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Lay beliefs about the causes of mental disorders: a new methodological approach

Abstract So far, researchers have, for the most part, used lists of Likert-scaled items in their quantitative analysis of lay beliefs about the causes of mental disorders. With the help of factor analyses they have then sought to identify the independent dimensions of the attitudinal space. In contrast, it is the aim of multiple unidimensional unfolding, which shall be presented in this paper, to establish a latent dimension of the order of preference regarding the causes offered as an explanation for the development of mental disorders. Using data from a representative survey examining the attitude of the general public of the new *"Länder"* of the Federal Republic of Germany towards mental disorders, which was conducted during 1993, it can be shown that 11 of the 15 causal factors offered may be arranged along an unfolding scale. The centre of the scale was characterized by the item "God's will or fate". Psychosocial stress factors constituted one pole of the scale, personality disorders, the other. In between we found both external and biological influences over which the afflicted individuals had no control. Analogies to the concept of locus of control are discussed.

Background information

The main purpose of this paper was to present a new methodological approach to the investigation of lay beliefs about the causes of mental disorders. When reviewing studies carried out so far we can basically differentiate between a qualitative and a quantitative approach. Among qualitative studies, those involving

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problem-centred interviews, which were conducted with the help of interview schedules and which subsequently underwent content analysis, are clearly predominant. (Hohl 1983; Stoneall and Schmidt 1984; Estroff et al. 1991; Buchholz 1991; Kuyken et al. 1992; Stark and Stolle 1994 a, b). Narrative interviews (Mutz and Kühnlein 1991) and participant observations (Jodelet 1989) have been used, however, less frequently.

In addition to using open-ended questions with subsequent coding (Cumming and Cumming 1957; Bilzard 1968; Weinstein and Brill 1971; Angermeyer and Klusmann 1988; Angermeyer et al. 1988) and closed questions with dichotomous/trichotomous response categories (Graves et al. 1971; Faust 1981; Foulks et al. 1986; Sheehan and Kroll 1990), quantitative studies have mostly employed, Likert-scaled item lists (MacLean 1969; Jaeckel and Wieser 1970; Norman and Malla 1983; Narikiyo and Kameoka 1992; Kuyken et al. 1992). These then frequently underwent dimensional analysis, which was mostly achieved achieved by factor analysis (Furnham and Rees 1988; Angermeyer and Klusmann 1988; Angermeyer et al. 1988; Furnham and Kuyken 1991; Furnham and Bower 1992; Hambrecht and Hohmann 1993), or in some cases also by cluster analysis (Angermeyer and Matschinger 1994) or multidimensional scaling (Eisenbruch 1990). The space of characteristics covered by these item lists not only varied depending on the causal factors under consideration, but it was also determined by the answer categories chosen for the interview. The probability that a certain causal factor might be a etiologically relevant frequently served as an assessment criterion (i.e. in Angermeyer and Klusmann 1988; "no cause"—"possible cause"—"likely cause"—"very likely cause").

This procedure, however, provides no information regarding the relative importance attributed to a particular causal factor in comparison to other causal factors. It is quite possible that a specific causal factor might be considered aetiologically relevant by the majority of respondents, but that it will nevertheless be

viewed as less important than another causal factor that might be mentioned less frequently. To record this rank order, it is necessary to explicitly enquire which cause, according to the respondents, carries the greatest significance, which is the next important and so on. Data gathered by these means can also–analogous to Likert-scaled items–be examined in regard to their dimensionality. With this, however, it is not a matter of identifying the independent dimensions of the space of characteristics. Instead, based on the assumption that respondents have a generally valid order of preference concerning the causes offered, a latent dimension is to be established through which the similarity or dissimilarity between stimuli (in this case causes) and respondents may be represented as parsimoniously as possible. The appropriate method for this is unidimensional unfolding, which shall briefly be described in the following section.

Unfolding scale

The main difference between an unfolding approach and the better known scaling methods such as Gutman models or Rasch models lies in the shape of the item response function, which is at least monotonic for Gutman scales and single peaked for the latter group of scaling techniques. This simply means that when measuring attitudes, the probability of "solving an item" (answering "yes", exhibiting a higher score on a 5-point scale, etc.) is monotonically related to the latent dimension under consideration. However, there are instances when this relationship does not hold. If one wants to measure political orientation by assessing party preferences, for instance, the latent triat "right-left" obviously is not monotonically related to the preference of a party, as respondents in the middle of the scale will certainly reject both, parties on the extreme left and those on the extreme right. The probability of agreement is highest at the very point at which the observation is located on a latent dimension and decreases with increasing stimulus distance from this particular point (Hoijtink 1991).

Multiple unidimensional unfolding is an ordinal scaling technique to map both the stimuli and the respondents on a joint scale. Several procedures are known that analyse partial ranking (Post 1992). We will employ a deterministic unfolding model for dichotomous choice data, also called parallelogram analysis, introduced by Coombs (1964) for picking K stimuli out of a set of N stimuli equally available for all respondents. The following two assumptions must be fulfilled:

1. All subjects agree about the location of the stimuli (here causes of disease) along the latent dimension, although they may differ with respect to their preferences of particular stimuli. Only if this assumption holds true a joint scale can be found.
2. All subjects choose only those stimuli that are close to their position on the latent dimension (Post 1992: p. 6).

These assumptions mark the essential difference between cumulative scales and unfolding scales. The probability of a stimulus being selected by a particular respondent decreases if the distance between this respondent and a certain stimulus increases. However, the absolute position on the unfolding scale provides no information regarding the popularity of a certain stimulus (i.e. cause).

We employed a non-parametric approach, namely multiple unidimensional unfolding according to van Schuur (van Schuur 1984; van Schuur and Wiestra 1987), since this procedure posts only weak requirements for the quality of the data. A special form of hierarchical cluster analysis is used to select a set of items that meet the criteria of a joint scale. After the smallest possible scale, has been set up, other items are added to the scale until the test criteria chosen are fulfilled.

The main criterion to evaluate the quality of a particular unfolding scale is the scalability coefficient, H, which—similar to Loewinger's H (Mokken 1971)—compares the observed errors with the number of errors that can be expected if the "null model" (model of complete statistical independence) holds. The upper limit is 1, indicating a complete correspondence with the deterministic model. A scale is acceptable only if the coefficient is not below 0.3 (van Schuur 1987: p. 10). The scalability coefficient thus takes into account the relative number of errors.

Method

During March and April of 1993, a representative survey was conducted in the new "Länder" of the Federal Republic of Germany involving persons of German nationality who were at least 18 years old and living in private households. The sample was drawn using a three-stage random sampling procedure with sample points or synthetic sample points in the first stage, households in the second, and individuals within the target households in the third stage. Target households within the sample points were determined according to the random route method, the selection of target persons, according to random digits. In all, 2094 interviews were conducted with an exhaustion rate of 71.2%. The population survey was carried out in cooperation with the Centre for Surveys, Methods and Analyses (Zentrum für Umfragen, Methoden und Analysen e.V.) (ZUMA) is Mannheim. The field work had been assigned to the Association for Marketing, Communication and Social Research, Inc. (Gesellschaft für Marketing, Kommunikations- und Sozialforschung mbH; GFM-GETAS) in Hamburg.

A personal, fully structured interview was carried out, which began with the presentation of a vignette describing a diagnostically unlabelled psychiatric case history. De facto the case history either depicted a person suffering from schizophrenia, major depressive disorder or borderline personality disorder. The symptomatology described in the vignettes fulfilled the criteria of DSM-III-R for the

respective disorder. Before being included in the survey, the texts of the vignettes had been presented to five psychiatrists or psychologists (all proven experts in the field of psychopathology) for the purpose of a blind diagnostic allocation. For each of the three disorders all experts were able to provide the correct diagnosis based on the case histories described in the vignettes. Subsamples were presented with only one case history (schizophrenia $n = 1063$; depression $n = 501$; borderline personality disorder $n = 530$). Following the presentation of the vignette, respondents were asked what they believed to be the causes for the disorders described in the case history. For this purpose we had compiled a catalogue of a total of 15 possible causes, which included the most important explanations given for the development of mental disorders—those discussed by psychiatric experts, as well as those commonly offered by the lay public. Using a 5 point Likert scale, respondents were asked to indicate to what extent they considered the causal factors offered by us to be aetiologically relevant. Next, we requested that they choose the cause that the thought played the most important role in the development of the disorder, followed by the cause they viewed as the second most important.

Results

We will first describe the findings derived by the "traditional" procedure using Likert-scaled items plus subsequent factor analysis. Then we will report the results of the analysis of the preference order by means of multiple unidimensional unfolding.

Distinguishing between the three mental disorders and presenting them in descending order according to how frequently they were chosen in reference to schizophrenia, Table 1 lists the possible causes of the disorders offered by us. Combining both categories indicating agreement, the table shows that percentage of the population that considered a particular cause as given.

Psychosocial stress factors were mentioned most frequently as the causes of schizophrenic disorders: isolation and unemployment (each listed by almost

three-fourths of respondents), as well as somewhat less frequently stress in a partnership, family or on the job. Furthermore, almost two-thirds of our respondents considered factors located within the afflicted individual him/herself as a etiologically relevant, such as an unstable personality, weak mental constitution, drug use or alcohol abuse. Slightly more than half of our interviewees adopted the provided explanation that the disorder could be attributed to an unconscious conflict. The view that the illness might be due to a disorder of the brain or that it might be caused by genetic factors was given somewhat less frequently. In comparison, conditions of socialization were rarely seen as responsible for the development of the disorder (sexual abuse during childhood being named by 30% and wrong upbringing by 27% of respondents). Only every tenth interviewee considered the possibility that the disorders might be the will of God or fate, or that factors within the physical environment, such as atomic rays, might have played a part.

With depressive disorders, we mainly encountered the same pattern. Compared to schizophrenia, however, psychosocial stress factors were named somewhat more frequently, with unemployment ranking first (by four-fifths of respondents), followed by isolation, stress at work and at home, as well as the hectic state of life nowadays. However, the depressive disorder was less frequently attributed to biological factors: only every third respondent held genetic factors responsible for its development, and only every fourth respondent saw its cause in a disorder of the brain.

In the case of borderline personality disorder, and in contrast to the other two forms of mental illness, interviewees more frequently chose those explanations provided by us that located the cause within the afflicted individual him/herself: four-fifths of those interviewed laid the blame on an unstable personality (making it

Table 1 Beliefs about the causes of mental disorders assessed by 5-point Likert scales

	Schizophrenia ($n = 1063$) %[a]	Depression ($n = 501$) %[a]	Borderline ($n = 530$) %[a]
Isolation	73.0	76.4	63.7
Unemployment	71.7	82.4	75.5
Stress in partnership or family	64.0	73.1	68.1
Occupational stress	63.9	75.0	61.9
Unstable personality	63.8	62.0	79.8
Weak mental constitution	63.3	59.5	74.9
Drug or alcohol abuse	63.2	58.1	66.6
Hectic state of life nowadays	60.5	71.0	59.4
Unconscious conflict	52.8	48.7	53.0
Disorder of the brain	49.2	24.6	31.9
Heredity	44.6	37.1	40.0
Sexual abuse during childhood	30.3	26.0	34.1
Wrong upbringing	27.1	27.1	49.0
God's will or fate	9.2	7.0	5.7
Effect of atomic rays	8.9	6.8	7.0

[a] Categories 1 and 2 combined

the most frequently cited cause), three-quarters on a weak mental constitution and two-thirds on drug use or alcohol abuse. The observation that, according to half of all respondents, the wrong upbringing plays an important role pointed in the same direction.

In order to establish those dimensions represented by the 15 causal factors provided by us, we conducted principal axes factoring. To ensure their orthogonality, factor scores were calculated following the procedure described by Anderson and Rubin. We identified four factors for the total sample that, however, were able to explain only 35.1% of the variance. Only in the case of the first two factors did the eigenvalue go beyond 1. The four dimensions were composed as follows:
- Uncontrollable influences (eigenvalue 2.79, explained variance 18.6%): effects of atomic rays (factor loading 0.60), disorder of the brain (0.54), heredity (0.51), God's will or fate (0.42), sexual abuse during childhood (0.41)
- Disturbed personality (eigenvalue 1.19; explained variance 7.9%): unstable personality (factor loading 0.62), weak mental constitution (0.59), unconscious conflict (0.44), wrong upbringing (0.38)
- Social disintegration (eigenvalue 0.67; explained variance 4.5%): unemployment (factor loading 0.66), drug or alcohol abuse (0.52), stress in partnership or family (0.38), isolation (0.35)
- Psychosocial stress (eigenvalue 0.62; explained variance 4.2%): hectic state of life nowadays (factor loading 0.74), stress at work (0.55)

In order to examine to what extent the four aetiological dimensions were influenced by the type of mental disorder, as well as by the most important sociodemographic characteristics of respondents, we conducted a four-factor analysis of variance with a regression approach, using age as a covariate. We found that uncontrollable (supernatural or biological) influences were most frequently considered to be of causal importance for schizophrenia and least frequently in relation to borderline personality disorder. For the incidence (onset, development) of the latter, respondents preferred to blame a disturbed personality. Depressive disorders, in comparison to the other two disorders, were more frequently attributed to social and psychosocial stress. The gender of respondents did not influence the process of causal attribution. The same held true for age, with the exception of its correlation with psychosocial stress, which was assigned more causal significance with the increasing age of respondents. The lower the educational level of the respondents, the more frequently was the cause of the disorder seen as stemming from personality deficiencies. In addition, respondents with a lower educational level showed a stronger tendency to believe supernatural or biological influences to be of causal significance. Social disintegration was the cause most frequently mentioned by residents of those areas with the highest level of urbanization. (Tables supplied by authors upon request.)

When asked to choose from the 15 potential causes offered that, in their opinion, were most significant for the development of schizophrenia, respondents most frequently named isolation, followed by a weak mental constitution, disorder of the brain or unemployment – a combination of psychosocial stress factors and biological factors. With depression, three stress factors were ranked highest: unemployment, isolation, and stress in partnership and family. A weak mental constitution was ranked in fourth place. This was not the case with borderline personality disorder. Here, those causes located within the afflicted individual were predominant, i.e. a weak mental constitution, unstable character, drug use or alcohol abuse.

As the second most important causal factor with regard to schizophrenia, respondents most frequently named the consumption of drugs or alcohol abuse, followed by unemployment and a weak mental constitution. Regarding depression, chronic stress factors, such as stress at work, in partnership or family, and unemployment, were referred to most commonly. With borderline personality disorder, the following were cited most frequently as constituting the second most important causes: an unstable personality, weak mental constitution and unemployment (Table 2).

With regard to the total sample, multiple unfolding presented a solution that was easily interpreted and that was also acceptable in regard to the criteria mentioned above. Of the 15 items, 11 could be arranged along a joint scale (Table 3). The scaling coefficient H (I) was never below 0.3. Regarding the total scale, it amounted to 0.34.

One pole of the scale was made up of psychosocial stress factors, such as occupational stress, stress in partnership or family, as well as unemployment. The other pole consisted of personality disorders, such as a weak mental constitution and an unstable character, along with those factors of socialization, such as wrong upbringing, which were held responsible for their development. Between these two poles, we found those external influences that were beyond the control of the afflicted individual (the effect of atomic rays and sexual abuse during childhood), along with biological factors (i.e. heredity or disorder of the brain). The item "God's will or fate" constituted the centre of the scale. The items of isolation, drug or alcohol abuse, unconscious conflict and the hectic state of life nowadays were not incorporated in the unfolding scale.

As a last step, we examined to what extent specific subsamples differed from each other with regard to their position along the joint scale. Analogous to analyses of variance, using factor scores as independent variables, we examined the "location differences" in relation to gender, age and educational level. We did not establish any differences on the unfolding scale. Only the clinical picture presented in the vignette showed an effect concerning the position of respondents along the unfolding scale. Those subsamples that

Table 2 Causes considered most or second most important for the development of mental disorders

Schizophrenia (n = 1060)	[%]	Depression (n = 501)	[%]	Borderline (n = 530)	[%]
Isolation	16.5	Unemployment	18.6	Weak mental constitution	18.3
	8.7		13.0		13.2
Weak mental constitution	13.8	Isolation	14.4	Unstable personality	15.3
	9.5		8.4		16.0
Disorder of the brain	13.8	Stress in partnership or family	12.6	Isolation	10.4
	8.9		14.0		6.6
Unemployment	10.7	Weak mental constitution	10.0	Drug or alcohol abuse	9.1
	10.3		10.6		10.0
Drug or alcohol abuse	9.3	Unstable personality	9.0	Unemployment	8.9
	12.2		8.4		10.9
Stress in partnership or family	7.2	Hectic state of life nowadays	8.0	Stress in partnership or family	8.5
	8.5		9.2		8.3
Unconscious conflict	5.8	Disorder of the brain	6.8	Disorder of the brain	7.5
	5.8		2.6		3.4
Hectic state of life nowadays	5.5	Occupational stress	5.0	Unconscious conflict	6.8
	8.6		14.0		7.9
Unstable personality	5.5	Unconscious conflict	5.0	Wrong upbringing	4.5
	7.4		5.4		4.3
Occupational stress	4.9	Drug or alcohol abuse	5.0	Hectic state of life nowadays	4.0
	7.3		7.2		6.2
Heredity	3.1	Heredity	2.8	Heredity	2.8
	6.7		3.6		4.0
Wrong upbringing	1.5	Wrong upbringing	1.6	Occupational stress	2.3
	2.1		1.6		6.6
Sexual abuse during childhood	0.9	God's will or fate	0.6	Sexual abuse during childhood	1.1
	1.6		0.4		1.7
God's will or fate	0.8	Sexual abuse during childhood	0.4	God's will or fate	0.4
	0.7		1.4		0.4
Effect of atomic rays	0.4	Effect of atomic rays	0.4	Effect of atomic rays	0.2
	0.4		0.4		0.4

Table 3 Multiple unidimensional unfolding with causes considered most or second most important for the aetiology of mental disorders (n = 2081)

	P(I)[a]	H(I)[b]	
Occupational stress	13	34	1
Stress in partnership or family	19	36	2
Unemployment	24	32	3
Effect of atomic rays	01	35	4
Sexual abuse during childhood	02	33	5
God's will or fate	01	32	6
Heredity	08	32	7
Disorder of the brain	17	33	8
Weak mental constitution	25	37	9
Unstable personality	19	34	10
Wrong upbringing	05	36	11

[a] Percentage of respondents who preferred this cause
[b] Loewingers H for this cause

had either been presented with a case of depression or borderline personality disorder lay furthest apart, thus clearly preferring rather different causes. The subsample presented with a case history of depression chose "external" social causes, such as occupational stress, unemployment and so on. With borderline personality disorder, on the other hand, respondents

assumed causes located within the afflicted individual himself. Those respondents who were confronted with a case of schizophrenic psychosis lay in the middle of the scale, thus seeking causes involving neither social conditions nor the individual characteristics of the person described in the vignette, which in turn led them to the assumption that this disorder is a matter of fate and therefore beyond our control.

Discussion

When comparing the result of the assessed probability that the causal factors offered by us might play a role in the development of mental disorders, with the assessment of their relative aetiological importance, we found not only similarities but also distinct differences. For example, both with schizophrenia and with depression three psychosocial stress factors were named most frequently as the possible causes for the disorders. When enquiring, on the other hand, to which causal factors respondents attached the greatest and second greatest importance, the answer was indeed similar when looking at depression. With schizophrenia, however, after having named "isolation" as the most significant cause,

respondents most frequently chose a weak constitution and a disorder of the brain. Using traditional methods, the later was only listed in tenth place. Conversely, occupational stress "slid" from fourth to tenth place when respondents were asked to rank the causes according to their significance. Similar differences were also encountered concerning the other two forms of mental illness. We thus concluded that the conceptions of the lay public differed less widely from those of psychiatric experts when asked to judge the relative importance of each cause in the development of mental disorders than when we simply required them to assess the probability that these causes might be of aetiological importance. This preference for psychosocial explanations concerning the development of mental disorders, which has been established not only by ourselves (Angermeyer and Klusmann 1988) but also by other authors (Hohl 1983), was thus qualified by this approach.

The results of both dimensional analyses, the factor analysis using Likert-scaled items and the unidimensional unfolding with preference data, converged inasmuch as both procedures resulted in a similar grouping of causal factors. Their placement along the unfolding scale corresponded amazingly well to that that one would have expected according to the concept of locus-of-control (Rotter 1966; Levenson 1972, 1974); located in the centre of the scale we found the item "God's will or fate", framed by uncontrollable external influences on one side (effect of atomic rays, sexual abuse during childhood) and biological influences, which are also uncontrollable, on the other, with one scale pole based on external causal factors located within the social environment, the other on internal causal factors located within the individual him/herself. This ranking is remarkable inasmuch as those causes located within the social environment displayed the greatest distance to those causes located within the individual. The "most difficult" (and thus most unpopular) causes were found at the centre of this scale. Thus, the order of preference was not dependent on the frequency of a particular choice. Principal component analyses of the same data simply provided a ranking according to difficulty for the first axis, which is always the case with dichotomous items of substantially varying difficulty thus resulting in trivial solutions. Finally, the results presented here showed that the preference of a particular cause or set of causes is predominantly determined by the controllability of these causes, and we assumed that this fact might be related to individual characteristics, such as gender, age and education. Surprisingly, the preference pattern held for the total population, thus indicating the existence of a very general stereotype rather then a "theory" of the causes of mental disorders.

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