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Abstract

Background: Impulsivity is generally considered a core feature of psychopathy, however one problem with understanding the association between these constructs is that both are multifaceted. Existing research often treats one or both of these constructs as unidimensional with important information regarding the complex nature of the relationship being lost. To clarify this issue the present study employs a canonical correlation analysis (CCA) which allows for the comparison of two multifaceted measurement scales simultaneously.

Methods: Respondents (n=970) completed the Barratt Impulsiveness Scale (BIS-11) and the Psychopathic Personality Inventory (PPI). CCA was performed to explore the strength and nature of the association between impulse control and psychopathy.

Results: There was a large correlation (r =.57) between BIS-11 and PPI total scores. Further exploration using CCA showed that 70.2% of the variance was shared between the subscales, and three significant canonical functions emerged. These were found to be interpretable and suggest that impulsivity relates to the broader psychopathy domain in a complex fashion, and that non-planning impulsivity may be the primary trait which distinguishes between psychopathy subtypes.

Discussion: The findings support a complex multi-dimensional relationship between impulsivity and psychopathy. The simple impulsivity-psychopathy correlation has much less explanatory power than has a multivariate approach.

Keywords:

Impulsivity; Psychopathy; Individual Differences; Self-Control; Sensation Seeking; Self-Report Measurement; Canonical Correlation Analysis.

1. Introduction

Impulsivity or 'impulse control' is central to the study of personality. Impulse control is considered a core trait within most of the dominant theories of personality, and there are also numerous theories of impulsivity specifically. One of the key areas of personality theory where impulse control is discussed is within forensic or offending populations. There are substantial differences in definitions of impulsivity but one generally accepted definition is "a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individuals or to others" (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). This definition suggests the potentially pathological nature of the construct. This implies the likelihood of negative outcomes which may befall people with impulsive traits or those displaying impulsive behaviours.

Psychopathy has been a construct of interest since Cleckley's (1941) seminal work 'the Mask of Sanity' which he published in 1941 (Hare & McPherson, 1984). Since then, psychopathy has become one of the most widely researched personality constructs, especially in forensic populations. The distinctive features of psychopaths are egocentricity, deceitfulness, shallow emotions, lack of empathy, stimulation seeking, *impulsivity*, and a tendency to ignore or violate social conventions and rules (Hare, 2003). Alternative definitions of psychopathy have been put forth in the literature, but notably the role of impulsivity is consistently identified as a key facet of the construct. Hare (2003) regards impulsivity as "one of the hallmarks of psychopathy". Hart and Dempster (1997) stated that impulsivity is a cardinal feature of psychopathy and Blaszczynski, Steel and McConaghy (1997, p.85) furthered this notion in their claim that "impulsivity and psychopathy are one and the same thing". Psychopathy has even been conceptualised as purely an externalising/disinhibitory disorder (e.g. Patrick et al., 2005).

1.1 Relationship between impulse control and psychopathy

Despite the widely accepted association between impulsivity and psychopathy, a clear understanding of this relationship is hindered by the inconsistent definitions and the multifaceted nature of each construct. There is a debate in the literature over how many dimensions should constitute 'impulse control', however there is consensus that this is a multi-dimensional - not unidimensional - trait. The number of dimensions ranges from two (e.g. Dickman, 1991) to five (e.g. Lynam et al.). The most widely cited model of impulse control is Barratt's three factor model, measured by the self-report questionnaire the Barratt Impulsiveness Scale (BIS; Patton et al., 1995). The three subscales comprising the BIS are: Attentional, Motor, and Non-Planning Impulsiveness. Evenden (1999, p.358), following an extensive literature review, concluded that "even though almost all authors are in agreement that impulsivity is multifactorial, there is little agreement to what these factors are even within a single field of research such as human personality traits". Thus, impulse control is now regarded as a multi-dimensional construct which must include measurement of its sub-dimensions for accurate assessment (Patton, Stanford, & Barratt, 1995).

Similarly, most self-report measures of psychopathy use a two-factor structure (e.g. the Psychopathy Checklist-Revised comprises Factor 1: "selfish, callous and remorseless use of others", and Factor 2: "chronically unstable, antisocial and socially deviant lifestyle" [Hare, 1991]), however there is debate regarding the convergence of these factors. Another problem is that studies utilising the construct of psychopathy have generally worked with a unitary measure of the overall score, a now substantial body of literature suggests a multi-faceted conceptualisation is more appropriate (see Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003, for a review). Increasing evidence suggests that psychopathic personality, or

psychopathy (Lewis, 1974), is not a monolithic construct but is instead a constellation of several partially independent traits (Skeem, Polaschek, Patrick, & Lilienfeld, 2011, as cited in Berg 2015). This erroneous reliance on a unitary definition of psychopathy may help to explain some conflicting research findings, for example in the inconsistent relationships reported between impulsivity and psychopathy (e.g. Karpman, 1948; Woodworth & Porter, 2002). One explanation would be that the multiple dimensions of psychopathy bear differing relationships with impulsivity and related constructs. There is a small body of research comparing the two constructs but this issue of multi-dimensionality has not typically been taken into account.

The psychopathic personality inventory (PPI, Lilienfeld & Andrews, 1996) and its revision (PPI-R, Lilienfeld & Widows, 2005) represent a measure of psychopathy which considers its multifaceted nature. Recent studies have demonstrated that seven of the eight PPI content scales operate as indicators of two higher order, and largely orthogonal, factors, labelled Fearless Dominance (FD; Benning, Patrick, Blonigen, Hicks, & Iacono, 2005) and Self-Centered Impulsivity (SCI; Lilienfeld & Widows, 2005). A second benefit of the PPI and PPI-R over similar scales is that they exclude items which explicitly measure anti-sociality, meaning that they offer a 'purer' measure of psychopathy.

Several studies have confirmed that (a lack of) impulse control is a key feature in psychopathy (e.g., Blackburn & Coid, 1998; Gray & Hutchison, 1964; Vitacco & Rogers, 2001). Impulsivity entails rapid, spontaneous, ill-planned, excessive and potentially maladaptive behaviour (Enticott & Ogloff, 2011) and has been related to various offences (Patton, Stanford, & Barratt, 1995) and aggression (Halperin & Newcorn, 1998) as cited in de de Tribolet-Hardy, Vohs, Mokros, & Habermeyer (2014).

Some previous research has examined the relationship between the PPI and self-reported impulsivity. Ray, Poythress, Weir and Rickelm (2009) investigated the relationship between the FD and SCI subscales of the PPI-R and the UPPS impulsive behaviour scale (UPPS; Whiteside & Lyman, 2001) in a forensic sample. Results showed that all of the UPPS subscales were significantly associated with PPI-R total score. When this relationship was investigated for the subscales of the PPI-R, only the SCI was significantly associated with all of the UPPS scales; FD was strongly associated only with sensation seeking, weakly associated with (lack of) premeditation, unrelated to urgency, and negatively associated with (lack of) perseverance. The authors acknowledged some limitations of their study including its small sample size, and recommended that future research use alternative measures of impulsivity. The UPPS measures very specific subtypes of impulsivity such as sensation seeking which have been shown through meta-analysis to bear non-significant correlation with measures of 'general impulsivity', such as the Barratt Impulsiveness Scale (BIS-11; Patton, Stanford & Barratt, 1995; Cross, Copping & Campbell, 2011).

In a study among psychiatric inpatients, Edens and McDermott (2010) investigated the relationships between PPI-R total score, the SCI subscale, the FD subscale and impulsivity, as measured by the BIS-11, as well as a number of other criterion measures. They found that PPI-R and BIS-11 total scores were moderately correlated (r=.32, p<.001). A different pattern of correlations was evident however when the total BIS-11 score was compared with the two subscales. SCI was strongly and positively associated with impulsivity (r=.32, p<.001). FD was negatively, though not significantly, associated with impulsiveness (r=-.10, p>.05). Having found extensive cross-loading of the fearlessness content scale, the authors computed an alternative version of the FD scale (which they labelled FD_2) substituting for the full fearlessness content scale a subscale which loaded uniquely on FD. The negative correlation between FD_2 and impulsivity was significant, albeit small (r=-.23, p<.01).

Furthermore a test of these dependant correlations indicated these opposing associations were significantly different from each other ($t(194) = 6.86$, $p<.001$). The magnitude of this difference was even more pronounced when examining FD_2. Such findings are consistent with previous research and with theoretical conceptualisations of primary and secondary psychopathy.

One limitation of Eden and McDermott's study is that they only reported the total score for impulsivity. Investigation of the correlations between all of the subscales of both measures would likely have provided a clearer picture of the nature of the associations of psychopathy and impulsiveness constructs. Indeed, in a recent review Poythress and Hall (2010, p.120) concluded that "the blunt assertion that 'psychopaths are impulsive' is no longer defensible, and that future models of psychopathy need to consider more complex associations among the various manifestations of these two constructs".

The present study addresses this gap, expanding on previous research by exploring the relationship between psychopathy and impulsivity while taking into account the multi-faceted nature of each construct in a large non-offending sample. The primary hypothesis of this study is that the set of impulsivity variables and the set of psychopathy variables are related to each other.

2. Method

2.1 Participants

Participants were drawn from a University (student) population. In total, 1149 responses were returned, however due to missing data (where 1 or more questions were left unanswered) the final n = 970. Of the sample, 69.4% (n = 673) respondents were female. Ages of participants

ranged from 17 to 66 years (M = 22.2, SD = 6.42). The majority of respondents were Irish (88.6%). Two other nationalities comprised >1% of the total sample, these were British (2%) and American (1.9%).

2.2 Measures

2.2.1 Barratt Impulsiveness Scale, version 11 (BIS-11, Patton et al., 1995). The BIS-11 is a widely used and well-validated self-report measure of impulsivity. It consists of 30 items which form three distinct scales, namely: Attentional, Motor, and Non-planning Impulsiveness. Items were scored on a four-point Likert scale, with four indicating the most impulsive response. The higher the summed score from all responses, the higher the level of impulsivity. Eleven items were worded to indicate 'nonimpulsiveness' to avoid response sets such as acquiescence.

Internal consistency of the BIS-11 has generally been reported as good, often with Cronbach's alpha values greater than .8 (e.g. Spinella, 2007; Stanford et al., 2009; but see also von Diemen et al., 2007). Test-retest reliability is also consistently reported to be satisfactory (e.g. Fossati, Di Ceglie, Acquarini, & Barratt, 2001; Stanford et al., 2009).

2.2.2 Psychopathic Personality Inventory (PPI, Lilienfeld & Andrews, 1996). The PPI is a self-report measure of psychopathy which is suitable for use among general population samples, i.e. it is devoid of any items that measure anti-sociality. The PPI consists of 187 items which have been shown through factor analysis to form eight subscales, namely Social Potency, Fearlessness, Coldheartedness, Impulsive noncompliance, Blame Externalisation, Carefree Nonplanfulness, Stress Immunity, and Machiavellian Egocentricity. Items are

scored on a four-point Likert scale with higher total scores indicative of higher level of psychopathic traits present.

Lilienfeld and Andrews (1996) have reported high internal consistency for the PPI total score, ranging from .89 to .93. Internal consistency for the eight PPI subscales ranged from .70 to .90.

2.3 Procedure

The BIS and the PPI were compiled into one computer based survey using 'Survey Monkey', a web-based survey tool. The survey was distributed electronically to a University population via email. This study was conducted in accordance with the Psychological Society of Ireland Code of Ethics and was granted ethical approval from the Social Research Ethics Committee, X University. In the invitation email, the full aims of the study were outlined, and the voluntary nature of participation was highlighted. No remuneration or other form of incentive was offered for participation. Participants were made aware that they could stop completing the survey at any time and that their answers provided to then would be deleted. They were provided with contact details for the researchers should they have any queries.

2.4 Data analysis

Simple relationships between the scales were investigated using bivariate correlations. A canonical correlation analysis was performed to explore the strength and nature of the association between impulsivity and psychopathy. Preliminary analyses were conducted using SPSS version 18, the canonical correlation analysis was conducted with a Windows computer program written by the second author and can be made available on request.

The present study employed canonical correlation analysis techniques for numerous reasons. Canonical correlation provides a statistical analysis for research where each subject is measured on two sets of variables and the researcher wants to know if and how the two sets relate to each other (Tabachnick & Fidell, 1996). Much of the previous research interested in the relationship between impulsivity and psychopathy has used multiple regression. In multiple regression a set of predictor variables is related to a single criterion variable, in other words a total score for psychopathy is related to all of the sub-scales of an impulsivity measure, or vice-versa. Canonical correlation is similar in theory to multiple regression, however in Canonical correlation there are several variables on both sides of the equation. Sets of variables are combined to produce, for each side, a predicted value that has the highest correlation with the predicted value on the other side. The combination of variables on each side can be thought of as a dimension that relates the variables on one side to the variables on the other (Tabachnick & Fidell, 1996). As psychopathy and impulsivity are multivariate in nature, an analytic approach that allows for multiple independent variables is preferred. Use of canonical correlation for this study enabled a more in-depth analysis of the relationship between impulsivity and psychopathy than would have been possible with univariate statistical procedures such as multiple regression. To the authors' knowledge, this study is the first to investigate the relationship between psychopathy and impulsivity using a canonical variate analysis. For more information on this technique, see (Sherry & Henson, 2005).

3. Results

The simple relationships between the scales of the BIS and PPI were investigated using bivariate correlations (table 1). There was a large significant correlation between BIS and PPI

total scores (r = .57, p < .01). The majority of the correlations between the subscales (shown within dashed lines table 1) of the BIS and PPI were also significant, and of a medium to large effect size.

A canonical correlation analysis was conducted to evaluate the multivariate shared relationship between the subscales of the PPI and the BIS. The three subscales of the BIS were entered as the dependent variables and the eight variables of the PPI were entered as the canonical variables.

The analysis yielded three functions with squared canonical correlations (R_c^2) of .757, .432, and .377 respectively. The full model across all functions was statistically significant (Wilks's λ = .298, F[24, 263] = 56.74, p < .001). Because Wilks's λ represents the variance unexplained by the model, $1 - \lambda$ yields the full model effect size in an r^2 metric. Thus, for the set of three canonical functions, the r^2 type effect size was .702 which indicates that the full model explained a substantial portion, 70.2%, of the variance shared between the variable sets. It is important to note that any function other than the 1st is based upon the residual variance left after that of the preceding functions is removed. Thus interpretation of these functions needs to be carried out with caution.

A dimension reduction analysis was used to test the hierarchal arrangement of functions for statistical significance. As noted, the full model (Functions 1-3) was statistically significant. Functions 2 to 3 and 3 to 3 were also statistically significant, F(14, 181) = 25.54, p < .001, and F(6, 90) = 25.11, p < .001, respectively. Given the R_c^2 effects for each function, all three of the functions were considered statistically meaningful in this analysis. Table 2 presents the Eigenvalues and Wilk's Lambda values for the Functions 1, 2 and 3, and Table 3 presents the standardised canonical function coefficients and structure coefficients for the three functions, as well as the squared structure coefficients and the communalities (h^2) across the three

functions for each variable. It is important in CCA that these functions manifest a clear and unambiguous structure that can be theoretically supported because of the residual nature of the variance that they are based upon.

Looking at the Function 1 coefficients, all three criterion variables (Attentional Impulsiveness, Motor Impulsiveness, and Non-Planning Impulsiveness) were all primarily relevant (all $r_s > .7$). This conclusion was supported by the squared structure coefficients. While Non-Planning Impulsiveness had a large canonical function coefficient, this value was small for Attentional and Motor Impulsiveness. This may be due to the multicollinearity that these two variables exhibited with the other criterion variables. Lastly, these three variables had structure coefficients with the same sign, indicating that they were all positively related, as expected.

Regarding the predictor variable set in Function 1, Non-Planfulness and Impulsive Non-Compliance were the primary contributors to the predictor synthetic variable, with secondary contribution by Machiavellian Egocentricity and Fearlessness. Again, all of the predictor variables were positively related. These results support the relationship between PPI and BIS variables where one might expect the impulse control related subscales of the PPI to correlate most highly with all of the subscales of the BIS. Important to note is that the amount of shared variance between the set of PPI scales and the BIS scales was high ($R_c^2 = 75.7\%$).

Moving to Function 2, the structure coefficients suggest modest relationships between the variables. Of the criterion variables only Non-Planning Impulsiveness had a structure coefficient greater than .4, and of the predictor variables Fearlessness, Impulsive Non-Compliance, Non-Planfulness, and Social Potency had structure coefficients greater than this value. Fearlessness, Impulsive Non-Compliance, and Social Potency were all inversely

related on this function. Non-Planning Impulsiveness from the BIS, and the two impulse control related scales and two other PPI scales, all showed similar shared variances.

Looking at Function 3, Motor- and Attentional Impulsiveness had the greatest structure coefficients of the criterion variables, with Attentional Impulsiveness showing an inverse relationship to this function. Of the predictor variables, Stress Immunity and Social Potency were the primary contributors (with $r_s^2 > 45\%$), while Blame Externalisation made a secondary contribution, and was the only variable showing an inverse relationship to the function.

4. Discussion

In the present study over 70% of the variance in psychopathy and impulsivity scores was shared, consistent with the body of research supporting a strong relationship between psychopathy and deficient impulse control (Hare, 1991). Blaszczynski, Steel, and McConaghy (1997, p.85) asserted that "impulsivity and psychopathy are one and the same thing"; while this extreme view may not be defensible, the current results suggest that generalised measures of psychopathy, such as the PPI, may be in fact be largely contaminated by impulsivity variance. It has been suggested that the power of some psychopathy measures, specifically the PCL-R to predict violence/criminality may be due largely to their tapping into impulse control (Skeem et al., 2011).

More recently it has been recognised that the relationship between psychopathy and impulse control is more complex. The current study addressed the need for an investigation into the complex relationship between these two constructs (e.g. Poythress & Hall, 2010) by going

beyond unitary measures using a multivariate technique; with the results supporting a more complex relationship between these two constructs.

The results supported three unique patterns of relationship between the PPI and BIS subscales. Function 1 showed that about three quarters of the variance in psychopathy scores can be accounted for by impulsiveness. This reflects other research suggesting that psychopathy scales may largely be measuring impulsive traits (Blaszczynski, Steel & McConaghy, 1997).

Function 2 is defined by non-planning impulsiveness (i.e. a present orientation), fearless dominance, (i.e. takes physical risks), impulsive nonconformity (i.e. reckless, rebellious), Non-planning impulsivity (i.e. lacks forethought) and Social Potency (i.e. able to manipulate and influence others). This person lives in the now, and is similar to conceptualisations of the Impulsive Antisociality subtype of the PPI or Secondary Psychopathy.

Function 3 describes a person who has the ability to plan ahead (low in Non-Planning impulsiveness) but can think and act quickly, where this may be beneficial (high in Attentional and Motor Impulsiveness). This person doesn't experience anxiety in tense situations, is able to influence others, and tend to blame their mistakes on others (Social Potency, Blame Externalisation, Stress Immunity). This is closer to the description of the Fearless Dominance subtype of the PPI or the Primary psychopath.

Overall these results add weight to previous arguments that the shared spaced between psychopathy and impulsivity is best understood as multidimensional. In this case three dimensions were uncovered, however this number is an artefact of the BIS having three scales, i.e. there were three dependent variables in the analysis. Accepting the division of Fearless Dominance/Primary and Impulsive Antisociality/Secondary Psychopathy, these results suggest that 'planning impulsivity' may be the key to distinguishing between the two

types. These sub-divisions also support the results of Ray, Poythress, Weir and Rickelm (2009) and Edens and McDermott (2010), who found different patterns of relationship, while using other statistical techniques. This research has addressed the claim by Ray (2009) that a clearer understanding of the precise relationship between impulsivity and psychopathy will be useful in identifying psychopathy subtypes.

There are some limitations to the CCA technique. Some authors (Marascuilo and Levin, 1983; Tabachnick and Fidell, 1996) state that canonical correlation is best considered a descriptive technique or a screening procedure rather than a hypothesis-testing procedure. We concur with this view and emphasis that the analysis that is presented here is descriptive. However, it gives us a picture of how the BIS and the PPI scales relate. The use of CCA in this study had a number of advantages. Most of the previous literature in this area has used the more common univariate (one dependent variable) methods such as multiple regression and ANOVA which mean that the total score of one scale is compared with the multiple facets of the second scale individually. The CCA is an analytic method which allows for comparison of all of the subscales of two measures at once, thus allowing for the clearest picture of the relationship between the multiple facets of psychopathy and impulsivity offered thus far. In this instance, use of this procedure was appropriate given that use of CCA enabled us to account for fully 70% of the shared variance between the measures. However, future research seeking to replicate and refine these findings might make use of more familiar hypothesis-driven, analytic strategies drawn from Structural Equation Modelling. This would allow for a more detailed examination of a higher factorial dimensionality in impulse control measures.

These findings apply to one particular broad-based model of psychopathy as operationalised through the PPI. There are of course other models such as those exemplified in the PCL-R (Hare, 2003) although our purpose was to explore a conception of psychopathy in the general

population. Equally, the BIS is not the only model of impulsivity and indeed the UPPS-P (Cyders et al., 2007) appears to have a better claim as a multifaceted tool. Nevertheless, the BIS is the most commonly used and accessible tool in impulsivity research ranging from normal contexts to forensic pathology. It would be useful to examine whether the picture that emerges from these analyses might be replicated using other assessment devices and models and might serve as a basis for future SEM modelling at both the measurement and structural levels of analysis.

4.1 Conclusion

The present findings support a complex multi-dimensional relationship between impulsivity and psychopathy, while at the same time supporting a multifaceted model of psychopathy. CCA was shown to be a useful technique for exploring multivariate shared relationship between these constructs.

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Table 1

Bivariate Correlations between BIS and PPI subscales and total scores

	1	**2**	**3**	**4**	5	6	7	8	9	10	11	12	13
1	1												
2	.769*	1											
3	.852*	.483*	1										
4	.851*	.485*	.568*	1									
5	.569*	.402*	.551*	.396*	1								
6	.185*	.024*	.316*	.034*	.686*	1							
7	.408*	.299*	.447*	.239*	.769*	.508*	1						
8	.058*	-.087*	.055*	.086*	.631*	.306*	.323*	1					
9	.516*	.396*	.517*	.334*	.790*	.483*	.661*	.338*	1				
10	.345*	.407*	.221*	.223*	.632*	.224*	.342*	.225*	.457*	1			
11	.661*	.442*	.487*	.673*	.728*	.277*	.444*	.485*	.561*	.455*	1		
12	-.010*	-.193*	.108*	-.057	.658*	.607*	.571*	.567*	.436*	.080^	.340*	1	
13	.459*	.429*	.380*	.302*	.842*	.423*	.514*	.506*	.580*	.660*	.635*	.326*	1

Notes. **1** = BIS Total; **2** = BIS Attentional; **3** = BIS Motor; **4** = BIS Non-planning; 5 = PPI Total; 6 = PPI Social Potency; 7 = PPI Fearless Dominance; 8 = PPI Coldheartedness; 9 = PPI Impulsive Nonconformity; 10 = PPI Blame Externalisation; 11 = PPI Nonplanfulness; 12 = PPI Stress Immunity; 13 = PPI Machiavellian Egocentricity.

* $p < 0.01$, ^ $p < 0.05$

Table 2

Canonical Correlation Between PPI and BIS subscales

Function	Eigenvalue	%	Canonical R	Wilks's lambda
1	1.340	77.25	.757	.298*
2	0.229	13.19	.432	.698*
3	0.166	9.55	.377	.858*

* $p < .001$

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Table 3

Canonical solution for Impulse Control predicting Psychopathy for Functions 1 to 3

	Function 1			Function 2			Function 3			
Variable	Coef	r_s	r_s^2 (%)	Coef	r_s	r_s^2 (%)	Coef	r_s	r_s^2 (%)	h^2 (%)
Attentional Impulsiveness	.378	-.782	61.15	.510	.319	10.18	1.011	.536	28.73	100.00
Motor Impulsiveness	.331	-.799	63.84	.776	.360	12.96	-.947	-.481	23.14	100.00
Non-planning Impulsiveness	.502	-.874	76.39	-1.166	-.478	22.85	-.0387	-.086	0.74	100.00
Social Potency	.116	-.160	2.56	.189	.455	20.70	-.617	-.698	48.72	71.98
Fearlessness	.264	-.497	24.70	.296	.483	23.33	-.029	-.300	9.00	34.80
Cold-heartedness	.142	-.021	0.44	-.247	-.304	9.24	-.155	-.285	8.12	17.80
Impulsive noncompliance	.200	-.638	40.70	.414	.462	21.34	-.123	-.237	5.62	67.66
Blame externalisation	.071	-.437	19.10	-.028	.234	5.48	.427	.561	31.47	56.05
Nonplanfulness	.735	-.871	75.86	-.805	-.461	21.25	-.235	-.059	0.34	97.45
Stress Immunity	.220	.105	1.10	-.161	.053	0.28	-.222	-.721	51.98	53.36
Machiavellian Egocentricity	.056	-.570	32.49	.457	.325	10.56	.333	.220	4.84	47.89
$\boldsymbol{R_c^2}$			**75.7**			**43.2**			**37.7**	

Notes. Structure coefficients (r_s) greater than .40 are underlined. Communality coefficients (h^2) greater than 40% are underlined. Coef = standardised canonical function coefficient; r_s = structure coefficient; r_s^2 = squared structure coefficient; h^2 = communality coefficient.