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A Comparative Study of PSE/CATEGO and DiaSiKa:

Two Psychiatric Computer Diagnostic Systems

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Summary: An unselected series of 100 psychiatric in-patients was independently diagnosed by two clinicians using the PSE and by two computer diagnostic systems: CATEGO based on PSE items and DiaSiKa based on AMDP items. The computer programs are compared with respect to their diagnostic agreement with the clinical diagnoses.

There is evidence that standardizing the diagnostic process leads to a higher agreement among psychiatrists and improves communication between investigators; with this in mind, various instruments have been developed, such as rating scales and structured clinical interviews (Mombour, 1972), diagnostic criteria (Feighner *et al*, 1972; Spitzer and Endicott, 1978) and computer procedures for diagnostic classification (Spitzer and Endicott, 1968, 1969; Fleiss *et al*, 1972; Spitzer *et al*, 1974; Wing *et al*, 1974, 1977a). In this report, we compare two systems of computer-assisted diagnosis: the widely used PSE-CATEGO-program (Wing *et al*, 1974, 1977a) and DiaSiKa, a program developed at the Max-Planck-Institut für Psychiatrie in Munich (von Zerssen, to be published).

A considerable number of studies have been done on the reliability and validity of PSE-CATEGO (Kendell *et al*, 1968; von Cranach and Cooper, 1972; Luria and McHugh, 1974; Cooper *et al*, 1977; Wing *et al*, 1977b; Luria and Berry, 1979). DiaSiKa ('Diagnostische Sichtloch-Kartei') is a diagnostic instrument based on the ICD (8th revision) and major psychiatric textbooks and manuals. The psychopathological items utilized by DiaSiKa are described and defined in the detailed glossary of the AMDP (Arbeitsgemeinschaft für Methodik und Dokumentation in der Psychiatrie, 1979; Busch *et al*, 1980). They are assigned to psychiatric diagnoses by a combination of a logical decision tree and pattern recognition. The AMDP system for documenting psychiatric data has, for years, been widely in use in German-speaking countries for the selection and assessment of patients in therapeutic studies and the routine documentation of hospital admissions. A more detailed description of DiaSiKa is in preparation (von Zerssen, to be published).

The main differences between DiaSiKa and PSE/CATEGO are:

(1) The DiaSiKa checklist consisting of 120 items on current psychopathology and 59 items on the patient's history is rated immediately after a free clinical interview or by using the data from a patient's case record. The 107 PSE items are rated during a structured interview and complemented by the 33 additional items of the 'Aetiology Schedule'.

(2) There are 45 diagnoses from the ICD (8th revision) available in the DiaSiKa program whereas CATEGO provides syndromes and psychopathological profiles and differentiates among 14 diagnostic classifications in accordance with the ICD.

Materials and Methods

After training in the use of the PSE, two clinicians from the Max-Planck-Institut für Psychiatrie (MPIP) interviewed 45 adult patients consecutively admitted to the wards of the MPIP and 55 patients from the admission wards of the Bezirkskrankenhaus Haar, a psychiatric hospital near Munich, with the kind support of Dr Schulz and his colleagues. Patients whose main diagnosis was identical to their leading symptom (sexual deviation, alcohol or drug addiction) and patients with psychosomatic disorders or oligophrenia were excluded from the study. During the interview both clinicians independently rated the PSE and immediately afterwards completed the DiaSiKa checklist and the 'Aetiology Schedule' also independently making their own diagnostic decision.

The computer-assisted DiaSiKa diagnoses were assessed at the computer center of the MPIP; the PSE and 'Aetiology Schedule' were forwarded to Dr von

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Cranach who, in collaboration with Drs Klug and Wegscheider, worked out the CATEGO diagnoses (Bronisch *et al*, 1982).

For measuring diagnostic agreement we grouped the diagnoses in broad diagnostic categories since the number of cases in diagnostic subgroups was too small for statistical evaluation. The category 'depression' included all kinds of non-organic depressive disorders, 'major' or 'minor' depressive disorder and 'endogenous' or 'neurotic' depression, as agreement among clinicians in discriminating these subdivisions has so far been insufficient (see Möller and von Zerssen 1980; Schmid *et al* 1974).

Results

Table I shows the diagnostic agreement between the clinical interviewers and the two computer programmes, using only four diagnostic categories.

TABLE I

Diagnostic agreement between clinical interviewers and computer[1]

Diagnostic categories	Interviewer 1	DiaSiKa	CATEGO	Interviewer 2	DiaSiKa	CATEGO
Organic psychoses	16	18 (15)	6 (5)	16	19 (15)	5 (4)
Endogenous psychoses	53	57 (50)	50 (46)	51	55 (49)	53 (47)
Neuroses	16	11 (10)	14 (7)	14	9 (6)	12 (7)
Depression	14	14 (10)	20 (11)	18	17 (13)	20 (15)
Unclassified	1	0 (0)	10 (1)	1	0 (0)	10 (0)
Overall agreement (×)		0.76	0.56		0.74	0.60

[1] Figures show the number of cases assigned to the diagnostic categories by the clinical interviewers and the computer programmes. In parentheses the number of identically assigned cases is shown.

TABLE II

Diagnostic agreement between clinical interviewers and computer[1]

Diagnostic categories	Interviewer 1	DiaSiKa	CATEGO	Interviewer 2	DiaSiKa	CATEGO
Alcohol psychoses	0	2 (0)	1 (0)	0	2 (0)	1 (0)
Organic psychoses	16	16 (13)	5 (5)	16	17 (13)	4 (4)
Schizophrenia	45	42 (34)	37 (34)	44	45 (39)	35 (31)
Schizoaffective psychoses	1	11 (0)	0 (0)	1	6 (0)	0 (0)
Mania	2	1 (1)	8 (2)	3	1 (1)	11 (3)
Depression	14	14 (10)	20 (11)	18	17 (13)	20 (15)
Neuroses	8	9 (5)	2 (2)	10	5 (4)	3 (3)
Personality disorders	6	2 (1)	6 (5)	2	4 (1)	4 (2)
Non-psychotic disturbances from organic illness	2	0 (0)	6 (0)	2	0 (0)	5 (0)
Paranoid syndromes and reactive psychoses	5	3 (2)	5 (3)	3	3 (1)	7 (2)
Unclassified	1	0 (0)	10 (1)	1	0 (0)	10 (0)
Overall agreement (×)		0.55	0.53		0.62	0.50

[1] Legend see Table I.

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TABLE III

Overall diagnostic agreement using 4 diagnostic categories[1]

	Project diagnosis[2] versus Catego diagnosis	Project diagnosis[2] versus DiaSiKa diagnosis	Project diagnosis[2] versus final diagnosis[3]	DiaSiKa diagnosis versus final diagnosis[3]	Catego diagnosis versus final diagnosis[3]
Interviewer 1	0.66	0.79	0.67	0.63	0.51
Interviewer 2	0.69	0.77	0.66	0.65	0.50

Agreement is expressed in values of Kappa (×) (see Table I).

[1] Organic syndromes (i.e. organic psychoses and non-psychotic disturbances from organic illness).
Endogenous psychoses.
Neuroses.
Depression.

[2] Clinical diagnosis using the PSE.

[3] Derived from the patient's case record.

Overall agreement is expressed by × (Cohen, 1960), the proportion of agreement corrected for chance. × is scaled to vary from −1 to +1 so that a negative value indicates poorer than chance agreement, 0 indicates exactly chance agreement and a positive value indicates better than chance agreement, with +1 indicating perfect agreement.

It can be seen that computer diagnoses by DiaSiKa come closer to the clinicians' diagnostic decisions than CATEGO diagnoses. When more diagnostic subgroups are differentiated, agreement is lower, as shown in Table II. The overall diagnostic agreement between the two clinical interviewers is rather high in both subdivisions (× = 0.92 within the diagnostic groups of Table I and × = 0.88 in the subgroups of Table II). The agreement between clinical diagnoses from the interview and final diagnoses from the patient's case records is considerably lower (× = 0.65 for Table I and × = 0.51 for Table II).

The distinction between 'psychotic' and 'non-psychotic' disturbances in patients with organic disorders is obviously difficult in some cases. Therefore, the degree of agreement improves when these diagnoses are grouped together as 'organic syndromes' (Table III).

Discussion

It is confirmed by our figures (Table II) that in cases of a severe disturbance from an 'organic psychosis', the observed behaviour of the patient is not sufficient for CATEGO to find the diagnosis. Oligosymptomatic subtypes of schizophrenia (hebephrenia and schizophrenic residual syndrome) were also not recognized as psychotic disturbances but classified as 'depression'. The 'British bias' towards the diagnosis of affective disorders, earlier described by Cooper *et al* (1972), can also be seen from our figures: 'mania' diagnosed in 19 cases by CATEGO, in 2 cases by DiaSiKa, and 'depression' diagnosed in 40 cases by CATEGO, in 31 cases by DiaSiKa. On the other hand, there is an obvious bias in the DiaSiKa program towards the diagnosis of 'schizoaffective psychosis'.

The diagnostic agreement between clinicians and DiaSiKa is generally higher than between clinicians and CATEGO. This can be explained by their training according to classical textbook diagnoses on which the DiaSiKa algorithm is based (von Zerssen, to be published) and by the fact that they applied the DiaSiKa items strictly according to the definitions of the AMDP-manual.

The agreement between project diagnoses or computer diagnoses and final diagnoses from the case histories is generally lower. This is to be expected as for the final diagnoses additional sources of information are available and the patient has been under long term observation. In these aspects, computerized diagnoses are limited since they are based mainly on a cross-sectional rating; but agreement on psychopathological definitions and diagnostic criteria is essential to a comparison of findings by investigators in different countries. The AMDP system is already in use in German-speaking countries and has been translated into various languages (López-Ibor Aliño *et al*, 1980; Bobon, 1981; Guy and Ban, to be published). This system, in combination with DiaSiKa, may contribute to the improvement of international communication on psychiatric diagnoses in clinical practice, training and research.

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