Construct Validity of a Two-Factor Model of Psychopathy

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There is currently limited evidence for the two-factor structure of Psychopathy. The aim was to provide evidence for the construct validity of Primary and Secondary Psychopathy. Batteries including the Five Factor Model, the Hogan Development Survey, and Narcissism, Machiavellianism, Empathy, and Aggression, were administered to 241 undergraduate psychology students. Confirmatory factor analysis indicated that a two component structure fitted the data reasonably well (chi-square = 1.939, CFI = .799, RMSEA = .063). The strongest markers of Primary Psychopathy were Agreeableness, Empathy, and the HDS Bold and HDS Colourful subscales, while the strongest markers of Secondary Psychopathy were Narcissism, Conscientiousness, and HDS Excitable. It was concluded that preliminary evidence for the two-factor model of Psychopathy had been gained.

Keywords: Construct Validity; Levenson Self-Report Psychopathy Scale; Five-Factor Model; Hogan Development Survey

Introduction

The construct of Psychopathy has been of interest to psychologists for some time (Lee & Salekin, 2010). On the basis of clinical observation, Cleckley (1955) posited a clinical profile of the psychopathic personality that included as its key features inadequately motivated antisocial behaviour, a lack of remorse or shame, and a general poverty in major affective reactions. High levels of the trait have been associated with violence, criminal recidivism, and antisocial behaviour in both forensic and general populations (Flores-Mendoza, Alvarenga, Herrero, & Abad, 2008; Freidenfelt & Klinteberg, 2007; Vitacco, Neumann, & Jackson, 2005). The literature on the measurement of Psychopathy indicates disagreement over the construct’s structure, with anywhere from two to eight separate factors proposed (Forth, Brown, Hart, & Hare, 1996; Lilienfeld & Andrews, 1996; Vitacco, Neumann, & Jackson, 2005; Williams, Paulhus, & Hare, 2007). A two-factor model was proposed by Karpman (1948), which has been empirically demonstrated in the Psychopathy Checklist (PCL-R; Hart & Hare, 1989; Templeman & Wong, 1994). The first factor was labelled Primary Psychopathy, which consists of callous, selfish and manipulative personal attitudes. Secondary Psychopathy is characterised by high impulsivity and emotional instability, coupled with a self-defeating lifestyle. Both factors of Psychopathy are negatively related to Agreeableness from the Five Factor Model (Lyam & Derefnko, 2006) and Empathy (Andrew, Cooke, & Muncer, 2008; Munro, Bore, & Powis, 2005; Wastell & Booth, 2003). They are also positively correlated with Agreeableness, while Secondary Psychopathy was related to boredom susceptibility. Lynam, Whiteside and Jones (1999) investigated the relationships of Psychopathy with the Five Factor Model. Primary Psychopathy was found to have a negative correlation with Agreeableness, while Secondary Psychopathy was negatively correlated with Agreeableness and also with Conscientiousness, but positively with Neuroticism. These results suggest that the two factors of Psychopathy should have different correlates.

Psychopathy has also demonstrated relationships with the DSM-IV defined Personality Disorders in forensic populations (Blackburn & Coid, 1998; Decuyper, De Fruyt, & Buschman, 2008; Hart & Hare, 1996; Ross, Bye, Wrobel & Horton, 2008). However, the research used clinical tools, which are designed to diagnose people with significant deficits in psychological functioning. The Hogan Development Survey (HDS) was designed for organisational contexts, to identify the presence of sub-clinical personality traits reflective of the Axis II disorders. It consists of eleven scales mapping onto the DSM-IV defined Personality Disorders, the names of which can be found in Table 1. Research indicates that Primary Psychopathy is associated with Narcissistic and Histrionic Personality Disorders.
The uncertainty in the larger project examining the construct validity of the Dark fact, the results reported in the current study were a part of a component of the Dark Triad (Paulhus & Williams, 2002), which consists of Narcissism, Machiavellianism, and Psychopathy. In contrast, Narcissism was first assumed to be related to both Primary and Secondary Psychopathy (Lee & Ashton, 2005). However, reanalysis has been submitted to numerous reliability and validity examinations, all indicating its similarity to the NEO PI-R (Goldberg et al., 2006).

The Narcissism-Aloofness-Confidence-Empathy (NACE) scale. A 100-item four-point Likert scale ranging from A = definitely true to D = definitely false originally designed to discriminate among potential medical students, the NACE scale measures Narcissism, Aloofness, Confidence and Empathy. The 48 items in the Narcissism and Empathy subscales were used.
An example item is “I am quite affectionate towards people”. The validity of the four factor structure is supported by extensive replication, as is the Cronbach’s alpha for all four scales, which has been found to range between .78 and .84 (Munro, Bore, & Powis, 2005).

The MACH-IV. A 20-item scale designed to measure Machiavellian orientation; participants are required to respond using a 5-point Likert scale ranging from “strong disagreement” to “strong agreement” (Christie & Geis, 1970). An example of an item from this scale is “It is wise to flatter important people”. The validity of the scale (Ray, 1982, 1983).

Research findings indicate weak to acceptable reliability and validity of the scale (Ray, 1982, 1983).

The Hogan Development Survey (HDS). The HDS is a commercially published and highly respected 154-item scale, used extensively in organisational psychology research to measure personality disorders. The survey is scored for eleven scales, each consisting of fourteen items (Furnham & Crump, 2005; Hogan & Hogan, 2001). The names of each scale are as follows: Excitable, Sceptical, Cautious, Reserved, Leisurely, Bold, Mischievous, Colourful, Imaginative, Diligent, and Dutiful. A description of each scale can be found in Table 1. Respondents are requested to “agree” or “disagree” with the items. The item data from this scale was not available to us for the calculation of reliability coefficients.

The Buss and Perry Aggression Questionnaire. A 29-item scale endorsed by participants on a seven-point Likert scale ranging from “extremely uncharacteristic of me” to “extremely characteristic of me”. An example of an item is “It is wise to flatter important people”.

Descriptive statistics for the Five Factor Model can be found in Table 2. Including the alpha reliability for each scale. Participants who completed version A of the questionnaire were compared to those that completed version B to check for any order effects. No fatigue effects were detected for any of the scales in Table 2. Alpha coefficients indicated acceptable reliability for each of the scales. The sample mean for each scale was compared to the norm mean where available, and indicated that our sample was significantly different from the norm values for all scales except Primary Psychopathy, and Physical Aggression for males. Further inspection of the differences between the current study and the normative sample suggest a clinically important discrepancy for Machiavellianism, with our sample being substantially less Machiavellian.

Descriptive statistics for the Five Factor Model can be found in Table 3. No fatigue effects were detected for any of the Big Five domains. Alpha reliabilities for the domains were all found to be in the acceptable range.

Descriptive statistics for the Hogan Development Survey can be found in Table 4. No fatigue effects were detected for any of the subscales. Table 4 presents norms for the HDS as percentiles, indicating how the present sample compares to the Australian norms for this measure. The 50th percentile corresponds to the mean. As can be seen in Table 4, a substantial difference between the sample percentile score and the 50th percentile exists for the five first scales of the HDS. The sample mean for Excitable, Sceptical, Cautious, Reserved and Leisurely scales is, in each instance, substantially higher.

Descriptive statistics for Psychopathy, Aggression, Machiavellianism, Narcissism and Empathy can be found in Table 2, including the alpha reliability for each scale. Participants who completed version A of the questionnaire were compared to those that completed version B to check for any order effects. No fatigue effects were detected for any of the scales in Table 2. Alpha coefficients indicated acceptable reliability for each of the scales. The sample mean for each scale was compared to the norm mean where available, and indicated that our sample was significantly different from the norm values for all scales except Primary Psychopathy, and Physical Aggression for males. Further inspection of the differences between the current study and the normative sample suggest a clinically important discrepancy for Machiavellianism, with our sample being substantially less Machiavellian.

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Table 2. Descriptive statistics for psychopathy, aggression, machiavellianism, narcissism and empathy.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>SD</th>
<th>Alpha</th>
<th>Norm Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSRP-Primary P</td>
<td>29.95</td>
<td>7.42</td>
<td>.86</td>
<td>29.13</td>
</tr>
<tr>
<td>LSRP-Secondary P</td>
<td>20.88</td>
<td>4.33</td>
<td>.70</td>
<td>19.32</td>
</tr>
<tr>
<td>Total Psychopathy</td>
<td>50.84</td>
<td>9.99</td>
<td>.86</td>
<td>48.45</td>
</tr>
<tr>
<td>MACH-IV</td>
<td>52.42</td>
<td>8.55</td>
<td>.73</td>
<td>68.73</td>
</tr>
<tr>
<td>NACE-Narcissism</td>
<td>57.24</td>
<td>9.53</td>
<td>.86</td>
<td>53.00</td>
</tr>
<tr>
<td>NACE-Emathy</td>
<td>71.56</td>
<td>8.20</td>
<td>.84</td>
<td>74.00</td>
</tr>
<tr>
<td>Aggression</td>
<td>85.79</td>
<td>28.41</td>
<td>.93</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Notes: "p < .01 sample mean compared to norm, LSRP-Primary P = Levenson Self-Report Primary Psychopathy’ LSRP-Secondary P = Levenson Self-Report Secondary Psychopathy; MACH-IV = Machiavellianism Four Scale; NACE-Narcissism = the Narcissism subscale of the Narcissism-Aloofness-Confidence- Empathy scale; NACE-Emathy = the Empathy subscale of the Narcissism- Aloofness-Confidence-Empathy scale.

Table 3. Descriptive statistics for the five-factor model.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>SD</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>145.61</td>
<td>26.52</td>
<td>.96</td>
</tr>
<tr>
<td>Extraversion</td>
<td>168.30</td>
<td>19.35</td>
<td>.93</td>
</tr>
<tr>
<td>Openness</td>
<td>173.79</td>
<td>16.45</td>
<td>.89</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>176.35</td>
<td>17.71</td>
<td>.92</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>169.15</td>
<td>18.79</td>
<td>.92</td>
</tr>
</tbody>
</table>
gested modifying the model to include correlated errors. How-
residual covariance matrix and the modification indices sug-
proximation (RMSEA) of 0.06. Inspection of the standardised
ervative fit index (CFI) of .80, and a root mean square error of ap-
approach used by Lynam, Whiteside and Jones (1999) was
ever, as there was no theoretical justification for these changes,
prove the fit of the model,
577.702, with a normed chi-square ($\chi^2$) of 1.986, CFI = .80, RMSEA = 0.06. The regression weights for
the initial estimated model ranged from .19 to .66, with the
item-level data indicated approximately normal distributions,
ally upholding the CFA assumption of normality. Even
though missing data was replaced before statistical analysis was
conducted using the midpoint of each scale, it was more appro-
priate to use the expectation-maximisation (EM) algorithm re-
ported by Dempster, Laird, and Rubin (1977) for confirmatory
factor analysis. Missing value analysis indicated that EM esti-
ation was appropriate for replacing the missing data, $\chi^2(175)$ = 203.688, $p < .05$ (Little, 1988). Confirmatory factor analysis with maximum likelihood estimation was then conducted using AMOS 18.0.

In the first analysis, the two factors were allowed to correlate
and the model was estimated without any correlated errors. This
initial model provided a reasonable fit of the data, $\chi^2(298) = 577.702$, with a normed chi-square ($\chi^2$/df) of 1.939, a compara-
tive fit index (CFI) of .80, and a root mean square error of ap-
proximation (RMSEA) of 0.06. Inspection of the standardised residual covariance matrix and the modification indices sug-
gested modifying the model to include correlated errors. How-
ever, as there was no theoretical justification for these changes,
the approach used by Lynam, Whiteside and Jones (1999) was
used, in which they added 17 measurement error correlations to
the two-factor model provided a reasonable fit to the data,
and the model was estimated without any correlated errors. This
models, which improved the fit indices only in the case of Ly-
am et al. Despite the improvement in fit, there does not appear
to be a theoretical basis for expecting these correlated error
terms, which also impede the interpretation of the model. How-
however both concluded poor fit based on these results. Both previous studies introduced seventeen correlated error terms to their respective
models, which improved the fit indices only in the case of Ly-
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models, which improved the fit indices only in the case of Ly-

Conscientiousness, Agreeableness, HDS Excitable, HDS Bold,
Narcissism, and Empathy. In particular, Primary Psychopathy
was strongly and positively related to Narcissism, Empathy,
and the HDS Bold scale, corresponding to Antisocial persona-


dicates strong support for the
the study hypotheses. Confirmatory factor analysis indicated that
the two-factor model provided a reasonable fit to the data,
thereby supporting the two-component structure of Psychopa-

Correlations

The correlation between Primary and Secondary Psychopa-
8.67 2.47 65.97 *
Diligent 9.30 2.99 55.06
Colourful 7.04 2.92 45.44
Imaginative 6.87 2.79 64.77 *
Dutiful 8.67 2.47 65.97 *

Table 4.
Descriptive statistics for hogan development survey.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Percentile Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excitable</td>
<td>6.15</td>
<td>3.49</td>
<td>83.80</td>
</tr>
<tr>
<td>Sceptical</td>
<td>6.84</td>
<td>2.63</td>
<td>82.03</td>
</tr>
<tr>
<td>Cautious</td>
<td>6.35</td>
<td>3.14</td>
<td>81.22</td>
</tr>
<tr>
<td>Reserved</td>
<td>5.24</td>
<td>2.39</td>
<td>73.66</td>
</tr>
<tr>
<td>Leisurely</td>
<td>6.59</td>
<td>2.23</td>
<td>78.28</td>
</tr>
<tr>
<td>Bold</td>
<td>6.83</td>
<td>2.86</td>
<td>49.11</td>
</tr>
<tr>
<td>Mischievous</td>
<td>6.42</td>
<td>2.53</td>
<td>56.61</td>
</tr>
<tr>
<td>Colourful</td>
<td>7.04</td>
<td>2.92</td>
<td>45.44</td>
</tr>
<tr>
<td>Imaginative</td>
<td>6.87</td>
<td>2.79</td>
<td>64.77</td>
</tr>
<tr>
<td>Dutiful</td>
<td>8.67</td>
<td>2.47</td>
<td>65.97</td>
</tr>
</tbody>
</table>

Note: * $p < .05$.

Confirmatory Factor Analysis

As all participants in the current sample had completed the
LSRP scale, 241 cases were included in the confirmatory factor analyses. Inspection of skewness and kurtosis values on the
item-level data indicated approximately normal distributions,
and the model was estimated without any correlated errors. This

Correlations

The correlation between Primary and Secondary Psychopa-
was .40. The correlations between Primary and Secondary Psychopathy and their theoretically related constructs can be found in Table 5, along with the absolute difference between correlations, and the t-value for the significance of these differences. The personality variables that significantly distin-
guished between the two factors were Aggression, Neuroticism,

Examination of the results indicated strong support for the
study hypotheses. Confirmatory factor analysis indicated that
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Discussion

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Table 5.
Correlations between theoretically related constructs, primary, and se-
condary psychopathy scores.

<table>
<thead>
<tr>
<th></th>
<th>Psych</th>
<th>Psych</th>
<th>Difference</th>
<th>t (df = 230)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>−.61</td>
<td>.54**</td>
<td>.55</td>
<td>−9.40***</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>−.27**</td>
<td>−.69**</td>
<td>.42</td>
<td>7.82***</td>
</tr>
<tr>
<td>Excitable</td>
<td>.13**</td>
<td>.51**</td>
<td>.38</td>
<td>−6.09***</td>
</tr>
<tr>
<td>Narcissism</td>
<td>.71**</td>
<td>.36**</td>
<td>.35</td>
<td>6.68***</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.10</td>
<td>−.20**</td>
<td>.30</td>
<td>4.43***</td>
</tr>
<tr>
<td>Cautious</td>
<td>−.06</td>
<td>.24**</td>
<td>.30</td>
<td>−4.34***</td>
</tr>
<tr>
<td>Empathy</td>
<td>−.44**</td>
<td>−.17**</td>
<td>.27</td>
<td>−4.13***</td>
</tr>
<tr>
<td>Bold</td>
<td>.31**</td>
<td>.05</td>
<td>.26</td>
<td>3.79***</td>
</tr>
<tr>
<td>Total Aggression</td>
<td>.36**</td>
<td>.59**</td>
<td>.23</td>
<td>−3.91***</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>−.68**</td>
<td>−.48**</td>
<td>.20</td>
<td>−3.81***</td>
</tr>
<tr>
<td>Colourful</td>
<td>.25**</td>
<td>.05</td>
<td>.20</td>
<td>2.86***</td>
</tr>
<tr>
<td>Openness</td>
<td>−.29**</td>
<td>−.17**</td>
<td>.12</td>
<td>−1.73</td>
</tr>
<tr>
<td>Mischievous</td>
<td>.35**</td>
<td>.24**</td>
<td>.11</td>
<td>1.63</td>
</tr>
<tr>
<td>Reserved</td>
<td>.11</td>
<td>.21**</td>
<td>.10</td>
<td>−1.41</td>
</tr>
<tr>
<td>Leisurely</td>
<td>.10</td>
<td>.20**</td>
<td>.10</td>
<td>−1.41</td>
</tr>
<tr>
<td>Imaginative</td>
<td>.06</td>
<td>.15</td>
<td>.09</td>
<td>−1.26</td>
</tr>
<tr>
<td>Diligent</td>
<td>−.21**</td>
<td>−.30**</td>
<td>.09</td>
<td>1.31</td>
</tr>
<tr>
<td>Sceptical</td>
<td>.22**</td>
<td>.27**</td>
<td>.05</td>
<td>−0.72</td>
</tr>
<tr>
<td>Dutiful</td>
<td>−.07</td>
<td>−.11</td>
<td>.04</td>
<td>0.56</td>
</tr>
<tr>
<td>Machiavellianism</td>
<td>.63**</td>
<td>.61**</td>
<td>.02</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$.
two-component structure. As expected, both Primary and Secondary Psychopathy was negatively related to Agreeableness and Empathy, and positively with Aggression, Narcissism, and the Mischievous HDS subscale, corresponding to Antisocial personality traits (Hogan & Hogan, 2001). However, t-tests for the difference between dependent sample correlations indicated that all but Mischievous had significantly different relationships with the two factors. For example, Narcissism was positively correlated with both factors, but there was a difference in the magnitude of these correlations of .35, with Primary Psychopathy having a correlation with Narcissism of .71.

As expected, Primary Psychopathy was also related to the Bold and Colourful HDS scales, corresponding to Narcissistic and Histrionic traits (Hogan & Hogan, 2001). Secondary Psychopathy was not related to these scales. The comparatively stronger correlations with Narcissism and Empathy indicate that Primary Psychopathy can be defined by a sense of entitlement and attention seeking behaviours, coupled with a lack of consideration for the feelings of others. On the other hand, Secondary Psychopathy was negatively related to Conscientiousness, as well as positively related to Neuroticism, and to the Excitable and Sceptical HDS scales corresponding to Borderline and Paranoid personality traits (Hart & Hare, 1996; Lynam, Whiteside, & Jones, 1999). This indicates that Secondary Psychopathy may be characterised by impulsivity and emotional reactivity, including increased levels of paranoia. However, Primary Psychopathy was also related to Sceptical, and there was no significant difference between the correlations, indicating that Paranoid personality traits may be common to both constructs.

Contrary to expectations, Machiavellianism was related to both Primary and Secondary Psychopathy, with no significant difference between the correlations. This fails to replicate the results obtained by Wastell and Booth (2003). It is possible that Machiavellianism is a construct that is related to both components of Psychopathy, as was suggested by Lee and Ashton (2005). An alternative explanation could be the lower levels of Machiavellianism evident in the current sample in comparison to the normative sample. More investigation may be needed to determine the reason for the observed relationships.

Several limitations of the current study require mentioning. As previously discussed, Machiavellianism levels are significantly lower than the norms in the current sample, which may have impacted on our ability to differentiate between Primary and Secondary Psychopathy. A likely explanation for the lower Machiavellianism levels is the proportion of women in the current sample. Evidence indicates that both Machiavellianism and Psychopathy levels are lower in females (Christie & Geis, 1970; Williams, Paulhus, & Hare, 2007), though the average Psychopathy scores were not significantly different from norms in this case, making the gender proportion explanation unlikely for Machiavellianism.

Another limitation of the current study involves the fact that the current sample scored substantially higher than the Australian norm on the Excitable, Sceptical, Cautious, Reserved and Leisurely scales. An improbable explanation for these findings could be that the student sample had high levels of Borderline, Paranoid, Avoidant, Schizoid, and Passive-Aggressive traits. It is more likely that the HDS scale did not operate exactly as expected. Unfortunately the item-level data were not made available for comparison. Given that the majority of study participants were undergraduate psychology students, it is possible that the normative group of Australian managers was not an appropriate comparison population. The homogeneity of the sample may have also introduced a restriction of range issue. Although our hypotheses were supported, further research is required to clarify these issues.

The two-component model of Psychopathy may have application in forensic and clinical samples. The two-factor model has been derived from the “gold standard” psychopathy diagnostic tool, the Psychopathy Checklist Revised (PCL-R; Hare, 1985). Given the current results, which suggest a different personality profile for each construct, it is likely that this would also translate into behaviour, but further research is necessary to validate the model.

In conclusion, the findings of the current study appear to support Karpman’s (1948) two factor structure of Psychopathy, as well as the validity of the structure contained within the Levenson Self-Report Psychopathy Scale (Levenson, Kiehl, & Fitzpatrick, 1995). Preliminary evidence for the construct validity of Primary and Secondary Psychopathy has been obtained. It appears increasingly likely that there are two types of Psychopathy, one that taps into callous, manipulative and selfish interpersonal attitudes, and the other that reflects impulsivity and emotional instability.

Acknowledgements

Thanks go to Peter Berry Consultancy, who provided the Hogan Development Survey for use in this study. The assistance of Mrs. Paula Bridge in the data collection process is also recognised.

REFERENCES


