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Temperament and the structure of personality disorder symptoms

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SYNOPSIS This paper attempts to construct a simplified system for the classification of personality disorders, and relates this system to normally distributed human personality characteristics. One hundred and forty-eight subjects with a variety of psychiatric diagnoses were evaluated using the SCID-II structured clinical interview for personality disorders. A four-factor solution of personality disorder symptoms was obtained and we labelled these factors 'the four As': antisocial, asocial, asthenic and anankastic. The factors related to the four temperament dimensions of the Tridimensional Personality Questionnaire (TPQ), but less closely to Eysenck Personality Questionnaire (EPQ) dimensions. The four factors were similar to those identified in a number of studies using a variety of assessment methods and this lends some credibility to our findings. It suggests that a more parsimonious set of trait descriptors could be used to provide simpler, less overlapping categories that retain links with current clinical practice. In addition, these factors can be seen as extremes of normally distributed behaviours obtained using the TPQ questionnaire.

INTRODUCTION

The study of personality disorders has been hampered by problems in their classification. The large increase in literature (Gorton & Akhtar, 1990) has not been accompanied by a corresponding increase in systematic models to aid in understanding the underlying behavioural abnormalities. Clinicians have continued to use a categorical classification (DSM-IV and ICD-10) despite widespread acknowledgement that the categories are a mixture of theory, opinion and historical precedent. Although the categories are often considered to group patients into mutually exclusive diagnostic entities, most studies have reported high rates of co-occurrence (Pfohl *et al*. 1986; Joffe & Regan 1988; Mulder *et al*. 1994). Furthermore, the measured behaviours appear to be distributed dimensionally, with no evidence of the discontinuity a categorical model would imply (Zimmerman & Coryell, 1990).

Academic psychology has fared little better. It has been more involved in the search for a paradigm than in the development of a paradigm, resulting in endless generalizations about personality and conceptual models without any empirical justification (Zuckerman, 1991). The major exception has been the work of Eysenck (1967) and more recently the five-factor model currently being refined by Costa & McCrae (1992). As yet, however, these models are far from being generally accepted and are only just beginning to be related to the classifications clinicians use (Nestadt *et al*. 1994). A recent alternative is the tridimensional model of personality proposed by Cloninger (1986). Its formulation included specific predictions as to the relationship of its three personality dimensions to current categorical classifications (Cloninger, 1987). This model has now been expanded to four temperament scales and three character scales (Cloninger *et al*. 1993) and personality disorders have been reported to be a combination of extreme temperament scores and low character scores (Svrakic *et al*. 1993).

Another approach has been to group the personality disorder categories into broad

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clusters to reduce overlap, decrease redundancy and simplify diagnoses for clinicians. A number of studies using a variety of methods have identified three or four major groupings with reasonable consistency (Walton & Presly, 1973; Tyrer & Alexander, 1979; Kass *et al*. 1985; Hyler & Lyons, 1988; Dowson & Berrios, 1991; Schroeder & Livesley, 1991). These studies have identified a factor involving impulsive, sociopathic behaviour and a second factor involving avoidant, dependent behaviour. Most identify two further factors; one is probably best defined as obsessive–compulsive or anankastic personality, while the other is generally a mixture of social indifference and oddness. The clusters suggested by DSM-III-R (and now DSM-IV) are broadly similar to these groupings. Cluster A is paranoid, schizoid and schizotypal personality disorders, cluster B is antisocial, borderline, histrionic and narcissistic personality disorders, while cluster C is avoidant, dependent, obsessive–compulsive, and passive–aggressive personality disorders. Although poorly validated, these clusters are widely used by clinicians and appear helpful in aiding understanding of personality disordered behaviour.

We argue that an adequate system for the classification of personality disorders will relate simplified personality disorder categories to underlying dimensions of normally distributed human behaviour characteristics. The categories are needed to retain clinical traditions, and to aid communication and treatment decision making. They should be reasonably discrete, have adequate face validity and high clinical relevance. The dimensions should relate simply and understandably to these categories. The system should create a model for further testing and evaluation.

The objectives of this paper are to try to outline such a model. We used the operationalized features of DSM-III-R to test validity of its categorical perspective, its separation into 11 Axis II disorders and the three defined clusters it suggests. We then used factor analysis to see if we could define more valid factor models. Finally, we explored the relationship between our derived factors and the personality dimensions derived from the Eysenck Personality Questionnaire (EPQ) and the Tridimensional Personality Questionnaire (TPQ).

METHOD

General

The data presented were collected as part of a study of the prediction of treatment response in major depression and anxiety disorders. The patients were recruited from a variety of sources; most had not previously been treated and nearly all were out-patients. Subjects were aged 18 to 65 years, free of any significant medical illness, not currently suffering from moderate to severe drug or alcohol dependence, and drug-free for a minimum of 14 days (the oral contraceptive and low dose occasional benzodiazepine for sleep were allowed).

Subjects

One hundred and forty-eight subjects were assessed. The principal current psychiatric diagnoses were as follows: 100 major depression, 15 panic disorder, 14 obsessive–compulsive disorder, 4 bipolar I, 9 bipolar II, 4 dysthmia, 1 general anxiety disorder and 1 post-traumatic stress disorder.

Clinical assessment

Following an initial psychiatric interview and giving written consent, subjects underwent a detailed assessment. This assessment consisted of the Structured Clinical Interview for DSM-III-R (SCID) (Spitzer *et al*. 1992), ratings of depression and anxiety by the clinician, completion of a series of self-report questionnaires, and a neurobiological assessment. Over the ensuing weeks, there was further assessment of family history of psychiatric disorder, and a clinician assessment of personality disorder(s) using the SCID-II interview (Spitzer *et al*. 1987). The clinical assessments were performed by psychiatrists or psychiatric registrars with a minimum of 4 years of training. The SCID-II was completed by the psychiatrist who had seen the patient prior to consent, and who may have spoken with other informants including family members and the referring doctor or mental health professional.

Self-report measures

During the days of the assessment protocol, the subjects completed a series of self-report scales. These included: the SCID-PQ (Spitzer *et al*. 1987), which is a 112 item yes/no questionnaire

Table 1. *Distribution of the number of DSM-III-R personality disorder symptoms and signs in each personality disorder category and the average number of symptoms and the number of patients with each personality disorder* (N = 148)

	Number of symptoms										Symptoms (Mean)	With PD (*N*)
	0	1	2	3	4	5	6	7	8	9		
Avoid.	41	25	20	19	19	18	6	—	—	—	2·2	43
Depend.	45	35	19	20	10	11	3	3	2	—	1·9	19
Ob–comp.	47	29	26	15	12	6	5	6	2	—	1·9	19
Pass–agg.	67	38	20	9	5	4	3	1	1	—	1·2	9
Self–def.	54	27	29	16	8	5	5	3	1	—	1·7	14
Paranoid	69	32	15	13	6	6	6	1	—	—	1·3	19
Schizotyp.	48	42	27	17	7	6	0	1	—	—	1·4	7
Schizoid.	100	31	9	5	2	1	—	—	—	—	0·5	3
Hist.	77	41	17	4	2	3	2	1	1	—	0·9	9
Narcis.	69	42	18	8	3	6	1	—	1	—	1·5	8
Border.	51	32	16	15	11	4	7	7	5	—	2·3	23
Conduct.	85	27	15	3	5	3	4	2	1	2	1·2	20

designed to assess for DSM-III-R personality disorders (designed to yield false positive information, and is required by the clinician when they complete the SCID-II assessment of personality disorder); the Tridimensional Personality Questionnaire (TPQ), version 3 (Cloninger, 1987), a 100-item yes/no questionnaire designed by Cloninger (Cloninger *et al.* 1991), which contains three major scales called novelty seeking, harm avoidance and reward dependence, and a fourth scale, persistence, initially considered to be a subscale of reward dependence; the Eysenck Personality Questionnaire (EPQ), a 100-item true/false test measuring three dimensions of personality – neuroticism (N), extroversion/introversion (E), psychoticism (P) and a lie scale (L) (Eysenck & Eysenck, 1975).

Personality disorder(s) assessment

The assessment for personality disorders was completed by the treating psychiatrist, usually 6 weeks after the initial assessment. This assessment utilized the SCID-II and, by the time it was completed, the treating psychiatrist would usually have completed an initial assessment, a SCID assessment, have seen the patient on four to six occasions and may have seen family and/or friends. The psychiatrists were instructed to rate 'normal' personality features over the 5 years prior to initial assessment. In addition, the clinician had access to the self-report SCID-PQ, which had been answered during the initial assessment.

In our analysis we used conduct disorder symptoms rather than antisocial personality disorder symptoms because the latter were only obtained in patients who fulfilled the criteria for conduct disorder.

Statistical analyses

All data were entered into the relational database, Paradox (3·0, Borland International, 1988) and transferred to SYSTAT (Systat Inc, 1990) for statistical analyses, including Pearson correlations and factor analyses with Varimax rotations.

RESULTS

Demographic

There were 148 subjects: 69 males (47%) and 79 females (53%). The mean age of the sample was 32·1 years, range 18–64.

Distribution of DSM-III-R personality disorder symptoms and signs

Table 1 shows the number of DSM-III-R personality disorder symptoms and signs in individual personality disorder categories. The most common symptoms were borderline and avoidant symptoms, while the least common symptoms and signs were those of schizoid and histrionic personality disorders. The distribution of symptoms and signs within each personality disorder was similar for all categories. Most patients have none or one symptom with a declining number having a

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Table 2. *Factor analysis for personality disorder symptoms via varimax rotation (four-factor solution)*

	1	2	3	4
Conduct disorder	*0·819*	0·269	−0·038	−0·095
Borderline	*0·792*	0·123	0·345	0·012
Narcissistic	*0·716*	−0·048	0·308	0·092
Histrionic	*0·712*	−0·313	0·315	0·038
Passive aggressive	*0·603*	0·075	0·185	0·425
Paranoid	*0·565*	0·266	0·283	0·422
Schizoid	0·048	*0·874*	0·099	0·122
Avoidant	0·076	0·217	*0·831*	0·265
Dependent	0·306	−0·238	*0·744*	0·110
Self-defeating	0·299	0·198	*0·691*	−0·013
Obsessive–compulsive	0·000	0·101	0·126	*0·915*
Schizotypal	0·413	0·440	0·477	0·202

Values > 0·5 are shown in italics.

Table 3. *Pearson correlations of the derived factor scores against the Tridimensional (TPQ) and Eysenck (EPQ) Personality Questionnaire scores*

	Factor 1	Factor 2	Factor 3	Factor 4
TPQ†				
NS	0·381**	−0·021	−0·055	−0·093
HA	−0·071	−0·109	0·528**	0·042
RD	−0·203	−0·421**	−0·038	−0·258*
P	−0·088	−0·036	0·124	0·228*
EPQ‡				
P	0·582**	0·285**	0·057	0·044
E	0·081	0·167	−0·362**	−0·057
N	0·151	−0·160	0·530**	0·054

† NS = novelty seeking; HA = harm avoidance; RD = reward dependence; P = persistence.
‡ P = psychoticism; E = extraversion; N = neuroticism.
* $r > 0·21$, $P < 0·01$; ** $r > 0·26$, $P < 0·001$.

higher number of symptoms. It is of note that there was no evidence of a point of rarity in the distribution of the symptoms and signs in any category.

The most common personality disorder diagnoses were avoidant and borderline personality disorders. Dependent, obsessive–compulsive and paranoid personality disorders were also common, while schizotypal and schizoid personality disorders were rare.

Factor analysis

We reviewed the composition of the three- and four-factor solutions obtained via a varimax rotation and concluded that the four-factor solution accounted for 71% of the variance and differed from the three-factor solution only in that obsessive–compulsive personality symptoms loaded onto a separate factor (Table 2). The heaviest loadings on factor 1 are the cluster B personality disorders (antisocial, borderline, narcissistic and histrionic) and passive–aggressive and paranoid personality disorder symptoms which all have loadings greater than 0·50. Factor 2 consisted of schizoid personality criteria. The two highest loadings on factor 3 were avoidant and dependent personality disorder symptoms but self-defeating also loads. Factor 4 consists of obsessive–compulsive personality disorder symptoms.

Relationship of the four-factor model to TPQ and EPQ scores

Table 3 shows the correlations between the four factor solution and TPQ and EPQ measures. The four TPQ dimensions are correlated with the four factors. Factor 1 is correlated with high novelty seeking scores; factor 2 is correlated with low reward dependence scores; factor 3 is correlated with high harm avoidance scores; while factor 4 is correlated with high persistence scores. Low reward dependence scores are

common across all four factors, particularly factor 2, but also contributing significantly to factor 4. The EPQ dimensions are less clearly related to the four factors. Factor 1 is correlated with psychoticism scores, and so is factor 2, to a lesser degree. Factor 3 is a combination of high neuroticism scores and low extraversion scores, while factor 4 is not represented by EPQ dimensional scores.

DISCUSSION

This study suggests that a model of personality disorders using four categories which are related to extremes of normally distributed human temperament measures is feasible. DSM-III-R personality disorder symptoms load onto four factors which are reasonably similar to those reported by most other studies. These factors relate simply and logically to the four temperament dimensions derived using the TPQ.

Before discussing the implications of these findings, some methodological issues warrant consideration. First, the patients were selected on the basis of their Axis I disorders (major depression, anxiety disorders). They had high rates of Axis II pathology but certain personality disorder symptoms may be less common. However, no patient with an Axis II disorder, whatever its severity, was excluded and using a patient sample need not compromise the factor structures of the personality dimensions. Also, it is difficult, and unrealistic, to conceive of a sample of individuals with personality disorders who do not have significant Axis I psychopathology. Clinical and community studies indicate substantial comorbidity between personality disorders and Axis I conditions (Samuels *et al*. 1994). Depression and anxiety disorders are among the more common psychiatric disorders, so this sample is probably reasonably representative. At worst, the results are valid for the large proportion of psychiatric practice that manages patients with major depression and anxiety disorders. Secondly, it is possible that the patient's mental state might influence assessment of their personality disorder symptoms. This has been particularly reported in depressed patients (Stuart *et al*. 1992), although not all studies have found this (Loranger *et al*. 1991). We attempted to minimize this bias by instructing the psychiatrist to assess personality on the basis of pre-depressive functioning or on functioning over the 5 years prior to presentation, by obtaining information from as many sources as possible, by seeing the patient regularly over about 6 weeks before completing this Axis II diagnosis, and interviewing all patients face to face. Thirdly, there are a number of statistical considerations. The sample size of 148 is at the lower limit for the analyses we have undertaken. The four factor solution rather than three factor solution was chosen, as the percent variance explained increased from 62% to 71% and was more clinically compelling.

As far as we are aware, there has been no other study which has factor analysed DSM-III-R personality disorder symptoms obtained using a structured interview. One study reported on a factor analysis of DSM-III-R symptoms obtained using a personality disorder questionnaire (Dowson & Berrios, 1991) but questionnaires have been reported to correlate poorly with structured interviews (Zimmerman, 1994). Other studies have used DSM-III criteria and utilized a variety of methods; one study used a structured interview (Zimmerman & Coryell, 1990) but others used clinician diagnoses (Hyler & Lyons, 1988) and four point scales (Kass *et al*. 1985; Hyler & Lyons, 1988). DSM-III-R criteria differ significantly from DSM-III criteria (Morey, 1988*a*) but despite these differences, the studies broadly agree with each other and with our findings. All the studies identify one factor involving impulsive, sociopathic behaviour and one factor involving avoidant, dependent behaviour. Three of the five studies have obsessive–compulsive personality disorder symptoms as a separate factor. The only real difference is our second factor which we conceptualize as social withdrawal and indifference and is best described as schizoid personality disorder symptoms. This may reflect the change in criteria for schizoid personality disorder from DSM-III to DSM-III-R. Furthermore, similar higher order factors have been identified in studies using non-DSM-III or DSM-III-R criteria. Walton & Presly (1973) identified four factors: social avoidance, submissiveness, obsessional/schizoid characteristics and hysterical personality by a factor analysis of clinicians' ratings of personality traits. Tyrer & Alexander (1979) also report a four-factor structure with factors they called sociopathy,

passive–dependence, anankastic and schizoid. Schroeder & Livesley (1991) used 79 descriptors based on DSM-III-R criteria and identified four higher order factors they labelled psychopathic entitlement, dependent emotionality, social avoidance and compulsiveness. Given the problems encountered when attempting to measure personality traits and behaviours and the differences in methods of assessment, this convergence is remarkable. Its robustness lends some credibility to our findings.

From our findings, and in light of other available data, we would speculate that personality disorders may be reduced to four factors, which we have called 'the four As': antisocial, asocial, asthenic, anankastic. The first factor, 'antisocial', is what DSM-III-R calls cluster B, namely antisocial personality disorder, borderline personality disorder, histrionic personality disorder and narcissistic personality disorder. Affected individuals are frequently impulsive, unstable, dramatic and easily bored. They display persistent abnormalities in maintaining stable social relationships (Rutter, 1987). There is currently little data to support their separation into four separate diagnostic categories. The second factor, 'asocial', is what is called schizoid by a variety of classification systems (including DSM-III-R). Such individuals are socially indifferent, have a lack of empathy and frequently display stereotyped interests. As Wolff & Chick (1980) have pointed out, this pattern of behaviour has similarities to Asperger's syndrome, and Rutter (1987) suggests it may be better classified as such. The third factor, 'asthenic', consists of a group of individuals with anxious, dependent and fearful behaviours who are timid, yet desire social relationships. In DSM-III-R terms, they have avoidant and dependent personality disorder symptoms. The high overlap between these symptoms has been frequently commented upon (Mulder *et al.* 1994) and, again, there appears little reason to separate them. The fourth factor, 'anankastic', has been consistently described in higher order factor analysis of behavioural styles. This is conceptualized in DSM-III-R as obsessive–compulsive personality disorder and consists of rigidity, persistence, excessive conscientiousness and perfectionism.

It is possible that the characteristics of our patient sample may have distorted the asocial and anankastic factors. Both factors are derived from relatively few personality disorder symptoms and largely consist of symptoms derived from a single DSM-III-R personality disorder. The presence of a separate anankastic factor might reflect the presence of obsessive–compulsive symptoms in depression rather than true obsessive–compulsive personality disorder symptoms, while the asocial factor might be related to the low incidence of schizoid symptoms in our sample. Against this is the fact that both obsessive–compulsive and schizoid factors have been reported in a number of other samples. However, the asocial and anankastic factors should be considered provisional.

Correlating the 'four As' with dimensional measures of personality led to some interesting results. Using the TPQ dimensions, we were able to demonstrate a relationship that has appealing face validity. Therefore, high novelty seeking scores (defined as high exploratory excitability, impulsivity, extravagance and disorderliness) are related to the antisocial factor (I); low reward dependence scores (defined as low sensitivity, attachment and dependence) are related to the asocial factor (II); high harm avoidance (defined as high worry, fear of uncertainty and shyness) is related to the asthenic factor (III); and high persistence (defined as high perseverance despite frustration and fatigue) is related to the anankastic factor (IV). It is of note that one end of the TPQ dimensions is more related to these derived factors than the other end. Thus, high novelty seeking scores are correlated with factor one, while low novelty seeking scores have no relationship to any of the derived factors. Low reward dependence scores are strongly correlated with factor two and also related to factor four, while high reward dependence scores make no significant contribution. Similarly, high harm avoidance scores and high persistence scores are related to factor three and factor four respectively, but low harm avoidance scores show no obvious relationship. This suggests that trying to relate personality disorder symptoms to both extremes of a temperament dimension may not be justified. Certain temperamental extremes might predispose individuals to personality disordered behaviour; for example, high novelty-seeking will predispose to 'antisocial' personality disorders. Other temperament extremes might not lead to these difficult

behaviours or might even be protective, such as high reward dependence in our sample. However, high reward dependence might be associated with other psychiatric problems, such as atypical depression (Joyce *et al*. 1994).

The correlations of the EPQ personality measures with the 'four As' were modest. Only two of the 'four As' were strongly related to the EPQ scores. The antisocial factor correlated with the psychoticism score, while the asthenic factor was related to low extraversion and high neuroticism scores. The asocial factor was weakly related to psychoticism while the anankastic factor had no relationship to EPQ measures. Since we believe that the 'four As' have some credibility due to their consistency with other studies, our results suggest that TPQ measures may be a better way to conceptualize personality disorder symptoms than EPQ measures.

Conclusions

Given the relatively low reliabilities of DSM-III-R diagnoses and the extent to which patients receive multiple diagnoses, it seems appropriate to explore alternative diagnostic systems (Schroeder & Livesley, 1991). Four higher order factors have now been identified in a number of studies, using a variety of assessment methods and theoretical constructs. The factors derived suggest a way that the DSM-III-R personality symptoms could be reorganised to create a simpler categorical system. A more parsimonious set of trait level descriptors could be used to provide an estimate of these four underlying categories we have labelled antisocial, asocial, asthenic and anankastic. Additionally, the tridimensional model of personality can be used. It conceptualizes these four categories as high novelty seeking, low reward dependence, high harm avoidance and high persistence respectively, and places them as extremes of normally distributed behaviours.

The issue of the number and content of underlying traits needed to describe personality pathology may never be resolved entirely, and it has been debated whether an empirical approach to taxonomy will ever be able to resolve the issues (Morey, 1988*b*). The data we have presented are exploratory and subject to other possible interpretations. Even with a simpler categorical system co-occurrence and overlap may occur. However, the findings are consistent with other attempts to simplify current categories of personality disorders, and have the added interest of their relationship to inherited temperamental traits. If replicated, these findings, while preserving links with traditional taxonomies, also provide a model to a better understanding of personality disorder psychopathology.

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