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Variants of premorbid personality and personality disorder: a taxonomic model of their relationships

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Abstract From a biographical analysis of approximately 500 case records of patients with various kinds of mental state (in particular mood, anxiety and schizophrenic) disorders, a typology of premorbid personality variants was derived. It comprises three “affective types” dominating in patients with major affective disorders and three “neurotoid types” prevailing in other, above all anxiety and schizophrenic, disorders. These types were operationalized so that they could be assessed by means of a diagnostically “blind” rating of biographical case reports or of interview protocols concerning the premorbid development of clinically remitted patients. The material for the present analysis consisted of ratings regarding 120 subjects (100 patients and 20 healthy controls) who had been interviewed within a project primarily aiming at the development of a novel assessment tool, the Biographical Personality Interview (BPI). This data was used for constructing a comprehensive taxonomic model of premorbid personality variants and their relationships to personality disorders.

The intercorrelation of type-scores representing the six premorbid personality types suggests a circular order of these types, opposing the “neurotoid types” on one side to the “affective types” on the other side of the circle (circumplex) along a dimension of mental abnormality vs. normality. Two types, the (“neurotoid”) nervous, tense type, and the (“affective”) manic type are contrasted with the (“affective”) melancholic and the (“neurotoid”) anxious, insecure types along an orthogonal dimension of rather changeable vs. rather constant habitual behaviour. This order is confirmed by the correlation of type-scores with factor scores of the two main dimensions of BPI-item scores.

It is also concordant with the correlation of type-scores and scores on questionnaire scales of personality. Personality disorders as maladapted extreme variants of personality can be located outside the circle according to their similarity or dissimilarity with the six premorbid personality types. They are necessarily distributed almost exclusively along the “neurotoid” side of the circumplex. This two-dimensional model of variants of premorbid personality and personality disorders is in basic agreement with models derived from dimensions of personality in mentally healthy subjects and with findings concerning the comorbidity among personality disorders. Further empirical studies are required for choosing or developing the most appropriate model of the relationships between personality variants and personality disorders.

Key words Premorbid personality · Personality disorders · Taxonomic model · Personality types · Personality dimensions · Big Five

Introduction

During the last few decades, the development of new psychometric assessment tools in connection with novel taxonomies of personality structures (Eysenck and Eysenck 1975, 1985; Cloninger 1987; Cloninger et al. 1993; von Zerssen et al. 1988, 1998a, b; Costa and McCrae 1989; Pössl and von Zerssen 1990b) has fostered progress in research on the premorbid personality (pP) of psychiatric patients (see von Zerssen 1996a). The operational definition of personality disorders (PDs) starting with DSM-III (American Psychiatric Association 1980), which was accompanied by the introduction of standardized techniques for their assessment (see Widiger and Frances 1987; Bronisch and Mombour 1998), has simultaneously facilitated research on the formerly rather neglected topic of PDs (see Livesley 1995; Millon 1996; Fiedler 1997). However, the two fields of research are still only loosely interrelated. Although it is generally accepted that PDs represent maladapted extreme variants of personality structures (see

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Berrios 1993), their relationships to the pP of patients suffering from different kinds of mental state disorders (axis I disorders according to DSM-III to -IV) are still rather obscure. There are attempts to define normal variations in personality by diluting the diagnostic criteria of PDs (Oldham and Morris 1990; Kuhl and Kazén 1997) or, the other way round, by deriving PDs from independently conceived dimensions of variations in personality (e. g., Eysenck 1987; Cloninger 1987; Svrakic et al. 1993; von Zerssen 1993; Wiggins and Pincus 1993). Yet, no general agreement has been achieved so far with respect to an optimal common taxonomy of normal personality variations and PDs. Moreover, pP was usually not taken into account in this context or it was restricted to only one group of mental state disorders, either schizophrenia (see Ellison et al. 1998) or mood disorders (Akiskal 1988).

In the present paper, a comprehensive taxonomic model of typical configurations of personality traits (see Wiggins 1997) in different kinds of mental state disorders, particularly schizophrenia, mood and anxiety disorders, is presented. This model was empirically developed on the basis of a biographical approach to the assessment of pP (von Zerssen: unpublished report to the Deutsche Forschungsgemeinschaft, 1994). It was later hypothetically expanded to embrace the PDs according to DSM-III-R/-IV (American Psychiatric Association 1987, 1994) as well as two other forms of PDs, the hyperthymic and the depressive PDs as described originally by Schneider (1923; see Saß et al. 1993) and again recently by American authors (Akhtar 1988; Phillips et al. 1990) (von Zerssen: paper presented at an international conference on "Premorbid Personality and Personality Disorders... in Major Psychiatric Disorders" at Ringberg Castle, Bavaria, Germany, April 1997).

Development of a comprehensive typology of premorbid personality

From writings of Bleuler (1911) and Kraepelin (1913) to those of Arieti (1955, 1959) in the USA and Tellenbach (1961) in Germany, descriptions of pP in mental state disorders were usually based on clinical observation without the application of psychometric techniques for assessing personality traits, of statistical data analyses nor of any attempts at an operational definition of the intuitively achieved concepts. These concepts (schizoid personality in schizophrenia according to Bleuler, to which the "stormy personality" was later added by Arieti, the depressive, irritable, manic, and cyclothymic "personal dispositions" in manic depressives according to Kraepelin, the melancholic type of personality in melancholics according to Tellenbach) were typological without any reference to underlying dimensions of personality variations. The search for such dimensions started already in the early 1920s (Sjöbring 1923), but it was originally purely speculative. This changed with the introduction of psychometric measurements and the application of statistical techniques to the data thus obtained (e. g., Perris 1966; Eysenck 1970; Becker 1974; von Zerssen 1982).

On this basis, the clinically conceived type concepts often turned out to be multidimensional. Thus, the "melancholic type" was shown to be composed of an elevated degree of conscientiousness (Furukawa et al. 1998) or rigidity (Mundt et al. 1997; von Zerssen et al. 1998b) and low degrees of extraversion (Hecht et al. 1997; von Zerssen et al. 1998b), frustration tolerance (von Zerssen et al. 1998b), and aggressiveness (von Zerssen et al. 1998b) or, vice versa, a high degree of agreeableness (Furukawa et al. 1998), i. e., the contrary of aggressiveness (von Zerssen 1994; von Zerssen et al. 1998b), etc. Such deviations of test scores, in particular those concerning rigidity, have indeed been found in studies of patients recovered from an episode of severe unipolar depression (e. g., Maier et al. 1992; Schäfer 1994; Heerlein et al. 1996; Sauer et al. 1997; von Zerssen et al. 1997). However, in the majority of recent psychiatric investigations on the pP of patients with mental state disorders or in high-risk (e. g., Maier et al. 1992; Lauer et al. 1997) as well as in prospective field studies (e. g., Clayton et al. 1994), test scores have been elicited without referring to traditional type concepts. None the less, these studies clearly indicate that deviations do exist *premorbidly* in the personality sphere long before the onset of an axis-I disorder. Therefore, it is unlikely that such deviations simply reflect a "scar" phenomenon when assessed *postmorbidly* in patients remitted from an axis-I disorder. This problem, however, will not be dealt with in the present paper (for discussion see Shea et al. 1996; von Zerssen 1996a, b, 2001a, b; von Zerssen et al. 1998a) which focusses on the modelling of findings achieved by means of a biographical approach to the assessment of premorbid traits in psychiatric patients.

Several investigators (e. g., Schäfer 1994; Heerlein et al. 1996; Mundt et al. 1997; Akiskal et al. 1998) still apply personality inventories or interviews under the assumption of typological constructs reported in the literature by Kraepelin (1913), Tellenbach (1961) and others. Our group in Munich has recently followed a somewhat different approach by developing a comprehensive typology of pP in patients with various kinds of axis-I disorders (schizophrenia, mood disorders, anxiety disorders, and others) by a systematic evaluation of biographical data from psychiatric case records (Pössl and von Zerssen 1990a, b, 1996a; von Zerssen and Pössl 1990; von Zerssen et al. 1994a). The complex typing procedure was applied to a total of more than 500 case records, including those of an earlier study (R. Tellenbach 1975). The typing did not imply the diagnosis of PDs, yet it was complemented by a global rating of the degree of abnormality of a patient's premorbid development (similar to the respective rating suggested by Bleuler 1972). This rating covered the range from inconspicuous over conspicuous to definitely and, finally, extremely abnormal. The score thus obtained turned out to be closely related to the clinical diagnosis of any PD (Pössl and von Zerssen 1990b; Winkler 1993; see von Zerssen 1993).

In Table 1, our typology is briefly outlined by a series of characteristic features ordered according to hypothetically related dimensions of personality. It comprises altogether six types of pP. Three of them were found to predominate

Table 1 Characteristic features of the premorbid personality types (1)

Manic type	Relaxed, easy-going type ^a	Melancholic type	Anxious, insecure type	Unrealistic, dreamy Type	Nervous, tense type ^b	Hypothetically related dimension of personality
active vigorous vivid willful noisy		quiet	passive asthenic lame irresolute calm		restless tense impulsive	<i>Extraversion:</i> Activity
adventurous daring inconsiderate	carefree	cautious considerate	neophobic timid hesitant		incautious	<i>Extraversion:</i> Venturesomeness
sociable outgoing communicative attention seeking witty sexually active	easy-going humorous sexually natural	attached unobtrusive earnest sexually passive	shy sexually inhibited	unsociable withdrawn aloof unconcerned sexually indifferent	 cynical sexually unrestrained	<i>Extraversion:</i> Sociability
emotionally robust optimistic	emotionally balanced happy-go-lucky	emotionally restricted	emotionally labile pessimistic anxious worrying easily exhausted	sensitive	emotionally uncontrolled ambivalent nervous resentful easily frustrated	<i>Neuroticism:</i> Emotionality
assertive independent self-reliant self-governing		dependent	insecure dependent clinging helpless help seeking easily offended self-deprecating			<i>Neuroticism:</i> Ego-strength

in subtypes of major primary affective disorders (Pössl and von Zerssen 1990a, b; von Zerssen et al. 1990, 1994a, b); therefore, they were labeled as “affective types”. The three others were, although less specifically, associated with the broad groups of schizophrenia and so-called “neurotic” disorders (anxiety disorders, dysthymia and non-melancholic forms of major depression in the context of anxiety disorders, dysthymia or PDs) (Pössl and von Zerssen 1990b; von Zerssen et al. 1994a). For the sake of simplicity, we called them “neurotoid types”. Two types – one in each group – were conceived as rare variants of one of the four main types, the relaxed easy-going type as a variant of the manic type and the unrealistic, dreamy type as a variant of the anxious, insecure type. They should thus, by definition, closely resemble the respective main types. The manic type, which was found to prevail in bipolar patients with a marked preponderance of manic (M) over depressive (D) episodes ($M:D \geq 4:1$; see von Zerssen et al. 1994b), was conceptualized as a kind of opposite of the melancholic type (von Zerssen 1977, 1988). It is thus mainly characterized by features contrary to those of the melancholic type which predominates in patients suffering from severe pri-

mary unipolar depression with melancholic features. The two main “neurotoid types” also show several features opposite to each other, yet they share comparatively more features than the manic and the melancholic types do.

The similarities and dissimilarities of the type concepts are clearly reflected by the shared item-scores which were used for forming the respective (dimensional) type-scores (Gruben 1993). It turned out that the manic type-score did not only resemble that for the relaxed, easy-going type but also that for the independently conceived nervous, tense type; likewise, the type-score for the anxious, insecure type did not only show a close resemblance with that for its variant, the unrealistic, dreamy type, but also some similarity with the score for the independently conceived melancholic type. Conversely, pronounced dissimilarities of type-scores were found with respect to the pairs: melancholic vs. nervous, tense type; melancholic vs. manic type; manic vs. anxious, insecure type, and relaxed, easy-going vs. unrealistic, dreamy type.

These relationships point to a redundancy of the typology which is in the focus of our attempt at developing a taxonomic system on the basis of the type constructs de-

Table 1 Characteristic features of the premorbid personality types (2)

Manic type	Relaxed, easy-going type ^a	Melancholic type	Anxious, insecure type	Unrealistic, dreamy Type ^b	Nervous, tense type	Hypothetically related dimension of personality
dominating self-centered	cooperative empathetic	subordinate altruistic	submissive	detached	uncooperative depreciating others irritable obstinate rebellious provocative quarrelsome explosive	<i>Aggressiveness</i> (vs. Agreeableness)
boastful	friendly tolerant	loyal compliant indulgent obedient striving for harmony modest				
changeable	flexible	constant orderly rigid meticulous solid responsible sincere honest reliable faithful diligent			inconsistent in feelings and behaviour	<i>Conscientiousness</i>
generous extravagant					irresponsible truant untruthful unreliable faithless neglectful	
versatile						
imaginative unconventional		unimaginative conventional conformistic		dreamy idealistic romantic	non-conformistic	<i>Openness</i>
broad-minded enthusiastic	open-minded realistic pragmatic	narrow-minded sober pious		unrealistic esoteric interests	unreligious	
uncritical					critical	

^a relatively specific traits only; otherwise similar to the manic type, but not adventurous, dominating and extravagant

^b relatively specific traits only; otherwise similar to the anxious, insecure type, but not neophobic, dependent and clinging

scribed here. This was achieved within a project primarily aiming at a methodological improvement of the biographical approach to the assessment of pP. For this purpose, an interview technique – the Biographical Personality Interview (BPI) – was designed (von Zerssen et al. 1998a) and then tested in combination with the application of self-rating personality inventories (von Zerssen et al. 1998b). The taxonomic model to be described in this paper resulted from an analysis of the intercorrelation of type-scores and the correlation of these scores with those of the factoranalytically developed questionnaire scales. It was then generalized to personality disorders on rational grounds.

Methods

Subjects

The data originate from the validation sample of the BPI study (von Zerssen et al. 1998b). This sample consisted of 120 subjects, 100 of them psychiatric patients in remission from an axis-I disorder; the

other 20 subjects were healthy volunteers from the general population. In both subsamples, the distribution of gender was equal (50 % each of both sexes) and that of age was rather similar (range from 19 to 64 years with a mean of 39.5 and 42.2, respectively). The verbal IQ according to the subtest “Information” of the Wechsler Scale (Wechsler 1944) varied between 80 and 133 with a mean of 105.4. The diagnoses of the patients (which were unknown to the investigators) covered a broad range of psychotic, mood, anxiety, and other disorders (see von Zerssen et al. 1998b). All subjects had been informed about the principle aim of the study and the general steps of the assessment. They had given written and oral consent. Further details can be found in von Zerssen et al. (1998b). For the present analyses, which are directed towards the development of a taxonomic model of the pP types, data of the total sample (n = 120) are used for constructing a circumplex (circular structure) from the intercorrelation of type-scores. A subsequent principal component analysis of BPI item scores, however, is restricted to data of the patient sample (n = 100) because we combined the data of controls (n = 20) with the data obtained in cases (n = 59) not fulfilling the project criteria with respect to age, verbal IQ, clinical remission, etc. (see von Zerssen et al. 1998b). As the size of this sample (n = 79) is still below the number of items selected for the principal component analyses (see Data analysis), the data has only been utilized for additional analyses which are not relevant for the model to be presented here.

Assessment tools

Interview

The BPI (von Zerssen et al. 1998a, b) is an interview, applied by trained investigators who are not informed about any clinical data of the interviewee except, in the case of patients, the time of onset of an axis-I disorder (including, as in the selection of case records described above, unspecific prodromal stages). Onset before the age of 15 years was an exclusion criterion for a patient. The interview covers the whole premorbid period of life. In our healthy subjects, only periods of comparable duration were taken into account. The inquiry followed a strict schema. Starting with sociodemographic data at the time before the onset of an axis-I disorder and the family history, it proceeds to external circumstances of living and acute life events ("external life history") during the premorbid period (or the respective time period of a healthy subject). The data are documented on life charts somewhat similar to those proposed by Adolf Meyer (1919). These charts, in combination with a checklist of items referring to typical areas of living (home, job, etc.), serve as guidelines for an inquiry of thoughts, feelings and behaviors during the sections of the premorbid life span ("internal life history"). The acceptance of the interview is generally very high, in spite of its considerable duration of two to four hours per subject.

After the inquiry, a verbal interview protocol of about four to six pages is typed. It is structured in the same order as the interview procedure (sociodemographic data – family history – external life history – internal life history). This protocol is later used for rating characteristics of the subject along a list of 175 items, an extended version of the 106 item list used for evaluating case records (see von Zerssen et al. 1994b). The rating is performed by another trained investigator who has not even seen the interviewee and has not received any information about him or her beyond that contained in the protocol. The rater has to document the ratings by marks on the item list (which also includes items regarding a subject's spiritual attitudes) and on another list for global ratings, of which only the one referring to the general degree of abnormality of a subject's premorbid mental development has been selected for the present data analyses.

As in the analyses of case records, the ratings on the item list are transferred to a computer program which forms item-scores for the six pP types, computes the respective type-scores and assigns a subject to the type for which the intra-individually highest score has been achieved. The inter-rater agreement for the type-scores varies between .81 for the relaxed, easy-going type and .88 for the nervous, tense type. The concordance rate for the assignment to the respective types reaches a kappa value of .60.

Furthermore, separate scores for two empirically derived spiritual attitudes are calculated, one reflecting a conventional belief in God ("piety"), the other one characterizing an unconventional "search for meaning" behind the obvious. The global rating of the degree of abnormality of premorbid development is reproduced as such and in a dichotomized form (inconspicuous vs. conspicuous, definitely or extremely abnormal). Further details are presented by von Zerssen et al. (1998a). It should be pointed out here that biographical data, in contrast to self-ratings of personality, are not markedly influenced by a patient's mood state (Bühler et al. 1999). This is important for the interpretation of the BPI ratings as reflecting premorbid habits.

Personality inventories

The Six-Factor Test (SFT; von Zerssen 1994) is a self-rating questionnaire composed of 52 items, among them three control items for assessing a subject's motivation (Mo) to respond adequately to the test items. From the other items, factoranalytically derived test scales have been constructed, five of them corresponding to the Five Factors of basic personality research, also called the "Big Five" (see Wiggins and Trapnell 1997): Extraversion (E) – Neuroticism (N) – Conscientiousness (C) – Aggressiveness (A, conceived as the reverse of agreeableness; see above); – Openness to experience (O). The

sixth scale mirrors a conventional form of religious belief (Piety: P), analogous to the respective BPI scale.

The internal consistency of the scales according to the Spearman-Brown formula is satisfactory (.75 for P to .89 for C), with the exception of O (.61). The same is true for the re-test reliability after six weeks in a preceding study (von Zerssen 1994): .81 for E to .89 for N, but only .61 for O. In a study by Steinmeyer et al. (1996), the construct validity of the SFT has been shown to be higher than that of the NEO-FFI (Costa and McCrae 1989; German version), particularly in psychiatric patients.

The Munich Personality Test (MPT; von Zerssen et al. 1988) was applied in order to check the validity of the BPI and that of the SFT scales. The reliability and validity of this 51 item questionnaire had been demonstrated in the original investigation of samples of psychiatric patients, former patients and subjects from the general population (von Zerssen et al. 1988) and was confirmed in subsequent high-risk studies (Maier et al. 1992, 1995; Lauer et al. 1997; Hecht et al. 1998) as well as case control studies in Germany (Bronisch and Hecht 1989, 1990; Schäfer 1994; Hecht et al. 1997, 1998; Assion et al. 1998), Chile (Heerlein et al. 1996) and Japan (Sakado et al. 1997; von Zerssen et al. 1997). Besides Mo (as in the SFT), there is another control scale, namely that for the social desirability of responses, labelled as Orientation towards Social Norms (No). This is, at least in part, also a personality scale reflecting the extent to which social norms are accepted by the subject (von Zerssen et al. 1997, 1998b). Of the six personality scales proper, three correspond closely to scales of the SFT, namely E, N, and R (Rigidity), a construct rather similar to conscientiousness (von Zerssen 1994). The other scales ascertain Frustration tolerance (F), which almost equals stress tolerance or resilience, Isolation tendency (Is), i. e., the tendency to active seclusion from close-intimate relationships, and Esoteric tendencies (Es), i. e., tendencies to replace or supplement experience of reality by unusual (e. g., mystical) experience, thus resembling the O scale of the SFT (with which it correlates around .45).

The internal consistency (Spearman-Brown) in the general population sample varied between .67 for Es and .90 for N. Similar values were obtained in clinical and other samples (von Zerssen et al. 1988). The re-test reliability after six weeks had a range from .73 (Is) to .85 (F); after approximately seven years, the values ranged between .43 (F and R) and .49 (Es), with the exception of the value for N (.32). The comparatively low temporal stability of neurotic tendencies (N) has been found in several investigations with questionnaire scales and can easily be explained by the symptom sensitivity of such tendencies (Hirschfeld et al. 1989; Duncan-Jones et al. 1990; Sauer et al. 1997). Construct and concurrent validity of the MPT scales are documented in the papers quoted above.

Data analysis

For a correlational analysis of scale values (sum scores of items), the samples of patients ($n = 100$) and controls ($n = 20$) were combined in order to maximize the sample size ($n = 120$). This seemed justified as it was known from a comparison of scale values from various subsamples of the total group that the differences between patients in general and non-patients were not more pronounced than those between certain diagnostically homogeneous subgroups of patients (see von Zerssen et al. 1998b). Of the 22 scales, nine were BPI scales (six type scores, two scores reflecting spiritual attitudes and one referring to the degree of premorbid abnormality), six were SFT scales and seven MPT scales (six personality scales proper and one scale for assessing the Orientation towards Social Norms). The correlation of the six BPI type-scores with the other BPI scores and the scores of questionnaire scales served as measures of concurrent validity. The intercorrelation of the type-scores, however, was used to construct a circular model of relationships among the six types of pP by converting the correlation coefficients into angle degrees. Ideally, a coefficient of $r = 1.00$ would correspond to an angle of 0° , one of 0.00 to 90° and one of -1.00 to 180° . Taking into account the facts that, in general, the absolute values (except for the correlation of a variable with itself) cannot exceed those representing the reliability of ratings (e. g., the inter-rater agreement of $r = .81$ to $.89$) and that a projection

of the interrelations on a plane cannot totally reflect the information contained in the correlation matrix, only a rough estimate of angle degrees was feasible. The correlation coefficients for this particular analysis were obtained by an inter-rater comparison of BPI type-scores (see von Zerssen et al. 1998b: Table 2). The coefficients are very similar to those resulting from ratings of only one investigator (J. Pössl) reproduced in Table 2 of this paper. Thus, the basic structure of the model can be expected to be relatively independent of the individual ratings.

For testing the validity of the circular structure of the model (circumplex), the following strategy was chosen: In order to reduce the number of items (175) below the number of subjects ($n = 100$) for further analyses, the total item pool was divided into two subsets of 87 and 88 items, respectively, largely equivalent with respect to their content and their distribution over the BPI sum-scores. The matrix of intercorrelation of items in each of the two subsets was factoranalyzed by means of a principle component analysis. The axes (components) were then orthogonally rotated according to Varimax criteria for four through eight components in order to test the stability of the resulting components. It was expected that the first two of them would lend themselves for the construction of a circular structure similar to that based on the intercorrelation of types-scores. They were arbitrarily selected from one of the two versions, the one with 87 items and an n of 97 (because of some missing data regarding the item scores of three cases) of the six factor solution. In fact, the other version (with 88 items and an n of 98) or any other solution could have been utilized as well (see Results). However, the decision for only one version and solution reduces the possibility of a biased selection.

For the components, factor scores were computed and correlated with the six type-scores, the other BPI sum and global scores, questionnaire scores and other variables. This facilitated the comparison of the ten ($= 2 \times 5$) factor solutions and the interpretation of each component. Above all, it could thus be excluded that the composition of the two main components selected for testing the circumplex model of personality was simply determined by our preconceived type-scores. Instead, the locations of the type-scores within the factor space were primarily determined by the independently defined principal components. The components were then graphically represented as orthogonal axes in a two-dimensional space and the correlation of type-scores were plotted against these axes. The resulting structure should resemble the one derived from the intercorrelation of type-scores although, possibly, only after a rotational procedure (which would not change the structure as such, i. e., the spacial relationships among the types of pP represented by the graph). Afterwards, the axes were rotated in a way that they could be interpreted most easily from a general psychological and clinical point of view.

Finally, the positions of PDs in this taxonomic model of pP were hypothetically derived on rational grounds from the similarity or dissimilarity of their descriptions in the DSM-III-R and a paper on "sub-affective" PDs (Saß et al. 1993), respectively, with the description of the six types of premorbid personality in our item lists (Table 1; see also Appendix A through C in von Zerssen et al. 1994a).

Results

The correlation of the type-scores (derived from J. Pössl's ratings) with one another, with the ratings of premorbid abnormality and of spiritual attitudes as well as with the questionnaire scales is presented in Table 2. Evidently, there are some close positive and negative associations among the type-scores and corresponding, although generally somewhat weaker, associations with the other BPI ratings and the questionnaire scales. Of the latter, only the SFT scale O and the (similar) MPT scale Es do not show significant relationships ($p < .01$) to any of the pP types.

A graphic representation of the relationships expressed

by the figures of Table 2 in von Zerssen et al. (1998b) and the similar figures in the table reproduced here leads to a circular order of type concepts, similar concepts located near each other and opposite to the most dissimilar ones. When putting the manic type symbolically on top of the circle, the two other "affective types" on the right and the three "neurotoid types" on the left sides, the circumplex depicted in Fig. 1 is achieved (the methodology of the construction is explained under Methods: Data analysis). Obviously, the circumplex can be related to two orthogonal axes, e. g., one opposing the "neurotoid types", in particular the unrealistic, dreamy type, to the "affective types", in particular the relaxed, easy-going type. This axis would represent the degree of premorbid abnormality; the orthogonal axis, contrasting the types more changeable with regard to personal relations, job, ideas, etc. (nervous, tense and manic types) with the less changeable and thus more constant (anxious, insecure and melancholic) types, would represent the degree of unsteadiness of a subject's life style.

The validity of this two-dimensional taxonomic model of pP types was tested by a comparison with the location of the types according to the correlation of type-scores with the first two principle components of BPI item-scores in our patient sample (see Methods: Subjects, and Data analysis). The principal component analysis yielded 25 factors with eigenvalues > 1.00 , which together accounted for 78.27 % of the total variance. However, the first two factors alone reached eigenvalues of 10.88 and 7.46, respectively, followed by values below 5.00 (2), 4.00 (2), 3.00 (5), and 2.00 (14 components). The variance explained by the first factor was 12.05 % and that accounted for by the second factor was 8.57 %, together 21.07 %.

From the fourth through the eighth factor solutions, the composition of the rotated factors did not change at all. This is documented by the intercorrelation of the respective factor scores ($r = 1.00$). Yet only for the first two com-

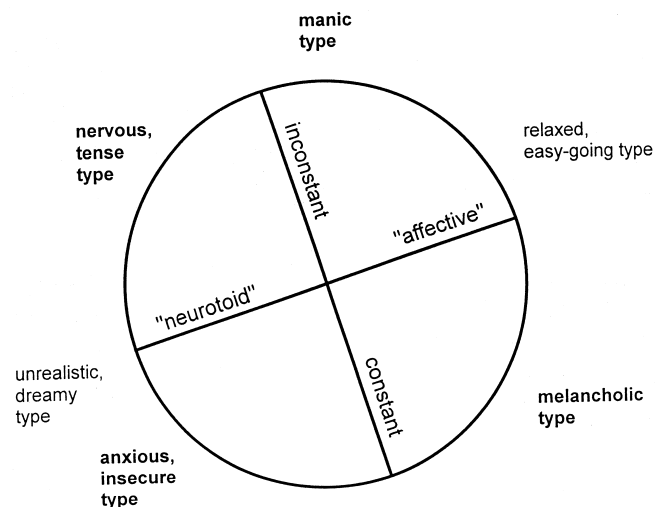


Fig. 1 Circumplex model of premorbid personality types according to the intercorrelation of type-scores (von Zerssen: unpublished report to the Deutsche Forschungsgemeinschaft, 1994)

Table 2 Correlates of the premorbid personality types (n=120)

Source	Variable	Abbrev.	“Affective Types”			“Neurotoid Types”		
			man. t.	r,e.-g. t.	mel. t.	a.,i. t.	u.,d. t.	n.,t. t.
BPI	“Affective Types”	Manic type	man.t					
		Relaxed, easy-going type	r,e.-g. t.	.41				
		Melancholic type	mel. t.	-.63				
	“Neurotoid Types”	Anxious, insecure type	a.,i. t.	-.55	-.64	.29		
		unrealistic, dreamy type	u.,d. t.		-.70	.78		
		nervous, tense type	n.,t. t.	.58		-.66	.28	
BPI	Abnormality			-.48	-.29	.43	.51	.45
	Belief in God		-.33		.46	.24		-.39
	Search for Meaning		.37					
SFT	Extraversion	E	.50	.55		-.48	-.51	
	Neuroticism	N		-.29		.45	.31	
	Conscientiousness	C		.27	.33		-.28	-.39
	Aggressiveness	A			-.36			.28
	Openness to Experience	O						
	Piety	P			.30	.24		-.29
MPT	Extraversion	E	.50	.35	-.30	-.39	-.26	
	Neuroticism	N		-.35		.52	.37	
	Rigidity	R			.32			-.30
	Frustration Tolerance	F	.25			-.36		
	Isolation tendency	Is		-.43		.31	.46	
	Esoteric tendencies	Es						
	Normorientation	No	-.31		.43			-.39

Product-moment correlation $p < .01$. Coefficients $\geq |.50|$ in bold face. *BPI* Biographical Personality Interview. *MPT* Munich Personality Test. *SFT* Six Factor Test

Mind that the expected value for a false positive result at $p < .01$ in a 6x16 contingency table is .96, i. e., 1 coefficient meeting the criterion instead of 44 coefficients as in the lower three sections of this table

ponents was there a very close correspondence between the two parallel versions (with 87 and 88 items, respectively; see Methods: Data analysis): $r = .91$ for the first and second components and $r = .86$ for the second and first components of the two versions. Moreover, only with respect to the first two components did the personality type-scores reach a correlation above .50. Thus, the factor score for the first component of the preselected 87 item version (see Methods: Data analysis) opposed the manic type ($r = .87$) and its variant, the relaxed, easy-going type ($r = .67$), to the anxious, insecure type ($r = -.78$) and its variant, the unrealistic, dreamy type ($r = -.56$). The factor score for the second component of the same version contrasted the melancholic type ($r = -.67$) with the nervous, tense type ($r = .64$) and the unrealistic, dreamy type ($r = .55$). The respective figures for the corresponding factor scores of the parallel version were rather similar.

The other components reflect various facets of an individual's complex biography (such as home environment, certain childhood behaviors, working habits, etc.) which, of course, are not completely covered by our type concepts of premorbid behavioral traits. This can be neglected in our attempt to develop and test a taxonomic model of the *main*

variants in premorbid personality and to generalize it to personality disorders.

The position of the type-scores in the factor space determined by the first two components derived from one of the two subsets of BPI items (see above) is presented graphically in Fig. 2. At first glance, this graph looks rather different from the circumplex displayed in Fig. 1. However, the spatial orientation of the graphs is arbitrary and has no influence on the structures thus represented. The rotation of the second schema (Fig. 2) by around 75° counter-clockwise would make the concordance with Fig. 1 obvious. In order to make the figure more easily comprehensible in the frame of our concept, one should rotate the distribution of points (types) alone by 55° and leave the coordinates in their horizontal and vertical positions, respectively (which is mathematically equivalent to a rotation of the coordinates in the opposite direction). This would pose the three “affective types” (including the manic type) on the right side and the three “neurotoid types” on the left side of the circle. Now, left of the vertical axis means, by definition, comparatively abnormal. In perfect agreement with the correlation of type-scores and the BPI rating of premorbid abnormality (see Table 2), the hori-

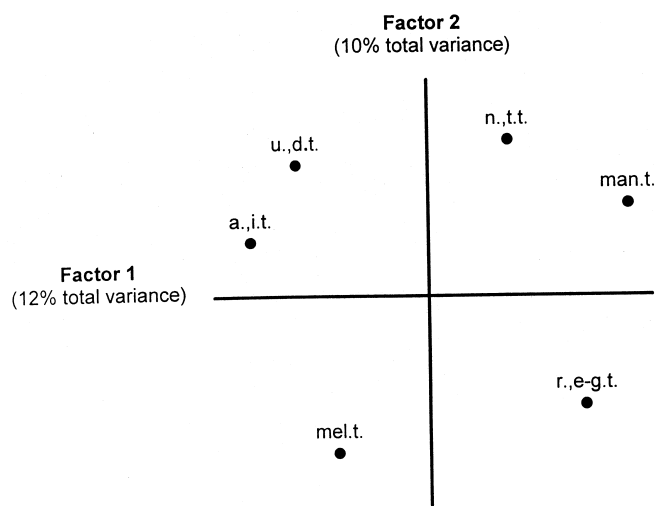


Fig. 2 Location of types in the factor space determined by the first two dimensions of 87 BPI items in psychiatric patients ($n=100$) (von Zerssen: unpublished report to the Deutsche Forschungsgemeinschaft, 1994)

<i>man t.</i>	manic type	} “affective types”
<i>r.,e.-g. t.</i>	relaxed, easy-going type	
<i>mel. t.</i>	melancholic type	
<i>a.,i. t.</i>	anxious, insecure type	} “neurotoid types”
<i>u.,d. t.</i>	unrealistic, dreamy type	
<i>n.,t. t.</i>	nervous, tense type	

zontal axis would thus oppose the most abnormal unrealistic, dreamy type with the “supernormal” relaxed, easy going type.

The hypothetical positions of PDs in our model should be outside the circle because disorders of personality deviate more from the average (i.e., the center of the circle) than the pP types do; furthermore, the location of PDs should be largely restricted to the left side of the coordinate system (i.e., the side representing the abnormality of premorbid personality development). Exceptions could be types of PD that are usually less dysfunctional than the majority of these disorders. An example of this kind is the hyperthymic PD as described by Schneider (1923) and recently by Akhtar (1988). This PD is surely an extreme variant of the manic type of pP. According to DSM-III-R/-IV criteria of PDs, the narcissistic PD resembles the hyperthymic PD in several respects, particularly so in its tendency to grandiosity, and should therefore be located near it on the more abnormal (left) side. Somewhat further to the left is located the histrionic PD which shares some features with both PDs, in particular the tendency to be in the center of attention. However, due to the pronounced lack of emotional control, its location should be nearer to that of the nervous, tense type of pP than the two other PDs.

The opposite of the hyperthymic PD is represented by Schneider’s “depressive psychopathy”, more recently described as “depressive personality” by Phillips et al. (1990). It is therefore to be located 180° away from the hyperthymic PD. As the melancholic type is characterized by

personal dependency in combination with a high degree of conscientiousness/rigidity rather than by premorbid depressive features, the dependent and the compulsive PDs should be located outside the circle between the positions of the melancholic type of pP and the depressive PD. The extremely conscientious and rigid compulsive PD, which usually does not display depressive features, should be still nearer to the melancholic type than the dependent PD, directly opposite to the highly changeable histrionic PD. The dependent PD should be located nearest to the depressive PD because both these disorders share the high sensitivity to refusal by and the separation from others. Thus, the position of the dependent PD would be just opposite to that of the extremely selfish narcissistic PD. In relation to the types of pP, the depressive PD should be located nearer to the anxious, insecure type than to the melancholic type because it shares the tendency to negative emotions and cognitions with the former and not with the latter. However, the closest relationship to the anxious, insecure type is evidently shown by the avoidant (DSM-IV: hypersensitive) PD which can be regarded as a particularly maladapted extreme variant of this type. The unrealistic, dreamy type, i.e., the variant of the anxious, insecure type, exhibits features similar to those of the schizotypal PD although not so pronounced and not so dysfunctional. The schizoid PD shares the tendency to active seclusion from close social relationships with the schizotypal PD as well as with the unrealistic, dreamy type of pP; but it is less imaginative than both of them, in this respect rather resembling the avoidant PD and the anxious, insecure type.

Among the remaining PDs, the borderline PD displays features (e.g., instability of interpersonal relations and impulsiveness) which resemble those of the nervous, tense type even more than the histrionic PD does. The antisocial PD has to be placed near the explosive variant of the borderline PD. The location of the paranoid PD is assumed to be between the antisocial and the schizotypal PDs because it shares the reduced sense of reality with the schizotypal PD and the hostility in social relations with the antisocial PD. The greatest problem of location in our circumplex model is presented by the passive-aggressive PD of DSM-III/III-R which, in DSM-IV, is only listed in the appendix as “negativistic PD”. The passive attitude relates it to the area around the depressive and the avoidant PDs, the hostility and the neglect of social responsibility, however, makes it even more similar to the antisocial and, to a lesser extent, to the borderline PDs. With this exception, all DSM-III-R/-IV PDs would be placed in an order which corresponds to the clusters A, B and C as demonstrated in Fig. 3.

Discussion

In perfect agreement with assumptions underlying the terminology of our personality types, the correlation of type-scores with the degree of abnormality of a subject’s premorbid development points to the relative abnormality of the “neurotoid types” compared with the “affective types”. Of the latter three, the relaxed, easy-going type appears to

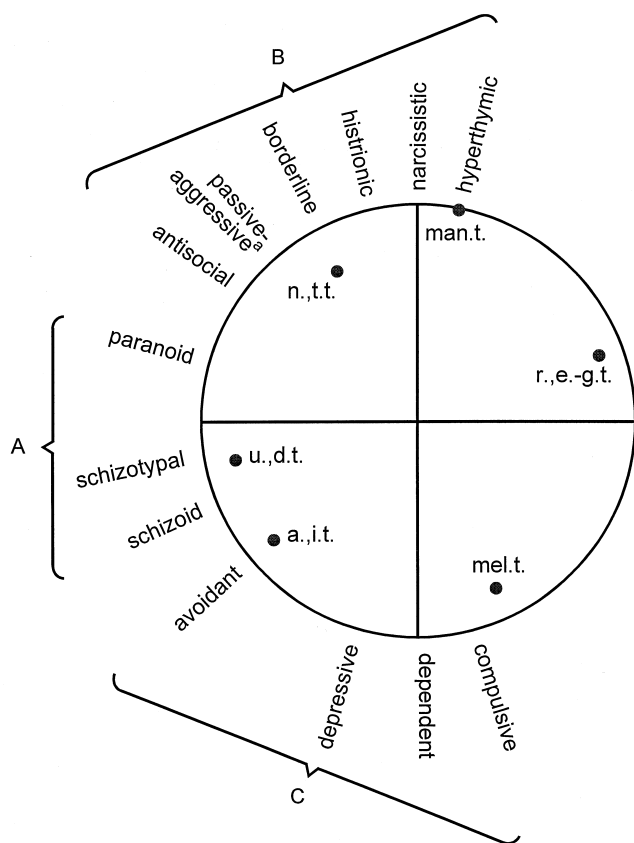


Fig. 3 Hypothetical locations of personality disorders in the circumplex model of premorbid personality types
A Cluster A Personality Disorders (PDs); B Cluster B PDs; C Cluster C PDs; other abbreviations see legend to Fig. 2.

^a Placed in Cluster B (not C) on conceptual grounds (high aggressiveness)

be the most normal one and is thus in pronounced contrast to the three "neurotic types", in particular to the unrealistic, dreamy type. This was expected on the basis of our experience with the analysis of case records. Likewise, it is concordant with the respective type concept that the melancholic type is characterized by a conventional religious attitude (see Gneist 1969). The manic type, however, is rather unconventional not only in life style but also in spiritual attitudes which show a tendency to a search for meaning behind the obvious instead of accepting more official religious convictions (see von Zerssen 1988). With respect to the degree of premorbid abnormality and spiritual attitudes, the nervous, tense type represents the opposite of the melancholic type; this is also found with respect to the scores on questionnaire scales. Whereas the melancholic type is conscientious (SFT) and rigid (MPT), non-aggressive (SFT), pious (SFT, but documented by the respective BPI ratings, too) and strongly oriented towards social norms (MPT), the nervous, tense type displays exactly the opposite tendencies. Only the melancholic type's reduction of extraversion (which, however, is restricted to the respective MPT scale) has no counterpart in the psychometric profile of the nervous, tense type.

A comparable degree of dissimilarity is found with respect to the psychometric profiles of the unrealistic, dreamy and the relaxed, easy-going types. The last named type appears extraverted and unneurotic (SFT and MPT), conscientious (SFT), although not rigid (MPT) as the melancholic type is, and shows no tendency to social isolation (MPT); the unrealistic, dreamy type, however, exhibits just the opposite features. A psychometric profile similar to that of the unrealistic, dreamy type is shown by the anxious, insecure type which, however, appears to be comparatively less tolerant to frustration (MPT) and does not show a lack of conscientiousness (SFT). Similar to the melancholic type, this neurotic type demonstrates more piety than average which corresponds with the respective BPI rating. With very few exceptions, these findings confirm the expectations based on our former experience with the analysis of case records (see Table 1) and the intercorrelation of type-scores from the BPI ratings (see below).

The exceptions refer to the lack of an association of quantitative scores for O (SFT) and Es (MPT) to the imaginative manic and unrealistic, dreamy types which was expected to be positive, and to the unimaginative melancholic type which was expected to be negative (see von Zerssen 1977). This may be due to the relatively low internal consistency of the respective questionnaire scales (see Methods: Assessment tools) which necessarily reduces their discriminative power. However, the same reason cannot be given for the lack of extravertive tendencies (SFT and MPT) of the nervous, tense type because the E scales of both tests are very reliable measures. Yet, due to the content of items of which they are composed (see von Zerssen 1994; von Zerssen et al. 1988), impulsiveness is underrepresented in these scales compared with sociability, another facet of extraversion (see Eysenck and Eysenck 1963). This could have favored positive values of E in the rather sociable relaxed, easy-going as well as manic types and obscured the impulsiveness of the nervous, tense type.

Similarly, the N scores of SFT and MPT should correlate positively with the nervous, tense type-score which characterizes one of the "neurotic types". However, this expected association should likewise depend on impulsiveness which is also partly implied in the broad concept of neuroticism (Costa and McCrae 1989). Among our questionnaire scales, only A (Aggressiveness: SFT) includes aspects of impulsiveness and this scale does show the expected positive relationship to the nervous, tense type. Together with the low values of conscientiousness, this implies a high position on Eysenck's psychoticism dimension which is composed of low agreeableness (i.e., high aggressiveness) and low conscientiousness (see Eysenck 1992). Thus, in the framework of his three-dimensional system of variations in personality (Eysenck and Eysenck 1985), the nervous, tense type would be opposed to the melancholic type on one dimension (psychoticism); the anxious, insecure type and its variant, the unrealistic, dreamy type, however, would be contrasted with the manic type and its variant, the relaxed, easy-going type, on the two other dimensions (neuroticism and introversion vs. extraversion). A higher order factor for these

two dimensions was already found in earlier work and described under the heading of "mental vitality" (von Zerssen 1976). The positive pole of this "superfactor" characterizes emotional stability in combination with extraversion, i. e., the same combination as ascertained in the relaxed, easy-going type. The opposite, namely a combination of emotional lability with introversion, has been detected now in the anxious, insecure type and its variant, the unrealistic, dreamy type.

Taking the information conveyed by the figures of Table 2 together, it can be inferred that the psychometric data are largely consistent with expectations based on our typological constructs of pP, thus confirming the validity of the BPI ratings.

The intercorrelation of type-scores is almost perfectly in accord with the inferences drawn from the correlation of type-scores with the questionnaire scales. Thus, the highest value (.78) which approaches that of the inter-rater agreement of the respective scores ($r = .84$ and $.83$, respectively) refers to the association of the anxious, insecure type and its variant, the unrealistic, dreamy type. However, both types can be distinguished by their differential relationships to the manic and the melancholic types which are significant only for the anxious, insecure type but not for the unrealistic, dreamy type. Taking the amount and direction of significant associations into account, it becomes evident that the anxious, insecure type is somewhat similar to the melancholic type (.29) and very dissimilar to the manic type ($-.55$; almost as much as the melancholic type: $-.63$) whereas the unrealistic, dreamy type is rather indifferent in this respect. It does show, however, some similarity with the nervous, tense type (.28) which is missing in the case of the anxious, insecure type. This last type and its variant are convergently opposed to the relaxed, easy-going type, the unrealistic, dreamy type ($-.70$) even more so than the anxious, insecure type ($-.64$). A similar sharp contrast exists between the nervous, tense and the melancholic types ($-.66$) whereas a positive correlation connects the nervous, tense and the manic types (.58). The last correlation even exceeds that between the manic type and its variant, the relaxed, easy-going type (.41), a finding not expected on the basis of the respective type concepts (see section on the Development of a comprehensive typology...).

On the whole, there is a remarkable agreement between the interrelations of type-scores and their relations to the questionnaire scores. It should therefore be possible to replicate the typology by means of questionnaire data from the SFT and/or the MPT. This implies the possibility to project the "Five Factors" of personality, which have been derived from factoranalytical research, on a plane or, in other words, to relate these orthogonally conceived factors to two main dimensions only. The latter would, e. g., represent the degree of abnormality in personality development and the degree of variability of behavior (highly changeable vs. hardly changeable). Judging from the correlation of questionnaire and BPI scores, four of the "Big Five" could easily be located within this frame of reference, namely E, C, N, and A (as aggressiveness or its contrary, namely agreeableness). Extreme positions on these

factors could thus be arranged in a circular order corresponding to that of our six types of pP. The sequence around the clock, starting at the upper section of the circumplex, would be (abbreviations of the types according to Fig. 2): E+ (between the man. t. and the r., e.-g. t.), N- (nearest to the r., e.-g. t.), C+ (between the latter type and the mel. t.), A- (nearest to the mel. t.), E- and N+ (both between the a., i. t. and its variant, the u., d. t.), C- (between the last type and the n., t. t.), and finally A+ (nearest to the n., t. t.). O cannot be located on this basis because of a lack of significant correlation with any of the type-scores. According to the type concepts, we expected a positive correlation with the manic as well as with the unrealistic, dreamy types and a negative correlation with the melancholic type. From this point of view, we would locate O+ in our circumplex left of E+, and O- on the opposite side between A- and E-

The extension of our model to PDs implies associations of these disorders with the "Big Five" according to the respective locations around the circle. Thus, none of the PDs should correlate, at least markedly, with O; yet, on the basis of our type concepts, some positive associations of O with cluster B PDs (near to the location of the manic type of pP) and with the schizotypal PD could be expected. In any case, none of the PDs should show a negative correlation with N. On the contrary, all of them (with the exception of the hyperthymic PD) should correlate positively with N, particular so the depressive, avoidant, schizoid, and schizotypal PDs. E should correlate positively with the hyperthymic, narcissistic and histrionic PDs and negatively with the same cluster A and C PDs that show the highest positive correlation with N. The correlation of C should be positive in the case of compulsive PD and negative in that of antisocial, passive-aggressive and borderline PDs; A, however, should correlate in the opposite direction to C with these PDs.

A comparison of these hypothetical associations between PDs and the Five Factors with empirical findings reported in the literature point to a remarkable agreement of facts and assumptions, with the following exceptions: O was found to be reduced in the schizoid PD and seems to be particularly elevated in the borderline PD. Furthermore, the correlation of N is more pronounced in the compulsive PD than hypothetically predicted and less pronounced in the schizoid PD. Finally, a negative correlation of C with the dependent PD found in some empirical studies (e. g., Wiggins and Pincus 1989; Costa and McCrae 1990; Trull 1992) could not be predicted from our model; the positive correlation of C with the compulsive PD, expected on the basis of our model and of clinical experience, was – curiously enough – found in only one of these studies (Wiggins and Pincus 1989).

Some of the divergencies may be due to the fact that PDs had been assessed by means of self-rating questionnaires in a number of empirical studies and the validity of this methodological approach seems questionable (see, e. g., Hyler et al. 1990; O'Connell et al. 1991). This objection also applies to a study in which a similar two-dimensional model of personality as ours was used as the frame

of reference for a taxonomy of PDs (Becker 1995, 1998). The data on which this integrated model was based had been obtained in a Canadian investigation of a non-patient sample by means of a multidimensional personality and personality disorders questionnaire (Schroeder et al. 1992). A re-analysis of the data was performed under the assumption of two main dimensions by Becker (1998). There is basic agreement of his results with our expanded model in that the PDs are located on one side of a circumplex indicating, according to Becker, "low mental health" which is, by definition, almost equal to a high degree of abnormality in our terminology. The dimension orthogonal to the mental health axis opposes high and low "behavior control", similar to the corresponding dimension in our model which opposes changeable and constant forms of habitual behavior. The sequence of DSM-IV PDs from low to high "behavior control" is: histrionic, antisocial, narcissistic, negativistic (corresponding to passive-aggressive), borderline, dependent, paranoid, schizotypal, avoidant, schizoid, obsessive-compulsive. With few exceptions, e. g., the positions of the antisocial, the dependent and the schizoid PDs, this order is largely consonant with that suggested by us on the basis of similarities of PDs with our six types of pP. Above all, cluster B PDs as well as the negativistic/passive-aggressive PD are located together in corresponding sections of the respective coordinate systems indicating high abnormality/low "mental health" in combination with various degrees of changeable behavior/low "behavior control". The cluster B PDs are opposed to the cluster C PDs which present constant behavior/high "behavior control". The cluster A PDs hold an intermediate position along this dimension, although not so clear in Becker's model as in ours, and a comparatively extreme position on the axis of abnormality/low "mental health" (with the exception of schizoid PD in Becker's model).

The high degree of agreement of the two models is particularly striking in view of the fact that they were developed independently on the basis of different methodological approaches with respect to samples (clinical vs. non-clinical), assessment tools (rating of personality traits from biographies ascertained by means of an interview vs. self-ratings by means of a questionnaire) and principles of construction (hypothetical extension of a model originally referring to the pP of psychiatric patients vs. combined factor analysis of self-ratings of personality traits and traits that are characteristic of PDs). If a clinical sample (psychiatric patients) would be investigated by means of one of the personality questionnaires used in our study and the PD ratings would be based on clinical interviews, the correspondence of the results with our model could be expected to be even more pronounced.

It should be pointed out that our and Becker's models are basically consonant with other circumplex models of personality, e. g., the original one of Eysenck (1970) with the axes Extraversion (changeable vs. constant according to Wundt 1903) and Neuroticism (in Wundt's terminology: positive vs. negative emotions). There is also a marked degree of agreement with circumplex models of interpersonal relations from that proposed by Leary (1957) to Kiesler's

(1983) interpersonal circle. Kiesler (1986) used his model also as a frame of reference for the positions of some of the DSM-III PDs. A profound difference to Becker's and our models relates to the position of the histrionic PD which is placed by Kiesler on the side of the circumplex corresponding to a high degree of mental health in Becker's and a low degree of abnormality in our model. However, this does not make much sense from a clinical point of view.

This argument is strengthened by results of other attempts to relate DSM-III-R PDs to the interpersonal circle (see also Wiggins and Pincus 1993). The study by DeJong et al. (1989) will be considered here in more detail, because PDs were assessed by a semistructured interview of psychiatric patients and this increases the chance of clinically meaningful results compared with questionnaire methods. The authors found that the affiliation dimension (which corresponds to Becker's dimension of mental health and our normality-abnormality dimension) does not clearly discriminate between different forms of PD. The reason is simply that all PDs correlate negatively with the score representing this dimension, i. e., they deviate from the mean in the same direction – as in Becker's and our models. They vary, however, markedly along the control dimension, i. e., the equivalent of the similarly named dimension in Becker's model and the changeable vs. constant dimension in our circumplex. The sequence of PDs in the interpersonal circle differs from that suggested in this paper profoundly only in the positions of the compulsive PD on the one hand and the borderline as well as the passive-aggressive PD on the other. According to de Jong et al., the compulsive PD should be characterized by a lack of control, the passive-aggressive and even the borderline PDs by a certain degree of overcontrol. This is difficult to comprehend. Other differences from the locations of PDs in our model are, however, minimal and need no comment.

On the whole, the similarities of the various models clearly outweigh the dissimilarities. This is a strong argument for their general validity. Another inference can be drawn from the similarity of our model of pP with models derived from non-patient samples. Apparently, variations in pP are not fundamentally different from those in the personality of mentally healthy subjects. Only their distribution in various forms of mental state disorders seem to differ between these disorders and between them and the general population. The same inference can be drawn from the concordance of the factorial structures of personality inventory data in psychiatric patients, former patients and healthy subjects (von Zerssen et al. 1988) and from differences in BPI type-scores between psychiatric patients in general and healthy subjects compared with differences between certain subgroups of patients (von Zerssen et al. 1998b).

Two-dimensional models of PDs alone are, by necessity, less informative than models that integrate variations in personality or interpersonal behavior such as those by Kiesler (1986), Becker (1998) and the one presented in this paper. An example of a model restricted to PDs is that proposed by Kernberg (1996). It also differs from our model, which is a descriptive one like the DSM-III to DSM-IV tax-

onomies of mental disorders, with respect to the information on which the similarity relationships are based. Kernberg's taxonomy was largely derived from psychoanalytic assumptions regarding the psychodynamic origin of PDs and not from the clinical manifestations of these disorders. It is thus a theoretical rather than a descriptive model. Therefore, it will be more appealing to those who share Kernberg's theoretical assumptions. Our purely descriptive model is less ambitious but can more readily be applied independently of an investigator's theoretical orientation.

Finally, we have to discuss an obvious limitation of our model which it shares with all other two-dimensional models of highly complex relationships; that is the loss of information. Many, but not all relationships, among PDs can be represented by a projection on a plane. Consequently, some relationships will be hidden. Findings of studies concerning the comorbidity among PDs compiled in a review article by Widiger et al. (1991) (see also Stuart et al., 1998, concerning four more recent studies) may serve as an example: A correlation analysis across nine studies (Table 9–8 in Widiger et al. 1991) indicates relatively close associations ($\Phi \geq .30$) of paranoid PD with schizotypal and passive-aggressive PDs which fits in well with the neighbourhood of these disorders in our circumplex. This is also true for schizotypal and avoidant PDs as well as for histrionic, narcissistic and borderline PDs and, finally, for antisocial, borderline, passive-aggressive, and narcissistic PDs. The correlation of borderline PD with histrionic, antisocial and passive-aggressive PDs and the correlation of avoidant with dependent PD are also consistent with our model; the correlation of avoidant and dependent PDs with borderline PD are, however, contrary to the hypothetical relations among these disorders within our circumplex. The same applies to the correlation of dependent and passive-aggressive PDs. It seems remarkable, though, that the discrepant findings are restricted to associations of borderline and/or passive-aggressive PDs with other PDs, because the two PDs are those which are comorbid with most of the other PDs. This may indicate that they are the most unspecific PDs, representing features of PDs in general (with the exception of schizoid and compulsive PDs) rather than clearly separable forms of PDs. This applies at least to the DSM-III-R definitions upon which analyses of comorbidity were based. Assessment of PDs by inventories apparently enhances the impression of unspecificity of borderline and passive-aggressive PDs by suggesting more comorbidity in general than observed clinically. This is a strong argument for testing the validity of our model with the aid of interview-based PD diagnoses.

Nevertheless, even the meta-analysis of nine studies (Widiger et al. 1991), four of which had been performed by means of inventories, revealed a factorial structure of the correlation among PDs that is basically in accordance with our circumplex model. Four (unrotated) factors reached eigenvalues ≥ 1.0 , but the contribution of the first two factors (2.9 and 2.6, respectively) far exceeded that of the remaining two factors (1.2 and 1.0) and accounted for 42 % of the total variance (compared with only 20 % explained by the next two factors).

Projected on a plane, the structure of the first two factors can easily be compared with our model, although the relationships of PDs to normal variations in personality are missing in the analysis of Widiger et al. (for which reason the right part of our abnormality dimension has no counterpart in their factorial model). In order to simplify a visual comparison, the signs of the factor loadings should be converted and the axes of the coordinate system be rotated by approximately 25 degrees counter-clockwise so that the y-axis divides the position of the histrionic PD on top of the distribution of points representing the eleven PDs. Clearly, the first factor with positive loadings for all variables (PDs), which are substantial ($\geq .30$) with only one exception (compulsive PD), represents a unipolar general factor. It thus corresponds, by definition, to the left section of the abnormality dimension in our model. The second factor is bipolar, opposing the cluster B PDs, including the borderline and the passive-aggressive PDs (as in Becker's and our models and different from the positions of these disorders in the interpersonal circle according to DeJong et al. 1989; see above) to the schizotypal and avoidant PDs.

The other cluster A and C PDs are distributed in the median section of this factor. The cluster A and C PDs, partially intermingled on this dimension, are separated in the third factor which opposes the more autonomous forms of PDs (narcissistic, paranoid and schizoid) with the dependent PD (the loading of the avoidant PD which bare the same sign as the dependent PD just fails our criterion of $\geq .30$). In our model, however, the separation of cluster A and C PDs is integrated in the order of PDs along the y-axis which contrasts the changeable and constant modes of habitual behavior. Evidently, some information (regarding the degree of autonomy which is low in histrionic PD despite its similarity in other respects with the more autonomous narcissistic PD; see above) is lost due to the projection of the complex relationships on a plane.

To check the adequacy of our simplified taxonomy of PDs, these disorders should be assessed by means of a clinical interview in a sample which contains a sufficient proportion of subjects with habitually dysfunctional life styles (as in samples of psychiatric patients). Furthermore, variations in the main dimensions of personality should be ascertained in the same subjects using scales for the Five Factors. The intercorrelation of scores referring to PDs and personality variations should then be factor analyzed and a two-factor solution be chosen for a comparison with our model. Such an investigation has meanwhile been performed by another group (Pukrop et al., 2000), the results of which support the validity of the model suggested in this paper. The remarkable convergence of the results of two independent studies should stimulate further attempts to test and refine the model on a broad empirical basis in order to establish a taxonomy of personality and personality disorders that is most appropriate in terms of validity and clinical utility.

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