

## THE NATURE OF SCHIZOTYPY<sup>1</sup>

HANS J. EYSENCK AND PAUL BARRETT

*Institute of Psychiatry  
University of London*

*Summary.*—The matrix of intercorrelations between scales of schizotypy presented by Kendler and Hewitt in 1992 was reanalyzed, and results rather different from those reported by the original authors were found. The new structure shows good agreement with the theory of personality disorder published by Eysenck in 1987. In all, the different scales seem to fall into three groups or factors, identified as Neuroticism (N), Extraversion (E), and Psychoticism (P). It is doubtful if there is a common element left over once these three groups have been eliminated.

Ever since Bleuler described the schizoid personality in 1911 (Bleuler, 1948) and Rado (1953) coined the term “schizotypy,” there has been a good deal of interest in this concept, sometimes identified as “schizotaxia” (Meehl, 1962). The underlying hypothesis is, of course, that there exists a latent trait (or set of traits) which underlies schizophrenic illness, extends beyond schizophrenia, and can be measured in a normal or nonpsychiatric population. An alternative hypothesis is that all functional psychoses share an underlying latent trait (psychoticism) which extends beyond psychotic states and can be measured in normal populations (Eysenck, 1952; Eysenck & Eysenck, 1976). Different varieties of psychosis and schizotypy are believed to be manifestations of the other two major personality constructs, extraversion and neuroticism (Eysenck, 1992). Fig. 1 shows the conception of the underlying trait of psychoticism (P), with  $P_A$  indicating the increased probability of a person developing a functional psychosis as his score on P increases.

Kendler and Hewitt (1992) administered 10 separate self-report scales that are putative indices of schizotypy, as well as shortened measures of Extraversion (E) and Neuroticism (N), and a depressive and anxiety scale, making 14 scales in all. (A short form of the P scale was included among the 10 schizotypy scales, although not claiming to measure schizotypy as such.) The sample consisted of 409 twins, treated for the purpose of correlating the 14 variables as singletons. Various factor analyses were carried out, although never using all the scales together. The main results are an identification of a “positive trait schizotypy factor,” with major loadings on hallucination and perceptual aberration scales, as well as on “magical ideation.” A second factor was labelled “nonconformity,” with loadings on P and nonconformity, as well as physical anhedonia. The third factor, named “social schizotypy,” had high loadings on paranoid ideation and social anhedonia. When E and N

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<sup>1</sup>Address enquiries to H. J. Eysenck, Institute of Psychiatry, University of London, De Crespigny Park, Denmark Hill, London SE5 8AF, England.

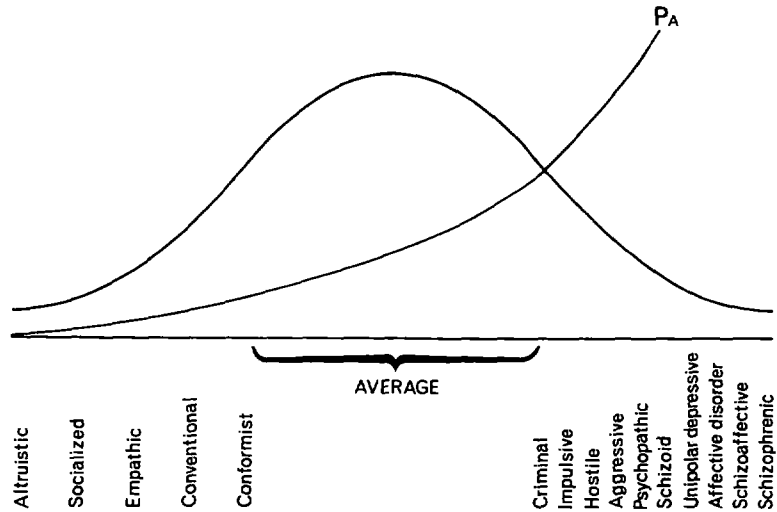


FIG. 1. Psychoticism as a latent trait underlying functional psychoses.  $P_A$  denotes probability of developing psychosis for given degrees of psychoticism (Eysenck, 1992).

were added to the matrix, this third factor split into two, “neuroticism-paranoid ideation” and “extraversion-social anhedonia.”

We have carried out a factor analysis of the matrix incorporating all 14 scales, to establish better the dimensionality of the matrix, and to bring out certain features which are not identified clearly in Kendler and Hewitt’s discussion. Table 1 shows the unrotated matrix, using principal component analysis. Certain features are noteworthy. On the Kaiser-Guttman, Kaiser Alpha, Velicer MAP, and the Autoscreen tests, three factors are indicated, so we have not attempted to over-extract factors. The test with the highest communality is the psychoticism measure; this is truly astonishing. Being a shortened scale,  $P$  has a much lower reliability (.516) than the schizotypy tests (mean value = .75), i.e., less than half of the variance ( $r^2$ ) of the schizotypy tests. It must therefore have much lower intercorrelations and a much lower communality than a comparable test with higher reliability, yet it has the highest communality, suggesting that whatever is common to all the measures used is most closely related to  $P$ .

When we look at the first factor, which, of course, has much the highest proportion of common variance, neuroticism, anxiety, and depression have the highest loadings ( $M = .74$ ), while the nine schizotypy scales only average .62. This is surprising because on the hypothesis of a single factor of schizotypy the nine scales designed to measure that variable should (1) be uncorrelated with neuroticism variables and (2) clearly decide the nature of

TABLE 1  
PRINCIPAL COMPONENT ANALYSIS OF 14 SCALES

Variables	Factor 1	Factor 2	Factor 3	Communality
Hallucination	-0.723	-0.308	-0.130	0.6345
Perceptual Aberration (Chapman)	-0.723	-0.074	0.135	0.5461
Magical Ideation (Chapman)	-0.744	-0.328	0.152	0.6835
Social Anhedonia	-0.478	0.564	0.209	0.5911
Physical Anhedonia	0.193	0.571	0.366	0.4969
Nonconformity	0.655	0.021	0.510	0.6904
Magical Ideation (Claridge)	-0.654	-0.442	-0.059	0.6261
Perceptual Aberration (Claridge)	-0.743	-0.122	-0.055	0.5692
Paranoid Ideation (Claridge)	-0.679	0.367	-0.153	0.6194
Extraversion	-0.033	-0.739	0.315	0.6469
Neuroticism	-0.702	0.240	-0.344	0.6684
Psychoticism	-0.339	0.280	0.743	0.7453
Anxiety	-0.766	0.118	-0.308	0.6958
Depression	-0.747	0.196	-0.361	0.7272
Hyperplane Count	1	2	2	
Variance	5.487	1.933	1.521	

the first factor. Clearly there is no support here for the notion of schizotypy as a unitary factor, a notion also disowned by Kendler and Hewitt.

It might be argued that the Kendler and Hewitt (1992) paper, in Table 4, contains a "positive trait schizotypy" factor which loads quite heavily on many core schizotypal scales, and that we might perhaps have extracted four factors in the hope that in addition to P, E, and N a (small) schizotypy factor might emerge. In view of the (unusual!) agreement of four separate tests on three factors, it would not have been correct to extract another factor; possibly further studies relying on larger numbers and longer questionnaires might support Kendler and Hewitt's view, but our analysis certainly does not.

Table 2 shows the result of an oblique rotation of the matrix given in Table 1. We employed hyperplane maximized direct oblimin rotation, using delta values between  $-40.5$  and  $0.5$  in  $0.5$  steps. The maximum simple structure is at  $\text{DELTA} = -1.5000$ , with an over-all hyperplane count of 11, and over-all runs of squared deviations within the hyperplane of 0.050219669. Again, Factor 1 is identified as neuroticism, with all the schizotypy scales except for physical anhedonia having high loadings on the factor. Clearly a major part of schizotypy, as measured by these scales, is in fact *neuroticism* and not schizotypy at all. Note that this factor has almost as high a variance count as the other two factors put together.

The second factor has a high loading on extraversion (.676) which would no doubt have been higher had the full scale been used rather than a shortened scale. The mean of the loadings of the schizotypy scales is .471, suggesting that the second factor is extraversion, with many schizotypy scales being simply measures of E.

TABLE 2  
OBLIMIN ROTATION OF TABLE 1

Variable	Factor 1	Factor 2	Factor 3
Hallucinations	-0.524	-0.679	0.275
Perceptual Aberration (Chapman)	-0.583	-0.491	0.382
Magical Ideation (Chapman)	-0.530	-0.710	0.293
Social Anhedonia (Chapman)	-0.502	0.144	0.616
Physical Anhedonia (Chapman)	0.155	0.493	0.458
Nonconformist (Chapman)	-0.415	-0.452	0.692
Magical Ideation (Claridge)	-0.494	-0.709	0.038
Perceptual Aberration (Claridge)	-0.655	-0.503	0.219
Paranoid Ideation (Claridge)	-0.759	-0.054	0.328
Extraversion	0.273	-0.676	-0.060
Neuroticism	-0.815	-0.131	0.131
Psychoticism	-0.114	-0.114	0.855
Anxiety	-0.828	-0.272	0.133
Depression	-0.850	-0.188	0.117
Hyperplane Count	1	4	6
Variance	4.277	2.660	2.004

Factor Correlation Matrix			
1.0000	0.2246	-0.2156	
0.2246	1.0000	-0.0459	
-0.2156	-0.0459	1.0000	

Finally, Factor 3 has much the highest loading on Psychoticism, in spite of the low reliability of that scale. Three schizotypy scales also have elevated loadings on this factor (social anhedonia, physical anhedonia, and nonconformity). This factor clearly is a psychoticism one, so that we may interpret the outcome of the analysis as showing that among what is a selection of the most widely used schizotypy tests, the major factors are P, E, and N; there is little trace of schizotypy left, and no evidence of any single factor corresponding to such a concept. These results thus strongly support the arguments brought forward in connection with personality disorder (Eysenck, 1987) here as there the evidence supports a view that behaviour classified as schizotypy or "personality disorder" is in fact determined by a combination of three fundamental dimensions of personality (Eysenck & Eysenck, 1985).

Exploratory factor analysis, as used by Kendler and Hewitt (1992), does not of course permit any certainty in its conclusions, and similarly we would not insist on our solution being more credible than that of Kendler and Hewitt insofar as they differ. Nevertheless, it should be noted that our solution and suggested taxonomy is in line with a large empirical literature (Eysenck, 1992). The notion of "schizotypy" rests on the Kraepelin-Bleuler view of schizophrenia and manic-depressive illness being *qualitatively* different *categorical* disease entities; opposed to this view is the *dimensional* one

shown in Fig. 1 (Eysenck, 1970). The evidence from a great variety of sources, examined in detail elsewhere, does not support the *categorical* point of view (Eysenck, 1992). This seems to rule out *schizotypy* as a meaningful theoretical concept, i.e., independent of other functional psychotic disorder, and the failure of different measures of its supposed constituents to correlate together and form a coherent factor noted by Kendler and Hewitt, and equally apparent in previous factorial studies discussed by them, is well in line with expectation.

These demonstrations should have a profound effect on psychiatric practices which still use categorical disease concepts like personality disorder, when clearly dimensional components like P, E, and N, in various combinations, would give a much better picture of phenotypic behaviour. The infinite variety of all the possible combinations of even a few factors is much closer to reality than the rigid concept of disease entity still embraced by psychiatrists—even though some efforts at loosening these bonds are noticeable in DSM-III. For psychologists the outcome of the empirical attempts to define and measure a concept of schizotypy must be profoundly disappointing; there is no communality beyond P, E, and N, only specificity.

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