The EmpiricalRelevance of Modes of Behavior in Depressive Patients

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ABSTRACT

This study deals with the predictability of depressive conditions based on a list of modes of behaviour taking neuro-biological aspects as a starting-point. The empirical relevance of these modes of behaviour can be proved with regressional and discriminative methods. Expert assessments and subjective self-evaluations are predictable to a significant degree. The results are discussed in the framework of a new hypothesis concerning depressive behaviour (Mitterauer 1986).

Key words: depressive states, modes of behaviour

Introduction

In the 1960's the McCulloch-Group (Kilmer W.L. et al. 1968) worked on a biocybernetic theory of the reticular formation of the brain-stem. They took as their starting-point the hypothesis "that the reticular formation (RF) is the structure of vertebrates that commits an animal to one mode of behaviour or another... they are mutually exclusive" (Kilmer W.L. et al. 1969).

Mode of behaviour as a concept implies the following: a living being or the human being adopts a certain mode of behaviour when the focus of attention of his entire central nervous system is directed towards performing this mode of behaviour. According to Iberall and McCulloch (Iberall A.S. and McCulloch W.S. 1969), there are about 23 (however no more than 30) modes of behaviour which are mutually exclusive. At a certain point in time the brain can devote its full attention to only one mode of behaviour, whereby the RF, as the integration and command system of the brain, organizes or controls the production of individual behavioural modalities (McCulloch W.S. 1966.)

As part of our own research programme on a biocybernetic model of the RF (Mitterauer B. 1983, Mitterauer B. 1988) we also tested the hypothesis of the modes of behaviour of the McCulloch-Group. The relevant study of healthy and mentally ill probands showed that the 23 modes of behaviour proposed by Iberall and McCulloch must be extended to at least 36. If it is assumed that the RF as a complete system consists of contrasting subsystems (sensorymotory; arouse-quiet; inspiratorial-exspiratorial; pain-pleasure etc.) the modes of behaviour organized by the RF can obviously be conceived as pairs of opposites.

Table 1 lists the 36 modes of behaviour formed by pairs of opposites resulting from the 23 behavioural modalities defined by Iberall and McCulloch. We should like to point out that voiding as a mode of behaviour can occur in opposing directions either as the need to empty the bowels or to vomit. The mode of behaviour opposite to voiding is the need to eat or drink.

On the basis of this biocybernetic model Mitterauer (Mitterauer B. 1986) has proposed the following hypothesis concerning depressive behaviour:

A person is in a depressive state when

1) at least one of the named modes of behaviour consciously persists or is blocked (behaviourally ineffective).

2) such changes in behaviour can be precisely described by the person concerned, although

3) no subjectively sufficient explanation is possible for the condition.

4) the individual change in behaviour is accepted or rejected.

At present this hypothesis is gradually being empirically tested. This study deals exclusively with the following question: to what extent is the absence, or the persistence of certain modes of behaviour typical for depressive behaviour?

Material and Methods

A statistical study is made to see: 1) whether the behavioural range differs between depressive persons (D) in comparison with non-depressive persons (ND). 2) Items relevant for the prediction of depressive behaviour are determined. Both sets of questions must not necessarily lead to concurring results. For the prognosis of depressive conditions, subjects may be of importance in which patients do not differ from non-depressive persons.
From this it is evident that this question is treated with correlative-analytical instruments, namely

a) with a multiple regression and
b) with a discriminative analysis (Weinberg G.S. and Goldberg R. 1989)

The process of evaluation (a) - that is the multiple regression - provides direct information about the predictive power of an
item (beta - weights). Additionally, in the course of a linear combination the corresponding value can be estimated on a continuous criterion variable (D-scale, 10). The discriminative analysis (b) aims to deal with the same kind of problems. However, in this case a dichotomous characteristic, the DSM III diagnosis, functions as a criterion.

The approach adopted by this study can therefore be defined as follows:

where modes of behaviour can be distinguished discriminately, can they a) predict the extent of a depressive personality structure and b) separate a sample test of depressive patients from a coincidental sample test?

Scientifically and theoretically the formulation of the two questions corresponds to the differential psychological and the general pyschological paradigm. In terms of general psychology a rule is sought for the connection between physiologically represented modes and the personality characteristic "depressive"; this was operationalized once in a psychological test (D-scale, 10) and once by means of an experimental assessment (DSM III R-Diagonal). In terms of differential psychology we are interested in the different "anchorage" of behavioural categories in D and ND persons.

The study contains the following variables:

- the items on the list of behaviour function as indicators;
- on the one hand the criteria are formed by the scale of depression established by Zerssen (Zerssen D.V. 1976) and on the other with the help of the DSM III - diagnosis.

The choice of modes of behaviour listed is based on neuropsychological considerations. The test persons have to assess frequency changes of behaviour classification in a defined phase. Zerssen's scale of depression is a one-dimensional questionnaire for making a self-evaluation of a depressive mood.

Corresponding to the experimental nature of this study two groups of test persons were formed; a depressive group (N = 133) and a random test group (N = 140). They were arranged on the basis of a DSM III - diagnosis and the cut offs of St<4 and St>8 on the D-scale.

Results

To begin with let us look at the first question, in which we tried to find modes of behaviour with varying probability of occurrence between the two groups.

Table 1 shows the following picture: the difference between the groups (D and ND) in the categories "drinking", "arguing", "seeking reconciliation", "greedy", "generous", "eating" are not significant. All other emotive words evoke significant differences regarding the self-evaluation of the course of time between D and ND persons. With the communicative relationships and the physiological primary needs - subsumed under the zero-hypothesis - an elementary alphabet of behaviour necessary for the maintenance of psychophysiological organization could have been found (Leibetseder M. et al. 1992). A further accent becomes clear in the depressive nature, if the t-values are subjected to a one-sided examination (t 0.05; 271 = 2.576). Depressive patients sleep and rest more, they feel anxious more frequently, and a more frequent need to pass urine, they avoid people more often, they have a greater tendency to submit to everything, to cry, to be sad, and to be angry more often than non-depressives. This result fits in neatly with a series of other similar results (Baumeister R.F. 1990, Morris W.N. 1989). In the'context of the theory presented here (Mitterauer B. 1983, Mitterauer B. 1986), this result was, however, not eo ipso foreseeable. This experiment does not define depressions as complex states but by means of the operative implementation of modes of behaviour. Two opposing functional disturbances fundamentally characterize a depression: the lessening in frequency and increase in frequency of a mode. It was not possible to predict the specific direction of the changed probability in a subject's occurrence.

We now reverse the problem and examine the relationship between the modes of behaviour and an outside criterion (2nd question).

Here the object was to clarify the variance of the D-values of the Zerssen scale by the items of the behaviour list in a multiple regression; it was possible to systematically predict en bloc 58% of the criterion variance (multiple R = 0.76; F = 9.4,
p = 0.0000). 52.9% of the variance were clarified by a gradual regression (multiple R = 0.727; F = 42.54, p = 0.0000). The following items were extracted from the entire set and combined to form a weighted linear combination: "Non-vomiting (M1)", "Rigidity (M9)", "Fear (M10)", "having no sexual
contact (M14)", "not arguing (M18)", "inability to be happy (M28)", "feeling sad (M35)". The equation for the estimated
A n
value of depression (D) is : D = 6.0085 + 2.65 M10 + 2.85 M35 -2.72 M28 - 1.54 M18 - 1.49 M14 + 1.85 M9 - 1.09 Ml.

A gradual discriminative analysis directed towards the DSM III - diagnosis, was able to classify 87.6% of the cases correctly. This result proved to be somewhat too optimistic. When a 60 to 40 check was made (Schubft W. et al. 1991), the allocation
quota sank by 8% (A= 0.4788, chi2 = 120.4, df = 13, p = 0.0000). The following items proved to be relevant: vomiting, lack of exercise, conflict, sexual activity, having no fear, feeling free and happy, not being evasive, no urge to pass urine, arguing, not resting, listening, not becoming angry, crying, feeling happy, not feeling sad.

Finlay-Jones et al. (Finlay-Jones R. et al., 1980) selected an analogue approach and listed which discriminatory functions could be identified with depressions, border-line disturbances and a control group. The taxonomic quotas amounted to around 90%, but this was without a subsequent 60 to 40 test. However, the list of symptoms between their and our study do diverge partly. Characteristics of fear seem to be a particularly distinctive feature of border-line cases, whereas in the present study they proved to be inherent in depression. We omitted meta-perspectives on the "cognitive apparatus" due to anatomical and physiological considerations (Mitterauer B. 1983); Finlay-Jones et al (Finlay-Jones R. et al. 1980) on the other hand regarded them as being diagnostically permissible.

Discussion

The main result to be recorded is as follows:

Quantitative self-evaluations and also expert assessments concerning depressive behaviour can be predicted by a physiologically deduced set of modalities. There is therefore possibly a pragmatic value in this direction of research: it seems that in future depressions can be diagnosed with a set of global behavioural mechanisms; this is even true when the lpsubjective mood experience of a person is not accessible or definable (Branscombe N., 1988). At present it is too early to reduce the list of modes of behaviour to those in the discriminative analysis and to identify multiple regression as
relevant for classification. It was not yet possible to achieve a sufficient level of differentiation for reliable

diagnostic purposes. In this respect further research studies will be necessary. Furthermore the kind of "bundling" of other mood states (manic, euphoric etc.) still has to be characterized. Nevertheless, the clarification quota achieved here leaves room for the speculation that in future, in addition to temporal fluctuation, aspects of cognitive and volitive attitude and the descriptive, or interpretative existence of a disturbed mode of behaviour are significant for depressive behaviour.

This study further clarified the methodological determinacy of the results. If the patterns of modes of behaviour are analysed according to their various "anchorage" in depressive patients and non-depressive persons, combinations are reflected in the intermediate value differences other than on the correlative-analytical instruments. Relevance and selection of individual dimensions are directed towards the problem in question. Diagnostic long-term aims - as we hope will be achieved in futher projects - must be based on the predictability of depressive behaviour; methodologically this corresponds to a correlative-statistical approach.

In this study depression proved to be an enigmatic phenomenon. Its manifestations of state change according to the methodological perspective and system of reference (DSM III vs. D-scale (Faravelli C. et al., 1986). This dilemma seems to
be soluble by recourse to constitutive operators (Kammer D. et al. 1986, Alloy L. 1988, Campbell J.D. and Fehr B. 1990).

However, as may be apparent from the terms selected, we do not intend to make a contribution to the discussion of emotion and cognition (Klix F. 1989, Kammer D. and Hautzinger R. M., 1988, Bower G.H. and Cohen P.R. 1982) which despite its significance concerning the interaction or causal direction of its components, hardly leads to any significant trends. The concept of depression as presented here and for which further studies are necessary can be formulated as follows: depression is an extreme increase in frequency and/or reduction of at least one of the behaviour modes listed plus an individual volitive-cognitive attitude plus a descriptive / explicative availability.

It was possible to ascertain the thematic relevance and effectiveness of the frequency operators of the modes of behaviour. All other aspects of the individual position must still be clarified in further studies.

Table 1: **36 MODES OF BEHAVIOUR AS OPPOSING PAIRS**

Laughing	Crying
Sleeping	State of attention or concentration
Greed	Generosity
Urge to empty the bowels	Eating
Movement	Rigidity
Feeling of fear	Feeling of freedom and happiness
Seeking conflict	Avoiding people
Sexual activity	State of full and complete intellectual occupation
Drinking	Passing urine
Arguing	Seeking reconciliation
Fighting	Submitting to everything
Feeling of envy	Wishing the best of everything for everybody
Working	Resting
Talking	Listening
Feeling joyful	Feeling angry
Vomiting	Need to eat or drink
Seeking human contact	Withdrawing from human contact
Happiness	Sadness

Table 2: **Arithmetical means (x), Standard deviations (s) and t-values of the items on the list of modes of behaviour.(M)**

Mode No.	item	x	s	t	p

M1	vomiting	ND: 1.921 D: 1.556	0.588 0.957	3.82	0.000
M2	sleeping	ND: 1.907 D: 2.142	0.414 0.566	-3.94	0.000
M3	State of attention and concentration	ND: 1.8 D: 1.27	0.59 0.77	6.39	0.000
M4	greed	ND: 1.95 D : 2.052	0.592 0.71	- 1.30	0.197
M5	generosity	ND: 2.1 D: 1.977	0.579 0.763	1.49	0.138
M6	eating	ND: 2.1 D : 1.992	0.682 1.034	1.01	0.314
M7	urge to empty the bowels	ND: 2.057 D : 1.834	0.394 0.687	3.26	0.001
M8	movement	ND: 2.014 D: 1.413	0.796 0.854	6.01	0.000
M9	paralysis	ND: 1.921 D: 2.286	0.45 0.61	- 5.59	0.000
M10	fear	ND: 2.021 D : 2.819	0.673 0.86	- 8.51	0.000
M11	feeling of freedom and happiness	ND: 1.907 D: 1.015	0.698 0.977	8.71	0.000
M12	seeking conflict	ND: 2.292 D : 1.774	0.773 1.034	4.71	0.000
M13	avoiding people	ND: 1.992 D: 2.631	0.594 0.9	- 6.95	0.000
M14	sexual activity	ND: 1.864 D: 1.331	0.578 0.902	5.85	0.000

M15	state of full and complete intellectual occupation	ND: 2.15 D : 1.669	0.678 1.035	4.56	0.000
M16	drinking	ND: 2.071 D : 2.165	0.518 0.698	- 1.27	0.206
M17	urge to pass urine	ND: 2.021	0.424	- 2.46	0.014
M18	arguing	ND: 2.0 D : 1.894	0.689	1.09	0.277
M19	seeking reconciliation	ND: 2.057 D : 1.992	0.621 0.764	0.77	0.442
M20	fighting	ND: 2.071 D : 1.789	0.595 1.052	2.74	0.007
M21	total submission	ND: 1.764 D: 2.413	0.716 0.914	- 6.55	0.000
M22	feeling of envy	ND: 1.914 D: 2.068	0.516 0.58	- 2:31	0.022
M23	wishing the best of everything for everybody	ND: 2.121 D : 1.932	0.529 0.525	2.96	0.003
M24	vomiting	ND: 2.1 D: 1.511	0.78 0.982	5.5	0.000
M25	resting	ND: 2.021 D: 2.421	0.704 0.915	- 4.06	0.000
M26	talking	ND: 2.114 D : 1.587	0.576 0.897	5.81	0.000
M27	listening	ND: 2.186 D: 1.895	0.57 0.846	3.35	0.001

				9.33	0.000
M28	feeling joyful	ND: 2.071 D: 1.21	0.653 0.862		
M29	feeling angry	ND: 2.079 D: 2.308	0.647 0.923	- 2.39	0.017
M30	laughing	ND: 2.0 D: 1.195	0.71 0.723	9.28	0.000
M31	crying	ND: 1.943 D : 2.368	0.727 0.925	- 4.24	0.000
M32	seeking human contact	ND: 2.114 D : 1.474	0.647 0.867	6.94	0.000
M33	withdrawing from human contact	ND: 1.993 D : 2.714	0.651 0.822	- 8.06	0.000
M34	feeling happy	ND: 2.071 D: 1.098	0.631 0.777	11.39	0.000
M35	feeling sad	ND: 1.929 D : 1.865	0.696 0.747	- 10.72	0.000
M36					
M37					

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