WHAT IS THE OPTIMAL NUMBER OF TRAITS TO DESCRIBE PSYCHOPATHY?

Hare's Psychopathy Check List – Revised (PCL-R) represents one of the most frequently used instruments for measuring psychopathy. However, there is a dispute regarding the optimal number of factors that configure its latent structure. Previous research in Serbia has shown that several tested models did not fit well with the empirical data. In this study, we have gathered and analyzed all of the available data on PCL-R collected in Serbia (406 male convicts, mean age 34 years, SD = 9.98). Exploratory factor analysis has shown that the variance of the scale items could be best explained with five latent components: Interpersonal, Affective, Impulsivity, Lifestyle and Antisocial. Several structural models were tested as well, with a special focus on two of them: the first where all of the traits are treated equally, and the second where Lifestyle and Antisocial traits were set as behavioral outcomes of the three personality traits. The second model surpassed not only the first one, but its fit indices showed a better fit than any of the other models proposed in literature. The results of the present research support models that describe psychopathy as a compound of three core traits: manipulative tendencies, affective superficiality and impulsiveness.

Keywords: psychopathy, PCL-R, core psychopathic traits, structural models

2 This study was conducted as a part of the project “Crime in Serbia: Phenomenology, Risks and Possibilities of Social Intervention” (#47011), realized by the Institute of Criminological and Sociological Research. The project is supported by the Serbian Ministry of Education, Science and Technological Development of the Republic of Serbia.
PCL-R scale for measuring psychopathy

How can we describe psychopathic traits most accurately? In the nineteenth century, psychopathy was described by clinicians and psychiatrists. They saw it as a clinical syndrome of several traits: impulsiveness, irresponsibility, absence of regret and shame, proneness to lying, manipulation and antisocial behavior, which is based on moral underdevelopment (Radulović, 2006). A description made by Harvey Cleckley is very important in the contemporary research of psychopathy. He depicted psychopathy as a personality structure consisting of the following traits: superficial charm, adequate intellectual functioning, unreliability, dishonesty, antisocial behavior, incapability of learning from experience, egocentricity, poor social relations, impersonal and trivial sexual relations; there is also an absence of the following phenomena: delusions, irrational thinking, neurotic manifestations, guilt, shame and introspectiveness (Cleckley, 1941/1976).

Based on Cleckley’s indicators, a group of researchers led by Robert D. Hare constructed the first method for measuring psychopathy and named it the Psychopathy Checklist (Hare, 1980). It is a rating method scale, based on an interview with a participant, performed in an institutional setting. It also allows the interviewer to use external data regarding the participant, mainly from dossiers held in penal or forensic institutions. The scale has been revised and its second version contains 20 indicators that operationalise psychopathy (Hare, 1991): after the interview and access to the files regarding the participant, the interviewer can evaluate him/her on these 20 items. The second version of the scale (PCL-R) is in use in present research and psychological practice (Hare, 2003). It is one of the most used methods of measuring psychopathy, and is therefore called the “gold standard” for psychopathy assessment by some authors (Paulhus & Williams, 2002).

Examining the factor structure of PCL-R

Hare and his coworkers constructed the model of psychopathy with the assumption that all of the indicators measure a unitary underlying construct. However, this assumption was only recently empirically tested. The authors used the Item Response Theory to evaluate the unidimensionality of psychopathy (Bolt, Hare, Vitale, & Newman, 2004). Results of the research suggested that the construct is unidimensional. This finding is replicated using the structural modeling (Neumann, Hare, & Newman, 2007).

However, this is the only factor solution that included all of the PCL-R items. Harpur, Hare, and Hakstian (1989) found two correlated factors behind the empirical items of psychopathy. They were very broad, so they were called only Factor 1 and Factor 2 (Hare, 1991). The first one gathers the markers of a psychopathic personality – endogenous and core psychopathic traits. It is consisted of manipulativeness, exploitativeness, emotional superficiality and the absence of guilt and empathy. The second one represents the characteristics of a lifestyle...
related to psychopathy – impulsiveness, irresponsibility, antisocial and criminal behavior. However, two of the PCL-R items did not contribute to the structure of these factors. These were items aimed to measure promiscuous behavior and frequent sexual relationships (Hare & Neumann, 2009). Recently, there was an attempt to include these behaviors in the model of psychopathy again (Harris, Rice, Hilton, Lalumière, & Quinsey, 2007), but the correlations of promiscuity items with Factor 1 and 2 were quite low (.16 and .22) which suggests that coercive and precocious sexuality could be a correlate but not an essential part of psychopathy.

There were more serious challenges to the PCL-R model of psychopathy. Cook and Michie (2001) have shown that the three-factor model fits the empirical data better than the two factor structure. However, in order to acquire the best fit, the authors had to remove the items that measure antisocial and criminal behavior from the model. The three remaining factors were interpreted as manipulative tendencies, shallow affectivity and impulsiveness. Other authors have replicated this finding (Johansson, Andershed, Kerr, & Levander, 2002). This result has an important consequence not only for the measurement of psychopathy but also for its conception: it suggests that antisocial and criminal behavior is not the central component of psychopathy. They could be its correlates (Cooke, Michie, & Skeem, 2007) or a behavioral outcome of core psychopathic traits (Cooke, Michie, Hart, & Clark, 2004).

The three-factor structure is found outside the PCL-R too. One of the frequent methods for measuring psychopathy, beside the PCL-R, is the Psychopathic Personality Inventory (PPI: Lilienfeld & Andrews, 1996). It is based on a broader set of psychopathy indicators, not only those proposed by Cleckley. The latent structure of this method is hierarchical: it comprises eight first-order and three second-order factors (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). They are labeled as Self-Centered Impulsivity, Fearless Dominance and Coldheartedness. They resemble the three-factor structure captured by Cooke and Michie (2001) when the factor content is compared. There is an additional finding regarding the PPI, which challenges the view of psychopathy formulated by Hare and collaborators: Self-Centered Impulsivity and Fearless Dominance are orthogonal factors and they correlate with Cold-heartedness only to a small extent (Marcus, Fulton, & Edens, 2013). These findings oppose the view of psychopathy as a unitary, unidimensional and homogenous trait.

Recently, a new model of psychopathy was proposed. It is based on neurobiological data on psychopathy, it comprises the findings on the ontogenetic development of psychopathic traits and is in accordance with certain contemporary theoretical accounts of psychopathy (Fowles & Dindo, 2006). The model also consists of three traits, which is the reason why it is named the Triarchic Model of Psychopathy (Patrick, Fowles, & Krueger, 2009). The structure of this model is constituted by Meanness, Boldness and Disinhibition and these traits also tap very well onto psychopathic characteristics of PCL-R described by Cooke and Michie (2001).

Hare and coworkers have replied to the critics on several occasions regarding the empirical and conceptual removal of antisocial and criminal behavior as
core psychopathic characteristics. They criticized the statistical procedures that Cooke and Michie (2001) used to establish the three-factor model (Neumann, Vitacco, Hare, & Wupperman, 2005). Their position is that antisocial behavior must be an essential part of the psychopathy construct (Hare & Neumann, 2010). This conceptual account is based on the empirical data acquired by them. The results of their research imply that four factors are the optimal structure of the PCL-R (Hare, 2003; Hare & Neumann, 2009). It is an extension of the three-factor model and the fourth trait is added to the previously described traits: one that describes antisocial behavior. So, the final model proposed by Hare and his collaborators is constituted by four factors: Interpersonal, Affective, Lifestyle and Antisocial psychopathic traits (Hare & Neumann, 2009). Those four factors are recovered on several other instruments constructed on the PCL-R markers of psychopathy (Neumann, Kosson, Forth, & Hare, 2006; Paulhus, Neumann, & Hare, 2012; Vitacco, Neumann, & Jackson, 2005).

It is interesting to mention that an early exploration of the latent structure of psychopathy resulted in the extraction of five factors (Hare, 1980). Factor analysis of the original Cleckley’s indicators and the first version of the PCL resulted in a five-factor solution. This structure was described by: 1) impulsive, unstable lifestyle; 2) lack of empathy and callousness; 3) superficial interpersonal relationships; 4) early antisocial behavior and 5) impulsive antisocial behavior. Therefore, the difference from the four factor structure is that this solution has two factors related to impulsivity: one that is closely related to antisocial behavior and the other which is connected to an erratic, parasitic lifestyle. However, this solution has not been explored more thoroughly in later research.

Goals of the present research

An accurate description of psychopathy is the first and very important step in understanding it. If Hare and his coworkers are right, psychopathy is a homogeneous and unitary trait that is expressed in four narrower dispositions, and one of them is antisocial behavior. However, this viewpoint disregards empirical findings that are highly relevant to an explanation of psychopathy. The first one is that psychopathy consists of at least two separate core deficits (emotional shallowness and impulsivity) which have distinctive etiological pathways (Fowles & Dindo, 2006) based on different genetic determinants (Aluja, Garcia, Blanch, De Lorenzo, & Fibla, 2009). The second set of findings is based around the topic called “successful psychopathy”. There is a growing body of data suggesting that persons with pronounced psychopathic traits do not have to be engaged in antisocial or criminal activities, on the contrary, they can be well adjusted and function optimally in certain environments (Hall & Benning, 2006). These findings implicate that psychopathic traits do not have to be necessarily related to antisocial behavior, in fact they can facilitate adaptive personality functioning.
Previous research conducted in Serbia did not support any of the proposed models of psychopathy (Petrović, Međedović, Želeskov-Dorić, Savić, & Mentus, 2013). The indices of fit were too low for all of the tested models. In the present research, we have gathered all the available PCL-R protocols administered in Serbia (as far as we know, this is all of the data on PCL-R gathered in Serbia). Our goal is to explore the factor structure of the largest possible sample and to evaluate the results of this exploration using the fit parameters of several opposed models of psychopathy.

The obtained factors will be validated using the three criterion variables. The first one is self-reported psychopathy. The PCL-R model is transferred to the self-report methodology, and the instrument is designed to capture the same four traits described in the latest model by Hare and coworkers (Hare, 2003). It is called simply Self-Reported Psychopathy (SRP) and it taps the following traits: Interpersonal Manipulation, Shallow Affect, Erratic Lifestyle and Criminal Tendencies (Williams, Paulhus, & Hare, 2007). Research on the congruence between the self reported and rated four factors of psychopathy is still missing, however, some preliminary data suggests that the congruence is higher between behavioral aspects of psychopathy (impulsive/lifestyle and antisocial/criminogenic traits) than between the traits that operationalize manipulativeness and shallow affect (Kujačić, Međedović, & Knežević, 2015).

The second one is criminal recidivism. It is one of the most used behavioral criteria to test the prognostic validity of psychopathy traits. Several meta-analyses have confirmed the ability of psychopathy to predict criminal recidivism; however, most of them identify Factor 2 (Lifestyle/Antisocial) as a crucial factor in the prediction of criminal relapse (Leistico, Salekin, DeCoster, & Rogers, 2008). In fact, empirical data shows that the connection between psychopathy and recidivism can be attributed mostly to the psychopathic trait of Antisocial characteristics (Walters, Knight, Grann, & Dahle, 2008).

Finally, the third measure is schizotypy, or psychosis proneness. This construct is based on the assumption that psychosis-like experiences are present in the general population as well, and that they are continuous in their nature (Lenzenweger, 2006). This criterion measure is important for the study of psychopathy because psychopathy is still considered a disposition that is pathological in its nature, more precisely, as a personality disorder (Cooke, Michie, Hart, & Clark, 2004). This assumption implicates that psychopathy should be positively related to schizotypy, and indeed, this was the result of the research conducted by Međedović (2010). However, other findings suggest that the relations between psychopathic traits and schizotypy are much more complex. In fact, they point to the conclusion that impulsive/lifestyle traits are positively correlated with schizotypy, but the relation between affective/manipulative traits and schizotypy is negative (Ragsdale & Bedwell, 2013; Ragsdale, Mitchell, Cassisi, & Bedwell, 2013b). This finding accentuates a very important distinction between psychopathy traits, leading to the conclusion that not all psychopathy features will lead to maladaptive and dysfunctional behavior.
Method

Sample

The sample for this research consisted of 406 male convicts. The mean age of the participants was 34 years (SD = 9.98). The mean level of education was 8 years (SD = 4.3) which means that the participants on average had completed elementary school. However, only the participants with adequate reading skills were included in the sample. The participants were sampled from four penitentiary facilities in Serbia: Kosovska Mitrovica, Požarevac-Zabela, Padinska Skela and the Special Prison Hospital in Belgrade. They varied per type of offense and the duration of their sentence. All subjects participated in the research on a voluntary basis.

Instruments

**Psychopathy Check List – Revised (PCL-R: Hare, 2003).** This is a rating method based on interviews and biography data. It was used to measure psychopathy. Data was collected by the authors of this report. Individual interviews were held (lasting approximately 60–75 minutes) and the data was retrieved from the participants’ personal files and dossiers. Afterwards, every participant was evaluated on 20 indicators of psychopathy, scoring 0 if the indicator was absent, 1 if it was present or 2 if it was present in a large degree.

**Self Report Psychopathy (SRP-3: Paulhus, Neumann, & Hare, 2012).** This questionnaire explores psychopathic traits also, using the self-report method. It measures four traits which are parallel to the four factors of the PCL-R: Interpersonal manipulation, Flattened affect, Erratic lifestyle and Criminal tendencies. Only the Erratic lifestyle scale is used in the analysis.³ It contains 16 items and has a reliability of α = .75.

**DELTA 10 inventory (Knežević, Opačić, Kutlešić, & Savić, 2005).** It was used to measure Disintegration, as a measure of the participants’ mental health. It is a trait that operationalises psychosis proneness: a tendency to have psychotic-like experiences. This definition is in accordance with the concept of schizotypy (Lenzenweger, 2006), which can suggest that Disintegration could be one of the models that represent schizotypy. However, Disintegration is a very comprehensive construct: it is aimed to be the reconceptualization of the psychoticism as a basic personality trait (Eysenck & Eysenck, 1976). It is consisted of ten modalities which are subordinate traits to the general factor of Disintegration: General executive dysfunction, Perceptual distortions, Enhanced awareness, Depression, Paranoia, Mania, Social anhedonia, Flattened affect, Somatoform dysregulation and Magical thinking. It is a self-report method with 30 items and only the total

³ This is done as a consequence of the exploratory factor analysis of the PCL items (Table 1, further in the text): only the structure of lifestyle items deviated from the proposed model. Because of that, Erratic lifestyle is used to validate an empirically obtained structure of psychopathy traits.
score is used in the analysis. The reliability of the scale is $\alpha = .88$. Both of the self-report measures were administered on a subsample of participants that had 286 subjects, so the analyses that incorporate these two variables were conducted on a reduced sample of participants.

**Indicators of criminal recidivism.** Two indicators of multiple criminal recidivism are taken from participants’ prison dossiers. They are the total number of convictions that the participants had and the total number of prison sentences that the participants served. These indicators measure criminal-legal and penal recidivism (Jovanić, 2010).

**Procedure**

In the first phase of the research participants filled out the self-report measures. This data was collected in a group administration of measures. The second phase consisted of individual interviews aimed at gathering the data necessary to provide the rating measures of psychopathy. Finally, in the third phase, the researchers gathered the relevant data from participants’ prison files and dossiers.

**Results**

**The latent space of the PCL-R indicators**

The Exploratory Factor Analysis with a Principal Component Analysis as a method of factor extraction was conducted to explore the latent space of PCL-R items. Following the procedure established by other authors (Hare, 2003), we excluded two items that measure promiscuity and frequent sexual relationships from the analysis. The five factors that have eigenvalues larger than 1 are extracted and rotated in the Promax position. We decided to analyze five factors because our previous research showed that models containing one to four factors did not explain data well (Petrović et al., 2013). The pattern matrix of these factors is shown in Table 1.

As may be seen from Table 1, the structure of the latent components resembles the one proposed by Hare and collaborators. In fact, the Affective and Interpersonal traits are fully replicated. The Antisocial trait is also almost fully recovered. The main difference is in the emergence of the fifth component. It originated as a consequence of the Lifestyle factor splitting into two components. One is constituted by the markers of impulsivity, recklessness and sensation seeking. It is labeled as Impulsivity. The other one is loaded with indicators of a lifestyle based on financial dependence on others, irresponsible behavior and absence of long-term goals. It is labeled Lifestyle.
Table 1

*Pattern matrix of the factors extracted from PCL-R items*

<table>
<thead>
<tr>
<th>Item</th>
<th>Antisocial (α = .74)</th>
<th>Affective (α = .66)</th>
<th>Impulsivity (α = .75)</th>
<th>Lifestyle (α = .60)</th>
<th>Interpersonal (α = .61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 20*</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Item 18</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 12</td>
<td>.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 19</td>
<td>.49</td>
<td>.31</td>
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<tr>
<td>Item 6</td>
<td></td>
<td>.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 16</td>
<td>.70</td>
<td>-.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 8</td>
<td>.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 7</td>
<td>.48</td>
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<td>Item 14</td>
<td>.32</td>
<td>.74</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Item 10</td>
<td>.33</td>
<td>.68</td>
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<td>Item 3</td>
<td>.61</td>
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<tr>
<td>Item 9</td>
<td></td>
<td>.85</td>
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<tr>
<td>Item 15</td>
<td></td>
<td>.75</td>
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<tr>
<td>Item 13</td>
<td></td>
<td>.62</td>
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<td>Item 1</td>
<td></td>
<td></td>
<td>.75</td>
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<td></td>
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<tr>
<td>Item 5</td>
<td></td>
<td>-.32</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 2</td>
<td>.32</td>
<td>.59</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Item 4</td>
<td></td>
<td>.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antisocial</td>
<td>4.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective</td>
<td>4.19</td>
<td>2.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulsivity</td>
<td>.18</td>
<td>.21</td>
<td>1.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifestyle</td>
<td>.41</td>
<td>.22</td>
<td>.27</td>
<td>1.26</td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.10</td>
<td>.35</td>
<td>.05</td>
<td>.13</td>
<td>1.06</td>
</tr>
</tbody>
</table>

*Note.* Loadings smaller than .30 are omitted. Correlations between the extracted factors are shown in the lower part of the Table. Eigenvalues of the factors are present in the diagonal. Coefficients of internal consistency are shown in the brackets. * The full names of the PCL-R items could not be reproduced because of the copyright issues.
Relations between the extracted factors and external criteria

To validate Impulsivity and Lifestyle as distinct traits, we conducted three regression analyses where psychopathy traits were set as predictors and a self-reported Erratic lifestyle (since only the Lifestyle trait differed in the obtained latent structure from the proposed four-factor model, we analyzed only a parallel trait of the Lifestyle from SRP-3), Disintegration and Criminal recidivism were set as criterion variables. Common variance between two measures of recidivism was used in the analysis (the correlation between them is $r = .58; p < .01$). It was extracted by PCA (one component was extracted with the Eigenvalue of 1.58 and 79.15% of the explained variance of original measures). Age and education of the participants were also controlled in the analyses. Three significant regression functions were obtained. They are shown in Table 2.

Table 2
The prediction of Erratic lifestyle, Disintegration and Criminal recidivism

<table>
<thead>
<tr>
<th>Erratic lifestyle</th>
<th>Disintegration</th>
<th>Recidivism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>-.02</td>
<td>-.21**</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>-.12*</td>
<td>-.25**</td>
</tr>
<tr>
<td><strong>Antisocial</strong></td>
<td>.27**</td>
<td>.43**</td>
</tr>
<tr>
<td><strong>Affective</strong></td>
<td>.09</td>
<td>.18**</td>
</tr>
<tr>
<td><strong>Impulsivity</strong></td>
<td>.35**</td>
<td>.44**</td>
</tr>
<tr>
<td><strong>Lifestyle</strong></td>
<td>.09</td>
<td>.33**</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>-.04</td>
<td>.02</td>
</tr>
</tbody>
</table>

| $F$               | 20.77**        | 5.57**     | 32.74**    |
| $R^2$             | .35            | .07        | .31        |

Note. $\beta =$ standardized regression coefficient; $r_0 =$ zero order correlation between the predictor and a criterion; $F = F$ statistic; $R^2 =$ coefficient of determination.

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

As can be seen from Table 2, regression functions with Erratic lifestyle and Criminal recidivism are quite similar. Antisocial and Impulsivity traits predict both of the criteria. However, recidivism is predicted by Interpersonal psychopathy features too. Disintegration has a different set of predictors. Impulsivity and Lifestyle predict the criterion with a positive contribution, while the relation between the Interpersonal features and Disintegration is negative.
Evaluation of the different models of psychopathy

We used structural equation modelling to evaluate models of psychopathy containing one to four factors (correlated latent traits models where all of the traits were treated as constructs of the same conceptual status). Furthermore, two models structured by five factors were tested also: the first one treats all traits as the constructs of the same theoretical status (five correlated latent variables). The second one is causal in its nature. It comprises Affective, Interpersonal and Impulsivity traits as exogenous while Lifestyle and Antisocial are set as endogenous variables. This model is formulated using the findings obtained by Cooke et al. (2004). Their results showed that three personal psychopathic attributes can be viewed as a source of causal influence onto behavioral outcomes: Antisocial and, in our case, Lifestyle features. This model does not treat the five extracted factors equally: it views core psychopathic characteristics as endogenous personal attributes that can be expressed in the behavior described by Lifestyle and Antisocial factors. Fit indices of all the evaluated models are shown in Table 3.

Table 3
Indices of model fit for 1 to 5 factor structures

<table>
<thead>
<tr>
<th>Model Description</th>
<th>CMEAN/df</th>
<th>NFI</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-factor model (Bolt et al., 2004)</td>
<td>7.72</td>
<td>.53</td>
<td>.55</td>
<td>.44</td>
<td>.12</td>
</tr>
<tr>
<td>Two-factor model (Harpur et al., 1989)</td>
<td>5.35</td>
<td>.68</td>
<td>.71</td>
<td>.64</td>
<td>.10</td>
</tr>
<tr>
<td>Three-factor model* (Cooke &amp; Michie, 2001)</td>
<td>4.73</td>
<td>.75</td>
<td>.78</td>
<td>.68</td>
<td>.09</td>
</tr>
<tr>
<td>Four-factor model (Hare, 2003)</td>
<td>4.70</td>
<td>.73</td>
<td>.77</td>
<td>.69</td>
<td>.09</td>
</tr>
<tr>
<td>Five-factor model-correlated traits (present research)</td>
<td>3.14</td>
<td>.82</td>
<td>.87</td>
<td>.82</td>
<td>.07</td>
</tr>
<tr>
<td>Five-factor model-causal (present research)</td>
<td>2.38</td>
<td>.88</td>
<td>.93</td>
<td>.88</td>
<td>.06</td>
</tr>
</tbody>
</table>

Note. CMEAN/df = minimum discrepancy divided by its degrees of freedom; NFI = normed fit index, CFI = comparative fit index; TLI = Tucker–Lewis coefficient; RMSEA = root mean square error of approximation. * the three-factor model is comprised from 13 PCL-R items: indicators that measure antisocial behavior are excluded from the model.

Comparisons of various models of the PCL-R structure revealed that five-factor model has the best fit of all the tested structures. Furthermore, the proposed causal structure has a fit even better than the model that comprises five traits of...
the same status. NFI and TLI indexes are slightly lower than it is recommended (they are below .90). This means that even causal five-factor model does not describe empirical data completely accurately; however, it does fit to the data better than any other analyzed model. This is the reason why this model will be shown in Diagram 1, together with its path and correlation coefficients. The measurement model will not be shown because it is not of interest in the present analysis.

Diagram 1. Causal relations between the psychopathic traits. Correlations are presented with simple lines; causal pathways are presented with arrows. Dotted lines represent non-significant paths.

Diagram 1 shows that only three causal pathways are statistically significant (all of the coefficients presented on the diagram are significant at the $p$ level of $< .01$). Impulsivity is the trait that influences both Lifestyle and Antisocial features, while Affective characteristics have an impact on psychopathic Lifestyle. All coefficients are positive.

Discussion

Five factors behind the PCL-R items

During almost three and a half decades, researchers have attempted to describe the latent structure of the psychopathy construct developed by Robert D. Hare. However, these attempts did not result in a definitive solution. Factor analyses have shown that several solutions of latent traits, from one to five factors, can be extracted from the variance of the rated items of psychopathy (Hare & Neumann, 2006). We conducted the Exploratory Factor Analysis on 406 PCL-R pro-
tocols administered in penitentiary facilities in Serbia. The results of the analysis suggest that the optimal solution for the description of the PCL-R items is a five-factor structure. It is similar to the common four factor model proposed by Hare and Neumann (2006; 2009; 2010) in three factors that can be labeled Affective, Interpersonal and Antisocial features. However, the trait that depicts an erratic, irresponsible lifestyle based on impulsivity and the lack of long-term goals is divided into two components. One refers to a personality trait that describes low impulse control and recklessness, while the other is much more related to a specific behavioral style marked by irresponsibility, absence of goals and a tendency to live at the expense of others. This solution is quite similar to the results of early factor analysis of the PCL scale (Hare, 1980). There is a slight difference compared to the structure obtained by Hare: it seems that components extracted from the present research are more distinctive in a manner that one is closer to a personality trait (impulsivity), while the other describes a specific behavioral lifestyle.

The relations between the five factors and relevant exterior criteria are investigated. The self-reported Erratic lifestyle is regressed onto the five factors in the first regression model. The result of this analysis has shown that a lifestyle trait is explained by rated Antisocial and Impulsivity psychopathic features. This finding confirms that there is a satisfactory congruence between behavioral psychopathic traits, measured by two different methods (Kujačić et al., 2015). However, the Lifestyle trait extracted from psychopathy ratings cannot independently predict self-reported Erratic lifestyle. This result means that the self-report scale of Erratic lifestyle (Williams et al., 2007) primarily measures a lack of impulse control. Earlier research that investigated the relation between psychopathy and personality traits came to a similar conclusion. Erratic lifestyle correlates positively with traits that measure impulsiveness (Ray, Poythress, Weir, & Rickelm, 2009) and negatively with traits that operationalize functional impulse control and an ability to gratify reinforcement (Mededović, 2011; Seibert, Miller, Few, Zeichner, & Lynam, 2011).

A similar pattern of relations is present in a regression model where psychopathy traits were set as the predictors of the criminal recidivism. Antisocial characteristics and Impulsivity have an independent contribution to the prediction, and they are joined by Interpersonal psychopathic features in this regression function. This result confirms many previous findings that Factor 2 of the PCL-R is a reliable predictor of stable criminal behavior, with the Antisocial trait as a key predictor (Leistico et al., 2008). However, there are two interesting findings from this regression model. The first one is that Lifestyle features did not predict recidivism, which implicates that irresponsibility and a lack of planning do not have to be necessarily related to criminal behavior. The second finding refers to the role of the Interpersonal factor in the prediction: it disconfirms earlier data that suggested the exclusive role of Antisocial features in the prediction of recidivism (Walters et al., 2008). This result leads to a conclusion that core psychopathy traits can result in criminal activity, at least under some conditions.
Finally, psychopathy traits can predict a disposition towards psychotic-like experiences, although to a smaller extent than the two previous criteria. The structure of the regression function is different when Disintegration is set as a criterion variable: it is predicted positively by Impulsivity and Lifestyle traits and negatively by the Interpersonal factor. Schizotypal characteristics are predicted by a higher scores on both impulsiveness and irresponsibility traits, and a lack of manipulation tactics. This is a full replication of earlier findings that schizotypy positively correlates with low impulse control and lack of ability for planning, but its relation with deceptiveness and exploitation of others are negative (Ragsdale et al., 2013a, 2013b). This implicates that the ability to con and manipulate others is based on adequate psychological functioning and a low expression of schizotypal experiences. These results show that at least some of the psychopathic traits can be associated with adequate psychological functioning. This finding is also in line with the data related to successive psychopathy (Hall & Benning, 2006), especially with the results that identify the Interpersonal factor as an indicator of adaptive psychological and behavioral functioning (Caldwell, 2011; Salekin, Neumann, Leistico, & Zalot, 2004; Snowden & Gray, 2011; Vitacco, Neumann, & Wodushek, 2008).

Most of the researchers describe psychopathy with two (Harpur et al., 1989), three (Cooke & Michie, 2001) or four factors (Hare, 2003). Despite the fact that the five-factor solution was obtained in some studies (Hare, 1980) an objection might be put forward, that the extraction of five latent components is a result of “overfactorization” (Neumann, Kosson, & Salekin, 2007). This is why we offer three findings that suggest that Impulsivity and Lifestyle may present “real” psychological constructs, in terms of Momirović (1998): 1) the correlation between them is quite low ($r = .27$); 2) these two traits have different relations to external constructs – Impulsivity is related to two criterion measures in the regression functions, but Lifestyle is not, while in explanation of Disintegration both traits have an independent contribution to the prediction which means that they are not redundant in explaining the variance of schizotypy, and 3) models ranging from one to five factors are tested via structural equation modeling (SEM) and all fit indices confirm that the five-factor model is in best accordance with empirical data. These results suggest that a five-factor solution is a valid one, at least in our data, where it has advantages above all the other structures described in literature.

**The conceptual status of the five extracted factors**

From the previous part of the discussion, we could conclude that the five factors could be the optimal structure needed to understand a latent space of the PCL-R items. However, this might not be the case. Analyzing the content of extracted factors a similarity emerged between the three obtained traits (Interpersonal, Affective and Impulsivity) and three-factor solutions of psychopathy traits described by Cooke and Michie (2001), Benning et al. (2003) and Patrick et al. (2009). All of the previous models imply that traits describing manipulation/ex-
Proliferation, callous/shallow affect and disinhibition/impulsivity are core personality traits, while certain behavioral patterns, like antisocial behavior, can represent the consequences of these psychopathic traits. This is why we followed the logic of Cooke et al. (2004) and formulated a second five-factor model where three personal psychopathic attributes were set as a source of causal influence onto behavioral outcomes: Lifestyle and Antisocial features. SEM analysis clearly singled out this model as the one with the best fit to empirical data. In fact, according to some fit indices (e.g. CFI) only this model has a satisfactory concordance with the empirical data. This result supports the findings of previously stated authors that these three traits represent core psychopathic features.

It is important to analyze more closely the influences of three psychopathic traits on behavioral patterns. In fact, only three pathways reached statistical significance: Impulsivity influences both Lifestyle and Antisocial features while Affective characteristics can lead to the irresponsible and parasitic lifestyle. The influence of impulsiveness on lifestyle characterized by a lack of goals, and antisocial behavior, is expected. A large number of previous research confirmed that impulsivity is related to various patterns of maladaptive behavior, including externalizing problems (Carlson, Pritchard, & Dominelli, 2013) and stable patterns of delinquency (Le Couff & Toupin, 2009). The relation between affective shallowness and irresponsible lifestyle is less clear. However, Affective and Lifestyle factors do correlate, both in rating (Hare & Neumann, 2009) and self-report data (Williams et al., 2007). A lack of guilt, fear and empathy with others apparently can lead to a development of a parasitic, careless and irresponsible lifestyle.

Our results have shown that Impulsivity can be the strongest source of maladaptive behavior among psychopathic traits. However, data from the present research also suggest that a lack of impulse control does not need to be related to other psychopathy traits necessarily. This is especially true for the Interpersonal trait that is orthogonal to Impulsivity, while the Affective trait has a low correlation with it. This is in accordance with the empirical results that revealed orthogonality between Fearless Dominance and Self-centered Impulsivity in the Psychopathic Personality Inventory (Marcus et al., 2013). This finding can be related to the theoretical view that psychopathy is not a syndrome of traits, but rather a compound of characteristics that can, but do not need to emerge together (Lilienfeld, 2013), because they originate from different etiological sources (Fowles & Dindo, 2006).

Furthermore, other empirical research has shown that even impulsiveness is not unconditionally related to maladaptive behavior: the influence of this trait on antisocial and criminal behavior is dependent on environmental conditions. Impulsiveness results in deviant behavior and delinquency only in families with cold emotional and social relationships (Chen & Jacobson, 2013), poorer neighborhoods (Farrington, 1995); it is related to the school context (Eklund & Fritzell, 2014) and exposure to violence (Low & Espelage, 2014). All of this data suggests that antisocial behavior does not necessarily need to be related to psychopathic traits, which is the position of most of the researchers who support the three-
factor model of psychopathy (Cooke et al., 2004). This is especially true for Affective and Interpersonal traits, which had no influence on Antisocial behavior in our data. In fact, previous research uncovered relations of both Interpersonal and Affective traits with functional and adaptive patterns of psychological functioning and behavior (Burt, 2004; Hoffman, Korte, & Suvak, 2009; Lilienfeld et al., 2012). Our results on the negative relation between Interpersonal features of psychopathy and schizotypy is in line with these studies. Altogether, these findings suggest that psychopathic traits can have very different behavioral trajectories and that some of them can lead to successful adaptation (Boddy, Ladyshewsky, & Galvin, 2010), although it is still based on immoral and deceitful behavior (Stevens, Dueling, & Armenakis, 2012).

**Concluding remarks**

The debate between the authors that propose three and four factors as core psychopathic traits is the most important one when it comes to the phenotypic expression of psychopathy. In the present research, five factors are extracted from PCL-R items. However, three of them are very similar to the traits proposed by other authors that advocate the three-factor model. They can be interpreted as personal dispositions depicting callousness, manipulation and impulsivity. Two other factors can be viewed as behavioral manifestations of these traits. When a model that comprises these relations among the traits was tested, it showed the best fit with the empirical data. We believe that the foundation of three core psychopathic traits in this data supports the three-factor conceptions of psychopathy. The consequence of this is that antisocial behavior and parasitic/irresponsible lifestyle are one of many possible behavioral consequences of core psychopathic traits. Their main generator is Impulsivity, but impulsiveness can produce deviant and antisocial behavior only in certain conditions. In other circumstances impulsivity does not have to be a maladaptive disposition.

Furthermore, there is additional data in the present research that supports the conception of “successful psychopathy”. Some of the core psychopathy traits are not highly correlated which means that they may emerge together, but not necessarily. This particularly refers to Interpersonal and Impulsivity traits in the present data. Experts claim that the main characteristic of successful psychopaths is elevated scores on the personality dimension of Conscientiousness (Mullins-Sweatt, Glover, Derefinko, Miller, & Widiger, 2010), which means that they are not impulsive, because impulsivity lies on the negative pole of the Conscientiousness trait (Marcus, Fulton, & Edens, 2013). This suggests that the Interpersonal features of psychopathy could have the highest potential for adaptive behaviors: this factor is not only orthogonal with Impulsivity; regression analysis has shown that it is associated with stable psychological functioning described by a lack of psychotic-like experiences. This result is in accordance with previous findings that
offenders with elevated scores on the Interpersonal trait have the greatest benefit from the psychological treatment (Caldwell, 2011).

Determining if behavioral styles like irresponsible and antisocial are core psychopathic features, or their consequences, cannot be entirely solved by empirical data. This problem has its theoretical aspects and it depends on the conceptual views of the researcher. However, when it comes to empirical research, a cross-sectional design is not the ideal way to test the hypothesis on core traits and behavioral consequences. A more adequate design is certainly a longitudinal one, where the influence of important environmental moderators on psychopathic traits can be captured. This type of research, when it comes to psychopathy, is still in its infancy, but longitudinal data on psychopathy will accumulate, perhaps even in the near future. On the other hand, this line of research also extends to other behavioral manifestations of psychopathy, not only to maladaptive ones. The rapid development of self-report measurements of psychopathy has already widened the field of psychopathy onto the general population as well, allowing the exploration of the influence that psychopathic traits can have on the successful adaptation and adequate functioning of individuals. This trend of research is likely to intensify in the future.

Extracting five factors from the PCL-R items could have some implications on the practice of psychopathy assessment in the practical context. Calculating the scores of five, instead of four traits could provide more detailed information about the psychopathy, leading to more successful risk prediction. However, a caution is advised when the practical implications of current findings are considered. Five-factor solution is not frequently obtained from the PCL-R items and it need to be further validated and replicated in order to be used in the practical work of psychologists.

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SA KOJIM BROJEM CRTA SE MOŽE OPTIMALNO OPISATI PSIHOPATIJA?

Jedan od instrumenata koji se nejčešće koristi u proceni psiho-
patije je Hareova ček-lista (PCL-R) koja predstavlja rejting metod procene i operacionalizovana je preko dvadeset indikatora. Iako je instrument u upotrebi već nekoliko decenija, podaci o latentnoj strukturi ovih dvadeset indikatora psiho-patije nisu jednoznačni. U literaturi je opisano nekoliko empirijski deriviranih struktura PCL-R-a: jednofaktorski model koji operacionalizuje psihopatiju kao unitarni, jednodimezionalni konstruk; dvoфaktorski koji razli-
kuje endogene psihopatske karakteristike ličnosti i bihejvioralne obrasce ispoljavanja psihopatije; troфaktorski model u kome su kao sržne psihopatske crte postavljene manipulativni interpersonalni stil, emocionalna površnost i impulsivnost; četvoro-faktorski model koji pored prethodno navedenih crta u sebi inkorporira i antisocijalno ponašanje individua.

Podaci dobijeni u prethodnom istraživanju o latentnoj strukturi psihopatije merene preko PCL-R-a u Srbiji nisu podržali ni jedan od prethodno opisanih modela. Za potrebe ovog rada prikupljeni su i analizirani podaci sa svih PCL-R protokola administriranih u Srbiji do sada. U pitanju su podaci dobijeni od 406 osuđenih lica (prosečni uzrast 34 godine, SD = 9.98) koja su kaznu izdržavala u četiri kazneno-popravne institucije u Srbiji. Pored podataka sa PCL-R skale, njima su administrirane i mere samoprocenjene psi-

Podaci dobijeni u prethodnom istraživanju o latentnoj strukturi

Rezultati eksploratorne faktorske analize pokazali su da varira-
nje opsraviranih indikatora psihopatije najoptimalnije opisuje pet faktora. Ključna distinkcija u odnosu na četvorofaktorski Hareov

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Resul
strukture PCL-R-a, već i drugih instrumenata za ispitivanje psihopatije. Po trofaktorskom modelu manipulativne tendencije, afektivitet i impulsivnost su sržne, endogene psihopatske crte ličnosti dok antisocijalne tendencije (i određeni aspekti životnog stila u ovom istraživanju) mogu predstavljati neke od bihevioralnih manifestacija sržnih psihopatskih dispozicija.

**Ključne reči:** psihopatija, PCL-R, sržne psihopatske crte, strukturnalni modeli