Eur Arch Psychiatry Clin Neurosci (1990) 240:48–53

European Archives of Psychiatry and Clinical Neuroscience

On the Validity of the German Version of the Comprehensive Psychopathological Rating Scale

P. Richter[1], H. Saß[2], and H. Sauer[1]

[1]Department of Psychiatry, University of Heidelberg, D-6900 Heidelberg, Federal Republic of Germany
[2]Department of Psychiatry, University of Munich, D-8000 Munich, Federal Republic of Germany

Received September 30, 1989

Summary. The construct validity of the German Version of the Comprehensive Psychopathological Rating Scale (CPRS) was investigated in a longitudinal study on 60 hospitalised RDC-schizoaffective patients. The validation included tests of hypotheses about means in cross-section and, in therapy, the course of schizoaffective psychoses. Thus, it is assumed that differences in diagnosis (RDC-schizodepressives versus RDC-schizomanics) are reflected by significantly higher scores on the respective subscales of the CPRS. Furthermore, the subscales of the CPRS should be sensitive to therapeutic change. In addition, correlations were tested using instruments of similar or different validity claim (Hamilton Depression Scale, Mania Rating Scale, Brief Psychiatric Rating Scale). All hypotheses about means could be confirmed. The convergent and discriminant validity of the CPRS is discussed on the basis of multiple-indicator matrices computed for each of the three points of measurement.

Key words: Comprehensive Psychopathological Rating Scale – Validation

Introduction

The CPRS (Comprehensive Psychopathological Rating Scale) (Åsberg et al. 1978) is an observer rating scale for depressive, manic and schizophrenic symptoms. The CPRS consists of 67 items: 40 refer to the self-reported symptoms, 25 to the observed symptoms; 2 items require an assessment of the severity of illness (global rating).

The Swedish scale was translated into six languages (Maurer et al. 1982), among others into German (Kuny et al. 1982). On the basis of factor analyses of the data of 170 hospitalised patients and of other test criteria (Lienert 1969), Maurer et al. constructed the following subscales: "Manic Syndrome", "Schizophrenic Syndrome", "Depressive Syndrome", and "Side-Effects" (first-order factors). A subsequent factor analysis of the subscales resulted in the following second-order factors: "Manic-Depressive Syndrome" and "Schizophrenic Syndrome".

While the scale construction and the interrater reliability have been investigated (Maurer et al. 1982; Kuny et al. 1982 for the German version of the CPRS; Lemperiere et al. 1985 for the English, Swedish, German, and Italian versions), the validity of the instrument has not yet been studied using longitudinal data. Since the CPRS was introduced as an instrument for the assessment of change in psychopathology (Åsberg et al. 1978), a study was carried out to evaluate the utility of the CPRS for measuring psychopathological changes.

Theoretical Assumptions on the Validational Process

As Lienert (1969) pointed out, there is no universal validity of a test, but there are several types of validity. The appropriate method of validation has to be chosen with regard to the field of application which in the case of the CPRS is the assessment of change in depressive, manic and schizophrenic syndromes (Åsberg et al. 1978; Maurer et al. 1982). From a test analytical point of view, psychopathological syndromes can be considered as constructs (Baumann 1986), as for example in the DSM-III (Wittchen 1986). Thus, a construct validation appears to be an appropriate approach to validate psychopathological rating scales. In order to examine whether the CPRS measures the constructs that it is intended to measure, the theoretical assumptions on the traits[1] to be assessed have to be made explicit and tested by data. The assumptions to be tested can be divided into hypotheses about means and hypotheses about covariances.

In this paper, the notion "trait" does not refer to a stable characteristic of a person. "Trait" is rather used as a technical term and refers to the multitrait-multimethod approach. The notions "trait" and "syndrome" are used synonymously.

Since the CPRS has been constructed for the measurement of change in depressive, manic and schizophrenic

Offprint requests to: P. Richter

[1] A trait is defined as any potentially measureable attribute of the subject whose responses are observed or reported

syndromes, schizoaffective disorders seem to be particularly appropriate for investigating the differential validity of the various subscales, i.e. the CPRS subscales intended to measure depression or mania can be expected to show different means in the schizodepressive and schizomanic syndromes.

Hypotheses About Means

Cross-section

1.1. The schizodepressive and schizomanic patients differ in the respective CPRS-subscales on admission (t_0), i.e. schizomanics show higher scores in the subscale "Manic Syndrome", schizodepressives in the subscale "Depressive Syndrome".

1.2. In the subscale "Schizophrenic Syndrome" there is no statistically significant difference between schizomanics and schizodepressives at t_0.

Therapy Course

2.1. In the subscale "Manic Syndrome" the scores of the schizomanics significantly decrease in the course of therapy, whereas the scores of the schizodepressives remain on a constant level.

2.2. In the subscale "Depressive Syndrome" the scores of the schizodepressives significantly decrease, whereas the scores of the schizomanics remain on a constant level.

2.3. In the subscale "Schizophrenic Syndrome" the curves of the schizomanics and schizodepressives are expected to be parallel.

Hypotheses About Covariances

The convergent and discriminant validity of the CPRS are examined analysing the multitrait-multimethod matrices computed for each of the three points of measurement. According to the approach of Campbell and Fiske (1959), monotrait methods (instruments measuring the same construct, i.e. CPRS subscale "Schizophrenic Syndrome" and Brief Psychiatric Rating Scale (BPRS); CPRS subscale "Depressive Syndrome" and Hamilton Depression Scale) correlate better than heterotrait methods (i.e. CPRS subscale "Manic Syndrome" and BPRS). Since we assume that mania and depression are inversely related constructs, significant negative correlations between methods measuring these constructs are expected.

In contrast to the postulates of Campbell and Fiske, in our study the methods are nested within the traits and the independence of the methods is doubtful, because all methods are observer rating scales filled in by the same observer. Therefore, according to Schnell et al. (1988) it would be more precise to call the present matrices multiple-indicator matrices instead of multitrait-multimethod matrices. A validation on the basis of multiple-indicator matrices requires that each trait is measured by several indicators irrespective of the mode of measurement (dependence or independence of methods). Although we realise that basic requirements of the multitrait-multimethod analysis may not be fulfilled in our study, we discuss our data on the basis of this methodological approach in order to clarify the potential and limits of our data.

Method

Inpatients were diagnosed by two experienced psychiatrists according to RDC criteria. Thirty-one schizoaffective patients (48% female) of the depressed type, 29 (58% female) of the manic type were included in the study. The mean age of the schizodepressives was 41.2 ± 14.5, the mean age of the schizomanics 29.3 ± 9.7 years ($P = 0.0004$); 75% reported first rank symptoms (Schneider 1979). Twenty-three patients experienced their first, 15 patients their second, 14 their third, 4 patients their fourth and 4 inpatients their fifth episode. The mean number of past episodes was 1.18.

In addition to the CPRS, the following rating scales were applied: Hamilton Depression Scale (Hamilton 1960), the Mania Rating Scale (Young et al. 1978) translated into German by the authors of this study, and the German version of the BPRS (Overall and Gorham 1962). Subsequent to an unstructured interview, the rating scales were completed by an experienced psychiatrist who was not involved in the therapeutic process.

The rating scales were completed at the following points of measurement: shortly after admission (t_0), 14 days (t_1), and 28 days (t_2) after t_0. All patients received psychopharmacological treatment with haloperidol. In addition, the schizomanics were given lithium, the schizodepressives the antidepressant dibenzepine.

Results

Hypotheses About Means

These hypotheses were tested by two-way analyses of variance with repeated measurement (Hays 1973). The individual means were tested for significance by post-hoc comparisons (t-tests). As to the assumptions of the analyses of variance, the patients could not be randomly distributed to the groups (RDC diagnosis schizomania vs schizodepression). Departure from the assumption of randomisation is, however, to be found in any analysis of variance of non-experimental data. Since the groups are sufficiently large and of almost equal size (29 vs 31 patients), differences in variance and departures from normality can be neglected (Hays 1973; Bortz 1989).

The results concerning the hypotheses about means are presented in Table 1. With regard to hypothesis 1.1, the following findings are of interest: whereas the schizomanics score significantly higher on the CPRS subscale "Manic Syndrome" at every occasion than the schizodepressives (Fig. 3), the latter show significantly higher scores in all depression scales than the schizomanics (Figs. 1, 2). With regard to the CPRS scale (second-order factor) "Manic-Depressive Syndrome" negative scores indicate mania, positive scores depression. As shown in Table 1, the schizomanics have significantly lower scores than the schizodepressives (Fig. 2). Thus, hypothesis 1.1. is fully confirmed.

As the schizomanics do not significantly differ from schizodepressive patients in the CPRS subscale "Schizophrenic Syndromes" (first-order factor) at any of the three points of measurement (see Table 1), and as the same is true with regard to the CPRS scale "Schizophrenic

Table 1. Hypotheses on differences

Variable		Schizomanics AM ± SD		Schizodepressive AM ± SD	Analysis of variance (two-factor)		
					Diagnosis *P*	Time *P*	Interaction *P*
CMAN	t_0	25.1 ± 8.12	*	0.2 ± 5.61	0.000	0.000	0.000
	t_1	7.8 ± 7.57	*	−1.3 ± 2.40	$F = 139.5$	$F = 99.7$	$F = 68.1$
	t_2	4.9 ± 6.54	*	−1.8 ± 2.50			
CSC1	t_0	31.8 ± 14.76		33.6 ± 13.71	0.241	0.000	0.592
	t_1	11.2 ± 10.08		14.8 ± 14.83	$F = 1.41$	$F = 140$	$F = 0.44$
	t_2	7.1 ± 8.16		11.6 ± 13.53			
CDEP	t_0	12.0 ± 8.09	*	49.6 ± 8.78	0.000	0.000	0.000
	t_1	11.7 ± 8.32	*	33.8 ± 12.49	$F = 128.3$	$F = 33$	$F = 34.3$
	t_2	12.3 ± 9.43	*	28.6 ± 14.10			
CSE	t_0	3.3 ± 3.24	*	7.3 ± 2.24	0.000	0.000	0.112
	t_1	2.8 ± 2.57	*	5.7 ± 2.70	$F = 36.6$	$F = 10.6$	$F = 4.62$
	t_2	2.4 ± 2.10	*	4.7 ± 2.78			
CMADE	t_0	−15.3 ± 9.53	*	49.2 ± 11.71	0.000	0.135	0.000
	t_1	4.3 ± 13.64	*	35.6 ± 13.24	$F = 203.6$	$F = 2.04$	$F = 92.6$
	t_2	7.8 ± 12.96	*	31.1 ± 15.56			
CSC2	t_0	32.9 ± 15.77		34.0 ± 13.83	0.273	0.000	0.461
	t_1	11.8 ± 10.65		15.7 ± 15.02	$F = 1.28$	$F = 128$	$F = 0.7$
	t_2	7.4 ± 8.31		12.1 ± 13.72			

CMAN, CPRS-Manic; CSC1, CPRS-Schizophrenic Syndrome (first-order factor); CDEP, CPRS-Depressive Syndrome; CSE, CPRS-Side-Effects; CMADE, CPRS-Manic-Depressive Syndrome (second-order factor); CSC2, CPRS-Schizophrenic Syndrome (second-order factor)

* Statistically significant differences in means t_0, time 0; t_1, time 1 (14 days after t_0); t_2, time 2 (28 days later)

AM, Arithmetic mean; SD = standard deviation

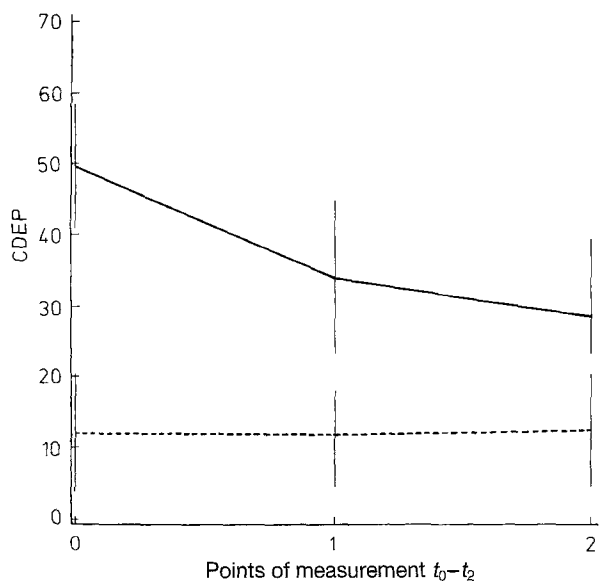

Fig. 1. CPRS subscale "Depression" (CDEP) (mean ± SD). Diagnosis: —— Schizodepressives; – – – – Schizomanics

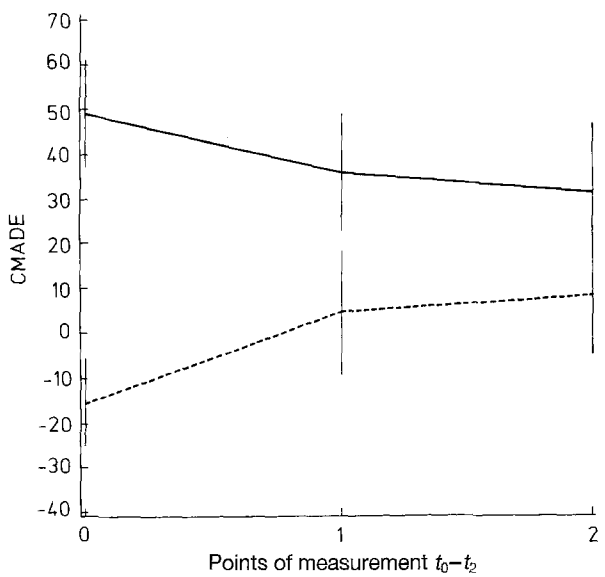

Fig. 2. CPRS scale "Manic-Depressive Syndrome" (CMADE) (mean ± SD). Diagnosis: —— Schizodepressive, – – – – Schizomanics

Syndrome" (second-order factor) (see Table 1), hypothesis 1.2. is also confirmed.

As shown in Table 1, the schizomanic patients show a significant decrease of the mean values in the CPRS subscale "Manic Syndrome", which indicates a significant therapeutic effect, while the scores of the schizodepressives remain constant (Fig. 3). This indicates that there is a significant interaction between the factors time and diagnosis. In the subscale "Depressive Syndrome" (first-order factor), the scores of the schizodepressives

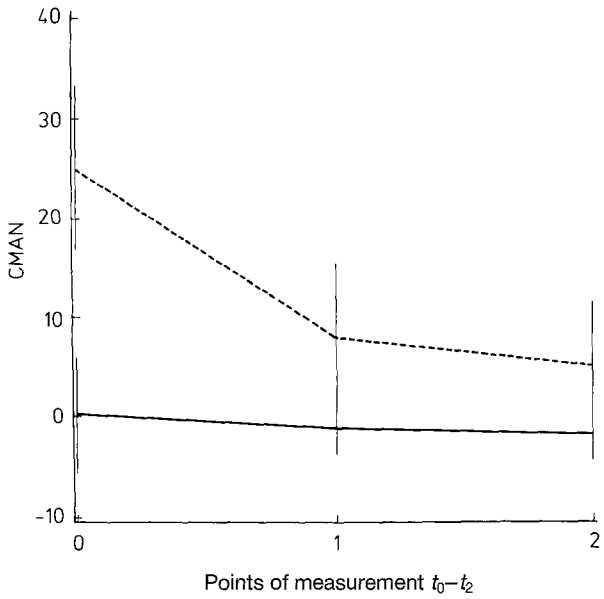

Fig. 3. CPRS subscale "Manic Syndrome" (CMAN) (mean ± SD). Diagnosis: — Schizodepressives; – – – – Schizomanics

significantly decrease but not those of the schizomanics (Fig. 1) (hypothesis 2.2.). In the subscale "Schizophrenic Syndrome" (first-order factor), the scores for the schizomanics and the schizodepressives are almost parallel (Table 1). The same is true for the scale "Schizophrenic Syndrome" (second-order factor) (Table 1). In both diagnostic groups, this scale indicates comparable therapeutic effects (hypothesis 2.3.). Thus, all hypotheses about means could be confirmed.

Hypotheses About Covariances

To investigate the convergent and discriminant validity of the CPRS, an analysis of the multitrait-multimethod matrices (Campbell and Fiske 1959) computed separately for the three occasions was carried out. In the matrices, the correlations between different rating scales are presented.

In contrast to Campbell and Fiske, in our study the methods (CPRS, Mania Rating Scale, Hamilton Depression Scale, BPRS) are nested within the traits (mania, schizophrenia, depression), since only the CPRS mea-

Table 2. Multi-trait-multimethod matrix (t_0)

Traits (syndromes)									
Traits		Mania		Schizophrenia			Depression		
	Methods	CMAN	MRS	CSC1	CSC2	BPRS	CDEP	CMADE	HAMS
Mania	CMAN	–							
	MRS	0.92	–						
Schizo	CSC1	0.09	0.11	–					
	CSC2	0.11	0.14	0.99	–				
	BPRS	−0.15	−0.13	0.82	0.82	–			
Depres	CDEP	−0.79	−0.79	0.27	0.24	0.58	–		
	CMADE	−0.93	−0.90	0.11	0.09	0.41	0.95	–	
	HAMS	−0.84	−0.88	0.19	0.16	0.49	0.94	0.95	–

Multi-trait-multimethod matrix (t_1 and t_2)
Upper triangle (t_1: 14 days after t_0)
Lower triangle (t_2: 28 days after t_0)

Traits (syndromes)									
Traits		Mania		Schizophrenia			Depression		
	Methods	CMAN	MRS	CSC1	CSC2	BPRS	CDEP	CMADE	HAMS
Mania	CMAN	–	0.76	0.07	0.07	−0.14	−0.58	−0.80	−0.55
	MRS	0.77	–	0.20	0.21	−0.01	−0.50	−0.66	−0.58
Schizo	CSC1	−0.04	0.08	–	0.99	0.90	0.52	0.34	0.52
	CSC2	−0.04	0.08	0.99	–	0.89	0.51	0.34	0.51
	BPRS	−0.10	0.07	0.85	0.85	–	0.75	0.59	0.72
Depres	CDEP	−0.49	−0.31	0.64	0.64	0.78	–	0.95	0.75
	CMADE	−0.73	−0.50	0.51	0.57	0.65	0.95	–	0.84
	HAMS	−0.50	−0.47	0.59	0.60	0.71	0.82	0.81	–

CMAN, CPRS-Manic; CSC1, CPRS-Schizophrenic Syndrome (first-order factor); CSC2, CPRS-Schizophrenic Syndrome (second-order factor); CDEP, CPRS-Depressive Syndrome; CMADE, CPRS-Manic-Depressive Syndrome (second-order factor); HAMS, Hamilton-Depression Scala; BPRS, Brief Psychiatric Rating Scale; MRS, Mania Rating Scale
$n = 60$; correlations with $r \geq |0.25|$ are statistically significant

sures all relevant traits while in the remaining methods only one trait is assessed. Thus, only with regard to the CPRS can conclusions on the discriminant and convergent validity on the basis of the matrices be drawn. Moreover, the method variance cannot be estimated independently as postulated by Campbell and Fiske. In contrast to these authors, we consider discriminant validity to be present, if different traits measured by the same method correlate poorly, and if different traits measured by different methods do not correlate significantly.

As can be seen in Table 2, at all three points of measurement there are high correlations between methods supposed to measure the same construct, i.e. between the CPRS subscale "Manic Syndrome" and the Mania Rating Scale, between the CPRS subscale "Schizophrenic Syndrome" (first-order factor) and the BPRS, and between the CPRS subscale "Depressive Syndrome" and the Hamilton Rating Scale. Thus, our data confirm the convergent validity of the CPRS subscales.

The correlations between the CPRS subscales "Manic Syndrome" (CMAN) and "Schizophrenic Syndrome" (CSC1/BPRS) are not statistically significant at any point of measurement, i.e. the discriminant validity of the CPRS subscales "Manic Syndrome" and "Schizophrenic Syndrome" with respect to each other was shown. On the other hand, significant correlations between the subscales "Depressive Syndrome" and "Schizophrenic Syndrome" exist and even increase during the course of treatment (t_1 and t_2). The difficulty in differentiating between depressive and schizophrenic symptoms is also reflected by the fact that the correlations between the CPRS subscale "Schizophrenic Syndrome" and the Hamilton Depression Scale increase as well. Therefore, the CPRS subscales "Depressive Syndrome" and "Schizophrenic Syndrome" cannot be differentiated and lack discriminant validity in this respect. This, however, may be due to the course of the psychotic illness and need not necessarily be a shortcoming of the respective subscales.

Discussion

Basic ideas of construct validation concern the claim of testing an instrument within a nomological network (Cronbach and Meehl 1955). In addition, as pointed out by Campbell and Fiske (1959), the different sources of variance, especially of trait and method variance should be separated.

The present validation considers the following sources of variance: traits (mania, depression, schizophrenia), methods (CPRS, Mania Rating Scale, Hamilton Depression Scale, BPRS), and therapy course.

Since in our study the methods are nested within the traits, an independent estimation of method and trait variance as postulated by Campbell and Fiske (1959) is not possible. In view of the high correlations between different methods intended to measure the same trait, the method variance is expected to be small. A high proportion of method variance is not likely, for all instruments are observer rating scales and therefore very similar. Nevertheless, it cannot be excluded that the correlations between the same traits are inflated by common method variance due to the similarity of the methods.

An independent assessment of method variance according to the criteria of Campbell and Fiske is always difficult, for "method and trait variance are confounded within the multitrait-multimethod matrix" (Ostendorf et al. 1986). A separation of trait and method variance by aid of structural equations models (confirmatory factor analysis), as demanded by Ostendorf et al., is not possible because of the design (nesting of methods within traits) and the relatively small sample size ($n = 60$) (Bentler 1985; Bentler and Bonett 1980).

All hypotheses about means and covariances could be confirmed. With regard to the latter, the correlations presented in the multitrait-multimethod matrices of the three points of measurement indicate that the CPRS subscales have a high convergent validity. However, it is difficult to confirm the discriminant validity of the CPRS subscales "Depressive Syndrome" and "Schizophrenic Syndrome": whereas at t_0 the correlations between depression and schizophrenia scores are relatively low (except for the relatively high correlations between the depression scales and the BPRS), the correlations between both subscales increase at t_1 and t_2. Thus, the multitrait-multimethod matrices differ at the three points of measurement. Our clinical interpretation of this finding is the following: The increase in the correlations between both scales is possibly due to the fact that patients with a fully remitting disorder present with neither depressive nor schizophrenic symptoms at the end of the trial, whereas those with a non-remitting disturbance show schizophrenic as well as depressive symptoms.

In contrast to the low discriminant validity of the subscales "Schizophrenic Syndrome" and "Depressive Syndrome" at t_1 and t_2, the discriminant validity of the "Schizophrenic Syndrome" and "Manic Syndrome" is well confirmed.

Traits and therapy course appear to be the main sources of variance suitable to explain the correlations presented in multiple-indicator matrices. In clinical terms, the subscales of the CPRS seem to be properly defined for measuring schizoaffective psychopathology, although during the course of therapy it is difficult to discriminate depressive and schizophrenic symptomatology. Shortcomings of the CPRS subscale "Side-Effects", already mentioned by Maurer et al. (1982), are confirmed by our data. Despite this, the CPRS seems to be a useful instrument for rating patients with schizoaffective disorder.

Acknowledgement. The authors are grateful to Heinz Scheurer for his valuable comments.

References

Åsberg M, Montgomery SA, Perris C, Schalling D, Sedvall G (1978) A comprehensive psychopathological rating scale. Acta Psychiatr Scand [Suppl] 271:5–27

Baumann U (1986) Angst und Depression: Allgemeine methodische Überlegungen zur Begriffsbildung. In: Helmchen H, Linden M (eds) Die Differenzierung von Angst und Depression. Springer, Berlin Heidelberg New York, pp 5–15

Bentler PM (1985) Theory and implementation of EQS. A structural equations program. Technical Report, University of California

Bentler PM, Bonett DG (1980) Significance tests and goodness of fit in the analysis of covariance structures. Psychol Bull 88: 588–606

Bortz J (1989) Statistik für Sozialwissenschaftler. Springer, Berlin Heidelberg New York

Campbell DT, Fiske DW (1959) Convergent and discriminant validation by the multitrait-multimethod matrix. Psychol Bull 56: 81–105

Cronbach LJ, Meehl PE (1955) Construct validity in psychological tests. Psychol Bull 52:281–302

Hamilton M (1960) A rating scale for depression. J Neurol Neurosurg Psychiatry 23:56–62

Hays WL (1973) Statistics for the social sciences. Clarke, Double and Brendon, Plymouth

Kuny S, Maurer M, Dittrich A, Woggon B (1982) Interraterreliabilität der deutschsprachigen Version der Comprehensive Psychopathological Rating Scale (CPRS). Int Pharmacopsychiatry 17:354–369

Lemperiere T, Guelfi JD, Waintraub L (1985) Comparaison avec d'autres echelles d'evaluation generale de la psycho-pathologie. Ann Medico-Psychol 139:915–922

Lienert GA (1969) Testaufbau und Testanalyse. Beltz, Weinheim

Maurer M, Kuny S, Dittrich A, Woggon B (1982) Skalenkonstruktion der deutschsprachigen Version der Comprehensive Psychopathological Rating Scale (CPRS). Int Pharmacopsychiatry 17:338–353

Ostendorf F, Angleitner A, Ruch W (1986) Die Multitrait-Multimethod Analyse. Konvergente und diskriminante Validität der Personality Research Form. Hogrefe, Göttingen

Overall JE, Gorham DR (1962) The Brief Psychiatric Rating Scale. Psychol Rep 10:799–812

Sauer H, Richter P, Saß H (1989) Zur pämorbiden Persönlichkeit von Patienten mit schizoaffektiven Psychosen. In: Marneros A (ed) Schizoaffektive Störungen. Springer, Berlin Heidelberg New York, pp 109–118

Schneider K (1979) Klinische Psychopathologie. Thieme, Stuttgart

Schnell R, Hill PB, Esser E (1988) Methoden der empirischen Sozialforschung. Oldenburg, Munich

Wittchen H-U (1986) Das diagnostische und statistische Manual psychischer Störungen (DSM III) in deutscher Übersetzung – Implikationen für die Klinische Psychologie? – Z Klin Psychol 15:71–76

Young RC, Biggs JT, Ziegler VE, Meyer DA (1978) A Rating Scale for Mania: reliability, validity and sensitivity. Br J Psychiatry 133:429–435