Original articles

The Munich Personality Test (MPT) — A Short Questionnaire for Self-Rating and Relatives' Rating of Personality Traits: Formal Properties and Clinical Potential

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Summary. The Munich Personality Test (MPT) is a brief questionnaire for the assessment of six personality dimensions proper (Extraversion, Neuroticism, Frustration Tolerance, Rigidity, Isolation Tendency, Esoteric Tendencies), one additional scale (Schizoidia, composed of the two shortest scales, Isolation Tendency and Esoteric Tendencies); an Orientation towards Social Norms, which might bias the rating, and the Motivation to perform the rating adequately can be ascertained by means of two control scales. There are two test versions, one for self-rating, the other one for a rating by a key person from the subject's social surroundings ("relatives' rating"). The instruction of both scales explicitly relates to times of mental and physical health in order to reduce the influence of symptoms of a disease on the values of the scales. The data presented indicate a highly consistent factorial structure of self-ratings and relatives' ratings, a significant concordance of both kind of ratings, a sufficient to marked degree of internal consistency of the test scales depending on the number of items in the scales, a fair degree of retest reliability after approximately 1 year and also, though less markedly, after around 7 years in psychiatric patients, and significant differences between groups of psychiatric patients and healthy subjects in all personality scales proper, partially depending on the type of the mental disorder. Judging from relatives' ratings and from other authors' data obtained in recovered patients, these differences cannot be fully explained by the influence of symptoms on the ratings. On the other hand, secondary changes of personality after brain damage have been demonstrated by other authors using a modified testing procedure. On the whole, the MPT offers a fairly differentiated picture of the personality structure in mental patients and healthy subjects.

Key words: Personality questionnaire – Extraversion – Neuroticism – Frustration Tolerance – Rigidity – Schizoidia

Introduction

Problem

Personality structure (Eysenck 1970; Guilford 1959) plays an important role in psychiatric theories of the origin of mental disorders (Fenichel 1972; Foulds 1965; Janzarik 1988; Kretschmer 1936; Mayer-Gross et al. 1954; Möller and von Zerssen 1987; Sjöbring 1973), in the diagnosis of these disorders (Astrup and Ödegard 1970) and as a possible predictor in their prognosis (Ciompi 1973; Huber et al. 1979; see Zubin 1978). Nevertheless, psychiatrists are usually not trained to assess personality in a reliable fashion. So far, structured interviews are only available for the assessment of personality disorders (see, for example, Zimmerman et al. 1986), but not for ascertaining the manifold variations of personality within the normal range. Therefore, information about personality traits is often missing in psychiatric case histories, or it is biased by the subjective opinions of the interviewers. Psychoanalytically trained psychiatrists, for example, tend to diagnose an obsessional character structure in addition to an obsessional neurosis, whenever obsessional symptoms prevail in the clinical picture, although the respective character traits and symptoms seem to vary more or less indepen-

dently of each other according to the result of a factor-analytic study of questionnaire data conducted by psychoanalytically oriented authors (Sandler and Hazari 1960).

These may be the reasons why questionnaires (Wilde 1977) are given preference in psychiatric personality research (Eysenck 1970; von Zerssen 1979, 1982). However, some of the probably most widely used questionnaires are too lengthy. For the majority of psychiatric patients it is too time-consuming and strenuous to fill them in, as is the case with the MMPI (Hathaway and McKinley 1951) or the 16 PF test (Cattell and Eber 1957). Furthermore, most of the short questionnaires, such as the MPI (Eysenck 1959), the EPI (Eysenck and Eysenck 1971) and the ENNR (Brengelmann and Brengelmann 1960), reduce the total structure of personality to only two or three dimensions, which is probably not sufficient for discriminating between individual patients or groups of patients. Furthermore, many questionnaire scales, in particular those measuring the construct of neuroticism (Eysenck 1970), are state-dependent and often do not reflect habitual mental traits, especially in psychiatric patients (see, for example, Hirschfeld et al. 1983; Lumry et al. 1982). "There are many test instruments used by psychologists which are a mixture of trait and state measures, the results produced by such crossbreeds being confusing and difficult to interpret", as Philip (1971) put it. Moreover, many subjects, in particular psychiatric patients, are either not capable of or not motivated for an adequate rating of their personalities. This even applies to structured interviews for the assessment of personality disorders (Zimmerman et al. 1986). For this reason, we have developed a new questionnaire with the intention of overcoming some of the short-comings which are connected with the testing of personality structures of mental patients and healthy subjects. In this paper, we analyse the question of how far the goals of the test construction could be fulfilled. Before describing the methods and results of these analyses, however, a brief description of the instrument and its development is given in order to make the following text more comprehensible for the reader.

Description of the Instrument

The Munich Personality Test (MPT) is a questionnaire composed of 51 items providing an economical multi-dimensional assessment of personality structure in psychiatric and other patients as well as in healthy subjects. There are two versions of the test: one for self-rating (SR) by patients or healthy probands (see Appendix A); and a second one — with the wording adapted for the rating of male and female

subjects, respectively — for rating by another person closely related to the subject in question (see Appendix B). This rating is called — pars pro toto — "relatives' rating" (RR), although the other person may also be the spouse, a friend, or a close acquaintance. The only relevant criterion for the selection of this rater is that he or she is familiar with the subject and apparently capable and motivated to carry out the rating adequately.

The test instruction explicitly relates to times of physical and mental health and also precludes, besides times of impaired health, a subject's notion of how he or she would like to be. According to psychiatric personality research carried out in England (Foulds 1965; Kendell and DiScipio 1968) and Germany (von Zerssen 1982), this kind of instruction markedly reduces the influence of symptoms on the scale values of personality questionnaires.

Every item has to be marked as being more or less appropriate for describing the subject's emotional, cognitive and outward behaviour on a scale ranging from "completely true" to "not true". The scoring results in item scores that vary from 0 to 3 per item according to the key direction of the scoring (see Appendix A). The scores of factorially interrelated items are added up to form a scale value representing the strength of the respective factor in the subject's personality structure. The items are distributed over six personality scales proper, each of them containing three to ten items, one additional personality scale composed of the two shortest scales ($3 + 5 = 8$ items), and two control scales containing three and six items, respectively. Thus, the scale values can vary (theoretically) between a minimum of 0 and a maximum of 9–30. The control scales refer to the motivation (Mo) for an adequate performance of the rating (3 items) and an orientation towards social norms (No) in the assessment of one's own or another subject's personality (commonly called "lie" scale: 6 items). The personality scales proper embrace the following dimensions, the first two to four of which represent classical dimensions of self-rated personality traits (Eysenck 1970; Pawlik 1976; Wilde 1977):

1. Extraversion (E: 10 items)
2. Neuroticism (N: 10 items)
3. Frustration Tolerance (F: 6 items)
4. Rigidity (R: 8 items)
5. Isolation Tendency (Is: 5 items)
6. Esoteric Tendencies (Es: 3 items).

The last two and, at the same time, shortest scales (5 and 6) can be combined to form the additional scale designated as representing Schizoidia (Sc: 8 items).

The MPT was derived from a total of 476 items in a large series of data analyses. The original item pool

covered the whole range of clinical descriptions of premorbid personality traits of patients suffering from the main forms of functional psychoses (schizophrenia, unipolar depression and bipolar affective disorder) as well as neuroses (hysteria, obsessive compulsive neurosis, anxiety neurosis, and neurotic depression). They were distributed over several "Premorbid Personality Inventories" (PPIs; von Zerssen 1979, 1982), each containing 56–156 items. The analyses were carried out with data from various samples of hundreds of psychiatric patients (mainly subjects suffering from functional psychoses and neurotic disorders) and probands from the general population. The space available here does not permit us to describe samples and procedures in detail. In this context, only the main criteria for selecting the items of the final MPT version can be briefly summarized:

1. The content of the items should clearly refer to personality traits, not to symptoms, such as paranoid thoughts, depression, anxiety, somatic complaints etc., which can be assessed properly by our Clinical Self-Rating Scales (CSRS; von Zerssen 1976a–d, 1986).
2. The retest reliability of each item was calculated from data of psychiatric inpatients who had been tested twice by means of the PPIs — either at admission and discharge or at two admissions to the Max Planck Institute of Psychiatry (MPIP) — and had to be $r_{tt} \geq 0.30$ with a significance of at least $p < 0.05$ (generally $p < 0.01$).
3. In a comparison of mental patients and control subjects, the discriminatory power of each item had to be significant for at least one diagnostic subgroup (paranoid or non-paranoid schizophrenics, schizoaffectives, manics, unipolar endogenous depressives, neurotic depressives, other neurotics).
4. The remaining items had to form similar factors in various groups of patients and in control subjects.
5. There had to be principal agreement in this respect between the results regarding self-ratings and relatives' ratings.
6. Moreover, the items of relatives' and self-ratings had to correlate positively with each other, if possible, at the 5% level of significance.

The attempt to achieve a relative specificity of each scale for one diagnostic group of mental disorders was given up during the development of the final test version; however, all other points listed above could be fulfilled. Thus, we obtained fairly reliable scales with relatively high factorial homogeneity in various samples and adequate agreement between relatives' and self-ratings. It should be noted that the eight fac-

tors on which the final scales are based have appeared in all factor analyses of data from healthy subjects and from psychiatric patients irrespective of the kind of rating (self-rating or relatives' rating). In psychiatric patients, only the items of the Is and Es scales showed the tendency to form a common factor (Sc). The high degree of factorial reproducibility may justify the selection of the dimensions for the final version of the test.

In the present paper, we describe the most important test statistics for a normative sample (self-rating only) and for two samples of psychiatric patients, one investigated by means of the PPIs at index hospitalization and by means of the MPT at follow-up 6–8 years later (self-rating only), the second one consisting of inpatients for whom relatives' ratings were available in addition to self-ratings. For further information on self-ratings, two other samples of psychiatric inpatients have been employed.

Subjects and Methods

The statistics presented here were derived from several samples of mental patients and probands from the general population. Selection criteria were: age range between 25 and 64 years; a balanced sex ratio not deviating too much from 1:1; a verbal IQ (according to the subtest "Information" from the Wechsler-Bellevue Intelligence Scale for Adults; Wechsler 1964) of at least 80; complete data sets with respect to the variables in question; and a score on the motivation scale of 6 or above.

The results refer to the following samples:

(a) A subsample ($n = 238 = 105$ males + 133 females; mean age = 43.3 years) out of 419 subjects from a representative general population sample investigated within the Munich Follow-up Study (MFS; Wittchen and von Zerssen 1987) approximately 7 years after index investigation by means of the Clinical Self-Rating Scales (CSRS; von Zerssen 1976 a–d, 1986). Out of the total sample, 281 subjects had completed the MPT at follow-up; 238 subjects of this subsample satisfied the selection criteria and could also be matched by age and gender with the same number of psychiatric inpatients for whom a complete data set — including the MPT self-ratings — from our Psychiatric Information System (PSYCHIS Munich; Barthelmes and von Zerssen 1978) was available. The latter group (sex- and age-matched psychiatric patients), however, will not be dealt with in this context, since relatives' ratings were missing in several cases.

(b) A subsample ($n = 135 = 72$ males + 63 females; mean age = 39.3 years) of former inpatients of the MPIP who had completed the MPT during follow-up within the MFS 6–8 years after index hospitalization, when they had filled in the PPIs, so that the retest reliability could be ascertained on the basis of the data. The diagnostic distribution according to the ICD (World Health Organization 1974) at index hospitalization (around one-third of the patients suffering from a functional psychosis, the others from a non-psychotic mental disorder) and at follow-up is shown in Table 1.

Table 1. Distribution of psychiatric main diagnoses at index hospitalization and at follow-up 6–8 years later in patients of group b ($n = 135$)

Diagnostic term	ICD-8 no.	Index[a]		Follow-up[b]		
		n	%	n^c	%[c]	
1. Paranoid schizophrenia	295.3	5	3.7	10 (9/5)	7.4 (6.7/3.7)	
2. Non-paranoid schizophrenia	295.0,1,6	8	5.9	6 (6/0)	4.4 (4.4/0.0)	
3. Schizoaffective psychosis	295.7	4	3.0	9 (6/3)	6.7 (4.4/2.2)	39.3 (27.4/12.6) %
4. Unipolar depression	296.0,2	24	17.8	15 (7/5)	11.1 (5.1/3.7)	
5. Bipolar affective psychosis	296.1,3,8	8	5.9	13 (9/4)	9.6 (6.7/3.0)	
6. Paranoid reaction	298.3	1	0.7	–	–	
7. Anxiety disorder	300.0,2	34	25.2	33 (31/22)	24.4 (23.0/16.3)	
8. Neurotic depression	300.4	27	20.0	25 (22/12)	18.5 (16.3/8.9)	
9. Other neurotic disorder	300.3,8	3	2.2	1 (1/1)	0.7 (0.7/0.7)	60.7 (55.6/35.6) %
10. Personality disorder	301	16	11.5	22 (20/13^d)	16.3 (14.9/9.6)	
11. Special symptom (stuttering)	306.0	1	0.7	1 (1/0)	0.7 (0.7/0.0)	
12. Situational reaction	307	4	3.0	–	–	
		135		135 (112/65)		

(The Index column percentages are bracketed as 37.0% for items 1–6 and 63.0% for items 7–12.)

[a] Clinical diagnosis

[b] Final (lifetime) project diagnosis

[c] In parentheses: subjects still or again suffering from any psychiatric symptoms/overtly suffering from the main disorder (project diagnosis) or from a related disorder at the time of follow-up according to a standard interview

[d] This particular diagnosis cannot be made on the basis of the standard interview; instead, related diagnoses of a mental disorder (e.g. a neurotic disorder or substance abuse/dependency) were taken into account

Table 2. Distribution of main psychiatric diagnoses in patients of group c/d ($n = 208$)

Diagnostic term	ICD-8 no.	n	%	
1. Paranoid schizophrenia	295.3	28	13.5	
2. Non-paranoid schizophrenia	295.0,2,4,6,8	15	7.2	
3. Schizoaffective psychosis	295.7	38	18.3	
4. Unipolar endogenous depression	296.0,2	44	21.2	76.4%
5. Bipolar affective psychosis	296.1,3,8	30	14.4	
6. Paranoid psychosis (other than 1)	297	4	2.0	
7. Anxiety disorder	300.0	7	3.4	
8. Neurotic depression	300.4	16	7.7	
9. Other neurotic disorder	300.3,5,7,8	10	4.8	23.5%
10. Personality disorder/sexual deviation	301/302	5	2.5	
11. Psychosomatic disorder/special symptom	305/306	6	3.0	
12. Situational reaction	307	5	2.4	
		$n_t = 208$		

t = total

(c) A sample of psychiatric inpatients of the MPIP ($n = 208 = 91$ males + 117 females; mean age = 42.1 years) with the diagnosis of a functional psychosis (approximately three-fourths of the sample) or a non-psychotic mental disorder (see Table 2) for whom not only the MPT self-rating was available, but also

(d) a relative's rating existed in the data bank. Thus, the subjects in samples (c) and (d) are the same and only the raters are different: the subjects themselves in (c) and key persons from their social surroundings in (d). Further information on certain aspects of the MPT is based on additional samples, namely

(e) a sample of psychiatric inpatients ($n = 75 = 32$ males + 43 females; mean age 37.2 years) who had completed the MPT during two hospitalizations at the MPIP with an average interval of approximately 1 year between the two testings. From the data of this sample, the retest reliability over a relatively short time span was calculated; finally

(f) a sample of former inpatients ($n = 28 = 16$ males + 12 females; mean age = 38.3 years) with the diagnosis of a personality disorder at index hospitalization and at follow-up within the MFS. As additional diagnoses, those of another

non-psychotic and non-organic mental or psychosomatic disorder (neurosis, sexual deviation, substance abuse, etc.) at index hospitalization and/or at follow-up were accepted. At follow-up this applied to 15 of the subjects.

Testing Procedure. The questionnaires were given to patients and to key persons in their social environment within the first weeks of hospitalization by a nurse, who briefly explained the expected rating according to the test instruction and asked them to read the instruction carefully and complete the scoring quickly without any outside assistance. No item should be left out. A pre-condition for the self-rating was the patient's co-operativeness; for the relatives' rating it was the availability of a co-operative key person. On an average, patients received the questionnaire after 2 months of hospitalization, key persons, however, as early as during the 3rd week after the patient's admission. Within the MFS, former inpatients and probands from the general population received the questionnaires via the investigator, either a psychiatrist or a psychologist. Experience concerning investigations in a group situation exists only for the PPIs, not for the MPT. No questionnaires were sent to the raters by mail, but in some cases the key persons were allowed to take the questionnaire home for filling in because of time pressure during their visits to the clinic.

After receiving the filled-in questionnaires, the nurses checked them for completeness of information and, if necessary, returned them to the subjects for completion. Afterwards, the questionnaires were collected and forwarded, together with other protocols, to the technical staff for further data handling.

Data Handling and Processing. The protocols were again checked for completeness of information and the data transferred to the data bank of PSYCHIS on a DEC 20. The data bank is coupled with a method bank for data analyses (Barthelmes and Pfister 1980). In the following, only a section of the whole spectrum of analyses (factor analyses on the level of items and of scales, the usual item analyses, correlations of scale values with other variables, group comparisons, etc.; see Cohen et al. 1988; Cronbach 1984; Lienert 1969) can be reported. Special problems, for example, those related to the content of the scales and the form of their distributions, as well as the results of factor and item analyses of the individual scales, will be dealt with in subsequent reports. From the data of the normative sample of the general population ($n = 238$), standard values for the scales were calculated out of which the percentile values were chosen for representation (see Appendix C).

Results

Factorial Structure

Since the construction of the MPT was guided by the ideal of consistency of the factorial structure in various samples of mental patients and healthy control subjects who had completed the precursors of the scales, it could be assumed that the structure would also show up in analyses of the final version of the test. It was, of course, not expected that this could be demonstrated by a Varimax rotation of exactly eight factors with respect to their sequence and to the loadings per item of corresponding factors in different

samples. Yet, an orthogonal rotation aiming at maximizing the concordance of the factorial structure with the pattern underlying the scoring procedure of the MPT should lead to similar results for adequately sized samples ($n \gg 100$) of the adult population. For this purpose, the factors (principal components; Kim and Mueller 1978; Ost 1984) from data of the respective samples listed above were rotated according to the method described by Hurley and Cattell (1962) to approximate an idealized simple structure with loadings of 1.00 per item of a scale and loadings of 0.00 for all other items. The result of this procedure is summarized in Table 3 for samples (a)–(d). It should be kept in mind that the subjects in (c) and (d) are identical; the ratings, however, were performed either by the patients themselves (c) or by key persons from their social surroundings (d).

Remarkably, co-efficients or $r \geq 0.60$ are exclusively and consistently found in the diagonal, thus indicating a considerable agreement between the structure of the test and the factorial structures obtained in the samples under consideration. In fact, the lowest value is 0.68 and the highest above 0.90. On an average, the co-efficients (after a z-transformation for computing the arithmetic mean) amount to $r = 0.80$. All co-efficients below the diagonal are under 0.60, usually under 0.40. The values above 0.40 refer to a negative correlation between Neuroticism (N) and Frustration Tolerance (F), which makes sense, since − in a way − the capability to tolerate frustration is incompatible with a high degree of insecurity and nervous tension, so characteristic of the construct of neuroticism. An inverse relationship is also indicated by consistently negative co-efficients between −0.16 and −0.46 for Orientation towards Social Norms (No), on the one hand, and Extraversion (E) as well as Neuroticism (N), on the other, and is signified for Extraversion and Neuroticism by negative co-efficients between −0.13 and −0.33. These relationships could be expected from the literature (Eggert 1983; Fahrenberg and Selg 1970). The other relationships are negligible; this is surprising for Isolation Tendency (Is) and Esoteric Tendencies (Es), which originally had formed one common scale for Schizoidia in the PPI (see Introduction).

As shown in Table 4, the two short scales derived from the Schizoidia scale are indeed significantly correlated with each other in the four groups of ratings (a)–(d), the co-efficients varying from above 0.20 to above 0.40. This may justify the combination of these two scales to an additional Schizoidia (Sc) scale. However, other inter-relationships between the scales also become evident from the figures in Table 4. Neuroticism (N) is not only negatively correlated with Frustration Tolerance (F) and Orientation

Table 3. Factorial structure of data sets (a)–(d) after criterion-oriented orthogonal rotation with the eight primary test scales as the criterion

Criterion matrix (test scales) — Rotated matrix

Test scale		1. E		2. N		3. F		4. R		5. Is		6. Es		7. No		8. Mo	
1. Extraversion	E	82	91	−13	−24	11	10	−03	−28	−16	−18	−12	−08	−24	−16	−10	−09
		89	88	−24	−30	07	11	−18	−19	−20	−24	−05	−12	−20	−25	−08	−10
2. Neuroticism	N	−25	−30	74	82	−44	−41	−13	−04	06	05	01	03	−34	−31	−13	−15
		−32	−33	78	79	−44	−47	00	−07	10	16	−03	02	−31	−34	−12	−10
3. Frustration Tolerance	F	07	02	−39	−42	74	77	−13	−16	−07	−20	−10	−12	−04	−07	−08	−10
		05	07	−41	−41	78	84	−12	−25	−05	−09	−03	−17	−14	02	−03	−11
4. Rigidity	R	−02	−22	−01	02	−06	−06	77	82	−13	−05	−18	−17	07	01	−13	−07
		−11	−09	08	01	−04	−16	89	89	−11	−14	−18	−11	−01	03	−10	−06
5. Isolation Tendency	Is	−19	−17	10	08	−05	−14	−19	−06	69	75	−03	00	−14	−16	−06	−03
		−20	−26	12	16	−03	−08	−17	−22	73	68	06	−02	−18	−20	−20	−15
6. Esoteric Tendencies	Es	−08	−07	11	07	−05	−08	−20	−21	00	01	80	73	08	−09	−07	−01
		02	−04	07	09	04	−11	−17	−09	12	03	72	81	−05	01	−05	−07
7. Orientation towards Social Norms	No	−46	−27	−45	−37	−14	−09	−10	−10	−25	−25	−04	−15	71	83	−04	−04
		−41	−34	−44	−39	−26	−02	−27	−11	−32	−23	−20	−09	88	81	03	−03
8. Motivation	Mo	−09	−08	−08	−11	−06	−05	−16	−08	−05	−03	−09	−01	05	02	90	75
		−07	−05	−08	−05	−02	−06	−14	−07	−19	−11	−08	−09	13	05	81	88

Grouping of co-efficients per crossing of rows and columns:

a) n = 238	b) n = 135
c) n = 208	d) n = 208

0. per co-efficient omitted; loadings ≥ |0.30| in italics; loadings ≥ |0.60| in bold face

Table 4. Intercorrelations of the eight primary test scales in the data sets (a)–(d)

Scale	1.E	2.N	3.F	4.R	5.Is	6.Es	7.No
2. Neuroticism N	11, -07, -14, -23***						
3. Frustration Tolerance F	41***, 45***, 34***, 39***	-33***, -37***, -54***, -58***					
4. Rigidity R	38***, 19**, -06, 08	19***, 40***, 29***, 28***	18**, 07, -08, -15*				
5. Isolation Tendency Is	08, -02, -06, -27***	40***, 48***, 42***, 54***	-02, 02, -21*, -24***	05, 19**, 20*, 00			
6. Esoteric Tendencies Es	12, 28***, 08, 02	30***, 28***, 31***, 37***	-02, 16*, -16, -17*	06, 13, -04, 13	23***, 42***, 27**, 26***		
7. Orientation towards Social Norms No	-30***, -14, -35***, -26***	-47***, -46, -42***, -45***	04, -15*, 10, 18**	00, -20**, 07, 06	-31***, -42***, -30***, -30***	-06, -35***, -24**, -11	
8. Motivation Mo	07, 11, 06, 06	05, -08, -02, 06	06, 10, 04, -04	04, 07, 03, 17*	05, -17*, 03, -10	03, 01, 03, 05	04, 08, 04, 16*

Grouping of data as in Table 3
0. per co-efficient omitted; co-efficients $\geq |0.30|$ in italics; $*\ p < 0.05$, $**\ p < 0.01$; $***\ p < 0.001$

towards Social Norms (No), as could be expected from the factorial structure of the test, but is also positively correlated with Isolation Tendency (Is) and, to a lesser extent, with Esoteric Tendencies (Es) and Rigidity (R). Surprisingly, the expected negative correlation of Neuroticism (N) with Extraversion (E) only becomes evident in relatives' ratings (d). Instead, Extraversion (E) is correlated positively with Frustration Tolerance (F) and negatively with the Orientation towards Social Norms (No), though not significantly so in former inpatients (b). An even more consistent, but negative correlation is found between the Orientation towards Social Norms and Isolation Tendency. The other correlations are too low and too inconsistent to be worth mentioning.

The correlations of the additional Schizoidia (Sc) scale with the other scales of the questionnaire are reproduced in Table 5. The high positive correlations of Sc with the two short scales (Is and Es) of which it is composed are trivial, and the other correlations are plausible, except for the insignificant coefficients for the relationship between Sc and E. Although the lack of an association between Sc and E may seem surprising from a clinical point of view, it is well in accord with our earlier findings obtained by means of the precursors of the new scales.

Basic Statistics of Individual Scales

In this subsection, the distributions of scale values for each test scale are tabulated (Tables 6.1–6.8), and other statistical properties, including measures of internal consistency for the samples (a)–(d), also demonstrated in the tables are briefly commented in the text.

The product-moment correlation for relatives' (d) and self-ratings (c) per scale is also shown. The normative values, however, computed as the percentile values for the general population sample (a), are reproduced in Appendix C.

It becomes evident from the tables that the reliabilities of the scales correspond with the number of items per scale. Thus, the co-efficients for the 10-item scales E and N are, on an average, 0.89 and 0.87, respectively; for the 8-item scale R, they are around 0.76; and co-efficients for the 6-item scales F and No are 0.74 and 0.76, respectively; that for the 5-item scale Is is 0.65, and those for the 3-item scales Es and Mo are 0.51 and 0.53, respectively. The only exception to the rule refers to the additional 8-item scale Sc with a co-efficient of 0.66, which is lower than the respective values for the 6-item scales F and No. This could be expected because of the construction of the Sc scale from two by and large factorially independent scales (Is and Es). Nonetheless, the

Table 5. Correlation of the additional Schizoidia scale (Sc = Is + Es) with the eight primary test scales in the data sets a–d

		a	b	c	d
1. Extraversion	E	12	− 01	13	− 18**
2. Neuroticism	N	*45****	*46****	*47****	*59****
3. Frustration Tolerance	F	− 03	− 23**	09	− 26***
4. Rigidity	R	07	13	19**	07
5. Isolation Tendency	Is	**87***	**88***	**89***	**87***
6. Esoteric Tendencies	Es	**67***	**69***	**78***	**71***
7. Orientation towards Social Norms	No	− 27***	*− 34****	*− 46****	− 28***
8. Motivation	Mo	05	04	− 12	− 05

0. per co-efficient omitted; co-efficients $\geq |0.30|$ in italics; $\geq |0.60|$ in bold face; ** $p < 0.01$; *** $p < 0.001$

Table 6. Statistics of the test scales in the data sets a–d

Table 6.1. Extraversion (E)

	a	b	c	d
Correlation between relatives' and self-rating				*0.52****
Odd-even reliability, upgraded according to Spearman-Brown	0.91	0.92	0.92	0.89
Hoyt's reliability (adjusted for item difficulty)	0.84	0.89	0.90	0.87
1st quartile (Q_1)	5.00	3.00	5.00	6.25
2nd quartile (Q_2 = median)	9.00	7.00	10.00	11.00
3rd quartile (Q_3)	13.00	11.00	15.00	16.00
Mean value ($\bar{x}$)	9.32	8.00	10.80	11.63
Standard deviation (s)	5.41	6.14	6.43	6.44
Skewness	0.38	0.96	0.65	0.34
Excess	− 0.42	0.58	− 0.08	− 0.45

** $p < 0.01$; *** $p < 0.001$

Table 6.2. Neuroticism (N)

	a	b	c	d
Correlation between relatives' and self-rating				*0.41****
Odd-even reliability, upgraded according to Spearman-Brown	0.82	0.90	0.91	0.93
Hoyt's reliability (adjusted for item difficulty)	0.81	0.88	0.89	0.90
1st quartile (Q_1)	3.00	7.00	6.00	7.00
2nd quartile (Q_2 = median)	6.00	12.00	11.00	12.00
3rd quartile (Q_3)	9.00	17.00	16.00	18.00
Mean value ($\bar{x}$)	6.23	12.22	11.42	12.83
Standard deviation (s)	4.45	6.96	6.59	6.92
Skewness	0.89	0.35	0.45	0.15
Excess	0.79	− 0.64	− 0.41	− 0.74

** $p < 0.01$; *** $p < 0.001$

Table 6.3. Frustration Tolerance (F)

	a	b	c	d
Correlation between relatives' and self-rating				*0.34****
Odd-even reliability, upgraded according to Spearman-Brown	0.71	0.74	0.82	0.67
Hoyt's reliability (adjusted for item difficulty)	0.73	0.77	0.83	0.73
1st quartile (Q_1)	6.00	2.00	3.00	3.00
2nd quartile (Q_2 = median)	8.00	5.00	6.00	5.00

Table 6.3. (continued)

	a	b	c	d
3rd quartile (Q₃)	10.00	8.00	9.00	7.00
Mean value ($\bar{x}$)	7.86	5.36	6.13	4.97
Standard deviation (s)	3.48	3.65	3.87	3.16
Skewness	0.11	0.41	0.59	0.73
Excess	− 0.04	− 0.58	0.31	0.49

** $p < 0.01$; *** $p < 0.001$

Table 6.4. Rigidity (R)

	a	b	c	d
Correlation between relatives' and self-rating				*0.39****
Odd-even reliability, upgraded according to Spearman-Brown	0.68	0.77	0.75	0.87
Hoyt's reliability (adjusted for item difficulty)	0.68	0.75	0.81	0.84
1st quartile (Q₁)	6.00	6.00	7.25	7.00
2nd quartile (Q₂ = median)	9.00	9.00	10.00	11.00
3rd quartile (Q₃)	12.00	13.00	15.00	15.00
Mean value ($\bar{x}$)	9.24	9.46	10.88	10.99
Standard deviation (s)	4.35	4.89	5.17	5.73
Skewness	0.25	0.29	0.27	0.03
Excess	− 0.41	− 0.58	− 0.50	− 0.79

** $p < 0.01$; *** $p < 0.001$

Table 6.5. Isolation Tendency (Is)

	a	b	c	d
Correlation between relatives' and self-rating				*0.48****
Odd-even reliability, upgraded according to Spearman-Brown	0.58	0.62	0.68	0.72
Hoyt's reliability (adjusted for item difficulty)	0.60	0.66	0.70	0.76
1st quartile (Q₁)	1.00	2.00	1.00	1.00
2nd quartile (Q₂ = median)	2.00	4.00	4.00	3.00
3rd quartile (Q₃)	4.00	7.00	6.00	6.00
Mean value ($\bar{x}$)	2.61	4.48	3.86	3.78
Standard deviation (s)	2.38	3.16	3.04	3.29
Skewness	1.16	0.39	0.64	0.90
Excess	1.54	− 0.35	0.08	0.13

** $p < 0.01$; *** $p < 0.001$

Table 6.6. Esoteric Tendencies (Es)

	a	b	c	d
Correlation between relatives' and self-rating				*0.47****
Odd-even reliability, upgraded according to Spearman-Brown	0.34	0.47	0.50	0.44
Hoyt's reliability (adjusted for item difficulty)	0.56	0.55	0.64	0.67
1st quartile (Q₁)	0.00	1.00	1.00	1.00
2nd quartile (Q₂ = median)	1.00	2.00	2.00	2.00
3rd quartile (Q₃)	2.00	3.00	4.00	4.00
Mean value ($\bar{x}$)	1.44	2.37	2.60	2.84
Standard deviation (s)	1.57	2.06	2.20	2.33
Skewness	1.23	0.78	0.86	0.69
Excess	1.46	0.05	0.27	− 0.30

** $p < 0.01$; *** $p < 0.001$

Table 6.5 + 6.6. Schizoidia (Sc)

	a	b	c	d
Correlation between relatives' and self-rating			*0.53****	
Odd-even reliability, upgraded according to Spearman-Brown	0.58	0.64	0.71	0.69
Hoyt's reliability (adjusted for item difficulty)	0.62	0.67	0.75	0.73
1st quartile (Q_1)	2.00	4.00	3.00	3.00
2nd quartile (Q_2 = median)	4.00	7.00	6.00	6.00
3rd quartile (Q_3)	6.00	10.00	9.00	10.00
Mean value ($\bar{x}$)	4.05	6.85	6.45	6.63
Standard deviation (s)	3.14	4.22	4.43	4.49
Skewness	1.07	0.42	0.71	0.49
Excess	1.44	−0.44	0.55	−0.60

** $p < 0.01$; *** $p < 0.001$

Table 6.7. Orientation towards Social Norms (No)

	a	b	c	d
Correlation between relatives' and self-rating			*0.21***	
Odd-even reliability, upgraded according to Spearman-Brown	0.69	0.77	0.81	0.79
Hoyt's reliability (adjusted for item difficulty)	0.70	0.79	0.80	0.78
1st quartile (Q_1)	14.00	13.00	13.00	13.00
2nd quartile (Q_2 = median)	15.00	15.00	15.00	16.00
3rd quartile (Q_3)	17.00	17.00	17.00	17.00
Mean value ($\bar{x}$)	15.20	14.36	14.38	14.89
Standard deviation (s)	2.25	3.00	3.05	2.98
Skewness	−0.92	−1.33	−1.54	−1.11
Excess	2.22	2.19	3.93	1.00

** $p < 0.01$; *** $p < 0.001$

Table 6.8. Motivation[a] (Mo)

	a	b	c	d
Correlation between relatives' and self-rating			0.02	
Odd-even reliability, upgraded according to Spearman-Brown	0.62	0.46	0.49	0.60
Hoyt's reliability (adjusted for item difficulty)	0.61	0.29	0.36	0.55
1st quartile (Q_1)	8.00	9.00	9.00	8.00
2nd quartile (Q_2 = median)	9.00	9.00	9.00	9.00
3rd quartile (Q_3)	9.00	9.00	9.00	9.00
Mean value ($\bar{x}$)	8.55	8.70	8.72	8.42
Standard deviation (s)	0.86	0.63	0.63	0.90
Skewness	−1.81	−2.03	−2.46	−1.41
Excess	2.13	3.40	6.03	0.85

** $p < 0.01$; *** $p < 0.001$

[a] Tests with Mo scores below 6 not included

measures of internal consistency of the composite scale are higher than those for its two subscales. These are apparently too short to achieve higher values for internal consistency.

A measure of validity rather than reliability of the scales is the concordance of self-rating and relatives' rating in psychiatric inpatients (c and d). For the personality scales, the correlation co-efficients are all highly significant varying between 0.34 for F and 0.52 for E. This also applies to the two shortest scales, Is (0.48) and Es (0.47). As expected, the respective values for the control scales are much lower and only for No the value is significant.

The mean values and standard deviations of self-ratings and relatives' ratings are remarkably similar. Despite the high number of subjects, the Wilcoxon

Table 7. Retest reliability of test scales in data sets (e) ($\bar{x}_{\text{test interval}}$ ≈ 1 year) and (b) ($\bar{x}_{\text{test interval}}$ ≈ 7 years)

		e	b
1. Extraversion	E	0.76***	0.48***
2. Neuroticism	N	0.73***	0.32***
3. Frustration Tolerance	F	0.54***	0.43***
4. Rigidity	R	0.70***	0.43***
5. Isolation Tendency	Is	0.62***	0.48***
6. Esoteric Tendencies	Es	0.74***	0.49***
5. + 6. Schizoidia	Sc	0.68***	0.47***
7. Orientation towards Social Norms	No	0.78***	0.41***
8. Motivation	Mo	0.33**	[a]

[a] Mo items at initial testing not yet included in the questionnaire

** $p < 0.1$; *** $p < 0.001$

test for correlated samples indicates only one difference significant at the 1‰ level of significance (concerning F). Two others reach the 1% level (concerning N and Mo), one of which refers to a control scale (Mo) unrelated to the same construct in the two ratings, since it measures the motivation of the patient in one case and that of the key person in the other. The difference in E is significant at the 5% level and, as in the case of N, is quantitatively only small.

Differences in the distribution of the scale values for self-ratings between the general population sample (a) and former inpatients at follow-up (b) and those between these groups, on the one hand, and the inpatients (c), on the other, are probably related to real differences between the subjects from these groups and not to aspects of the formal properties of the scales. They will be briefly dealt with later on in the subsection on validation studies.

As can be seen from the high standard deviation relative to the mean values as well as from the values for skewness and excess which deviate from zero more or less, the distribution of scale values does not form a normal distribution. This underlines the importance of utilizing non-parametric statistical techniques for analysing group statistics of the MPT scales.

Retest Reliability

The retest reliability of the self-rating version of the scales is shown in Table 7 for two samples of psychiatric patients investigated for a second time after hospitalization, either after re-hospitalization within less than 1 month and almost 3.5 years, i.e., on an average, after around 1 year (e), or at follow-up around 6.5 years after index hospitalization (b). It has to be taken into consideration that in the case of (b) the first testing was performed by means of the precur-

sors of the MPT, the PPIs (see Introduction); in this case, the scaling procedure of the MPT was applied to the same set of items with the exception of the three items for Motivation not yet included in the PPIs. The discrepancy of the test forms may have reduced the correlations between the two testings in group (b). However, a shrinkage of the co-efficients over the years has in any case to be expected (Angst 1988).

The retest reliability over a time span of, on an average, approximately 1 year (e) is considerable for a sample of psychiatric patients with psychotic or neurotic disorders. With one exception (Mo), the values are significant at the 1% level. This is true even for the shortest of the personality scales proper, Es. Among these scales, Es reaches the second highest co-efficient, ranging only behind that for the highly consistent E scale. Yet the respective value for the 8-item control scale No is still higher than these values. On an average, the retest reliability of the six original personality scales proper is $r_{tt} = 0.69$ and thus not much lower than the mean internal consistency in psychiatric inpatients (0.77 for group c; see Tables 6.1–6.6).

The retest reliability over a time span of around 6–7 years is, on an average, 0.44, which seems quite remarkable. The lowest value, though still highly significant, is found for N (0.32), in spite of the fact that this scale, together with the E scale, contains the highest number of items. It is even more surprising that the highest value (0.49) was ascertained for the shortest scale, Es. Thus, Es, rather than the classical N scale, appears to be a trait measure.

Correlations of Scales with Other Variables

So far, we have only reported correlations between the scales and the same number of factors derived from the total set of items of the MPT, correlations among the scales and correlations between the same scales at two different points in time. However, the relationships of the scales to other variables are also relevant for an evaluation of their appropriateness to measure personality traits in mental patients and healthy subjects. Therefore, the correlations of the scales with three independent variables are presented in Table 8, namely gender, age, and verbal IQ (estimated by means of the subtest "Information" of the HAWIE for samples (a)–(d). It can be recognized that these relationships are only of minor magnitude or virtually missing (e.g. for Mo). It seems noteworthy, however, that Isolation Tendency (Is) is slightly more pronounced in males and that Rigidity (R) as well as the Orientation towards Social Norms (No) tend to increase with age. Although even these

Table 8. Correlations of test scales with gender (female), age (years) and verbal IQ in the data sets a–d

		Gender (female)		Age (years)		Verbal IQ	
1. Extraversion	E	− 25***	− 08	− 13*	− 03	15*	23**
		− 09	04	− 14*	02	15	17*
2. Neuroticism	N	16*	08	− 07	− 08	− 06	03
		15*	11	− 01	00	− 08	− 04
3. Frustration Tolerance	F	− 24***	− 18*	− 03	01	16*	01
		− 18**	00	− 27***	− 09	03	06
4. Rigidity	R	− 11	09	20**	47***	03	− 09
		08	06	13	29***	− 04	02
5. Isolation Tendency	Is	− 14*	− 25**	− 10	− 07	08	24**
		− 22**	− 17*	− 32***	− 14*	01	09
6. Esoteric Tendencies	Es	02	06	03	− 06	23***	13
		− 09	− 03	− 12	− 11	18	05
5. + 6. Schizoidia	Sc	− 09	− 16	− 06	− 08	18**	24**
		− 19**	− 14*	− 28***	− 16*	10	09
7. Orientation towards Social Norms	No	23***	23**	22***	25**	− 05	− 12
		16*	− 13	25***	02	03	09
8. Motivation	Mo	12	12	− 09	− 01	− 06	02
		03	09	04	07	00	06

Grouping of data as in Tables 3 and 4; co-efficients $\geq |0.30|$ in italics; 0. per co-efficient omitted; $n_{verbal\ IQ}$ for c and d = 198
$* p < 0.05; ** p < 0.01; *** p < 0.001$

relationships are generally weak, it is recommended to control at least for age and gender in studies using the MPT.

Validation of the Scales

The scales have face validity regarding the content of the items (see Apendix A). Construct validity (Cohen et al. 1988; Cronbach 1984; Lienert 1969) is too complex a construct in itself to be dealt with in detail here. It should only be mentioned that the factorial validity is high, as demonstrated in the subsection on the factorial structure of the MPT. One important aspect of criterion-related validity of a test constructed for use in mental patients and healthy subjects is its discriminatory power in comparisons of patients and probands from the general population. It can be inferred from the data presented in Tables 6.1–6.8 that former inpatients (b) and inpatients during hospitalization, whether rated by themselves (c) or by their relatives or other key persons (d), deviate considerably from the general population sample (a) in several of the scales, in particular in N. Expressed in z-values of the general population sample, the mean values of N for inpatients and former inpatients exceed the value of z = 1; with respect to Is, Es and the combined scale Sc, the deviation is approximately z = 0.5 or even more. A reverse deviation exists with respect

to F, the differences approximating z = 0.5 or more. The differences for E and R as well as for the control scales No and Mo are less pronounced, and, in the case of E, inconsistent for inpatients and former inpatients. In view of the large sample sizes, significance may even be reached for minor differences, yet only in a formal statistical sense, not in the sense of any theoretical and/or practical relevance.

Since the samples of psychiatric inpatients or former inpatients are heterogeneous from a diagnostic point of view and the deviations of scale values from the general population sample may in part be influenced by psychopathological symptoms, comparisons between a subsample from (b) consisting of subjects with a personality disorder (f) and the general population sample (a) as well as sex- and age-matched controls from this sample are presented in Table 9. Here, the deviations of scale values from the respective values in the general population sample are qualitatively similar to those of the total sample of former inpatients and quantitatively even more pronounced. In addition, there is also a marked deviation with respect to one of the control scales (No), however, not in the positive direction which would render ratings suspect of untruthfulness. Basically, the same deviations are found in 13 of the subjects in (f) who did not receive a diagnosis additional to that of a personality disorder. However, in both exam-

Table 9. Deviations of average scale values in former inpatients with a personality disorder (ICD-8 no. 301; n = 28) from normal means (in group a) and their significances compared with two samples of sex- and age-matched controls (from group a)

		$\bar{x}_{z_{(a)}}$	p_1 %	p_2 %
1. Extraversion	E	0.14	36.23	97.38
2. Neuroticism	N	1.98	0.00	0.00
3. Frustration Tolerance	F	−0.81	0.12	0.07
4. Rigidity	R	0.08	59.32	42.97
5. Isolation Tendency	Is	1.61	0.00	0.02
6. Esoteric Tendencies	Es	0.61	0.85	0.93
5. + 6. Schizoidia	Sc	1.49	0.00	0.00
7. Orientation towards Social Norms	No	−0.80	32.93	38.84
8. Motivation	Mo	0.12	72.95	77.59

$z_{(a)}$ = scores in z values of group (a); p_1 % = significance level in per cent compared with first control group; p_2 % = significance level in per cent compared with second control group

ples, significance in comparisons with two independent samples of matched controls is only reached for the personality scales and not for the control scale (No). Yet, this is the case for a subsample of psychopathic personalities from c/d not reported here in detail, because the patients were investigated during hospitalization, when they were in a particularly bad emotional state with only little improvement. Anyway, the problems raised by these findings merit further exploration.

Discussion

General Remarks

It can be inferred from our statistical data analyses that the goals of the test construction were largely achieved. The MPT is obviously not only a comprehensive and economical but also a fairly reliable and valid instrument for assessing personality traits in mental patients as well as in healthy subjects.

1. It is comprehensive in that it contains six personality dimensions proper (plus one additional scale composed of the two shortest of these scales) and two control scales.
2. It is economical in that it consists of only 51 items compared, for example, with more than the ten-fold number of items in the MMPI (Hathaway and McKinley 1951).
3. It is reliable in that the internal consistency of the basic scales composed of at least six items is rather high ($\bar{x}_{r_{tt}}$ = 0.75 to 0.89 per scale) and the retest reliability of inpatients' self-ratings varies between 0.54 and 0.76 over an average of 1 year, amounting even

to 0.62 and 0.74 for the two shortest scales; at follow-up of former inpatients around 7 years after index hospitalization, the co-efficients are still highly significant, varying between r_{tt} = 0.41 and 0.49 with the only exception of N (r_{tt} = 0.32) which, apparently, is more symptom-dependent than the other scales (see also Angst 1988; Hirschfeld et al. 1983).
4. It is valid in that its factorial structure is highly consistent and self-rating and relatives' rating ascertained in psychiatric inpatients are in good agreement with respect to factorial structure, group means and interindividual variations of scores on corresponding scales. Furthermore, these two versions of the test indicate clinically meaningful deviations of psychiatric patients on particular scales from normal mean values. This point will be further elaborated here for various diagnostic groups of psychiatric, psychosomatic and neuropsychiatric patients on the basis of recent studies by other authors whose results are still in press or in preparation for publication.

Clinical Validation of the Scales

It has to be noted in this context that a profound difference between Extraversion and Schizoidia emerged from our analyses. This was unexpected on the basis of the literature (Fritsch 1976). Isolation Tendency (Is) and Esoteric Tendencies (Es), the two components of Schizoidia (Sc), turned out to be independent of Extraversion (E) in our factorial analyses. The scales did not substantially correlate with Extraversion (E), but they did correlate significantly with Neuroticism (N). In the diagnostically heterogeneous samples of psychiatric inpatients (c, d) and former inpatients (b), the mean values of these inter-

correlated scales (N, Is, Es) were markedly increased compared with subjects from the general population, whereas the scale values of Frustration Tolerance (F) deviated in the opposite direction. On the other hand, no corresponding differences were found with respect to E. Further analyses of our data not reported in this paper proved this to be true also for schizophrenic patients, with respect to self-ratings as well as to relatives' ratings. However, the group mean for Is was particularly pronounced in schizophrenics.

Our findings may explain the somewhat surprising result of a prospective study in healthy subjects by Angst and Clayton (1986). These authors, using the FPI (Fahrenberg and Selg 1970) at index investigation, could not replicate the finding of a reduced Extraversion in subjects who later on developed a schizophrenic psychosis (Angst et al. 1985), but instead an increase in "Autonomic Lability" (Neuroticism) similar to their findings in subjects who later on suffered from a unipolar depression. It seems possible that Is would have discriminated prospectively between schizophrenics and depressives, since, according to our subsequent analyses of data from diagnostic subgroups of psychiatric patients, unipolar endogenous depressives — in contrast to schizophrenics — did not score higher than normals on this scale. They did, however, show increased values in Rigidity (R), a scale not included in the FPI. Meanwhile, using the MPT in recovered unipolar endogenous depressives, neurotics, patients with migraine, patients with other forms of pain, and patients with other psychosomatic disorders as well as healthy control subjects, Schäfer also found increased mean values for R in the group of depressives (Schäfer, in preparation). In addition, this group presented increased values for N and reduced values for F. A similarly pronounced increase for R, in combination with decreased values for F, was discovered in patients with migraine, as could be expected from clinical observations (Peters 1983; Schäfer et al. 1982). There was also a trend towards higher R values in neurotics, in addition to similar deviations with respect to N, F, Is, and Es as in our sample of psychiatric inpatients (c/d). Hence, an increase in N, Is, and Es and a decrease in F are diagnostically less specific than is an increase in R. It seems worth mentioning that in Schäfer's study three MPT (RR) scales, R, Is and F, reached the highest ranking in a discriminant function for the separation of patients with migraine from neurotics on the basis of various personality questionnaires.

Although there were no deviations with respect to the E scale of the MPT in the patient samples described in this paper or in any diagnostic subgroup of them, we did find a statistically significant increase of E values in combination with a less pronounced increase in Es in a particular diagnostic group, i.e. that of patients with a predominantly manic form of an affective psychosis investigated previously by means of the PPIs (von Zerssen 1988). Because this form of affective disorder is very rare and hence our sample was rather small ($n = 14$), and because we did not obtain ratings by key persons from the patients' social surroundings in all cases, the results of self-ratings could not be corroborated by an analysis of relatives' ratings. Therefore, the result was checked on the basis of an evaluation of case reports by an investigator (J. Pössl) who was unaware of the results of the statistical analyses of the questionnaire data. His description of premorbid personality traits was perfectly in line with our finding of markedly increased values for E and a comparatively smaller increase in Es.

It seems noteworthy that the findings so far obtained in clinical samples are basically in agreement with independent findings ascertained from case records and those reported in the literature (see, for example, Möller and von Zerssen 1987; von Zerssen 1982, 1988). This indicates an adequate comparability of MPT data from patients and healthy subjects, although the patients, if not fully recovered, have to perform a retrospective rating of their "usual self" (Kendell and DiScipio 1968) according to the instruction of the MPT, whereas healthy subjects as well as fully remitted patients can refer to their present state of mind. Apparently, the test instruction does, in fact, diminish the influence of mental symptoms on the rating without seriously distorting the judgement of habitual mental traits if the rating is a retrospective one. This obviously also applies to relatives' rating (Prosiegel and Säring, in preparation).

An advantage of the MPT compared with the FPI, the ENNR (Brengelmann and Brengelmann 1960), and the personality questionnaires which are most widely used in Anglo-Saxon countries, such as the MPI (Eysenck 1959), the EPI (Eysenck and Eysenck 1971), and also the much longer ones as, for example, the MMPI and the 16 PF test (Cattell and Eber 1957, is the existence of a test version for relatives' rating. It allows the investigator to check the results of self-ratings (as, for example, in the above-mentioned investigation by Schäfer) or to substitute self-ratings by relatives' ratings in cases where the patients' judgement and/or motivation for an adequate self-rating seems to be impaired. This is exemplified by a study on personality change following brain damage by injury or apoplectic insult which was performed by Prosiegel and Säring (in preparation). The authors asked key persons from the patients' social environment to judge the patients' present habitual mental state, and afterwards required an additional rating of the pre-

morbid state by means of a test version with a modified instruction for a retrospective evaluation (formulated in agreement with the first author of this paper). The results indicate remarkable deviations of personality following brain damage which only partially resemble those seen in functional mental disorders. In particular, an increase in Es is missing and E decreases to a considerable extent, whereas, according to our findings outlined above, there is no consistent change along this dimension in the groups of mental disorders studied so far, except for a deviation in the opposite direction in patients with a predominantly manic form of an affective disorder. However, in these patients, it is typically combined with an increase in Es and no deviations in other MPT scales.

It should be pointed out, however, that the concordance of relatives' rating and self-rating, although highly significant for the personality scales of the MPT, is only limited in extent. It is of the same order as the retest reliability after 7 years. Discrepancies between the two kinds of rating may occur in several cases. In these instances, it has to be explored from which sources these discrepancies arise and which of the ratings is probably the more valid one. Nevertheless, the existence of two basically different kinds of rating makes reciprocal controls of the ratings feasible. This also applies to statistical group comparisons, e.g. between psychiatric patients and healthy subjects or among patients with diverse, mental or physical, disorders. Concordant group differences point to real differences in habitual mental traits, whereas discrepancies are suspected to result from a bias of the respective raters.

Comparison with Other Personality Questionnaires

A meaningful comparison can only be performed with questionnaires of similar length, composed mainly of items which measure trait and not state variables. This is not the case for the MMPI with 566 items (see Graham 1987), many of which are related to psychiatric symptoms and not to personality traits. Therefore, the results largely depend on the clinical state of patients (see, for example, Lumry et al. 1982). Consequently, although considerably reduced in length as compared with the original questionnaire, the Mini-Mult (Armentrout 1970) is not a personality inventory in the strict sense either and can hence be excluded from our comparison. This will be restricted to instruments for assessing personality traits along dimensions derived from a larger set of items by means of factor analyses as in the case of the MPT. Further criteria for selection are multidimensionality (in a set of much less than 100 items) and the clinical relevance of the test scales as indicated by

results obtained in mental patients and healthy control subjects.

Out of the many questionnaires used in English- and German-speaking countries, the following fulfil the criteria for a meaningful comparison with the MPT (see Table 10): the MPI (Eysenck 1959); its successors, the EPI (Eysenck and Eysenck 1971) and the E.P.Q. (Eysenck and Eysenck 1975); the ENNR (Brengelmann and Brengelmann 1960) derived from the MPI by adding a rigidity scale to the extraversion and the neuroticism scales of Eysenck's questionnaire; moreover, the abbreviated version of the FPI, FPI-K (Fahrenberg and Selg 1970); and, finally, the GT (Beckmann et al. 1983).

Except for the GT, no parallel version exists for a rating by key persons from the subjects' social surroundings in addition to the self-rating version of these instruments. This doubtlessly reduces their applicability in severely disturbed psychiatric patients. In contrast to the MPT version for relatives' rating, the corresponding version of the GT was apparently not derived by means of factor analyses of such ratings. It represents just a modification of the self-rating version, but the concordance with this version at the level of items and factors has not been tested previously. This may be due to the intention of the test authors not to assess personality traits but rather a person's self-image and the image others (e.g. spouse, therapist, nurses, etc.) have of him or her. However, any rating is necessarily based on the images the respective raters have of the object of their rating. It probably has little influence on the results of the ratings whether a questionnaire (see Mummendey 1987) was constructed for an assessment of the images as such or of the objects of these images, whether they may be personality traits, symptoms or whatever. For this reason, it appears justified to compare the results obtained by means of the MPT and the GT in Schäfer's above-mentioned investigation of several clinical groups. Here, the MPT scales differentiated much more clearly than any of the GT scales among patients recovered from an episode of endogenous depression, patients with migraine, patients with various forms of neurosis, patients with other forms of headache or various forms of psychosomatic disorders and healthy subjects.

The shortest version of the FPI (the FPI-K with 74 items) has been comparatively neglected in clinical research, whereas the more extended FPI versions (namely its original form, FPI-G with 228 items; one of its two half-forms, the FPI-A (Fahrenberg and Selg 1970), the revised version of the FPI-A, the FPI-A1, each containing 114 items) and also the revised version of the original test (the FPI-R with 137 items; Fahrenberg et al. 1984) have been extensively used in

Table 10. Survey of brief[a] multidimensional personality inventories for use in mental patients and healthy subjects

Name of questionnaire	Abbr.	Author(s)	(Year)	No. of items	No. of scales	(No. of control scales)
Maudsley Personality Inventory	MPI	Eysenck	(1959)	48	2	(0)
Eysenck Personality Inventory	EPI-A	Eysenck and Eysenck	(1971)	57	3	(1)
	-B			57	3	(1)
Eysenck Personality Questionnaire	E.P.Q.	Eysenck and Eysenck	(1975)	90	4	(1)
Fragebogen der Extraversion, neurotischen Tendenz und Rigidität	ENNR	Brengelmann and Brengelmann	(1960)	56	3	(0)
Freiburger Persönlichkeitsinventar – Kurzform	FPI-K	Fahrenberg and Selg	(1970)	74	$9 + 3^b$	(1)
Gießen-Test[c]	GT	Beckmann et al.	(1983)	36	6	(0)
Munich Personality Test[c]	MPT	von Zerssen et al.	(1988)	51	$8 + 1^b$	(2)

[a] No items < 100
[b] Additional scales derived from the same set of items as the primary scales
[c] Parallel version for rating by key persons from a subject's social environment available

clinical studies. This is surprising, because the FPI-K is shorter than the other versions of the FPI and yet offers a more differentiated picture of the personality structure than the MPI and its successors. In this respect, it is similar to the MPT, although the two tests differ in the content of some of their scales. Thus, further research is needed to clarify which scales are the most relevant ones in a clinical context and which test is most appropriate for what kind of investigation.

With respect to the number of dimensions to be assessed, the MPI and its successors (the EPI, the E.P.Q. and the ENNR) are the least differentiating questionnaires in this comparison. The MPI and the EPI only contain the two classical dimensions of extraversion and neuroticism; the EPI, in addition, comprises a "lie" scale to control for a tendency towards self-evaluation in the direction of social desirability (Edwards 1957). The ENNR does not include this control scale, but rigidity can be assessed instead as a third dimension of personality. In the MPT, however, extraversion, neuroticism, rigidity, a tendency towards social desirability (No), and, moreover, three additional dimensions of personality as well as the motivation for an adequate performance of the rating can be ascertained. Compared with the results from investigations with the German version of the EPI (Eggert 1983), our scales for E and No, although

considerably shorter than the corresponding EPI scales E and L, seem to be the more reliable ones. For the N scales of the two questionnaires, there is apparently no difference in this respect. Thus, from the point of view of reliability, our scales for E, N, and No can fairly well compete with the corresponding EPI scales, and our other test scales have no counterpart in the EPI. For these reasons, we consider the MPT to be the more useful instrument.

The E.P.Q. which contains a psychoticism (P) scale in addition to the E, N and L scales is the longest and hence the least economical test in this comparison. Furthermore, the formal properties of the P scale are insufficient (Baumann and Dittrich 1976); and finally does this scale apparently not measure a predisposition to psychotic breakdown (Davis 1974; von Zerssen 1979) as suggested by the test authors. As long as the P scale has not been profoundly improved with respect to its internal consistency and its clinical validity, the clinical usefulness of the E.P.Q. appears doubtful. However, the comparative usefulness of tests can be definitely checked only by their combined application with the same subjects. Such investigations with the questionnaires mentioned in this subsection should be conducted so that recommendations can be made for an optimal assessment of personality traits in psychiatric patients and healthy subjects.

Appendix A

MPT Version for Self-rating (with Key for Scoring)

MPT (SR)

Date ....

Last name .... Maiden name ....

First name .... Date of birth ....

Occupation .... Age .... years   Sex m/f

Please decide for each of the following statements, whether or not it characterizes you *in times of physical and mental health.*

It is not a question of how you are when you feel unwell nor how you would like to be, but how you really are or usually were in times of physical and mental health. Mark the column which applies to you most closely with an ×.

Do not take too long, and answer *all* the questions.

	Completely true	Mostly true	Somewhat true	Not true
1. I understand the instructions	Mo (3)	(2)	(1)	(0)
2. I am willing to answer each question as truthfully as possible . .	Mo			
3. In my family I am my own master	Is			
4. I get over disappointments quickly	F			
5. Sometimes I talk about things I do not understand	(0)	(1)	(2)	No (3)
6. Other people think I am cold and formal	Is			
7. Sometimes I feel trapped by my own thoroughness	R			
8. I would consider myself talkative	E			
9. My mood can change in the opposite direction on trivial occasions	N			
10. Nothing can upset me easily	F			
11. I sometimes gossip				No
12. I often feel misunderstood	N			
13. Sometimes I try to get revenge rather than to forgive or forget .				No
14. I am full of spirit and enterprise	E			
15. I can quickly get over being annoyed or insulted	F			
16. If I am not immediately successful, I get very discouraged . . .	N			
17. I am a loner	Is			
18. I often make things more difficult for myself than they actually are	N			
19. I can easily get others to like me	E			
20. As a matter of principle, I will not allow anything to keep me from doing my work	R			
21. I am often afraid of being rejected by others	N			
22. In my opinion, one should enjoy one's leisure time, only after having completely attended to one's duties first	R			
23. I am very energetic and usually get my way	E			
24. Once in a while I enjoy telling a white lie				No
25. I can be hurt even by little things	N			
26. I find it relatively easy to endure mental stress	F			
27. I enjoy playing an active part at social events	E			
28. Sometimes I resort to slightly unfair means in order to gain an advantage				No
29. I am very much interested in mysticism, religion, and philosophy	Es			

	Completely true	Mostly true	Somewhat true	Not true
30. Other people consider me lively	E			
31. I believe that one should unconditionally trust one's superiors .	R			
32. When I really like someone, I am often bothered by the thought that, one day, he might turn away from me	N			
33. I suffer when I see the imperfection and inconsistency in the world	Es			
34. Whenever I start something, I insist on doing it to perfection . .	R			
35. I often set trends at school and at work	E			
36. I always plan my trips well in advance by making an accurate itinerary which I try to stick to	R			
37. I am strongly interested in psychic phenomena	Es			
38. I am able to overlook unpleasant things	F			
39. Other people like to choose me as their leader	E			
40. Being ignored by others hurts my feelings considerably	N			
41. I never leave my place of work until I have cleaned up thoroughly, even if this means working overtime	R			
42. I get easily upset	N			
43. I have an iron will and can carry through whatever I consider to be right, even against strong opposition	E			
44. I get accused of being somewhat arrogant and ironic	Is			
45. I am extremely dependent upon praise and criticism	N			
46. I usually consider my work as a deadly serious matter	R			
47. Occasionally I am a bit of a show-off				No
48. I do not let anyone get really close to me	Is			
49. I find it easy to relax	F			
50. I like to assume leadership in joint projects	E			
51. I believe that I have answered every question truthfully	Mo			

Appendix B

MPT Version for Relatives-Rating, 1. Page (without Key for Scoring)

MPT (RR) (m)

Date ....

I am acquainted or related to Mr. .... as his .... (e.g., colleague, friend, wife).
I have known him for .... years.
Please decide for each of the following statements, whether or not it characterizes him *in times of physical and mental health.*
Mark the column which applies to him most closely with an ×.
Do not take too long, and answer *all* the questions.

	Completely true	Mostly true	Somewhat true	Not true
1. I understand the instruction				
2. I am willing to answer each question as truthfully as possible . .				
3. In his family he is his own master				
4. He gets over disappointments quickly				
5. Sometimes he talks about things he does not understand				

	Completely true	Mostly true	Somewhat true	Not true
6. Other people think him cold and formal				
7. Sometimes he appears to be trapped by his own thoroughness .				
8. I would consider him talkative				
9. His mood can change in the opposite direction on trivial occasions				
10. Nothing can upset him easily				
11. He sometimes gossips				
12. He often feels misunderstood				
13. Sometimes he tries to get revenge rather than to forgive or forget				
14. He is full of spirit and enterprise				

Appendix C

Percentile values of test scales in the normative sample a ($n = 238$)

Raw values	1. E	2. N	3. F	4. R	5. Is	6. Es	5. + 6. Sc	7. No	8. Mo
0	4.62	6.72	0.84		21.01	**36.55**	10.50		
1	7.56	14.29	3.78	2.10	**39.50**	**61.76**	23.11		
2	9.24	21.85	7.56	4.62	**57.14**	76.47	**37.39**		
3	14.71	**31.09**	11.76	9.66	**70.17**	90.34	**49.16**	0.42	
4	18.49	**39.92**	17.23	16.81	80.25	95.38	**62.18**	0.42	
5	**25.21**	**48.32**	23.53	22.27	88.66	97.48	**71.43**	0.42	
6	**31.93**	**56.30**	**33.61**	**28.99**	92.44	99.16	80.25	0.42	6.30
7	**39.08**	**65.55**	**46.22**	**36.13**	96.64	99.58	89.08	0.42	13.45
8	**48.32**	**73.53**	**57.14**	**42.86**	97.90	100.00	92.02	0.42	**26.47**
9	**57.56**	80.67	**67.65**	52.52	98.74		94.12	0.42	100.00
10	**63.45**	84.87	79.83	**63.03**	98.74		96.22	2.10	
11	**70.59**	88.24	86.13	**68.91**	99.16		97.06	2.94	
12	**73.53**	93.28	90.76	78.99	100.00		97.90	13.87	
13	76.47	94.12	95.80	83.19			97.90	24.37	
14	81.09	94.54	97.06	89.08			99.58	**36.97**	
15	84.03	95.38	97.90	91.18			99.58	**50.84**	
16	89.92	95.80	98.74	94.54			99.58	**63.87**	
17	90.76	96.64	99.16	95.80			100.00	83.19	
18	92.86	98.32	100.00	97.90				100.00	
19	97.06	98.32		98.74					
20	97.90	99.58		99.16					
21	97.90	100.00		100.00					
22	98.32								
23	100.00								

Percentile values above Q_1 and below Q_3 in bold face
Protocols with raw values for Mo < 6 not included!

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