Does the Eysenck psychoticism scale predict psychosis? A ten year longitudinal study

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Abstract:

534 college students were selected by their scores on several scales of psychosis proneness, were interviewed, and were given the Eysenck and Eysenck (1975) Psychoticism Scale (P-Scale). After 10 yr, 508 subjects were reinterviewed. Subjects identified by initial deviantly high scores on the P-Scale (N = 26) did not differ from control subjects (N = 310) on the rate of subjects who developed psychotic disorders or in reports of psychotic relatives. However, High P subjects exceeded controls on ratings of psychoticlike experiences and on symptoms of schizotypal and paranoid personality disorder. The findings indicate that high scorers on the P-Scale are psychoticlike but are not at heightened risk for psychosis.

Keywords: Eysenck psychoticism scale | psychosis | P-scale

Article:

INTRODUCTION

The Psychoticism Scale (P-Scale) of Eysenck and Eysenck (1975, 1976) was originally constructed to measure 'psychoticism' as an aspect of normal personality. The Eysencks conjectured that schizophrenia is the extreme end of this normal personality dimension that also includes, at high levels, criminality, psychopathy and manic-depressive disorder. They adopted a diathesis-stress model with the diathesis for all of these disorders being psychoticism. Eysenck (1972) stated it most succinctly (p. 511):

> "Our concept of psychoticism probably has most similarity to that of *unspecific vulnerability* of Wellner and Stromgren . . . a general factor, predisposing persons to psychosis in varying degree, and inherited as a polygenic character; this predisposition

would extend into the psychopathicand criminal, antisocial field, but not into that of the dysthymic neuroses." (Italics his.)

The Eysencks were influenced in this conceptualization by the many reports that sociopathic personality, criminality and substance abuse are elevated in the families of schizophrenic probands (e.g. Kallmann, 1938; Heston, 1966; review by Planansky, 1972). Extrapolating from these findings, the Eysencks emphasized, in their choice of items for the several versions of their P-Scale, characteristics found in antisocial individuals. The version used in the present study is part of the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975). This is the most widely used form of the scale and was the most recent one available when the present study was initiated in the late 1970's. The items primarily tap antisocial, impulsive, non-conforming, callous and sadistic traits and secondarily tap paranoid ideation and anhedonia, and so it is not surprising that many investigators have found that antisocial and non-conforming persons have elevated scores on the scale. The number of demonstrations of this point is too large to review here, but in 1991 and 1992 alone, researchers have reported that the P-Scale is related to antisocial behavior (Farrell, 1992); criminality (Rahman, 1992; Gudjonsson, Petursson, Sigurdardottir, & Skulason, 1991); drug use (Nagoshi, Walter, Mutaner & Haertzen, 1992; Bentler, 1992; Kilbey, Breslau, & Andreski, 1992); delinquency (Fumham & Thompson, 1991); violent behavior (Cookson, Rushton, & Thornton, 1991); a preference for graphic violence in movies (Weaver, 1991), unsafe sexual practices (McCown, 1991), sadomasochistic sexual practices (Gosselin, Wilson, &Barrett, 1991), suicidal ideation and behavior (Lolas, Gomez & Suarez, 199 1; de Leo, Predieri, Melodia, Vella, Forza & De Bertolini, 199 1) and poor study habits (McCown & Johnson, 1991).

The literature on psychosis is much smaller, but schizophrenics and other psychotics are usually found to score lower than antisocial Ss, although higher than most normal control Ss (Eysenck & Eysenck, 1976; Eysenck, 1992). A number of authors have criticized the scale on these grounds, suggesting that it does not measure the trait for which it is named (Bishop, 1977; Block, 1977; Davis, 1974; Zuckerman, 1989).

Eysenck has responded to these criticisms, most recently in a lengthy, scholarly discussion of both the theory and the research evidence supporting it (Eysenck, 1992). He maintains that scores of schizophrenics are lowered by their confusion and their lack of candor (evidenced by their high scores on the MMPI Lie Scale) as well as by the effects of drug treatment and institutionalization.

Eysenck (1992) also pointed to numerous findings, from diverse laboratories that are consistent with his contention that the P-Scale measures predisposition to psychosis. He pointed to evidence that High P Ss differ from Low P Ss on a number of both behavioral and biological measures in the same ways that psychotics differ from normal Ss. Such measures include the antigen HLA B27, auditory hallucinations, deviant smooth pursuit eye tracking, lateralized dysfunction in dichotic shadowing, unusual and rare associates on a word association test, and several other relevant measures. These findings certainly strengthen the credibility of the hypothesis that the P-Scale measures a predisposition to psychosis, but the evidence is indirect, and therefore, not completely convincing. How, then, can one determine whether the P-Scale measures the predisposition to psychosis'? We suggest that direct evidence can be provided by a longitudinal study of non-psychotic Ss who have High P scores, assessing them for psychosis as well as for indicators of risk for psychosis. We present data here from such a study, a 10-yr

follow-up of 508 college students who had been initially selected by their performance on a number of putative psychosis proneness scales constructed in our laboratory.

The 10-yr follow-up interviews were designed to assess clinical psychosis as well as other indicators of high risk for psychosis. These risk factors include schizotypal, paranoid and schizoid traits, and psychotic-like experiences, as well as presence of psychosis in relatives.

METHOD

We initiated this study in the 1970's with the development of a series of self-report questionnaires that measure traits believed to characterize psychosis-prone individuals. By psychosis prone, we mean that the individual carries a risk or diathesis for psychosis, even though she/he may never decompensate into clinical psychosis. We administered these scales to approx. 7800 college students and identified hypothetically psychosis prone Ss on the basis of extreme scores. The four scales used for identification of Ss were the Perceptual Aberration Scale (Chapman, Chapman & Raulin, 1978), the Magical Ideation Scale (Eckblad & Chapman, 1983) the Revised Physical Anhedonia Scale (Chapman, Chapman & Raulin, 1976) and the Impulsive Nonconformity Scale (Chapman, Chapman, Numbers, Edell, Carpenter & Beckfield, 1984). Details of the identification procedures are given in Chapman and Chapman (1985). Subjects were also tested on the Revised Social Anhedonia Scale (Eckblad, Chapman, Chapman & Mishlove, 1982; Mishlove & Chapman, 1985) and on the P-Scale (Eysenck Bi Eysenck, 197S), although these scales were not used to select Ss.

Subjects

We originally identified 534 Ss. Those who qualified as experimental Ss scored deviantly high (in most cases, 1.96 standard deviations above the mean) on one or another of the four scales used for selection. Control Ss scored below 0.5 standard deviations above the mean on any of the scales. The Ss were initially interviewed following their identification and were re-interviewed approx. 10 yr later. We were able to locate and re-interview 508 of the original subjects, a 9.5% success rate, after an average interval of 10.7 yr.

For purposes of studying the P-Scale, we selected Ss from our pool of SO8 interviewed Ss on the basis of their scores on the P-Scale without regard to their scores on the other scales. Altogether, 490 of the SO8 Ss had completed the P-Scale at their initial examination. The sample included some high scorers because 74 Ss had been selected for standard scores of at least 1.96 standard deviations above the mean on the Impulsive Nonconformity Scale, which correlates very highly with the P-Scale. The sample also included many low scoring subjects because 159 of them were control subjects, selected for standard scores no higher than 0.5 standard deviations above the mean on the Impulsive Nonconformity Scale (as well as on the Perceptual Aberration Scale, Magical Ideation Scale and Physical Anhedonia Scale.) The mean score on the P-Scale for our sample was 0.49 raw score points below that of an independent sample of 15 12 undergraduate subjects whom we tested in the same course another semester. We established cutoff scores that identified approximately the top 8% of the high scoring individuals of that independent sample. Female Ss above a score of six and male Ss above a score of seven constituted the High P group. For either sex, a score below four defined a Low P group. By these criteria, 26 of our 508 interviewed Ss qualified for the High P group and 3 10 qualified for the Low P group. The Low P group was an unusual control group since it contained many Ss who were identified by our own scales as hypothetically at risk for psychosis. We felt that this was a

fair group to use for comparison with the High P subjects because the High P Ss also had elevated scores on these scales and Ss were assigned to the High P and Low P groups without regard to those other scores.

The description of these groups would be enhanced if we had the Lie Scale scores for the Ss. Unfortunately, we were not using the Lie Scale back in the 1970s when this study was initiated. We instead screened our Ss using an Infrequency Scale of 13 seldom endorsed items. Subjects were excluded from the study if they endorsed more than two items in the infrequent direction.

Follow-up measures

An interview was used to assess functioning over the previous 10 yr, including psychosis, schizophrenia spectrum personality disorders, mood disorders, substance abuse and mental health treatment. The interview was a modified version of the Schedule for AfSective Disorders and Schizophrenia-Lifetime Version SADS-L (Spitzer & Endicott, 1977). Additional questions inquired about psychotic-like experiences, which were rated for degree of deviancy using the Chapman and Chapman (1980) manual. Symptoms of schizotypal, schizoid and paranoid personality disorders were evaluated using Loranger's (1988) Personality Disorder Examination (PDE). The scoring of the PDE yielded both a diagnosis and a dimensional score for each of the three personality disorders. We also asked the Ss about psychotic first or second-degree biological relatives. Furthermore, we diagnosed the Ss for alcohol and drug dependence and abuse and gathered information on arrests.

We included the measures of schizotypal personality disorder and of schizotypal dimensional score because of the strong evidence that persons with schizotypal personality disorder are prone to schizophrenia (American Psychiatric Association, 1987; Kety, Rosenthal, Wender & Schulsinger, 1968). However, recent studies (Bornstein, Klein, Mallon & Slater, 1988; Schulz, Schulz. Goldberg, Ettigi, Resnick & Friedel, 1986; Squires-Wheeler, Skodol, Bassett & Erlenmeyer-Kimling, 1989; Squires-Wheeler, Skodol, Friedman & Erlenmeyer-Kimling, 1988) indicate that schizotypal personality disorder is also genetically linked to affective disorder, including affective disorder with psychotic features. Thus, a measure of schizotypal personality disorder seems suitable for assessing predisposition to psychosis. The schizoid and paranoid measures were included because of evidence that they may also indicate psychosis proneness (Millon, 1981) although the evidence is weaker than for schizotypal personaiity disorder.

The interviews, as well as the scoring and diagnosis, were conducted by clinical psychologists and advanced graduate students who had received extensive diagnostic training. Both the interviewers and scorers were unaware of the Ss' group membership. Hospital records were obtained to facilitate scoring and diagnosis when appropriate.

Psychotic-like experiences. Psychotic and psychotic-like experiences, as defined here, are transient and milder forms of experiences reported by psychotic patients. We developed a manual (Chapman & Chapman, 1980) that provides rating values for experiences on a continuum of deviancy from normal to severely psychotic. Scoring criteria are provided for six broad classes of psychotic and psychotic-like experiences. These are: (a) transmission of thoughts, (b) passivity experiences, (c) voice experiences and other auditory hallucinations, (d) thought withdrawal, (e) other personally relevant aberrant beliefs and (f) aberrant visual experiences. An 11 -point scale is provided for each category of experience, with examples given for the different

levels of deviancy. Scores of 2-5 are for psychotic-like experiences while scores of 6-l 1 are for psychotic experiences. The scoring of an experience as psychotic in this system does not indicate that the subject is clinically psychotic but instead implies that the experience was like that reported by clinical psychotics. A score of one is for experiences considered normal. Each subject's highest single rating from all six categories is the score used for analysis.

We view psychotic-like and psychotic experiences as indicators of risk for psychosis both because of the clinical reports that such experiences often precede psychosis (Bleuler, 1911/1950; Chapman, 1966; Gillies, 1958) and because of our recent finding (Chapman, Chapman, Kwapil, Eckblad & Zinser, 1994) that our measure of such experiences at initial interview was significantly related to DSM-III-R psychosis at follow-up.

RESULTS

Arrests and substance abuse

We compared the High P and Low P subjects on whether they had ever been arrested other than receiving a minor traffic ticket. Among the High P subjects, 30% had arrest records, as compared to 9% for Low P subjects, Fisher's Exact Test, $P < 0.05$.

The P scale also successfully predicted later drug and alcohol abuse. Fifty-eight% of the High P subjects qualified as having had a DSM-III-R substance use disorder during the follow-up period while 22% of the Low P subjects did so, a significant difference, $x2(1) = 16.93$, $P < 0.001$.

Psychosis and psychosis proneness

Fourteen of the 508 subjects developed a DSM-III-R psychosis by the time of follow-up, five with schizophrenia, one delusional disorder, three bipolar disorder with psychotic features, two major depression with psychotic features, and three atypical psychosis. P-scores from the initial evaluation were available on all 14 subjects who became psychotic as well as on 476 of the 494 subjects who did not. We standardized the scores for males and females separately to remove gender differences and compared the mean standardized scores of the psychotic subjects (mean = 0.05) with those of the nonpsychotics (mean = 0.21). The difference was not significant, $t(488) = 1.04$, $P < 0.30$, and was in the direction of higher P-scores for the subjects who did not become psychotic.

As an alternative analysis, we compared the High P and Low P groups on the number of subjects who became psychotic. None of the 14 psychotics were in the High P group. In contrast, 5 (1.6%) of the Low P group became psychotic. This difference was not significant, Fisher's Exact test, $P = 0.67$.

Subjects with psychotic relatives of either first or second degree (N = 57) were compared on P-score with subjects lacking such relatives (N = 432). The mean standardized P-score of those with psychotic relatives was - 0.03 as compared to - 0.22 for subjects without psychotic relatives. The difference was not significant, $t(487) = 1.50$.

As an alternative mode of analysis, we compared the High P and Low P groups on number of subjects having psychotic relatives. None of the subjects in the High P group reported having any first or second degree relatives with psychosis, while 30 (10%) of the Low P subjects did so. This difference approached significance, Fisher's Exact Test, $P < 0.10$. In short, the P-Scale failed to predict psychosis in the subjects and their relatives, and the non-significant difference between high and low scores were in the direction opposite to that predicted.

The findings on personality disorder dimensional scores were more encouraging. Table 1 shows the means for each group on the PDE schizotypal, paranoid and schizoid dimensional scores. The High P group exceeded the Low P group on schizotypal dimensional score, t(334) = 5.26, P < 0.001 and paranoid dimensional score t(334) = 4.35, P = 0.001, but not on the schizoid dimensional score. Diagnoses of the three types of personality disorder were uncommon and did not distinguish the high and Low P subjects.

The two groups also differed on psychotic-like experiences at the followup interview. The High P group earned a mean rating of 2.19 for their most deviant psychotic-like experience, whereas the Low P group earned a mean of 0.88, a significant difference, t(334) = 3.65, P < 0.001. We repeated this comparison of groups for each of the six individual types of psychotic-like experiences. The High P group exceeded the Low P group on thought transmission, t(334) = 2.20, P < 0.05, on aberrant beliefs, t(334) = 2.88, P < 0.01, and on aberrant visual experiences, r(334) = 4.17, P < 0.001, but not on passivity experiences, t(334) = 0.68, ns, or deviant auditory experiences, t(334) = 1.68, P < 0.10, or thought withdrawal, t(334) = 0.61, ns.

Psychoticism and psychosis

Table 1. Mean (and standard deviation) of personality disorder dimensional scores among high and low psychoticism subjects

	High P (n = 26)	Low P (n = 310)
Schizotypal*	3.04 (3.21)	1.02 (1.72)
Schizoid	0.54 (0.95)	0.60 (1.51)
Paranoid*	1.69 (2.63)	.52 (1.14)

*The difference between groups is significant, P = <0.001.

DISCUSSION

Our study confirms earlier findings from studies using cross-sectional designs, that subjects who score high on the P-Scale show an excess of antisocial behaviors. In addition, our findings show that the P-Scale has prognostic validity for future antisocial behaviors. However, the present study did not assess a broad spectrum of antisocial behaviors.

The results do not support the hypothesis that subjects scoring high on the P-Scale are at heightened risk for psychosis. None of the High P subjects were among the 14 subjects who became psychotic. Also none of the High P subjects reported having any first or second degree relatives with psychosis although some Low P subjects did so. Moreover, the failure of the P Scale to predict psychosis and to identify persons with psychotic relatives cannot be attributed to unreliability of our measures of psychosis in the proband and their relatives or to any inherent insensitivity of paper-and-pencil scales to these dependent variables. As reported elsewhere (Chapman et al., 1994) the Perceptual Aberration Scale, the Magical Ideation Scale, and the Revised Social Anhedonia Scale all contributed significantly to the prediction of psychosis, and the first two of these scales contributed significantly to the identification of those subjects who have psychotic relatives. In short, our findings appear incompatible with the hypothesis that the P-Scale measures a genetically transmitted predisposition to psychosis.

Nevertheless, the High P subjects were elevated on the PDE schizotypal and paranoid dimensional scores and reported more moderately psychotic-like experiences than did the Low P subjects. We are uncertain how to reconcile these findings of schizotypal and paranoid symptoms and psychotic-like experiences in High P subjects with the apparently contrary finding that High P subjects show no elevated rate of psychosis in either themselves or their relatives. One possibility would appear to be that the P-Scale measures a stable psychotic-like adjustment that does not eventuate in psychosis.

Evidence consistent with this interpretation is seen in factor analytic studies of the relationship of the P-Scale to other scales that have been proposed to measure the broader trait of schizotypy or schizotypal personality disorder (Bentall, Claridge & Slade, 1989; Kendler & Hewitt, 1992; Muntaner, Garcia-Sevilla, Femandez & Torrubias, 1988; Raine & Allbutt, J., 1989). In three of these four studies, the P-Scale did not load on the same factor as the other scales of schizotypy, but rather loaded on a separate factor which also includes the Nonconformity Scale (Chapman, et al., 1984), both the Physical and Social Anhedonia Scales (Chapman et al., 1976) and, to a lesser extent, the Borderline Scale (STB) of Claridge and Broks (1984). This factor content is not surprising given the content of the P-Scale. The loading of Claridge's Borderline Scale on this factor suggests that the P-Scale may be tapping borderline personality disorder. Our interview data do not include sufficient diagnostic information to confirm or refute this interpretation.

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