathways (hereditary vs. early environmental factors), are used here in a different way, to describe different profiles of psychopathic features. For example, in the study by Mokros et al. (2015) the term 'secondary' is used to refer to a sociopathic (not truly psychopathic) variant, while Olver et al. (2015) use it to describe an aggressive variant, amply psychopathic, but lower on interpersonal features. It is outside the scope of this paper to resolve this issue, but this use of the two terms is potentially confusing.

The study by Olver and colleagues (2015) also provided the first clues about treatment response. When looking at static and dynamic risk factors of pretreatment and post treatment change on dynamic scores measured with the VRS (Wong & Gordon, 2006), Olver et al. (2015) observed that the second ('aggressive') psychopathy subtype (relatively low Interpersonal but high on the other three facets) had higher risk and more criminogenic treatment needs at the start of treatment, and improved more during treatment. However, changes made during treatment were not related to reduced violent recidivism for this second subtype. On the other hand, the first ('manipulative' primary) subtype of psychopaths showed less improvement, but the changes they did make were indeed related to less violent recidivism. The authors speculate that the second subtype of psychopaths presented with more 'visible' emotional instability and impulsivity, and because of this profile, behavioral changes may be more easily spotted by coders of the VRS but are possibly less meaningful than changes seen in primary psychopaths. In sum, there is accumulating evidence for several distinguishable profiles among high scoring psychopathic offenders, and preliminary evidence as well as clinical conjecture suggests that these variants may be systematically related to progress in treatment and treatment outcome.

A principal limitation of these studies is that only offenders with high to very high PCL-R scores were included, effectively eliminating approximately 80% of the total sample of offenders. As several authors have noted (Mokros et al., 2015; Neumann et al., 2016), reliance on extreme groups is one particular strategy to address the question of meaningful distinctions within the offenders with psychopathic traits. Another approach is to use a comprehensive sample containing the full range of PCL-R scores. Previous research has shown that the group of offenders scoring in the medium range of the PCL-R (20–29) also has higher rates of reoffending than nonpsychopathic offenders (Serin & Amos, 1995), and clinical experience suggests that this can be a very challenging group in treatment. Using the full sample and deriving a range of PCL-R facet profiles offers the opportunity to understand the critical differences, as well as similarities, between

offenders with elevated PCL-R scores and those who present with midrange scores.

Only a few studies have used person-centered subtyping methodology with samples that contained the full range of PCL-R scores. Two studies sampling male offenders both identified one nonpsychopathic group and three clusters with differing constellations of psychopathic traits (Vassileva, Kosson, Abramowitz, & Conrod, 2005; Poythress et al., 2010). Unfortunately, both studies reported PCL-R factor (F1, F2) or facet scores only, making it impossible to determine mean total scores in the three psychopathic clusters. Nevertheless, both studies identified one 'primary' psychopathic group, one 'secondary' psychopathic group, and a third group with substantial psychopathic features. In addition, Poythress et al. (2010) included several indices of treatment behavior and outcome. Approximately half of their sample ( $n = 660$ ; 47%) consisted of offenders who had been court-ordered to residential drug treatment programs. Although the 'secondary' group showed less disruptive behavior during treatment than the 'primary' group, there was no significant difference in drug abuse treatment outcome or recidivism. Note, however, that the treatment involved was not based on an assessment of criminogenic treatment needs, but aimed at only one potential risk factor instead.

In more recent research, Neumann et al. (2016) conducted latent profile analyses (LPA) using four very large samples (North American and U.K. samples of male offenders, and North American and Dutch psychiatric samples;  $n$  ranging from 965 to 4865). The authors found four comparable classes across all samples: (a) a prototypical psychopathic group, (b) a group of callous-conning offenders with relatively high scores on the interpersonal and affective facets, (c) a sociopathic group with relatively high scores on the lifestyle and antisocial facets, and (d) a nonpsychopathic general offender group (see Figure 3). Noteworthy is that the proportion of, in particular, the prototypical psychopathic group (C1) varies widely between U.S. and U.K. offender samples. Possibly, varying cut-off scores or sampling variation (e.g., low vs. high security prisons) may underlie these differences; this conjecture warrants further research. Conversely, the proportions in the forensic psychiatric samples appear to be remarkably similar. Finally, a new LPA study on male sex offenders replicated the PCL-R subtypes reported in Neumann et al. (2016), which were further validated in terms of sexual offense profiles; as expected the prototypic subtype evidenced significantly more violent sexual assaults, compared with the other three subtypes (Krstic et al., 2018).

The current study is based on a sample of 190 violent male offenders, involuntarily committed to a forensic psychiatric hospital in the Netherlands, including the full range of PCL-R scores. We used LPA to determine the number and nature of profiles of PCL-R facet scores in this population. In line with the studies by Vassileva et al. (2005); Poythress et al. (2010), and as a replication of Neumann and colleagues research (Neumann et al., 2016; Krstic et al., 2018), we expected to find one prototypical psychopathic profile, one or two profiles with substantial psychopathic traits, and a nonpsychopathic group. Subsequently, we related the emergent profiles to various treatment outcome variables to assess for potential differences in treatability (length of treatment phases, total treatment duration, expulsion from treatment, recidivism). In view of the limited evidence (but widely accepted clinical knowledge), we expected that patients with a prototypical psychopathic

profile would have longer treatment duration, higher drop-out and higher recidivism more than other emergent profiles. We expected the nonpsychopathic offender group to show most favorable outcomes. Finally, one of the potential problems with latent class analyses is that the emerging subtypes simply reflect differences in score elevation, identifying groups scoring low, moderate, and high. For this reason, we determined whether the emergent profiles predict treatment outcome over and above PCL-R total score.

## Method

### Setting and Participants

The present study was conducted at a Dutch forensic psychiatric hospital providing treatment for patients with a TBS-order. It is one of 11 facilities in the Netherlands that treat this type of patients. TBS (“*ter beschikking stelling*”) is a measure of mandatory intensive inpatient treatment that can be ordered by the Dutch courts, together with a sentence for violent or sexually violent offenses that have a maximum sentence of at least four years. The TBS-order is imposed on those offenders whose offenses are believed to have been associated with a psychological disorder, and who are perceived to be at risk to reoffend. The primary goal of treatment is to minimize reoffending while working toward gradual rehabilitation. Patients are admitted immediately after completing a prison sentence. Treatment cannot be terminated by either the hospital or the patient; it is only the court that has the power to extend or to terminate the TBS-order, and this evaluation takes place at least every two years. However, hospitals can decide to request for a transfer to another TBS-clinic when they feel their attempt at treatment has failed. Hence, a drop-out is not truly a drop-out but can be seen as removal from treatment.

Participants were all male patients admitted between December 2000 and November 2012 ( $n = 192$ ) with an indefinite TBS-order. Two were discarded because the PCL-R could not be scored (lack of sufficient information). The sample size of the current study thus consisted of the remaining 190 patients. As noted before, of this sample, 135 participants were included in the large Dutch sample ( $n = 3224$ ) used by Neumann et al. (2016); 55 were not included in that sample. All 190 patients were convicted of one or (frequently) several violent offenses: 146 (76.8%) patients committed a violent offense, that is, (attempted) murder, manslaughter, or violent assault; and 68 (35.8%) patients committed a sex offense. Participants' ages ranged from 27 to 85 ( $M = 46.83$ ,  $SD = 10.71$ ). Ethnic constellation (based on the country of birth) was 75.8% Dutch, 11.0% Afro Caribbean, 4.7% Moroccan, 2.1% Turkish, 6.4% other.

### Treatment

Although the clinic involved in this study is a high-security hospital, treatment is delivered in a generally supportive and therapeutic atmosphere. Treatment activities are varied, ranging from education and work to individual and group therapy mostly based on cognitive-behavioral principles. Pharmacotherapy is included when necessary. Over the course of this study treatment methods have evolved, gradually incorporating the risk, need, and responsivity principles of effective correctional treatment (RNR-model; Andrews & Bonta, 2010). These principles state that fo-

rensic treatment is most effective (a) when it is matched to level of risk (higher risk implying more intensive treatment), (b) when it targets risk factors associated with reoffending (criminogenic needs), and (c) when treatment is adapted to the learning style of the offender (responsivity).

TBS-treatment consists of several phases with gradually increasing liberty to take leaves outside the hospital. During the first phase of treatment patients do not have permission for leave. During this phase, patients participate in an intensive daily program tailored to their personal treatment goals and individual responsivity issues. Treatment targets include risk factors like antisocial cognition, impulsivity, substance abuse, offense supportive attitudes, and lack of involvement in work and anticriminal leisure pursuits. Factors not directly related to reoffending are treated to improve responsivity (e.g., major mental disorder, social skills). Family members and friends important to the patient are contacted, screened, and, when appropriate, involved in treatment. Treatment is evaluated every three months, and formal risk assessment is done at least once a year. When a sufficiently reliable working alliance has been established and a patient has made progress on the treatment goals, additional risk assessment is done to determine whether it is feasible to start the next phase of treatment.

During the second phase patients have permission to go on supervised leave together with one or two members of the staff. Patients meanwhile continue their intensive program within the clinic. Supervised leave is mainly used to assess how the patient responds to being back in society. When the patient continues to do well, transfer to phase three is considered. During the third phase unsupervised leave is granted. For phase three the availability of a detailed relapse prevention plan is a minimum requirement. Again, structured risk assessment is done to determine whether risk of reoffending has been reduced sufficiently. During phase three various activities that were previously done within the clinic are transferred back to society (e.g., hobbies, family visits, work). Phase three basically prepares the patient for the final phase of TBS-treatment, the so-called ‘transmural’ phase, during which the patient lives outside the hospital but is still regularly supervised by staff members. For more information about the treatment program in the clinic involved in this study, see van Binsbergen, Keune, Gerrits, and Wiertsema (2007) or Kröger et al. (2014).

As mentioned before, a patient cannot decide himself to drop out. It is only the staff that can make a formal request to the Dutch Ministry of Justice to transfer the patient to another hospital for a another treatment attempt, or to a so called long stay unit for a temporary suspension of treatment. In general, such a request is done for one of two reasons: (a) when after serious incidents (such as severe violence involving physical harm, or continuous deception) the staff feels the working relationship has been damaged too much, and (b) when after several years of treatment, there are insufficient gains and the staff is convinced that a patient will not benefit from further treatment at their clinic.

Permission for every form of leave (supervised, unsupervised, and transmural) also has to be acquired from the Dutch Ministry of Justice. Permission is granted only after extensive information on treatment gains has been reviewed, including the outcome of structured risk assessment. For this reason permission for leave is considered a measure of treatment success in this study.

## Procedures

This research project was conducted according to the guidelines for ethical research of the Forensic Care Specialists in the Netherlands. All participants signed informed consent for the use of their file and test information.

Immediately after admission, as part of standard procedure, all patients participated in extensive psychological assessment during the first three months of treatment. The present hospital (like other forensic psychiatric institutes in the Netherlands) has separate units for personality disordered offenders and offenders with psychotic disorders and usually also adapts treatment to autistic offenders. Personality disorders were diagnosed by licensed and trained psychologists using the Dutch version of the Structured Interview for *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*) Personality (SIDP-IV; De Jong, Derks, Van Oel, & Rinne, 1996). Autism spectrum disorders were diagnosed in consensus by a multidisciplinary team containing at least one licensed psychologist and one psychiatrist. Over the course of this study different structured screening instruments have been used to aid in diagnosing autistic disorders, alongside observations in the hospital and interviews with relatives. Psychotic disorders were diagnosed by a psychiatrist, through clinical observation and interviewing. A full *DSM-IV* diagnosis (including the primary diagnosis) was determined at the onset of treatment; in a few cases autistic disorders were added at a later date. In this study we have used the primary diagnoses, defined as the most prominent disorder needing treatment, to place subjects in one of four categories reflecting this disorder: (a) personality ( $n = 105$ ), (b) psychotic ( $n = 11$ ), (c) autistic ( $n = 25$ ), and (d) personality pathology combined with psychotic episodes ( $n = 49$ ). For the patients in this fourth category, the personality disorder and psychotic disorder were deemed of equal prominence, and this combination was often related to the use of drugs.

PCL-R records of all patients were independently scored by two raters, who then determined a final consensus-score together. Available file information included criminal records, police records, reports from previous institutes and from prison, and information acquired from relatives, former employers, and schools. The raters were licensed psychologists with at least a Master's Degree who had been given a 3-day training in scoring the PCL-R.

Treatment phases were determined by using the official dates of permission from the Ministry of Justice as they were recorded in all patient files. In a few cases permission was temporarily withdrawn and later reinstated because of, for example, rule violation in the hospital. In these cases the first time permission was granted was used to determine the length of a treatment phase; withdrawal of permission was seen as part of the treatment process in that phase. Because the sample consists of all admissions until fairly recently (November 2012) it is important to note that only part of the sample have reached the end of treatment ( $n = 90$ ). End of treatment was determined by taking the official date of discharge from the Ministry of Justice as recorded in the patient files. Treatment phases and total length of treatment were measured in months.

Recidivism was determined by inspection of the current criminal records of all patients who had a TBS-order that was terminated by the court with a follow up time of at least 12 months. New charges and convictions were counted. Charges/convictions that

involved any actual, attempted, or threatened physical harm to another person were considered aggressive recidivism; convictions for offenses of a sexual nature (e.g., rape, abuse, possession of child pornography) were considered sexual recidivism. General recidivism included all charges and convictions.

## Instruments

**PCL-R.** The *Psychopathy Checklist-Revised* (Hare, 1991, 2003) consists of 20 items, which can be scored 0 (*definitely does not apply*), 1 (*may apply or partly applies*), or 2 (*definitely applies*), leading to a possible maximum score of 40. Although most empirical research with North American offenders has used a diagnostic cut score of 30 to define psychopathy, it appears that in European samples a lower cut score may be more appropriate (Mokros et al., 2013). No studies are available for Dutch samples, but based on a meta-analysis of samples from German speaking countries it was suggested that a score of 25 reflects the same level of psychopathy as a score of 30 in the North American samples (Mokros et al., 2013). Accordingly, a cut score of 25 was used in this study to define a high level of psychopathy.

In the clinic involved in this study, the PCL-R was scored on the basis of a combination of file information and an extensive interview, as advised in the manual. Extensive psychometric properties have been documented in the manual (Hare, 2003). As noted above, raters were licensed psychologists with at least a Master's Degree who had been given a 3-day training in scoring the PCL-R. The scores in this sample ranged from 3 to 38.9 ( $M = 23.9$ ,  $SD = 7.8$ ). The mean score on each facet was as follows: Interpersonal, 3.9 ( $SD = 2.2$ ); Affective, 6.1 ( $SD = 1.5$ ); Lifestyle, 6.4 ( $SD = 2.7$ ); and Antisocial, 5.6 ( $SD = 2.8$ ). Note that scores on the Lifestyle/Antisocial facets are based on 5 items, while scores on the Interpersonal/Affective facets are based on four items. Two items do not load on any facets but only contribute to the total score (i.e., promiscuous sexual behavior, many short-term marital relationships).

No formal interrater reliability estimates are available for the present sample. However, interrater reliability for a comparable sample from the same hospital (Hildebrand, De Ruiter, De Vogel, & Van der Wolf, 2002), largely based on the same pairs of raters, has been estimated previously. The single measure ICC was .88 for the PCL-R total score. For the classic factor 1 (comprising facet 1 and 2) the single measure ICC was .76; for factor 2 (comprising facet 3 and four of the five items of facet 4) the ICC was .83. In general, ICCs were good to excellent at the individual item-level ( $Mdn = .67$ , range .46 to .80).

**SIDP-IV.** The Structured Interview for *DSM-IV* Personality (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997) was administered to assess *DSM-IV* PD symptoms. The SIDP-IV follows a topically arranged format (work, interpersonal relations, impulse control, etc.) yielding symptom scores on a 0 (*absent*) to 3 (*strong presence*) scale that are combined into the 10 *DSM-IV* dimensional counts of PD symptoms. Its psychometric properties are well established (Widiger, 2002). Raters were extensively trained licensed psychologists.

## Analytic Strategy

LPA is a variant of latent class analysis based on observed continuous rather than categorical variables. As a mixture-

distribution model, LPA seeks to identify nominal variables that underlie the continuous data and whose identification allows demixing of the data (Rost, 2006). Noteworthy is that individual cases have associated probabilities for belonging to more than one latent class. The more distinct the average latent class probabilities are for the most likely class membership, the more useful will be a given latent class solution. In other words, the average probability of group membership across all subjects provides information about the quality of the class allocation, with average probability values for viable LPA solutions generally at approximately .80 or above (Mokros et al., 2015; Rost, 2006). Both information criteria (e.g., the Bayesian information criterion-BIC) as well as modified likelihood ratio tests (LRTs; Lo, Mendell, & Rubin, 2001; Nylund, Asparouhov, & Muthén, 2007) can be used to decide on the number of latent classes. For the BIC (Schwarz, 1978), a smaller value indicates better model fit in terms of the optimal trade-off between model parsimony and residuals. Reductions in BIC value of less than 3 are considered negligible (Kass & Raftery, 1995). We primarily relied upon the BIC for gauging the best LPA solution because the bootstrap LRT is more strongly affected by nonsymmetrical data distributions (Nylund et al., 2007) and often remains inconclusive (Kupzyk, 2011). Mplus Version 6.1 was used for all LPAs (Muthén, & Muthén, 2011).

As a next step, after a viable LPA solution was identified, the emergent profiles were related to various clinical outcomes. First, the profiles were related to treatment dropout by means of Cox survival analysis, with dropout (yes/no) as the event and recorded treatment duration as time. Treatment duration for the four PCL-R subtype profiles was compared by means of an ANOVA and, in case of a significant effect, HSD post hoc analysis. Only patients who completed treatment were included in the analysis. Next, the four PCL-R profiles were related to violent and general recidivism by means of two Cox survival analyses, with recidivism (yes/no) as the event and recorded follow up time since the end of treatment as time. Finally, all analyses were repeated while controlling for total PCL-R score, to assess the effect of subtypes over and above total score.

## Results

### Replication of Latent Classes

Fit indices of the LPA suggested that a four-class solution fitted the data best (see Table 1). More specifically, the BIC was lowest for four classes, and although the adjusted BIC was slightly lower for the five-group solution, the magnitude of difference indicated that there was no improvement in model fit. For the four-group solution the average probabilities for most likely latent class membership were 0.92, 0.84, 0.87, and 0.86, all of which can be considered substantial. When assigning subjects to classes based on their most likely class membership, four groups emerged: Class 1 (C1) with 77 subjects (40.5%), C2 with 32 subjects (16.8%), C3 with 56 subjects (29.5%), and C4 with 25 subjects (13.2%).

Figure 1 depicts the facet profiles of the four classes. For sake of comparability, mean item scores per facet were calculated (facets are comprised of unequal numbers of items). Mean PCL-R total scores for the four classes were: C1 31.4 ( $SD = 3.1$ , range 24.2–38.9), C2 17.1 ( $SD = 3.7$ , range 9.0–26.0), C3 22.6 ( $SD =$

Table 1  
Model Fit of the Latent Profile Analysis ( $N = 190$ )

Measure	1	2	3	4	5
Log-likelihood	-544.76	-455.84	-436.15	-415.49	-409.22
Number of free parameters	8	13	18	23	28
AIC	1105.53	937.68	908.31	<b>876.99</b>	874.44
BIC	1131.51	979.90	966.76	<b>951.67</b>	965.36
Adjusted BIC	1106.17	938.72	909.74	<b>878.81</b>	876.67
Entropy	—	.84	.85	.80	.80

Note. Optimal model according to AIC, BIC, and adjusted BIC is highlighted in boldface. A five-group solution produced a less than 10-point drop in AIC and adjusted BIC, which is a signal of no improvement in model fit. AIC = Akaike's information criterion; BIC = Bayesian information criterion.

3.1, range 16.0–27.4), and C4 12.4 ( $SD = 4.6$ , range 3.0–19.0). With a score of 25 and higher defining a high level of psychopathy, classes C1, C2 and C3 all contain cases with moderate to strong psychopathic features. Figure 2 shows the percentages of low, medium, and high total PCL-R scores within each of the C-types. The profiles shown in Figure 3 show similarities and differences between the profiles reported by Neumann et al. (2016) in several much larger samples (see Figure 3). As mentioned before, Neumann and colleagues chose to refer to the four subtypes as prototypic psychopaths (C1), callous-conning offenders (C2), sociopathic offenders (C3), and nonpsychopathic general offenders (C4), and we followed their lead.

We conducted several analyses that tested aspects of subtype reliability and replicability. First, to provide information on homogeneity of the items within each facet (and thus on consistency of PCL-R item ratings within facets), we calculated mean interitem correlations (MICs) for the four facets. The mean interitem correlations (MICs) for the four PCL-R facets were well within the acceptable range (Clark & Watson, 1995): Interpersonal (.42), Affective (.29), Lifestyle (.48), Antisocial (.33), indicating adequate item homogeneity within each facet. We also conducted a confirmatory factor analysis (CFA) to assess fit of the four-factor model of psychopathy (Hare & Neumann, 2008), and obtain item factor loadings, since large factor loadings (i.e., common variance account for) are closely related to scale reliability. Consistent with a large body of findings (Neumann, Hare, & Pardini, 2015), the CFA resulted in excellent model fit ( $CFI = .95$ ;  $RMSEA = .05$ ), and the average of the factor loadings for all factors were strong (Interpersonal = .72; Affective = .64; Lifestyle = .77; Antisocial = .66). Taken together, the results provide good evidence of reliability for each PCL-R facet. Second, to address subtype replicability, we compared classification accuracy across different samples. The classification accuracy for C1, C2, C3, and C4, respectively, in the current study was very much in-line with what was reported by Neumann et al. (2016), that is, North American offenders (0.91, 0.80, 0.81, 0.86), U.K. offenders (0.87, 0.82, 0.87, 0.91), and North American psychiatric patients (0.84, 0.80, 0.84, 0.86). Taken together, the evidence reveals that the respective subtypes are replicated with considerable accuracy across a number of large samples.

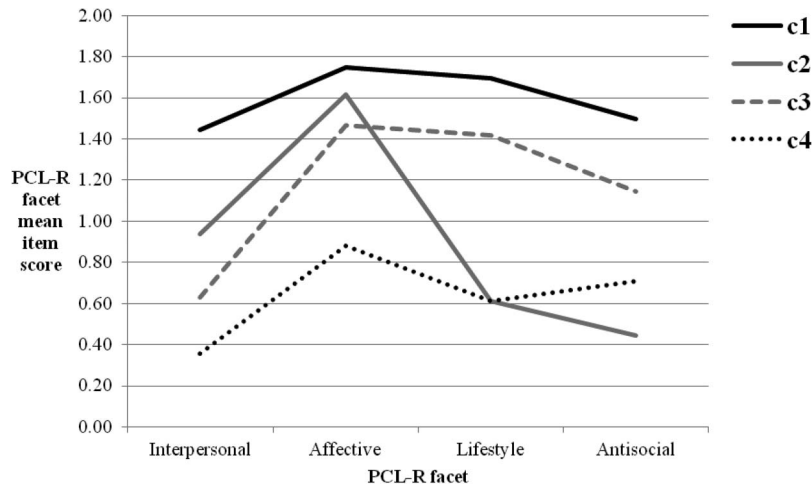


Figure 1. Four LPA subtype profiles by PCL-R mean item facet score. C1 = prototypic psychopaths ( $n = 77$ ); C2 = callous-conning offenders ( $n = 32$ ); C3 = sociopathic offenders ( $n = 56$ ); C4 = nonpsychopathic offenders ( $n = 25$ ).

### Association of Latent Classes With Treatment Variables

Table 2 contains the percentages (and number of cases) per latent class on several external variables. Nearly all subjects (97.4%) of the prototypical psychopathic Group C1 were diagnosed with a personality disorder, 22.1% of whom had a comorbid psychotic disorder as well. Autism was rarely diagnosed in this group (2.6%). The other three subtypes showed considerably more variation in their primary diagnoses. Reasons for discharge also show differences between the C1 and other profiles. Treatment failed for nearly half of the offenders in C1 (46.5%), whereas the majority of patients in the other classes were discharged because the court terminated their TBS-order in a regular manner (C2 = 85.7%; C3 = 78.9%; C4 = 82.4%). There was no sexual recidivism in this sample. Subjects in C2 and C4 did not recidivate at all.

Clinical status of all offenders was tabulated from their records. To perform the first survival analysis, 40 subjects were marked as

drop-outs. Of the 190 patients in the current sample, 53 were still in treatment at the reference date, 81 had been discharged from TBS treatment and released into society, 35 had been transferred to other TBS-clinics, four had been transferred to TBS-longstay-facilities (civil commitment), one had been sent back to prison because of a new offense during treatment, eight were deceased (of whom 4 attributable to suicide) and eight had been transferred to non-TBS health care facilities. The patients transferred to other TBS-clinics, to TBS-longstay-facilities (civil commitment), and to prison were considered drop-outs, and the other groups were considered non-drop-outs.

Cox regression analyses indicated significantly increased explanatory power of the PCL-R profiles-model compared with baseline for drop-out ( $\chi^2 = 21.49$ ,  $df = 3$ ,  $p < .000$ ). Patients with prototypical psychopathic C1 profiles dropped out at a significantly higher rate ( $B = 1.66$ ,  $SE = .73$ ,  $Wald = 5.16$ ,  $p = .02$ ,  $Exp(B) = 5.27$ , 95% CI [1.26, 22.09]) than the offenders with

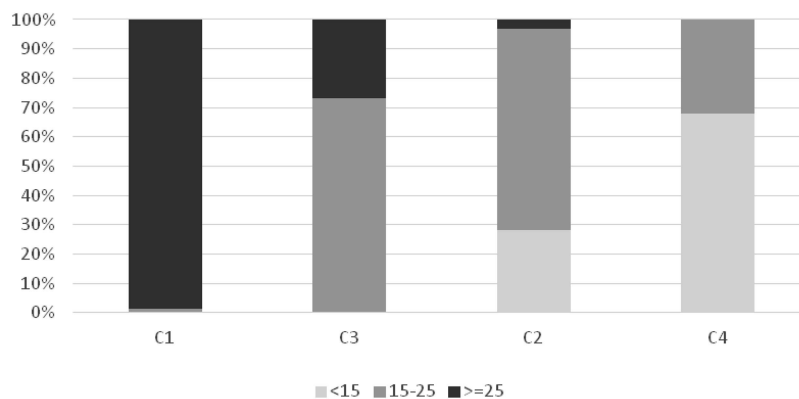


Figure 2. Percentage of 0–15, 15–25, and >25 total PCL-R scores per latent class. C1 = prototypic psychopaths ( $n = 77$ ); C2 = callous-conning offenders ( $n = 32$ ); C3 = sociopathic offenders ( $n = 56$ ); C4 = nonpsychopathic offenders ( $n = 25$ ). North American male offenders ( $N = 4865$ ); North American forensic psychiatric patients ( $N = 965$ ).



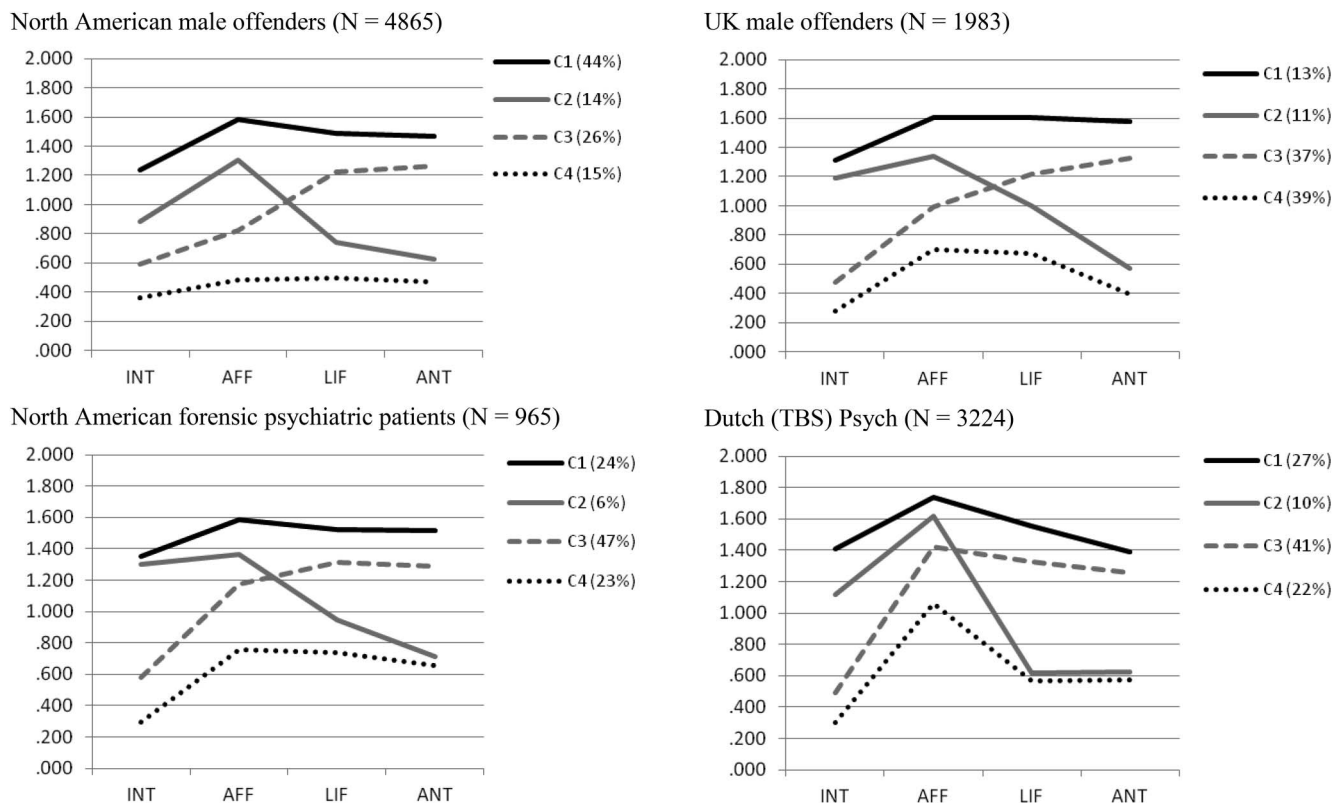


Figure 3. Reprinted from "Using Both Variable-Centered and Person-Centered Approaches to Understanding Psychopathic Personality," in *The Clinical and Forensic Assessment of Psychopathy: A Practitioner's Guide* (C. B. Gacono, Ed.), by C. S. Neumann et al., 2017, New York: Routledge. Copyright 2016 by Routledge. Reprinted with permission. U.K. male offenders ( $N = 1983$ ). Dutch (TBS) Psych ( $N = 3224$ ).

other profiles (see Figure 4). No significant differences in drop-out rates were found between the remaining profiles. Results reflected in Figure 4 suggest that the odds of surviving for C1-type offenders declined the steepest in the first two treatment phases, that is, before unsupervised leave was granted. When PCL-R total score was entered in the Cox regression, it became the sole significant predictor of drop-out ( $B = .12$ ,  $SE = .05$ ,  $Wald = 5.17$ ,  $p = .02$ ,  $Exp(B) = 1.13$ , 95% CI [1.02, 1.25]); C-type showed no additional significant effect.

To estimate the average duration of treatment, patients were included when they had finished treatment. Patients who left during treatment for reasons other than finishing the treatment as intended (i.e., because of drop-out, death, transfer to a non-TBS health care facility, or being released from TBS treatment by the court against the advice of the clinic, which is very rare) were excluded. An ANOVA showed a trend regarding differences in treatment duration between the PCL-R profiles,  $F = 2.61$ ,  $df = 3$ ,  $p = .06$ . Post hoc tests indicated a trend ( $p = .09$ ) toward longer total treatment duration for patients with a C1 profile ( $M = 93.63$ ,  $SD = 30.33$ ) than for those with a C2 profile ( $M = 70.65$ ,  $SD = 27.80$ ; 95% CI of the difference in duration [-2.68, 48.63 months]), whereas the other profiles fell in-between. Note that within-group differences were large. The ANCOVA including total PCL-R score as a covariate revealed no significant effect of C-type ( $F = 2.06$ ,  $df = 3$ ,  $p = .12$ , partial  $\eta^2 = .10$ ).

Follow-up data over a minimum period of 12 months 'at risk' were available for 70 subjects (13–23 for each PCL-R profile): 63 were discharged from treatment into society and seven were transferred to non-TBS health care facilities. Mean follow up time was 37.96 months ( $SD = 22.71$ ), ranging from 12.12 to 115.35 months. Recidivism rates were 11.4% ( $n = 8$ ) for violent offenses and 22.9% ( $n = 16$ ) for any/general (including violent) offenses. Cox regression analyses indicated significantly increased explanatory power of the PCL-R profiles-model compared with baseline for both violent recidivism ( $\chi^2 = 10.65$ ,  $df = 3$ ,  $p = .014$ ; see Figure 3) and any recidivism ( $\chi^2 = 23.94$ ,  $df = 3$ ,  $p < .001$ ). The analyses suggest that recidivism rates for patients with C1 and C3 profiles were higher than for patients with C2 and C4 profiles. However, because of the low number of participants and recidivists, the analyses could not detect significant differences between the individual profiles. A direct comparison including only the C1 and C3 profiles showed no significant differences in terms of either violent or general recidivism.

## Discussion

This study used LPA in a sample of 190 violent and/or sexually violent male offenders admitted to a forensic psychiatric hospital in the Netherlands to determine whether specific profiles could be replicated based on the four facets of the PCL-R. As expected, four

Table 2

External variables: Percentages (Numbers) per Latent Class Regarding Primary diagnosis, Reasons for discharge, and Recidivism

Variable	Latent class			
	C1	C2	C3	C4
PCL-R total score ( <i>M</i> , <i>SD</i> )	31.4 (3.1)	17.1(3.7)	22.6 (3.1)	12.4 (4.6)
Primary diagnosis, % ( <i>n</i> )				
Personality disorder ( <i>n</i> = 105)	75.32 (58)	56.25 (18)	33.93 (19)	40.00 (10)
Psychotic disorder ( <i>n</i> = 11)	0.00 (0)	12.50 (4)	7.14 (4)	12.00 (3)
Autistic disorder ( <i>n</i> = 25)	2.59 (2)	21.88 (7)	17.86 (10)	24.00 (6)
Personality/psychotic ( <i>n</i> = 49)	22.08 (17)	9.38 (3)	41.07 (23)	24.00 (6)
Total number of patients	(77)	(32)	(56)	(25)
Reasons for discharge, % ( <i>n</i> )				
End of TBS	45.90 (28)	85.71 (18)	78.95 (30)	82.35 (14)
Drop out (expulsion)	46.54 (29)	9.52 (2)	18.42 (7)	11.76 (2)
Deceased	6.56 (4)	4.76 (1)	2.63 (1)	5.88 (1)
Total number discharged	(61)	(21)	(38)	(17)
Recidivism with follow-up > 12 months, % ( <i>n</i> )				
Aggressive	21.74 (5)	0.00 (0)	15.00 (3)	0.00 (0)
General (including aggressive)	39.13 (9)	0.00 (0)	35.00 (7)	0.00 (0)
Total number follow-up > 12 months	(23)	(14)	(20)	(13)
Length of treatment phases in months, <i>M</i> ( <i>SD</i> )				
No permission for leave ( <i>n</i> = 159)	28.09 (16.33)	23.56 (9.50)	23.90 (13.69)	21.44 (12.86)
Supervised leave ( <i>n</i> = 142)	17.71 (9.46)	22.92 (16.87)	16.99 (9.46)	18.92 (13.16)
Unsupervised leave ( <i>n</i> = 122)	19.07 (16.35)	12.88 (7.16)	19.37 (15.36)	17.25 (19.92)
Transmural leave ( <i>n</i> = 83)	40.55 (24.84)	21.38 (10.25)	29.68 (16.00)	40.46 (27.59)
Total treatment duration ( <i>n</i> = 63)	93.63 <sup>a</sup> (30.33)	70.65 <sup>b</sup> (27.80)	74.53 (23.40)	88.79 (27.92)

Note. C1 = prototypic psychopaths; C2 = callous-conning offenders; C3 = sociopathic offenders; C4 = non-psychopathic offenders.

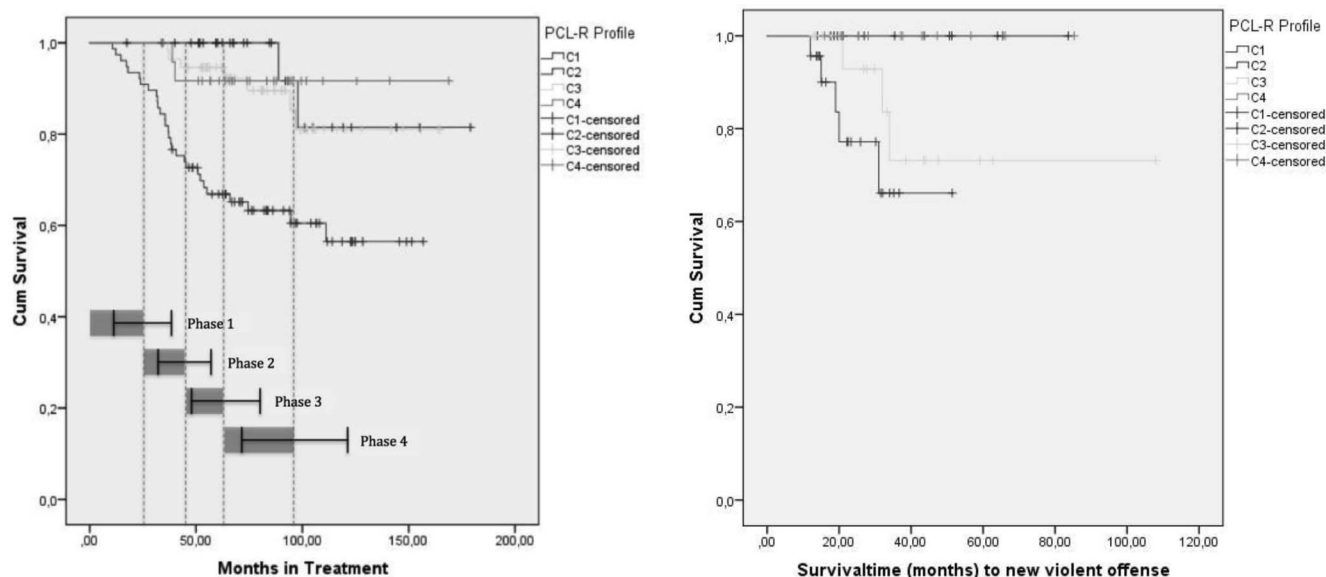
<sup>a</sup> is trending longer than. <sup>b</sup> ( $p < .06$ ).

distinct profiles appeared that largely replicated findings by Neumann et al. (2016) in large and diverse samples from North America ( $n = 4,865$  and  $n = 965$ ), the United Kingdom ( $n = 1983$ ), and the Netherlands ( $n = 3224$ ; a sample partly overlapping with the current sample). Also, the four subtypes are similar to a recent LPA study by Krstic et al. (2018), as well as those found by Vassileva et al. (2005) who used cluster analysis instead of LPA. One reviewer alerted us to the remarkably elevated facet two scores. Indeed, scores on facet two appear to be high for all three classes with psychopathic traits (see Figure 1), especially when compared with the North American en U.K. offender samples (Neumann et al., 2016; see Figure 3). Possibly this is attributable to a higher prevalence of comorbid disorders among forensic psychiatric patients, for example, autistic spectrum disorders, intellectual disability, psychotic disorders, severe addiction. In the North American psychiatric sample (see Figure 3) scores on facet two also appear to be higher for the three psychopathic profiles.

Next, an attempt was made to test the clinical utility of the four emerging profiles. The first subtype (C1) scored high on all facets and had a mean total score above the cut-off score of 25 on the PCL-R. Their primary *DSM-IV* diagnosis was most often a personality disorder. This subtype appears to be *prototypically psychopathic*. The second subtype (C2) scored moderately on the interpersonal facet and high on affective facet, but much lower on lifestyle and antisocial facets. Neumann and colleagues (2016) called this subtype the *callous-conning* offender, and we follow their lead. Mean total score on the PCL-R was just below 20 and this group showed a diverse range of *DSM-IV* classifications. The third subtype (C3) scored relatively low on the interpersonal facet but high on the affective, lifestyle and antisocial facets. This subtype was labeled the *sociopathic* group, and had a mean total

score just above 20. It is interesting to note that the sociopathic subgroup appears to have a wider range of comorbid disorders than the more prototypical psychopathic group. One or more personality disorder(s) was the primary diagnosis in 75% of the cases, but in more than half of these cases an equally prominent psychotic disorder was diagnosed, and nearly 20% were diagnosed as autistic. The C3 group bears resemblance to the group that Olver et al. (2015) called "secondary psychopaths," presenting with higher risk and more criminogenic treatment needs at the start of treatment, compared with their "primary psychopaths." The fourth subtype, C4, scored low on all facets. This is a group of *nonpsychopathic* offenders who were represented in all diagnostic categories. Dropout for C4 was low and none of the subjects in this sample recidivated.

With regard to the treatability of offenders with moderate to high psychopathic traits (classes C1, C2, and C3) the following, tentative conclusions can be drawn from this study. Within the prototypical psychopathic group, the distinction between intent-to-treat and completers seems crucial. Psychopathic offenders were significantly more likely to fail treatment, especially in the early stages of treatment before unsupervised leave was granted. In practically half of the cases clinicians prematurely transferred the offender to another hospital without finishing the program. However, psychopathic offenders who remained in treatment (completers), appeared to proceed through the different phases of treatment in much the same way as the other groups. Furthermore, prototypical psychopaths were comparable on recidivism with those assigned to the supposedly less severe, sociopathic profile (C3). In sum, although we do not know whether the drop-out among the psychopathic group was in any way selective, it is possible that if they could have somehow remained in treatment,



**Figure 4.** Survival analyses. *Left:* Treatment dropout failure rates among forensic psychiatric patients as a function of PCL-R profile (C1 = prototypic psychopaths ( $n = 77$ ); C2 = callous-conning offenders ( $n = 32$ ); C3 = sociopathic offenders ( $n = 56$ ); C4 = nonpsychopathic offenders ( $n = 25$ )). Including a visual indication of average treatment phase durations and standard deviations: Phase 1 = no permission for leave; Phase 2 = supervised leave; Phase 3 = unsupervised leave; Phase 4 = transmural leave. The C1 profile has a significant higher failure rate than the other profiles. *Right:* Violent recidivism failure rates among forensic psychiatric patients as a function of PCL-R profile: C1 ( $n = 23$ ), C2 ( $n = 14$ ), C3 ( $n = 20$ ), C4 ( $n = 13$ ). The PCL-R profiles model as a whole was significantly related to violent recidivism ( $\chi^2 = 10.65$ ,  $df = 3$ ,  $p = .014$ ). Because of the low number of participants and recidivists, specifically C2 and C4, no significant differences could be assessed between the individual profiles.

their clinical outcome could not be distinguished from the sociopathic group. At the same time, it is fair to say the C1 and C3 subtypes remain considerably dangerous given relatively high recidivism rates, compared with the C2 and C4 subtypes. Treatment durations varied between the subtypes, but also varied widely within the subgroups, with standard deviations as large as two to three years, and therefore showed no significant differences between the subgroups.

Comparing the two subtypes with moderate profiles (C2, C3) also yielded some interesting results. Whereas both profiles score mainly in the range of 15 to 25 on the PCL-R (see Figure 2), callous-conning offenders (C2) appear to do much better than sociopathic offenders (C3), at least in terms of recidivism; in our sample they never recidivated. Callous and unemotional traits, although generally considered difficult to handle for treatment providers (Olver, Lewis, & Wong, 2013; Olver & Wong, 2011), probably do not warrant the concerns with regards to recidivism that they often still invoke under clinicians. This is in line with the results of a meta-analysis of the predictive validity of the PCL-R (and other instruments) with regard to violence (Yang, Wong, & Coid, 2010). It was found that only factor 2 (comprising facets 3 and 4) predicted violence.

Our final objective was to determine whether the profiles offer predictive utility for treatment, beyond simply knowing an offender's total score on the PCL-R. Unfortunately, this appears not to be the case. Classes C1, C3, and C4 most clearly appear to represent groups with different levels of profile elevations (i.e., high, mod-

erate, low). C2 was the only possible exception, with a distinctive profile on the facets, a relatively high mean total score for European standards (17.1), and nevertheless a positive treatment outcome in terms of recidivism (no recidivism). However, when controlling for total score on the PCL-R, none of the classes showed a significant effect on any of the treatment variables in our sample.

This study has a number of limitations. First and foremost, the modest sample size and low recidivism rates ruled out several meaningful class comparisons because of low power. The zero recidivism rates of C2 and C4 offenders interfered with the assumptions of survival analysis. And the low numbers in each of the classes may not have allowed for the potential base rate to occur. Likewise, the group of patients who had reached the transmural phase and the end of treatment via the intended route was relatively small and unequally divided over the various PCL-R profiles. Observed power was limited to detect even large effects, (.59 and .63 for transmural leave and total treatment duration, respectively). Also, this study should not be mistaken for a formal evaluation of treatment efficacy. Treatment methods evolved during the observation period of this study, and no single, formal treatment manual was followed. Rather, we focused on available indirect indices of how treatment-as-usual worked out for the emergent profiles. Thus, the current study should best be seen as a naturalistic, ecologically valid evaluation of differences in treatment responsiveness across subtypes.

Our findings provide some indications for future research. Keeping prototypical psychopathic patients in treatment appears to be a first hurdle to overcome with regard to the C1 group. As noted in the introduction, we know very little about the differences between psychopathic patients who drop out and those that do not. And, to our knowledge, the specific treatment interfering mechanisms have never been systematically studied. One relatively accessible option to explore both differences in patient characteristics as well as treatment interfering mechanisms (apart from gathering a large dataset with exclusively high scoring offenders and more detailed information about treatment variables), would be to use a qualitative research design to generate hypotheses. These could then be tested in a series of less extensive empirical studies. Knowledge about how specific psychopathic traits affect treatability of psychopathic offenders could then inform the development of specialized treatment programs. In the RNR-model for effective forensic treatment, these traits could be seen as issues of responsivity. One example of possible traits that could influence treatability, emerged from our recent study using the Minnesota Multiphasic Personality Inventory (MMPI)-2 Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008) to elucidate the four-facet model of the PCL-R (Klein Haneveld, Kamphuis, Smid, & Forbey, 2017). Restructured Clinical scale 6 (RC6), related to interpersonal alienation, suspiciousness, and the belief that others seek to harm you, was found to be significantly correlated to the affective facet of the PCL-R. Alienation and suspiciousness are not explicitly assessed by the PCL-R. If indeed these traits are part of the problem in the treatment of psychopathic patients with high scores on Facet 2, this would call for certain adaptations of the treatment program. Klein Haneveld et al. suggested that to minimize the treatment interfering effect of distrust, treatment providers need to pay special attention to transparency about treatment methods and goals, accountability during the treatment process, and clarity about other rules and expectations.

In conclusion, although the psychopathic profiles that were replicated in this study were not found to differentiate in treatment outcome over and above PCL-R total score, we believe it remains a research priority to conduct research on traits that influence treatability of psychopathic offenders and to develop better guidelines for establishing therapeutic relationships that work with these patients.

## References

- Andrews, D. A., & Bonta, J. (2010). *The psychology of criminal conduct* (5th ed.). Newark, NJ: LexisNexis/Anderson.
- Ben-Porath, Y. S., & Tellegen, A. (2008). *MMPI-2-RF (Minnesota Multiphasic Personality Inventory-2-Restructured Form): Manual for administration and scoring*. Minneapolis: University of Minnesota Press.
- Caldwell, M. F., McCormick, D. J., Umstead, D., & Van Rybroek, G. J. (2007). Evidence of treatment progress and therapeutic outcomes among adolescents with psychopathic features. *Criminal Justice and Behavior, 34*, 573–587. <http://dx.doi.org/10.1177/0093854806297511>
- Caldwell, M., Skeem, J., Salekin, R., & Van Rybroek, G. (2006). Treatment response of adolescent offenders with psychopathy features: A 2-year follow-up. *Criminal Justice and Behavior, 33*, 571–596. <http://dx.doi.org/10.1177/0093854806288176>
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*, 309–319. <http://dx.doi.org/10.1037/1040-3590.7.3.309>
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment, 13*, 171–188. <http://dx.doi.org/10.1037/1040-3590.13.2.171>
- de Jong, C. A. J., Derks, F. C. H., van Oel, C. J., & Rinne, Th. (1996). *SIDP-IV: Gestructureerd interview voor de DSM-IV persoonlijkheidstoornissen [SIDP-IV: Structured Interview for DSM-IV Personality]*. Sint Oedenrode, the Netherlands: Stichting Verslavingszorg Oost Brabant.
- D'Silva, K., Duggan, C., & McCarthy, L. (2004). Does treatment really make psychopaths worse? A review of the evidence. *Journal of Personality Disorders, 18*, 163–177. <http://dx.doi.org/10.1521/pedi.18.2.163.32775>
- Forth, A. E., Kosson, D. S., & Hare, R. D. (2003). *The psychopathy checklist: Youth version (PCL: YV)*. Toronto, Canada: Multi-Health Systems.
- Hare, R. D. (1991). *The Hare Psychopathy Checklist-revised*. Toronto, Canada: Multi-Health Systems.
- Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. *Criminal Justice and Behavior, 23*, 25–54. <http://dx.doi.org/10.1177/0093854896023001004>
- Hare, R. D. (2003). *The Hare Psychopathy Checklist-revised* (2nd ed.). Toronto, Canada: Multi-Health Systems.
- Hare, R. D., & Neumann, C. S. (2006). The PCL-R assessment of psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 58–88). New York, NY: Guilford Press.
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a clinical and empirical construct. *Annual Review of Clinical Psychology, 4*, 217–246. <http://dx.doi.org/10.1146/annurev.clinpsy.3.022806.091452>
- Hare, R. D., & Neumann, C. S. (2010). The role of antisociality in the psychopathy construct: Comment on Skeem and Cooke (2010). *Psychological Assessment, 22*, 446–454. <http://dx.doi.org/10.1037/a0013635>
- Hare, R. D., Neumann, C. S., & Mokros, A. (2015). The PCL-R assessment of psychopathy: Development, properties, debates, and new directions. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 39–89). New York, NY: Guilford Press.
- Hervé, H. (2007). Psychopathy across the ages: A history of the Hare psychopath. In H. Hervé & J. C. Yuille (Eds.), *The psychopath: Theory, research, and practice* (pp. 31–55). Mahwah, NJ: Erlbaum.
- Hicks, B. M., Markon, K. E., Patrick, C. J., Krueger, R. F., & Newman, J. P. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment, 16*, 276–288. <http://dx.doi.org/10.1037/1040-3590.16.3.276>
- Hildebrand, M., de Ruiter, C., de Vogel, V., & van der Wolf, P. (2002). Reliability and factor structure of the Dutch language version of Hare's Psychopathy Checklist-Revised. *The International Journal of Forensic Mental Health, 1*, 139–154. <http://dx.doi.org/10.1080/14999013.2002.10471169>
- Karpman, B. (1929). The problem of psychopathies. *Psychiatric Quarterly, 3*, 495–525. <http://dx.doi.org/10.1007/BF01585441>
- Karpman, B. (1946). Psychopathy in the scheme of human typology. *Journal of Nervous and Mental Disease, 103*, 276–288. <http://dx.doi.org/10.1097/00005053-194603000-00007>
- Kass, R. E., & Raftery, A. E. (1995). Bayes factors. *Journal of the American Statistical Association, 90*, 773–795. <http://dx.doi.org/10.1080/01621459.1995.10476572>
- Kiehl, K. A., & Hoffman, M. B. (2011). The criminal psychopath: History, neuroscience, treatment, and economics. *Jurimetrics, 51*, 355–397.
- Klein Haneveld, E., Kamphuis, J. H., Smid, W., & Forbey, J. D. (2017). Using MMPI-2-RF correlates to elucidate the PCL-R and its four facets in a sample of male forensic psychiatric patients. *Journal of Personality Assessment, 99*, 398–407.
- Kröger, U., van Beek, D., van der Wolf, P., Klein Haneveld, E., van Geest, H., & Geraerts, R. (2014). *Treatment of psychopathy: A mission impossible?* Utrecht, the Netherlands: Forum Educatief.

- Krstic, S., Neumann, C. S., Roy, S., Robertson, C. A., Knight, R. A., & Hare, R. D. (2018). Using latent variable- and person-centered approaches to examine the role of psychopathic traits in sex offenders. *Personality Disorders: Theory, Research, and Treatment*, 9, 207–216. <http://dx.doi.org/10.1037/per0000249>
- Kupzyk, K. A. (2011). *Introduction to mixture modeling*. Retrieved from [http://r2ed.unl.edu/presentations/2011/RMS/012111\\_Kupzyk/012111\\_Kupzyk.pdf](http://r2ed.unl.edu/presentations/2011/RMS/012111_Kupzyk/012111_Kupzyk.pdf)
- Leistico, A. M. R., Salekin, R. T., DeCoster, J., & Rogers, R. (2008). A large-scale meta-analysis relating the hare measures of psychopathy to antisocial conduct. *Law and Human Behavior*, 32, 28–45. <http://dx.doi.org/10.1007/s10979-007-9096-6>
- Lewis, K., Olver, M. E., & Wong, S. C. (2013). The Violence Risk Scale: Predictive validity and linking changes in risk with violent recidivism in a sample of high-risk offenders with psychopathic traits. *Assessment*, 20, 150–164. <http://dx.doi.org/10.1177/1073191112441242>
- Lo, Y., Mendell, N., & Rubin, D. (2001). Testing the number of components in a normal mixture. *Biometrika*, 88, 767–778. <http://dx.doi.org/10.1093/biomet/88.3.767>
- Mokros, A., Hare, R. D., Neumann, C. S., Santtila, P., Habermeyer, E., & Nitschke, J. (2015). Variants of psychopathy in adult male offenders: A latent profile analysis. *Journal of Abnormal Psychology*, 124, 372–386. <http://dx.doi.org/10.1037/abn0000042>
- Mokros, A., Hollerbach, P., Vohs, K., Nitschke, J., Eher, R., & Habermeyer, E. (2013). Normative data for the psychopathy checklist-revised in German-speaking countries: A meta-analysis. *Criminal Justice and Behavior*, 40, 1397–1412. <http://dx.doi.org/10.1177/0093854813492519>
- Muthén, L. K., & Muthén, B. O. (2011). *Mplus (version 6.12 for Mac)* [Computer software]. Los Angeles, CA: Author.
- Neumann, C. S., Hare, R. D., & Pardini, D. A. (2015). Antisociality and the construct of psychopathy: Data from across the globe. *Journal of Personality*, 83, 678–692. <http://dx.doi.org/10.1111/jopy.12127>
- Neumann, C. S., Vitacco, M. J., & Mokros, A. (2016). Using both variable-centered and person-centered approaches to understanding psychopathic personality. In C. B. Gacono (Ed.), *The clinical and forensic assessment of psychopathy: A practitioner's guide* (pp. 14–31). New York, NY: Routledge.
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, 14, 535–569. <http://dx.doi.org/10.1080/10705510701575396>
- Ogloff, J. R., Wong, S., & Greenwood, A. (1990). Treating criminal psychopaths in a therapeutic community program. *Behavioral Sciences & the Law*, 8, 181–190. <http://dx.doi.org/10.1002/bsl.2370080210>
- Olver, M. E., Lewis, K., & Wong, S. C. (2013). Risk reduction treatment of high-risk psychopathic offenders: The relationship of psychopathy and treatment change to violent recidivism. *Personality Disorders: Theory, Research, and Treatment*, 4, 160–167. <http://dx.doi.org/10.1037/a0029769>
- Olver, M. E., Sewall, L. A., Sarty, G. E., Lewis, K., & Wong, S. C. (2015). A cluster analytic examination and external validation of psychopathic offender subtypes in a multisite sample of Canadian federal offenders. *Journal of Abnormal Psychology*, 124, 355–371. <http://dx.doi.org/10.1037/abn0000038>
- Olver, M. E., & Wong, S. C. (2009). Therapeutic responses of psychopathic sexual offenders: Treatment attrition, therapeutic change, and long-term recidivism. *Journal of Consulting and Clinical Psychology*, 77, 328–336. <http://dx.doi.org/10.1037/a0015001>
- Olver, M. E., & Wong, S. (2011). Predictors of sex offender treatment dropout: Psychopathy, sex offender risk, and responsivity implications. *Psychology, Crime & Law*, 17, 457–471. <http://dx.doi.org/10.1080/10683160903318876>
- Pfohl, B., Blum, N., & Zimmerman, M. (1997). *Structured Interview for DSM-IV Personality (SIDP-IV)*. Washington, DC: American Psychiatric Press.
- Polaschek, D. L., & Daly, T. E. (2013). Treatment and psychopathy in forensic settings. *Aggression and Violent Behavior*, 18, 592–603. <http://dx.doi.org/10.1016/j.avb.2013.06.003>
- Poythress, N. G., Edens, J. F., Skeem, J. L., Lilienfeld, S. O., Douglas, K. S., Frick, P. J., . . . Wang, T. (2010). Identifying subtypes among offenders with antisocial personality disorder: A cluster-analytic study. *Journal of Abnormal Psychology*, 119, 389–400. <http://dx.doi.org/10.1037/a0018611>
- Reidy, D. E., Kearns, M. C., & DeGue, S. (2013). Reducing psychopathic violence: A review of the treatment literature. *Aggression and Violent Behavior*, 18, 527–538. <http://dx.doi.org/10.1016/j.avb.2013.07.008>
- Rice, M. E., Harris, G. T., & Cormier, C. A. (1992). An evaluation of a maximum security therapeutic community for psychopaths and other mentally disordered offenders. *Law and Human Behavior*, 16, 399–412. <http://dx.doi.org/10.1007/BF02352266>
- Rost, J. (2006). Latent-class-analyse [Latent class analysis]. In F. Petermann & M. Eid (Eds.), *Handbuch der psychologischen Diagnostik [Handbook of psychological assessment]* (pp. 275–287). Göttingen, Germany: Hogrefe.
- Salekin, R. T. (2002). Psychopathy and therapeutic pessimism. Clinical lore or clinical reality? *Clinical Psychology Review*, 22, 79–112. [http://dx.doi.org/10.1016/S0272-7358\(01\)00083-6](http://dx.doi.org/10.1016/S0272-7358(01)00083-6)
- Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, 6, 461–464. <http://dx.doi.org/10.1214/aos/1176344136>
- Serin, R. C., & Amos, N. L. (1995). The role of psychopathy in the assessment of dangerousness. *International Journal of Law and Psychiatry*, 18, 231–238. [http://dx.doi.org/10.1016/0160-2527\(95\)00008-6](http://dx.doi.org/10.1016/0160-2527(95)00008-6)
- Skeem, J., Johansson, P., Andershed, H., Kerr, M., & Louden, J. E. (2007). Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology*, 116, 395–409. <http://dx.doi.org/10.1037/0021-843X.116.2.395>
- van Binsbergen, M. H., Keune, L. H., Gerrits, J., & Wiertsema, H. L. (2007). *Organising forensic psychiatry. Clinical practice at the Van der Hoeven Kliniek*. Utrecht, the Netherlands: Forum Educatief.
- Vassileva, J., Kosson, D. S., Abramowitz, C., & Conrod, P. (2005). Psychopathy versus psychopathies in classifying criminal offenders. *Legal and Criminological Psychology*, 10, 27–43. <http://dx.doi.org/10.1348/135532504X15376>
- Widiger, T. A. (2002). Personality disorders. In M. M. Antony & D. H. Barlow (Eds.), *Handbook of assessment and treatment planning for psychological disorders* (pp. 453–480). New York, NY: Guilford Press.
- Wong, S. C., & Burt, G. (2007). The heterogeneity of incarcerated psychopaths: Differences in risk, need, recidivism, and management approaches. In H. Hervé & J. C. Yuille (Eds.), *The psychopath: Theory, research, and practice* (pp. 461–484). Mahwah, NJ: Erlbaum.
- Wong, S. C., & Gordon, A. (2006). The validity and reliability of the Violence Risk Scale: A treatment-friendly violence risk assessment tool. *Psychology, Public Policy, and Law*, 12, 279–309. <http://dx.doi.org/10.1037/1076-8971.12.3.279>
- Wong, S. C. P., & Hare, R. D. (2005). *Guidelines for a psychopathy treatment program*. Toronto, Canada: Multi-Health Systems Inc.
- Yang, M., Wong, S. C. P., & Coid, J. (2010). The efficacy of violence prediction: A meta-analytic comparison of nine risk assessment tools. *Psychological Bulletin*, 136, 740–767. <http://dx.doi.org/10.1037/a0020473>

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