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What Does the P Scale Measure?

By HILTON DAVIS

Introduction

Beginning with the hypothesis that 'there exists a set of correlated behaviour variables indicative of predisposition to psychotic breakdown, demonstrable as a continuous variable in the normal population, and independent of E and N' (H. Eysenck and S. Eysenck, 1968), the Eysencks have been concerned to develop a questionnaire scale to measure such a variable. From an initial pool of potential items, hypothesized to be related to psychoticism, several factor analyses of adult responses have been conducted to obtain a small group of items measuring a factor orthogonal to the factors of neuroticism and extraversion, and these items have been called the Psychoticism or P Scale (H. Eysenck and S. Eysenck, 1968; S. Eysenck and H. Eysenck, 1968; S. Eysenck and H. Eysenck, 1972). The same arguments have been applied to children, and a similar set of items have been assembled to measure this variable (H. Eysenck and S. Eysenck, 1971; H. Eysenck, G. Easting and S. Eysenck, 1971; S. Eysenck and H. Eysenck, 1969).

Five criteria were given (S. Eysenck and H. Eysenck, 1968) for selecting the final items for the P scale, '(1) high loadings on the factor in question; (2) consistency of loadings over different samples and sexes; (3) low loadings on factors not being measured; (4) consistency of loadings from three-factor solution to third-order solution; (5) known previous loadings in earlier analyses on different factors . . .'. However, these criteria appear to have been applied in an extremely loose way. By careful study of their tables of factor loadings (H. Eyse and S. Eysenck, 1968; S. Eysenck and H. E nck, 1968; S. Eysenck and H. Eysenck, 1969, . Eysenck and H. Eysenck, 1972) it can be seen that far fewer items than were actually ected conform to the stated criteria. Consently, it is not surprising to find that factors N and P have not been consistently orthogonal; for example, factor correlations between N and P have been as high as 0·45 (S. Eysenck and H. Eysenck, 1968). Nor has consistency in reliability been found, and reliability figures as low as 0·57 have been quoted (S. Eysenck and H. Eysenck, 1970).

Although the questionnaire scale has been persistently called Psychoticism, or P for those not convinced, virtually no reasonable validational evidence has been presented. The content of the items suggests behaviour more characteristic of psychopaths than of psychotics, although it is true that concessions have been made in this direction (S. Eysenck and H. Eysenck, 1972). In support of the validity of the scale patients diagnosed as psychotic have been found to score significantly higher than controls (Eysenck, 1970; Eysenck, 1972, Verma and Eysenck, 1973). However, other groups, including criminals (S. Eysenck and H. Eysenck, 1970; S. Eysenck and H. Eysenck, 1971), drug users (Teasdale, Segraves and Zacune, 1971), and in-patient neurotics (Verma and Eysenck, 1973), have been found to score at about the same level as psychotics. The findings that masculinity, sexuality and P are colinear (Eysenck, 1971a) and that high P scores are related to sexual pathology and high libido (Eysenck, 1971b) provide little evidence to support the interpretation of the P scale as a measure of psychoticism.

The most recent attempt to demonstrate the validity of the scale is the study by Verma and Eysenck (1973). The investigation involved a factor analysis of a variety of measures administered to a sample of psychotic patients. Primary factors were extracted and rotated to oblique simple structure, and higher order factors were derived. In the summary, it was concluded that three major factors appeared, and these were named Psychoticism, Extraversion and Age.

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Although it was not made clear how age was a *major* factor, since there were only two super-order factors, this is unimportant for the present purpose. What is important is that the interpretation of the factors is demonstrably subjective, misleading, and consequently in line with the hypothesis. The interpretation of the first super-order factor as 'degree of psychotic illness' is circular, since this conclusion is drawn from the fact that P has the highest loading, even though P has never been demonstrated to be related specifically to psychotic behaviour. The second super-order factor was identified as Extraversion even though the E scale had a loading of only −·31, whereas the N scale loaded to the extent of 0·61 and was the second highest loading. If there was little justification for calling this factor Extraversion, there was even less justification for the statement that it was 'measuring *type* of psychotic illness', since there was no evidence at all supporting such a conclusion. A further disturbing interpretation involved the primary factors, the first of which was 'identified rather confidently as one of Psychoticism', even though the argument is circular and hostility scales had by far the highest loadings.

The present study was therefore conducted because of dissatisfaction with previous data and the conclusions drawn from them, and because of the need for independent replication. The P scale was used on a sample of abnormal offenders in a maximum security hospital: (1) to determine whether it was a measure of a unitary factor; (2) to investigate its relationship to other inventory measures; and (3) to determine whether it would discriminate between psychotic and non-psychotic offenders.

Method

Subjects

The subjects for the study were 103 testable male patients who were admitted to a Special Hospital for abnormal offenders during the period from March 1972 to March 1973. Three of the subjects were classified under the Criminal Procedure (Insanity) Act 1964 as 'under disability' and the remainder under the 1959 Mental Health Act (37 were classified under Psychopathic Disorder, 31 under Mental Illness, 24 under Subnormality and the rest under various combinations of these). The mean age of the sample was 26·3 years (S.D. 9·0 years) and mean WAIS Full Scale IQ was 80·2 (S.D. 13·6).[1]

Experimental variables

A routine battery of tests was administered to each patient within four weeks of admission, although, for reasons beyond the control of the experimenter, not all the results were available for all the subjects. The tests included in the battery are listed immediately below. The means and standard deviations of the measures can be found in Table I.

Table I

Means and standard deviations of the questionnaire measures

	Scale	Mean	Standard deviation
EWPI	N	9·52	5·52
	E	13·52	4·05
	L	4·80	2·87
P scale	P (32 items)	8·28	3·60
	P (20 items)	6·21	3·13
SHAPS	L	6·35	2·79
	A	19·12	9·39
	Ex	22·79	6·06
	Ho	14·16	6·00
	I	7·54	3·60
	D	7·62	4·04
	T	7·93	3·99
	Pd	24·57	5·27
	Im	15·27	5·45
	Ag	13·48	6·70

(1) *Wechsler Adult Intelligence Scale* (Wechsler, 1955) The full WAIS was administered to all subjects, unless it had previously been used within about 18 months prior to admission.

(2) *Eysenck-Withers Personality Inventory* This inventory was administered according to the manual (Eysenck, 1966) to provide measures of N (Neuroticism), E (Extraversion) and L (Dissimulation).

(3) *The P scale* The scale used in this study was composed of the first 20 items that have been suggested (S. Eysenck and H. Eysenck, 1968) plus 12 items that were published later (S. Eysenck and H. Eysenck, 1972). To enable comparisons with results obtained from other studies, the distribution parameters have been calculated for both the 20-item scale and the 32 item scale.

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However, for the purpose of the item and scale analyses, the 32-item version of the scale was used.

(4) *Special hospitals assessment of personality and Socialization (SHAPS)*
Designed for work with abnormal offenders, this is an inventory which consists of ten scales derived mainly from the MMPI, but also from the Buss-Durkee Hostility Inventory and the Peterson-Quay Psychopathy Factor Scale. The actual scales are the Lie scale (L), the Psychopathic Deviate scale (Pd), both from the MMPI (Hathaway and McKinley, 1967), an anxiety scale (A) (Welsh, 1956) and an extraversion scale (Ex) (Giedt and Downing, 1961), Tryon's scales of Introversion (I), Depression (D) and Tension (T) (Tryon, 1966), an impulsivity scale (Im) (Blackburn, 1971) and unpublished factor scales of hostility (Ho) and aggression (Ag) devised by Blackburn.

Data analysis

The analysis of the data was carried out in several ways. Firstly, the reliability of the P scale was calculated, using the Kuder-Richardson Formula 20. The separate items were then checked individually to find those that had been endorsed by less than 10 per cent or more than 90 per cent of the sample. Five items with less than 10 per cent endorsement were discarded for the purposes of the second analysis, which was a principal components analysis of P, N and E items. Following Eysenck's approach (e.g. S. Eysenck and H. Eysenck, 1968), the first three factors were rotated to oblique simple structure, using the method of Jennrich and Sampson (1966). This procedure was carried out in an attempt to replicate previous findings, in that the P items were expected to load a single factor and to be unrelated to N and E. The items used in the analysis are listed in the Appendix. Six N items and six E items which in previous analyses have been found to be relatively consistent measures of their respective factors were used as markers of these two factors. The third analysis was conducted to investigate how the P scale would fit into the factor structure usually found in questionnaire scale analyses. In terms of Eysenck's theory one would expect P to define a factor separate to those found previously. That is to say, one would expect a factor defined by P, as well as an emotionality factor, an extraversion factor and a factor loaded highly by the lie scale (e.g. Blackburn, 1971; Blackburn, 1972).

All the questionnaire scales were therefore intercorrelated to produce a matrix of product-moment intercorrelation coefficients, which was then subjected to principal components analysis. Those factors with eigenvalues greater than unity were then rotated into oblique simple structure, again using the Jennrich and Sampson method.

The final part of the study involved a comparison of the P scores of 18 psychotic patients (independently diagnosed by two psychiatrists) individually matched for intelligence with 18 non-psychotic patients. The reason for matching on IQ alone and not age was that P and age were found to be unrelated ($r = -0{\cdot}02$), whereas the correlations between P and WAIS Verbal IQ and Full Scale IQ were $-0{\cdot}46$ and $-0{\cdot}44$ respectively ($p < 0{\cdot}01$). This comparison was carried out to investigate whether the P scale measured anything common to psychotics.

Results

Reliability of P

The Kuder-Richardson Formula 20 yielded a reliability coefficient of 0·61. This figure is rather low considering that the scale, which has 32 items, is longer than the usual P scale.

Item factor analysis

Table II contains the matrix of rotated factor loadings, the variance accounted for by the factors, and the factor intercorrelations. The first factor is identifiable as the Neuroticism factor, since the six marker items for this factor all have high loadings. The second factor is clearly an Extraversion factor marked by the six extraversion items. If we consider only those items with loadings greater than 0·25, 13 P items load the third factor significantly, although some of them do not load in the same direction as in Eysenck's data. If one tried to form a scale of these items using only two of Eysenck's criteria (S. Eysenck and H. Eysenck, 1968), high loadings on the factor in question and low loadings on factors not being measured, then one would retain only 5 items (nos. 4, 5, 10, 16 and 30), not all of which would be keyed in the direction given by Eysenck. Although the factors were independent, the interpretation of the third factor is far from clear; however, the possibility could be considered that it is either an extrapunitive hostility factor or a factor related to the locus of control concept (Rotter, 1966).

Scale factor analysis

Three factors with eigenvalues greater than

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TABLE II

Matrix of the loadings (decimal point omitted) of P, N and E items on three factors rotated to oblique simple structure, percentage variance accounted for by each factor and factor intercorrelations

Item no.	Factor 1	Factor 2	Factor 3
P items			
1 ..	−558	−033	368
4 ..	103	074	−466
5 ..	−150	009	−581
6 ..	−329	−023	−456
7 ..	−319	045	049
9 ..	−511	−174	020
10 ..	014	−035	−396
11 ..	−430	−030	123
12 ..	−395	−015	011
13 ..	−164	125	−097
14 ..	−279	−074	−280
15 ..	−513	−018	−075
16 ..	049	−070	−461
17 ..	−452	−173	−171
18 ..	−394	182	−361
19 ..	−400	218	069
20 ..	−030	−320	407
21 ..	−333	142	335
22 ..	062	−671	080
24 ..	−452	120	436
25 ..	−307	−305	−078
26 ..	039	−200	182
27 ..	202	−190	−077
28 ..	268	−105	−024
29 ..	268	004	387
30 ..	−027	039	549
32 ..	−066	−036	125
N items			
33 ..	−422	−299	059
34 ..	−569	−031	−135
35 ..	−272	−298	−175
36 ..	−415	−368	−107
37 ..	−355	−275	−105
38 ..	−387	−054	−397
E items			
39 ..	−377	407	012
40 ..	−118	693	189
41 ..	069	608	−067
42 ..	155	692	−140
43 ..	108	604	−107
44 ..	−110	339	217
% variance ..	11	8	7
Factor correlations F2	0·03	—	—
Factor correlations F3	0·05	0·05	—

TABLE III

Matrix of questionnaire factor loadings (decimal point omitted) rotated to oblique simple structure, percentage variance accounted for by each factor and factor intercorrelations

Variable	Factor 1	Factor 2	Factor 3
N ..	−651	134	334
E ..	−019	−907	−182
L (EWPI)	−175	−113	−961
P ..	−860	−045	−262
L (MMPI)	172	090	−686
A ..	−848	006	180
Ex ..	080	−904	208
Ho .	−858	−106	048
I ..	−661	494	004
D ..	−752	110	249
T ..	−766	062	191
Pd ..	−300	032	494
Im ..	−319	−405	641
Ag ..	−433	−131	545
% variance ..	50	17	8
Factor correlations F2	−0·10	—	—
Factor correlations F3	−0·44	−0·05	—

unity emerged from the analysis of the fourteen variables. The matrix of the rotated factor loadings is shown in Table III. The results are very much in line with what was expected. Ignoring P for the moment, the first factor has high loadings on A, Ho, D, T, and N and can be interpreted as Emotionality, the second factor, which loads E and Ex, is clearly an Extraversion factor, and the third factor has high negative loadings on the L scales and a high positive loading on Im. As in previous analyses, factors 1 and 2 are orthogonal (correlation = −0·10), whereas factors 1 and 3 are quite closely related to the extent of −0·44. Turning to the P scale, it will be seen that it has the highest loading of all the variables on factor 1. It would seem, therefore, that P is simply another measure of Emotionality.

Psychotic vs. non-psychotic comparison

No significant difference was found on P between the 18 psychotics and 18 non-psychotics (individually matched within one IQ point), using the t-test for related samples. The mean

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for the psychotics was 9·0 and the mean for the control group was 8·89.

Various other comparisons were made, but the only result of particular interest is that the mean P score for sex-offenders was not significantly different from a control group of non-sex offenders (sex-offender mean = 8·38; control mean = 8·48). This is of interest in view of a previous finding that sex offenders score more highly on P than non-sex offenders (Eysenck, 1971a).

Discussion

The findings of the present study indicate that P is a rather unreliable scale, whose items do not measure a unitary factor orthogonal to N and E. The scale is found to be highly correlated with the factor generally called Emotionality, and does not discriminate psychotic from non-psychotic offenders. It is thought that the results are not surprising in view of the unjustified assumptions that have been made, the confusing and inconsistent statement of the arguments and the questionable logic.

Eysenck's basic assumption, even though he rejects the traditional medical model, is that there exists a class of behaviours which are distinct from all other types of behaviour and which are called psychotic. Such an assumption is logically permissible, but one must doubt its usefulness, since this class is broad, ill-defined and unreliably observed, and no consistent similarities have been found amongst psychotic individuals. Furthermore, the assumption of a single dimension of psychosis is falsified by the work of Lorr, Klett and McNair (1963) whose results indicate a multidimensional symptom structure.

Another point to be questioned is the assumption that the putative personality dimension of psychoticism exists in all individuals, whether normal or abnormal. If one assumes, with Eysenck, that the P scale measures this dimension, then the finding that P had a J-shaped distr ion in the normal population (Claridge and ppa, 1973) goes some way to falsifying his argument. It is incumbent upon Eysenck to demonstrate that the hypothesized dimension sychoticism exists in the normal population, but the way this has been done is of rather questionable logic. A series of items were administered to non-psychotic individuals, and their responses were analysed by extracting three factors, the third of which was called Psychoticism. Such a procedure assumes the truth of the hypothesis, since the only justification for the interpretation of the third factor as psychoticism is that the original items were pre-selected from scales purporting to measure psychosis or were written for the purpose. This justification is very weak, since scales like the MMPI Schizophrenia scale have very high loadings on the factor generally called Emotionality and are poor at discriminating psychotics from non-psychotics. Secondly, it is very difficult to understand how psychoticism items can be written, since the behaviours involved in the measurement of the trait are not defined (items referring to classical psychotic behaviour are excluded) and the authors' ability to predict the psychotic's responses to items is likely to be very poor, since uncertainty is introduced by such factors as thought disorder, poor self-judgement, etc.

If one were to accept the psychoticism hypothesis as imaginative theory building in the Popperian tradition, and to accept that there could exist an adequate measure of such a dimension, the fact that several non-psychotic groups score as highly on P as psychotic groups should make one doubt that the P scale measures it. Perhaps Gray's suggestion (Gray, 1971) that P '. . . has something to do with an excessive degree of intra-specific aggressive behaviour . . .' might have more to commend it in that aggressive responses might be more prevalent amongst out-groups. However, it is thought that a more likely interpretation of the P scale is that it is a measure of the tendency to evaluate oneself and others in a negative manner, i.e. a measure of the semantic dimension of evaluation. This interpretation gains support from (1) the content of the items, which broadly reflects a tendency to be negative by admitting maladjustment and having hostile attitudes towards others, (2) the Verma and Eysenck study (1973) where P was found to be highly correlated with N and with measures of hostility, and where the first primary and first super-order factors

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might be interpreted as hostility, and (3) the results of the present study, in which P and measures of emotionality and hostility all load a single factor. The finding of a relationship between emotionality and hostility is certainly not new, since it has been previously demonstrated by Bendig (1961) and Blackburn (1972), who stated that '. . . concepts of hostility, punitiveness or neuroticism appear to have an identical referent'.

In conclusion, therefore, it would seem likely that P is simply a broader measure than N of the semantic dimension of evaluation, which is an interpretation of the major questionnaire factor that has gained much support in recent years (e.g. Hallworth, 1965; Peterson, 1965; Mischel, 1968).

Summary

This study was conducted to investigate the validity of the questionnaire scale of Psychoticism, since the arguments for constructing the scale appear to be rather questionable and the data in support of the scale unsatisfactory. One hundred and three patients in a hospital for abnormal offenders were tested with Eysenck's P, N, E and L scales as well as with personality scales derived mainly from the MMPI. The results indicate that: (1) P is rather unreliable; (2) the items of the P scale do not consistently mark a factor separate from neuroticism and extraversion; (3) only 5 items meet the criteria for use as a scale; and (4) the P scale is found to be a good measure of the factor generally called Emotionality. A comparison of 18 psychotics with 18 non-psychotic offenders, matched individually for intelligence, resulted in no differences on P. Theoretically, it is argued that the concept of psychoticism as a personality dimension is based on unjustified assumptions. On the basis of the present results and previous research it is concluded that the evidence falsifies the hypothesis that the P scale is a measure of a dimension of psychoticism, but that it might be construed as a measure of a broad semantic dimension of evaluation.

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APPENDIX

P scale items: (Scored direction indicated by Y (= YES) or N (= NO).) Those items marked with an asterisk were not used in the item analysis.

1. Do most things taste the same to you?	Y
*2. Do you enjoy hurting people you love?	Y
*3. Are you generally in good health?	N
4. Was your mother a good woman?	N
5. Have you had more trouble than most?	Y
6. Have you had an awful lot of bad luck?	Y
7. Do you worry a lot about catching diseases?	Y
*8. Did you love your mother?	N
9. Are there several people who keep trying to avoid you?	Y
10. Is there someone who is responsible for most of your troubles?	Y
11. Do you let your dreams warn or guide you?	Y
12. Do people generally seem to take offence easily?	Y
13. Would you take drugs which may have strange or dangerous effects?	Y
14. Do you have enemies who wish to harm you?	Y
15. Do your friendships break up easily without it being your fault?	Y
16. Was your father a good man?	N
17. Do people mean to say and do things to annoy you?	Y
18. Would you have been more successful if people had not put difficulties in your way?	Y
19. When you are in a crowded place like a bus do you worry about dangers of infection?	Y
20. Would it upset you a lot to see a child or animal suffer?	N
21. Do you think that marriage is old-fashioned and should be done away with?	Y
22. Can you easily understand the way people feel when they tell you their troubles?	N
*23. Would you like to think that other people are afraid of you?	Y
24. Do you enjoy practical jokes that can sometimes really hurt people?	Y
25. Have you always been known as a loner?	Y
26. Would you feel very sorry for an animal caught in a trap?	N
27. Are you always specially careful with other people's things?	N
28. Do you try not to be rude to people?	N
29. Do you sometimes get cross?	N
30. Do good manners and cleanliness matter much to you?	N
*31. Did you mind filling in this questionnaire?	Y
32. Have you ever told a lie?	N
N items used in item analysis	
33. Do you ever feel 'just miserable' for no good reason?	Y
34. Do you worry about awful things that might happen?	Y
35. Have you often felt tired for no good reason?	Y
36. Do you often feel fed-up?	Y
37. Do you sometimes feel life is just not worth living?	Y
38. Are you often troubled with guilty feelings?	Y
E items used in item analysis	
39. Do you like plenty of excitement going on around you?	Y
40. Are you rather lively?	Y
41. Can you get a party going?	Y
42. Do you like mixing with people?	Y
43. Can you usually let yourself go and enjoy yourself at a gay party?	Y
44. Do you like going out a lot?	Y

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