

The Characteristics of Delusions: A Cluster Analysis of Deluded Subjects

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Summary. Using a group of 55 psychotic subjects, 11 belief characteristics of delusions were recently assessed. The present study describes a cluster analysis of these data to investigate whether subjects showing characteristic patterns of delusional experience form relatively distinct groups. Three sub-groups were generated, each of which was given a descriptive label: hebephrenic, paranoid and depressed. The characteristics of these groups are described, in terms of associations with measures of mental state and belief content.

Key words: Delusions – Cluster analysis – Belief content

Introduction

A recent investigation (Garety and Hemsley 1987), described the nature of delusional experience in a group of 55 psychotic subjects; 11 self-rated belief characteristics were studied and found to be relatively independent of one another, and four principal components were generated in a further analysis. One particular feature of the data was the great variability between subjects in their responses. This inter-subject variability prompted the suggestion that subjects showing characteristic patterns of delusional experience may form relatively distinct groups; such groups may ultimately be related to aetiology or outcome. Thus a cluster analysis of the data, collected as described in Garety and Hemsley (1987) was conducted, and is the subject of this brief report. (Cluster analysis techniques seek to discover whether or

not a set of multivariate data contain distinct groups or clusters of individuals. Many such techniques are available and they are described in detail by Everitt (1980)).

Method

In this investigation a combination of methods was employed; firstly Ward's hierarchical clustering technique (Ward 1963) was applied to the data and the clusters found used to provide initial estimates of means, variances etc., for the Normix method devised by Wolf (1970). This method is based on fitting mixtures of multivariate normal distributions by maximum likelihood; for details see Everitt and Hand (1981).

The subjects were 55 psychiatric patients described as deluded, regardless of diagnosis, by the psychiatrists responsible for their care. They were aged between 18 and 65 years and not thought to be suffering from any organic condition. Full details of the characteristics of the sample are given in Garety and Hemsley (1987).

The same 11 variables, the self-rated belief characteristics discussed in Garety and Hemsley (1987) were the variables analysed in this investigation. The 11 characteristics were conviction, preoccupation, interference (in terms of identifiable influence on behaviour), resistance (in terms of not liking to think about the belief), the degree to which the belief is dismissible from the mind, absurdity, the extent to which the belief is self-evident, the degree to which reassurance is sought from others, the extent to which the belief causes the subject worry and unhappiness, and, finally the pervasiveness of the belief in

Table 1. Cluster analysis – 3 sub-group solution

	Whole sample	Group 1 Hebe- phrenic	Group 2 Para- noid	Group 3 De- pressed
<i>n</i>	55	16	18	21
Belief characteristic	\bar{X} SD	\bar{X}	\bar{X}	\bar{X}
Conviction	9.1 (1.8)	9.6	8.8	9.0
Preoccupation	6.2 (3.3)	4.6	5.9	7.7
Interference	6.3 (3.6)	6.4	5.3	7.1
Resistance	7.8 (3.1)	4.9	9.6	8.5
Dismissibility	5.2 (3.8)	6.8	5.8	3.2
Absurdity	3.8 (3.7)	1.4	7.5	2.4
Self-evidentness	8.2 (2.9)	9.2	6.2	9.3
Reassurance	3.6 (3.1)	2.3	3.3	4.5
Worry	6.8 (3.7)	3.6	6.9	9.3
Unhappiness	6.1 (4.0)	1.1	7.2	8.9
Pervasiveness	5.2 (3.7)	6.9	5.8	3.0

terms of the subject's ability to attend to other thoughts simultaneously.

Results

Of the solutions examined, that involving three groups appeared to have most clinical relevance and is the one reported here. The means for the whole sample, and for the three sub-groups, to which descriptive labels were applied, are shown in Table 1. Relationships between these groups and the demographic and present mental state data were then analysed using one-way analysis of variance for the ordinal variables and a χ^2 statistic for the categorical variables. Data are presented in Tables 2 and 3. None of the measures of chronicity or length of stay showed an association with group membership, nor did any of the demographic variables (age, sex, employment and marital status). Of the present mental state measures associations between group membership and an assessment of clinical depression ($\chi^2 = 6.7$, $df = 2$, $P < 0.05$) and of self-rated depression ($\chi^2 = 8.3$, $df = 2$, $P < 0.05$) were found. Clinical depression was recorded as present or absent on the basis of the assessment of the psychiatrist responsible for the subject's care. Self-rated depression was regarded as present when the subject scored 14 points or more on the Wakefield Depression Inventory (Snaith et al. 1971). While there was no association with the presence of auditory hallucinations, there was an association between the assessed stability of

Table 2. Mental state characteristics by group

Variable	Whole sample %	Group 1 Hebe- phrenic %	Group 2 Para- noid %	Group 3 De- pressed %	<i>P</i>
Clinically depressed	18	0	17	33	< 0.05
Depressed by self-rating	56	25	56	81	< 0.05
Stable beliefs	60	33	59	81	< 0.05

Table 3. Belief content by group

Belief content	Whole sample %	Group 1 Hebe- phrenic %	Group 2 Para- noid %	Group 3 De- pressed %
Negative self	31.5	18.7	17.6	52.4
Positive self	25.9	62.5	17.6	4.8
Negative world	5.5	0	5.9	9.5
Positive world	1.8	6.25	0	0
Paranoid	35.2	12.5	58.8	33.3

the belief and group membership ($\chi^2 = 10.4$, $df = 4$, $P < 0.05$). No significant association was found between group membership and diagnosis. Finally, an association between the content of the belief and group membership was found ($\chi^2 = 24.1$, $df = 8$, $P < 0.005$, Table 3).

Discussion

While care must be taken not to emphasise unduly the validity of these findings, this preliminary, exploratory analysis of the belief characteristics of 55 subjects led to 3 groups of subjects which may be of interest in the study of delusions. We have attempted to select the key belief characteristics responsible for clustering, and the other associated variables. Each group has been given a name that appears to provide a descriptive label. While groups 1 and 3 appeared to map well on to the labels chosen, group 2 was more difficult to name. Group 1 was called the hebephrenic group – these subjects believed their delusions intensely, found that they make sense (are not absurd), but were not unduly distressed by their belief. They were not clinically depressed, and only a quarter reported depressive symptoms. They tended towards a positive self construct of their belief. Finally their beliefs were on the whole not stable, but fluctuating.

Group 2 could be described as the paranoid group. These subjects resisted their beliefs, finding them absurd, upsetting, moderately preoccupying and moderately dismissible. They were not clinically depressed, but a half were depressed as assessed by the self-report measure. Their beliefs were largely paranoid in content and stable. Although the analysis did not reveal a statistically significant association, scrutiny of the data suggests that the group were mostly male schizophrenics, unemployed and single. This group found their beliefs absurd; while this is not usually associated with a paranoid stance, in this sample, somewhat surprisingly, this was the case. Indeed half of the group found their beliefs maximally absurd, and two-thirds scored highly on this variable. This therefore represents an anomalous finding.

Group 3 appeared to be the depressed group. These subjects were preoccupied by their belief and resisted it. They saw it as sensible, self-evident and extremely upsetting. One-third were regarded as clinically depressed and four-fifths were depressed by self-report. The content of the beliefs was mostly a negative self content, and their beliefs appeared stable and difficult to treat. Scrutiny of the statistically non-significant results suggested that more of this group were women, that they had the longest current admission and were more likely than the other groups to have monosymptomatically deluded members.

No close association was found between the clusters and diagnosis. This finding should not however be taken to imply a lack of relationship: the number of diagnostic groups (5) and the uneven distribution of the sample by diagnosis resulted in some very small groups. An association was however demonstrated between depression, both as assessed by a psychiatrist and by self-report, and the clustering of the groups. The belief content was also associated with the clustering: that subjects with common char-

acteristics may express typical beliefs in terms of content was held by early phenomenologists (Kraepelin 1899; Bleuler 1911) but is a view little voiced in much current literature.

These data represent only preliminary findings concerning the nature of abnormal beliefs in sub-groups of deluded patients. Nonetheless it is of interest that by taking key characteristics of such beliefs, sub-groups are generated which have recognisable common features, to which clinical descriptive labels can be applied. That delusions take different forms is not new; that their different forms may be associated with aetiological or outcome differences, while not new, is certainly currently little discussed. The utility and validity of this classification of deluded subjects thus requires further investigation.

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