

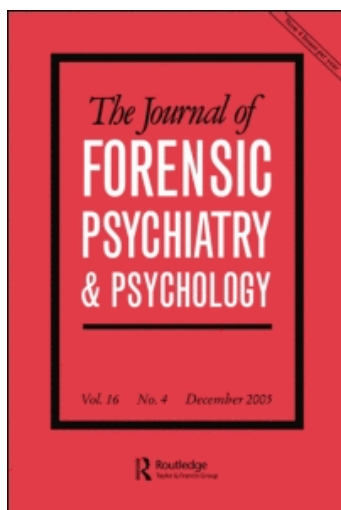
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Temperament and character as a function of psychopathy: relationships between the Psychopathy Checklist – Revised and the Temperament and Character Inventory in a sample of personality disordered serious or repeat offenders

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The relationship between the concepts of Psychopathy (as conceptualised by a four-facet model of the Psychopathy Checklist – PCL-R; Hare, R.D. (2003). *The Hare Psychopathy Checklist – Revised (PCL-R)* (2nd ed.). Toronto: Multi-Health Systems) and the biopsychosocial model of normal personality (the Temperament and Character Inventory, – TCI; Cloninger, C.R., Przybeck, T.R., Svrakic, D.M., & Wetzel, R.D. (1994). *The temperament and character inventory (TCI): A guide to its development and use*. Washington University, St Louis, MI: Centre for Psychobiology of Personality) was explored in a sample ($N = 121$) of personality disordered, serious and repeat offenders. High total PCL-R scores were associated with high Novelty Seeking and low Harm Avoidance alongside the characteristic of low cooperativeness. At a facet level, Facet 1 (Interpersonal) was associated with low Harm Avoidance, Facet 2 (Affective) with low Reward Dependence and Facets 3 (Lifestyle) and 4 (Antisocial), with both high Novelty Seeking and low Co-operativeness. The results show that the different facets of psychopathy are related to different personality constructs as defined by the biopsychosocial model, which in turn may suggest different treatment and management regimes.

Keywords: psychopathy; PCL-R; TCI; self-report; personality

Introduction

The concept of psychopathy is important in terms of the management and outcomes of many forensic patients. Recent advances suggest that the concept of psychopathy is a dimensional one (Edens, Marcus, Lilienfeld, & Polythress, 2006; Neumann & Hare, 2008; Walters et al., 2007) and thus all individuals could be placed on this dimension, albeit that the distribution is highly skewed (Coid, Yang, Ullrich, Roberts, & Hare, 2009). Hence, it would appear that the

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concepts and measures that relate to normal personality may be able to give insight into the nature of the psychopath that might in turn give insight into the management and treatment of such individuals.

Cloninger's seven-factor model

The Temperament and Character Inventory (TCI – Cloninger, Przybeck, Svrakic, & Wetzel, 1994) is a self-report measure of personality that can be used to evaluate both normal and abnormal personality. The TCI is based upon a unified biopsychosocial theory of personality. It identifies four aspects of temperament (defined as relatively stable dimensions of personality that are heritable and relate to automatic emotional reactions), and three aspects of character (defined as dimensions of personality that are influenced by the environment and by social learning) which mature and change throughout the life-span. The temperament factors (Novelty Seeking, Harm Avoidance, Reward Dependence and Persistence) are thought to be independently heritable and are based upon neurobiological constructs (Cloninger, Svrakic, & Przybeck, 1993; though see Herbst et al., 2000). They were designed to reflect differences in strength of associative learning in response to novelty, danger/punishment, reward and perseverance in the face of frustration (non-reward), respectively. On the other hand, the three character factors (Self-directness, Co-operativeness and Self-transcendence) are thought to be determined by environmental and cultural factors (again though this is much debate over this assertion – see Gillespie, Cloninger, Heath, & Martin, 2004) and reflect differences in the extent an individual views oneself as autonomous, as part of society, and as an integral component of the natural world and the universe, respectfully (Cloninger et al., 1993). Whilst this model has proved valuable and popular (see studies cited below) it has been criticised for having weak psychometric properties (Farmer & Goldberg, 2008) and there have been problems replicating the factorial structure of the temperament dimensions (Maitland, Nyberg, Backman, Lars-Goran, & Adolfson, 2009).

The TCI and personality disorder

The utility of the TCI to predict a clinical diagnosis of personality disorder, and to distinguish between variants of personality disorder, was explored by Svrakic, Whitehead, Przybeck and Cloninger (1993). They found that two of the Character subscales (Self-directness and Co-operativeness) were lower for patients diagnosed with personality disorder compared to either the general population or non-personality disordered psychiatric patients, and were inversely correlated with the number of personality disorder symptoms. Thus, the Character subscales predicted the presence of a personality disorder. The Temperament scores, on the other hand, tended to distinguish between the differing types of personality disorder. For example,

the presence of anti-social personality disorder was associated with high Novelty Seeking and low Reward Dependence compared to other personality disorder sub-types. However, we note that others (Ball, Tennen, Poling, Kranzler, & Rounsaville, 1997) have failed to replicate these results, whilst others have produced somewhat mixed results (Gutierrez, Sangorin, Martin-Santos, Torres, & Torrens, 2002; Maggini, Ampollini, Marchesi, Gariboldi, & Cloninger, 2000).

Psychopathy

Prototypical psychopaths show an interpersonal and affective cluster of traits such as grandiosity, callousness, manipulation, lack of empathy and lack of guilt or remorse (Cleckley, 1976; Hare, 1991). Behaviourally, psychopaths often lead a chaotic and socially deviant lifestyle that leads to violation of social norms, and both repeated and varied types of offence (Hare & Neumann, 2008). These traits of adult psychopathy can be apparent early in childhood (Kosson, Cyterski, Steuerwald, Neumann, & Walker-Matthews, 2002), and the aetiology of the syndrome is likely to be a product of complex interactions between genetic factors, organic predispositions and/or acquired organic deficits and social forces (Blair, Mitchell, & Blair, 2005; Hare, 1991). Psychopathy is most often measured by the Psychopathy Checklist – Revised (PCL-R) (Hare, 1991).

Normative personality and psychopathy

Other researchers have used already-established self-report measures of normal-range personality in an attempt to describe the underlying personality profile of the psychopath. This is a very large literature which we can not cover in detail in this article. The most widely used measure of personality is the ‘big-five’ model, the NEO (Costa & MacCrea, 1985), and therefore it is not surprising that there is a large literature relating the NEO to the concept of psychopathy (Harpur, Hart, & Hare, 1994; Miller & Lynam, 2003; Miller, Lynam, Widiger, & Leukefeld, 2001; Ross, Lutz, & Bailley, 2004; Skeem, Miller, Mulvey, Tiemann, & Monahan, 2005; Widiger, 1998). The results, which are broadly compatible across studies, show that psychopathy is related to several factors, but in particular to low agreeableness (Skeem et al., 2005). Other self-report measures of normal personality have also yielded interesting findings (Blonigen, Carlson, Krueger, & Patrick, 2003; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006; Edens, Hart, Johnson, Johnson, & Olver, 2000; Harpur et al., 1994; Hart, Forth, & Hare, 1991; Murrie & Cornell, 2000; Stalenheim & von Knorring, 1998). For example, Edens et al. (2000) examined the relationships between the antisocial features scale of the Personality Assessment Inventory (PAI – Morley, 1991). They found robust correlations to total

PCL score, and in particular to the behavioural symptoms (Factor 2 of the PCL) rather than the interpersonal and affective symptoms (Factor 1 of the PCL). Indeed, this finding of relationship with normal personality measures and Factor 2, but not Factor 1, seems to be a common finding (see Benning, Patrick, Hicks, Blonigen, & Krueger, 2003) and has been noted in relation to the Eysenck Personality Questionnaire (EPQ: Eysenck & Eysenck, 1975) – see (Harpur et al., 1994), the Millon Clinical Multiaxial Inventory-II (MCMI-II, Millon, 1987) – see (Hart et al., 1991) and the five-factor model (FFM) – see (Skeem et al., 2005).

One advantage of using self-report measures of ‘normal’ personality is that those thought to be potentially at high risk of future dangerousness by dint of their psychopathic personality, but who have not yet shown offending or dangerous behaviour, can be assessed using this method (Daderman, 1999; Hume, Kennedy, Patrick, & Partyka, 1996; Murrie & Cornell, 2000; Schmeck & Poustka, 2001). This is beneficial as one of the major drawbacks of the PCL-R is that it cannot be administered to people who do not have extensive file information with which to corroborate verbal reports (Hare, 1991; Ross et al., 2004). Any measurement device that has utility in identifying potential problems of psychopathy, but which does not depend on such corroborative sources, would be of immense value, not only in evaluations of those thought to be at risk of developing the disorder (and in whom we may be able to direct early intervention) but also in the assessment of non-offender populations where experimental investigations could help in the understanding of aetiology and cognition in sub-clinical psychopathy.

Four-facet model of psychopathy

For many years, it has been recognised that there are at least two factors that underpin psychopathy as defined by the PCL-R. Factor 1 described interpersonal and affective components, whilst Factor 2 was conceptualised as dealing with the social deviance components. More recently a three-factor model has emerged (Cooke & Michie, 2001; Hall, Benning, & Patrick, 2004; Skeem, Mulvey, & Grisso, 2003) that has split the old Factor 1 into two separate components (termed Factor 1 ‘arrogant and deceitful interpersonal style’, and Factor 2 ‘deficient affective experience’) and has restyled the old Factor 2 into a Factor 3 ‘impulsive and irresponsible behavioural style’, which has meant excluding some original PCL-R items. Hare and coworkers (e.g. Hare, 2003; Hare & Neumann, 2005, 2008) have also re-examined the factor structure and have put forward a four-facet model. Facets 1 (interpersonal), 2 (affective) and 3 (lifestyle) are identical to those of Cooke and Michie (2001), but Facet 4 (antisocial) includes items that were not included in the three-factor model. In this article, we adopt the four-facet model as our basis of analysis. We do this because it incorporates the three-factor model and retains the antisocial behaviours, irrespective of whether

these should be seen as part of the syndrome of psychopathy (Hare & Neumann, 2008) or as a downstream consequence of psychopathy (Cooke, Michie, Hart, & Clark, 2004).

So far there has been very little research into the four- (or three-) facet model of psychopathy and normal-range personality. One exception is that of Skeem et al. (2005) who compared the FFM of personality (McCrae & Costa, 1990) with the three-factor model of psychopathy using the PCL:SV (the screening version of the PCL-R; Hart, Cox, & Hare, 1995). The strongest correlations were all found between the FFM scale of agreeableness and psychopathy, however, there were no strong differences in this relationship across the three facets, each showing a weak to moderate (-0.25 to -0.36) negative correlation.

Hypotheses

In order to make predictions about the TCI profile of psychopaths we shall consider each of the seven dimensions of the TCI and compare these dimensions to the concept of psychopathy as operationalised via the PCL-R (for discussions of Cleckley's criteria to those of the PCL-R see Patrick (2010) and Hare and Neumann (2008)).

Novelty Seeking

Those high on Novelty Seeking consistently seek thrills and adventures, are unpredictable and disorderly, are intolerant of monotony, and tend to act on impulse. Many of these traits appear within the PCL-R (e.g. Item 3 'need for stimulation/proneness to boredom'; Item 13 'lack of long-term goals'; Item 14 'impulsivity'). We also note that high Novelty Seeking is also a feature of antisocial personality disorder (Svrakic et al., 1993). Hence, we predict that Novelty Seeking will be positively associated with total PCL-R score. The individual PCL-R items mentioned all load on Facet 3 (Lifestyle) of the four-facet PCL-R model, hence we predict that this facet will be strongly positively correlated with Novelty Seeking score.

Harm Avoidance

Those low on Harm Avoidance are described as highly uninhibited, calm and carefree even under conditions of stress or risk of personal injury. They tend to be confident and optimistic, without worries about problems or difficulties that may lie ahead. This 'fearlessness' has often been described in psychopathy (Cleckley, 1976), and thus we predict that those high on total PCL-R score will have low scores on the Harm Avoidance scale. Interestingly, this 'fearlessness' is not featured directly as an item on the PCL-R. However, such fearless features would seem to contribute to most of

the items contained under Facet 1 (interpersonal) as they would be causal to the lack of anxiety or embarrassment that is a feature of Item 1 (glibness/superficial charm), the self-assuredness and lack of sensitivity to current problems that is a feature of Item 2 (grandiose sense of self-worth), the ability to lie without embarrassment or worry that is evident in Item 4 (pathological lying), and aid in the ability to con others in a '*cool, self-assured, or brazen manner*' (PCL-R manual, page 37) as described for Item 5 (conning/manipulative). Thus, we predict a negative correlation between Harm Avoidance and Facet 1 of the PCL-R.

Reward Dependence

People low on Reward Dependence are described as practical and cold, are socially insensitive and make little effort to please others. Indeed, they are said to not appreciate the feelings, or accurately understand the feelings, of others. Poor emotional processing is regarded by some theorists as at the core of the concept of psychopathy (Blair et al., 2005), and thus we predict a negative relationship between Reward Dependence and total PCL-R score. Facet 2 (affective) deals directly with these matters and includes items such as Item 6 (lack of remorse or guilt), Item 7 (shallow affect) and Item 8 (Callous/Lack of Empathy). Hence we predict a negative relationship between Facet 2 of the PCL-R and Reward Dependence.

Persistence

People high on persistence are described as industrious, ambitious and perseverant. In contrast, low scorers are modest, pragmatic and give up easily. These traits do not appear to have simple matches in the PCL-R and related concepts of psychopathy. Whilst it is true that the PCL-R does contain items such as Item 9 (parasitic lifestyle) and Item 15 (irresponsibility) which do refer to a lack of effort in work etc., this is only one aspect of these items which appear to concentrate more on the deliberate lack of work (which in some cases takes considerable effort!) rather than the lack of persistence the name suggests. Thus, we do not predict any systematic relationships with total PCL-R, or to any of the four facet scales.

Self-directedness

People high on Self-directedness are described as mature and strong, as responsible and reliable, and as self-accepting. Some of these features (e.g. responsible and reliable) are the opposite of what might be expected from a psychopath (e.g. Item 15 'irresponsibility'), yet others (self-accepting) do appear compatible with high psychopathy (e.g. Item 2 'grandiose sense of self-worth'). Hence, we did not feel that the concept of Self-directedness was

related to psychopathy and therefore did not hypothesise associations to total PCL-R score.

Co-operativeness

Those high on the Co-operativeness scale are described as tolerant, empathic, ethical and principled. Clearly, these attributes are the ones that appear lacking in most conceptions of psychopathy (Cleckley, 1976). Co-operativeness also seems to share much overlap with the 'agreeableness' scale of the FFM (McCrae & Costa, 1990) which has been shown to be negatively correlated with psychopathy (e.g. Skeem et al., 2005). Thus, we predict a negative correlation between Co-operativeness and total PCL-R score.

Many items of the PCL-R discuss such matters (too many to list here), but in particular they seem associated with Facet 3 (lifestyle) and Facet 4 (antisocial) of the PCL-R. We therefore predicted negative correlations between these two facets and the Co-operativeness scale of the TCI. We note, however, that all three facets of the three-facet model of psychopathy were negatively correlated with agreeableness in the study of Skeem et al. (2005).

Self-transcendence

Those high on this scale are thought to be unpretentious, fulfilled, creative, selfless and spiritual. Whilst the concept of 'selfless' would not appear to be compatible with the concept of psychopathy, the other features of this scale do not appear to map onto, or relate to, the concept of psychopathy. Therefore, we do not predict any relationship between Self-transcendence and total PCL-R.

Method

All experimental protocols and data collection methods were given ethical permission by both Grendon Prison Research and Advisory Committee and the Ethical Committee of the School of Psychology, Cardiff University. All participants gave written informed consent to participate in the experimental procedures, the clinical interviews and for the researchers to have full access to their prison records.

Participants

Participants were recruited from a specialist medium secure prison (Her Majesty's Prison Grendon, UK), run as a therapeutic community (for further information about this unit see Genders & Player, 1995). In order to be admitted to this unit offenders had to (1) be adult males, (2) have committed serious and/or repeat offenders and (3) have been diagnosed as

having a personality disorder by a psychiatrist (a requirement for admission to the therapeutic community). As per normal clinical practice in the UK, prisoner records did not always specify which of the sub-types of personality disorder was diagnosed for each inmate. All prisoners in HMP Grendon are assessed by the prison service for intellectual ability and only those in the normal range are admitted, as it is believed that this level of intellectual ability is needed to be able to engage with the therapeutic process.

All inmates were maintained free from psychotropic medication as it was thought to interfere with the prisoner's ability to benefit from therapy and were against the rules of the institution. We view this as a distinct advantage for this research as symptoms of psychopathy were not masked or altered in any way by psychotropic medication.

All consecutive admissions within an 18-month period were asked to participate in the study. Sixteen people refused to participate, 5 people completed the TCI but refused to complete the PCL-R interview and 1 person did not participate due to illiteracy. This study reports data from 121 offenders who completed both the TCI and PCL-R.

All offenders had been convicted of serious offences, the majority of which were violent or sexual offences. Examining index offence only then 22% were convicted of murder or manslaughter, 15% of rape, 13% of robbery, 13% of child sexual offences against children, 13% of burglary/theft, 12% of grievous or actual bodily harm, 6% of arson, 3% of firearms offences, 1% of kidnapping and 3% other offences. Looking across their total previous criminal record the mean number of convictions was 13 (SD = 11, range 1–78), and the mean number of offences was 33 (SD = 27, range 1–138). Life sentences had been applied to 40% of the sample, while the remainder were serving determinate sentences.

Procedures

Psychopathy Checklist – Revised

PCL-R scores were obtained by interviews and access to file-based information. Interviews and PCL-R scoring was conducted by accredited raters who had completed the PCL-R training programme. For 17 of our offenders we obtained ratings from two raters and interclass correlations were very high ($ICC_{total} = 0.98$).

The Temperament and Character Inventory

The TCI was administered via self-report questionnaire (Cloninger et al., 1994). This has 240 questions, each of which required a true or false answer.

Results

Population statistics

Demographic information and mean (and standard deviations) of the TCI and PCL-R are presented in Table 1. Thus, 19% of this sample have PCL-R scores above the often-used threshold score of 30, and 43% had scores of 25 and above (a threshold often used for research purposes).

Total PCL-R score and TCI

Whilst for many clinical purposes a particular PCL-R score (e.g. ≥ 30) is used to define psychopaths from non-psychopaths, such a cut-off is somewhat arbitrary and there is clearly very little difference between someone scoring 30 and someone scoring 29. Further, there is increasing evidence that psychopathy is not a taxon, but should be considered a dimension (Edens et al., 2006; Neumann & Hare, 2008; Walters et al., 2007). In order to examine the relationship between the TCI and the PCL-R we therefore used a correlational approach. The fact that the TCI contains seven scales and the PCL-R contains a total and four facet scores means that we needed to perform multiple comparisons (35 comparisons in total). To fully correct for this using the Bonferroni correction would have meant setting our α level to $p < .0015$ and thus we would have committed many Type II errors. As a compromise we decided to tolerate a greater experiment-wise α of $p < .20$ and then fully Bonferroni correct. Hence results will only be regarded as significant for $p < .005$. The results are shown in Table 2.

Table 1. Demographics and descriptive statistics for the offender sample.

	Mean	Standard deviation
Age (years)	34.3	9.3
IQ (NART)	96.9	17.0
Convictions	12.7	10.5
Novelty Seeking	22.3	6.1
Harm Avoidance	18.6	8.5
Reward Dependence	13.5	4.2
Persistence	4.4	2.1
Self-directedness	25.8	7.7
Co-operativity	28.7	8.3
Self-transcendence	12.7	7.1
PCL-R total	21.5	8.6
Facet 1 (Interpersonal)	3.5	2.6
Facet 2 (Affective)	4.7	2.4
Facet 3 (Lifestyle)	5.4	3.0
Facet 4 (Antisocial)	5.9	3.2

NART, National Adult Reading Test (Nelson, 1982).

Table 2. Correlation between PCL-R total and four facets and the subscales of the TCI.

	PCL-R Total	Facet 1 (Interpersonal)	Facet 2 (Affective)	Facet 3 (Lifestyle)	Facet 4 (Antisocial)
Novelty Seeking	.32**	.12	-.07	.36**	.43**
Harm Avoidance	-.36**	-.39**	-.09	-.22	-.19
Reward Dependence	-.26*	-.00	-.31**	-.26*	-.21
Persistence	-.13	.04	.00	-.21	-.21
Self-directedness	-.13	.05	-.13	-.21	-.19
Co-operativity	-.31**	-.05	-.25*	-.31**	-.32**
Self-transcendence	.20	.24	.05	.21	.12

* $p < .005$, ** $p < .001$.

Novelty Seeking. As predicted PCL-R total score was positively correlated with Novelty Seeking score, producing a moderate (>0.30) effect size (Cohen, 1992). We had further hypothesised that Facet 3 (lifestyle) would also have a positive correlation with Novelty Seeking and this was the case (moderate effect size). Though not hypothesised we also found a significant positive correlation between Facet 4 (Antisocial) and Novelty Seeking (moderate effect size). Neither of the other facets produced a significant correlation.

Harm Avoidance. As predicted PCL-R total score was negatively correlated with Harm Avoidance score, producing a moderate effect size. We had further hypothesised that Facet 1 (Interpersonal) would also have a negative correlation with Harm Avoidance and this was the case (moderate effect size). No other facet produced a significant correlation.

Reward Dependence. We predicted that PCL-R total score would be negatively correlated with Reward Dependence score, and this was indeed the case producing a small effect size. We also predicted that it would be Facet 2 (affective) that would be most related to Reward Dependence and this did indeed produce the largest correlation, though the correlation with Facet 3 (lifestyle) was also statistically significant.

Persistence. We did not predict any correlations between PCL-R scores and Persistence, and no significant effects emerged.

Self-directedness. We did not predict any correlations between PCL-R scores and Self-directedness, and no significant effects emerged.

Co-operativeness. We predicted that PCL-R total score would be negatively correlated with Co-operativeness score. This was confirmed and produced a moderate effect size. We further predicted that both Facets 3 (Lifestyle) and

4 (Antisocial) would be negatively related to Co-operativeness and this was also confirmed. Facet 2 was negatively correlated with Co-operativeness score but had a small effect size.

Self-transcendence. We did not predict any correlations between PCL-R scores and Self-transcendence, and no correlation reached our very stringent α level for significance. Nevertheless we note that both the total, Facet 1 and Facet 3 produced positive correlations that exceeded normal levels of significance ($p < .05$).

Discussion

This study was the first to assess the relationship of a biopsychosocial model of personality (Cloninger's seven-factor model) to the concept of psychopathy as defined by the PCL-R (Hare, 1991). To this end we show that psychopathy is characterised by the character dimensions of low Co-operativity, and by the temperament dimensions of high Novelty Seeking with low Harm Avoidance. The finding of correlations between certain scales of the TCI and those of psychopathy may help us understand the nature of psychopathy and its underlying facets.

The recent findings that psychopathy is best viewed as a multi-dimensional construct, with three or four facets, suggested to us that these different aspects of psychopathy might well have different relationships to the TCI model, and therefore, if the hypotheses about the underpinnings of the TCI scales are correct, to different biopsychosocial systems. We did indeed find a differentiation between these facets, with Facet 1 being related to low Harm Avoidance, Facet 2 being related to low Reward Dependence, and that both Facets 3 and 4 both being associated with high Novelty Seeking and with low Co-operativeness. We examine the implications of these findings.

Facet 1 (interpersonal) and Harm Avoidance

Previous studies (Ball et al., 1997; Svrakic et al., 1993) did not find any association between HA and antisocial personality disorder. Dolan and Rennie (2007) examined the HA-scale of the TCI in a sample of youth offenders. In contrast to the present findings, they obtained significant negative correlations with Facets 3 and 4, but not with Facet 1.

Low HA is associated with a lack of sensitivity to criticism or punishment, a characteristic commonly described in psychopathy (Hare, Frazelle, & Cox, 1978; Lykken, 1957). For example, Patrick, Bradley, and Lang (1993) have noted that psychopathic individuals do not show an increased startle reflex to a loud noise when in the presence of a fear-inducing stimulus. It is of interest that this lack of modulation of startle response by fear has been shown to be characteristic of those with

high factor 1 scores on the PCL-R (Patrick et al., 1993) – see also Vanman, Mejia, Dawson, Schell, and Raine (2003). Implications for treatment and management of psychopathy are discussed later.

Facet 2 and Reward Dependence

As hypothesised, low Reward Dependence was most associated with Facet 2 (affective) of the PCL-R. Previous studies of those with antisocial personality disorders (Svrakic et al., 1993) have also shown lowered Reward Dependence scores (though again Ball et al. (1997) failed to replicate this in a sample of substance abusers). Poor affective processing is thought to be a core symptom of psychopathy (Blair et al., 2005) and has been demonstrated in many different experimental paradigms (e.g. Blair, Jones, Clark, & Smith, 1997; Patrick et al., 1993; Williamson, Harpur, & Hare, 1991).

Facets 3 and 4 and Novelty Seeking and Co-operativeness

We hypothesised that Facet 3 would be associated with high Novelty Seeking and with low Co-operativeness, whilst Facet 4 would be associated with low Co-operativeness. These predictions were supported. However, we also found that Facet 4 was also associated with high Novelty Seeking. Indeed, it is noticeable in Table 2 that the correlations between Facet 3 and the TCI scales are very similar to Facet 4 and the TCI scales. Thus, the present data do not provide any support for a distinction between Facets 3 and 4. However, we stress that this is a highly unusual sample where serious criminal and antisocial behaviour was present in the history of all inmates. The apparent close linkage between Facets 3 and 4 may not be present in less severely criminal samples.

The findings of low Co-operativeness and high Novelty Seeking is in line with previous studies of those with antisocial personality disorder (Svrakic et al., 1993) and related constructs (Schmeck & Poustka, 2001). The relationship between antisocial personality disorder and psychopathy has long been debated. The current findings clearly show that the correlations with high Novelty Seeking and low Co-operativeness are restricted to the lifestyle and antisocial aspects of psychopathy (the old Factor 2 – Hare, 1991), rather than the interpersonal and affective aspects. It might be argued that these traits are generic to antisocial personality disorder, and are just seen in a more extreme form in those with psychopathy (see also Coid et al., 2009).

Comparison to other studies of normal personality questionnaires and psychopathy

As mentioned in the introduction the study of normal range personality traits and psychopathy has been dominated by the big five model of personality, so it is natural to consider how the current findings fit to this

earlier work. Surprisingly, there are few studies of the relationship between the TCI and the FFM. De Fruyt, van de Wiele, and van Heeringen (2000) examined these relationships in a sample of patients admitted to an emergency psychiatric unit. Using a regression analysis they found that that Harm Avoidance was positively associated with high neuroticism and low extraversion, Novelty Seeking was inversely related to conscientiousness, persistence was related to conscientiousness and that Reward Dependence was most strongly associated with extraversion. For the character scales they found that Self-directedness was robustly negatively related to neuroticism, Co-operativeness was strongly related to agreeableness and Self-transcendence was related to openness. Thus, whilst there is certainly no easy one-to-one relationship between the factors of each model, there is some degree of overlap, and the authors note that each of the seven TCI scales correlate at least $|0.40|$ with a FFM scale. Considering the main results of this investigation, that high PCL-R score is associated with high Novelty Seeking, low Harm Avoidance and low Co-operativeness, this would predict a FFM profile of high PCL-R scorers being high on extraversion, but low on neuroticism, agreeableness and conscientiousness. The most robust findings in the literature are that PCL-R is linked to low agreeableness and low conscientiousness (Harpur et al., 1994; Skeem et al., 2005) providing some degree of convergence between the models.

Examination of facets showed that Facet 1 is most associated with low Harm Avoidance and therefore might be predicted to be related to low neuroticism and high extraversion on the FFM. Only the study of Skeem et al. (2005) is available for such comparisons. They found that the Facet 1 was weakly (but significantly) correlated with extraversion, but the negative correlation with neuroticism was not significant. We have characterised Facet 2 as low on Reward Dependence which might predict a relationship between low extraversion and this facet. Skeem et al. found no hint of such a relationship. Finally, we have characterised Facets 3 and 4 as being characterised by high Novelty Seeking and low Co-operativeness, which should in turn predict low agreeableness and low conscientiousness. Skeem et al. (2005) did indeed find these negative relationships for Facet 3, but did not employ the fourth facet in their analysis. Therefore, there appears to be some agreement between the TCI and the FFM models in term of the description of the facets in terms of personality characteristics, though this agreement is far from complete.

More recently Patrick (2010) has suggested that there are three recurring notions that are associated with the concept of psychopathy. He labels these as 'disinhibition' (broadly defined as a problem in impulse control, impaired regulation of affect and urges and the need for immediate gratification), 'boldness' (defined as a tolerance of stress, danger and unfamiliarity) and 'meanness' (deficient empathy, and a tendency to exploitativeness and cruelty). Thus, the concept of boldness appears similar to the concepts covered by the Harm Avoidance scale of the TCI and therefore suggests that

low Harm Avoidance is a characteristic of those with high score in Facet 1 (Interpersonal) of the PCL-R. On the other hand, the notion of boldness seems most related to low Reward Dependence on the TCI and, therefore, is associated most highly with Facet 2 of the PCL-R. Finally, the concept of disinhibition would seem to cover both the notions of high novelty seeking and low Co-operativeness on the TCI. High Novelty Seeking and low Co-operativeness were characteristics of those high on both Facets 3 and 4 of the PCL-R. Thus, whilst these links are only descriptive, there appears to be relationships between the tridimensional conceptualisation of the personality of psychopaths as suggested by Patrick (2010).

Theoretical implications – Treatment and management of psychopathy

The finding of high PCL-R scorers showing significantly lower scores on the Harm Avoidance subscale may be of particular interest in terms of effectiveness of future management strategies in this group. The four temperament dimensions included in the TCI were developed to reflect theoretical individual differences in associative learning to novelty, punishment and reward (alongside differences in perseverance in the face of frustration). Gray (1982) found that rate of learning in response to signals of punishment was minimal in participants termed stable extroverts (similar to the construct of low Harm Avoidance). Previous literature has shown that high PCL-R scorers do not respond to punishment (or threats of punishment) such as prison (Lykken, 1957), and this effect may be underpinned by a lack of fear or worry about the negative consequences of their behaviour (as indexed by low Harm Avoidance). This lack of response to punishment may manifest itself at a young age. Hawes and Dadds (2005) noted that boys who showed callous-unemotional (CU) traits did not show improvements in their behaviour, whilst other troubled boys did, in response to a programme that improved the parenting skills of their parents. In particular, they noticed that in child–parent interactions the only variable that appeared different for this group was the child’s reaction to a ‘time-out’ punishment. When taking such a punishment, the high-CU children showed little emotion and their parents rated this as less effective than for those with low-CU traits. Hence, treatment and management strategies utilising reward rather than punishment may be far more effective in these groups (Gray, 1982), and an analysis of an offender’s TCI profile could inform the most effective approach to their individual management.

Svrakic et al. (1993) found that low Co-operativeness and low Self-directedness are a common feature of all personality disorders, regardless of type. Of interest was the fact that we did not find an association between Self-directedness and psychopathy. This lack of discrimination on the basis of Self-directedness could be due to the fact that the majority of our sample had been

diagnosed with personality disorder, whereas only a sub-sample of our offenders was psychopathic. Thus, we would expect our sample to show low Self-directedness scores irrespective of psychopathy score. Indeed, our mean Self-directedness score (25.8) is quite a bit below the norms from community and patient samples without PD, which vary from 29.1 to 30.7 (Cloninger et al., 1994). The same argument could be applied to the Co-operativeness dimension. However, we found that we still had a negative correlation between Co-operativeness and psychopathy in our sample despite all this sample having a diagnosis of a PD. This is probably because low Co-operativeness is so central to the disorder of psychopathy, defined as it is as a deviation from the norms laid down by society and social acceptability.

Conclusions, limitations and future directions of research

We have shown that elevated levels of psychopathy in offenders is associated with a TCI profile consisting of high scores on Novelty Seeking, and low scores on Harm Avoidance and Co-operativeness. Although we managed to recruit a moderately large (> 100) sample, with a high level of psychopathy, there is still a good chance that we have made Type II errors. In order to correct for the many possible correlations we used a conservative α level ($p < .005$). Thus, several correlations in Table 2 meet less stringent standards of significance and will hopefully prompt others to perform further studies that explore these suggestive, but not significant, correlations. Finally, any self-report measure must be interpreted with caution (Hart et al., 1991), and in particular one from a population renowned for lying, conning and manipulation. As our participants were assured confidentiality in the research process this hopefully works against this limitation of our research design. However, this does cause concerns about the use of self-report measures in such a population for clinical purposes.

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