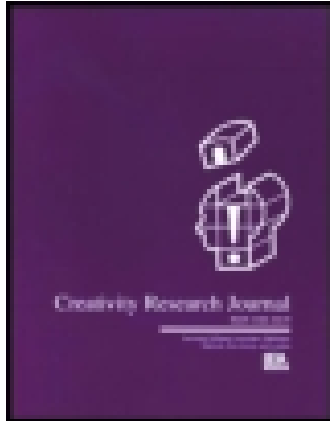


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Creativity and personality: Word association, origence, and psychoticism

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Creativity and Personality: Word Association, Origence, and Psychoticism

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ABSTRACT: *In this study the hypothesis that psychoticism as a personality variable would be associated with creativity, as measured by the Barron-Welsh Art Scale and the Word Association Rare Responses Test, was tested. An analysis of results from 100 nonacademic subjects by means of multidimensional scaling showed a clear grouping together of the three variables postulated to cohere together. IQ did not correlate with any of the variables involved.*

Eysenck (1983, 1989, 1993) suggested that the personality trait of *psychoticism* (Eysenck & Eysenck, 1976; Eysenck, 1992) underlies creativity, as measured by the usual tests (e.g., divergent thinking, unusual word associations, Barron-Welsh Art Scale “origence” responses). There is good evidence that both the Word Association Test and the Barron-Welsh Scale measure creativity, as shown in real-world achievement. With respect to the Word Association Test, the work of MacKinnon (1962a, 1962b) and Gough (1976) may be mentioned. The Barron-Welsh Scale also has been subjected to similar validity tests (Barron, 1953; Gough, 1994; Welsh, 1975). Correlations with such a criterion as rated originality in architects

is about .50 for both measures; oddly enough, although both tests were used on the same population, the actual correlation between them, or the multiple *R* with rated originality, has never been published.

Psychoticism is a dispositional trait variable which renders a person psychosis-prone; it is *not* synonymous with psychosis. There is good evidence that highly creative people are high on psychopathology but not actually psychotic (at least not at the time when they perform successfully). The evidence presented by Andreasen and Canter (1974), Jamison (1993), Prency (1980), Richards (1981), Schuldberg (1990) and many others supports such a view, as does the early work of MacKinnon (1962a, 1962b, 1965, 1978). Psychoticism, as represented by the P scale of the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975), measures this underlying psychopathology that forms such a large part of the creativity literature. The aim of this study was to test the theory that psychoticism is correlated with word association unique responses and with Barron-Welsh preference for complexity. Other personality test scores (e.g., extraversion,

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neuroticism, impulsivity, venturesomeness, empathy) were available and were included in the analysis, although only impulsivity was strongly linked with creativity in the past.

There is good evidence that word association tests, scored for unusual responses, give positive correlations with psychoticism (Hundal & Upmanyu, 1981; Merten, 1992, 1993; Upmanyu & Kaar, 1986). Particularly impressive are two recent studies by Merten (1992, 1993), carried out in Germany; they show a much more rigorous methodology than most previous studies, many of which are subject to criticisms such as those voiced by Schwartz (1978a, 1978b, 1982). Merten used several different methods of testing word association parameters, and it is important to look at the differential results for these different methods in order to be able to integrate the results within a theoretical framework. Beginning with Mannhaupt's (1983) norms for verbal reactions, Merten constructed six word lists of 25 words each, carefully equated for the categories of words used (e.g., tools, insects, musical instruments). Norms were established in the usual free association mode, and associations were described as frequent, medium, and rare.

Subjects were tested along several different lines: (a) Free association—respondent answered with the first word that came to mind; (b) Individual response condition—respondent was asked to give responses which were unusual; and (c) Usual responses—respondent was asked to give responses which most people would give. There is a fair literature concerning these different types of response requirements (e.g., Jenkins, 1959; Lisman & Cohen, 1972; Rothberg, 1967; Routh & Schneider, 1970). The fourth method was an original one in which respondents were offered a usual, a middling frequent, and an unusual response, and were required to indicate which was which.

In addition to these different tests, questionnaires and IQ tests were administered, including Sullwold's and Huber's (1986) Thinking and Speaking scales, the Brief Psychiatric Rating scale (Overall & Gorham, 1962), and the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975).

Subjects were 46 healthy persons, 43 schizophrenics, and 15 manic-depressive patients. The main results were as follows. There were no differences between acute and chronic schizophrenics. Manic-depressive patients were not differentiated from schizophrenics, except for the individual response condition, where they were close to the normal group. Most important, normals with *high P* scores gave more unusual answers in the free and usual association conditions, very much like the psychotics; in the individual association condition they gave more original and hence better answers. This is in good agreement with the theory that high *P* normals are more original but can also judge appropriateness well. High *L*-scorers (*Lie* scale, indicative of conformity) did poorly on the individual association condition, tending to give unoriginal answers. This finding is in good agreement with Horton, Marlowe, and Crowne (1963), who found high *L*-scale scorers giving less unusual responses, and Routh (1971) who found high "schizoid" subjects able to give more unusual responses in a free test, but also able to give even less usual responses on instruction.

Merten's (1993) second article took up the search for the relation between unusual responses and personality, particularly *P* and *L*. Using 46 normal subjects, he found *negative* correlations between *P* and response commonality in free, common, and individual response conditions. He concluded, "That means that they present the 'psychosis-like' associative disturbance in the free and common response condition, and yet fulfill the

individual response condition better since it is precisely in that condition that idiosyncratic responses are really demanded” (Merten, 1993, p. 838). Again, therefore, we find original response creation joined with control of relevance, with the former linking the high-P response activity with that of schizophrenics and the latter forming a crucial difference. Similarly, high P scorers did not fail to react appropriately to questions about the commonness or uncommonness of their own associations; they clearly were aware, as schizophrenics were not, of responding more individually on the word association test than did the majority.

L scorers show a high positive correlation with the individual association condition; in other words even when asked to give unusual responses, they were loath to do so. They generally fail to respond appropriately, confirming the usual interpretation of high-L scores as indicative of conformity. L correlates, as usual, negatively with P; $r = -.30$. These two studies are in good agreement with the theory of psychoticism.

There is direct evidence concerning the Barron-Welsh scale with P (Eysenck & Furnham, 1993) and the correlations published by Welsh (1975) with a variety of traits suggests that similar correlations with P might be found. The theory to be tested, therefore, predicts that high scores on psychoticism, unusual responses on the Word Association Test, and preferences for complex drawings on the Barron-Welsh Scale should go together. It was also predicted that differences in IQ would play little part in this “creativity” group of tests.

Additional predictions were made about a variety of personality measures other than psychoticism. As has often been found, creative people, as defined in terms of rated achievement, tend to combine psychopathology (high psychoticism) with ego-strength (Barron, 1969; Barron & Harrington, 1981);

this emphasis on ego-strength suggests that creativity, as measured by the three tests mentioned above, would be negatively correlated with neuroticism, which is in many ways the opposite of ego-strength.

Dellas and Gaier (1970) and Barron and Harrington (1981) gave lists of personality traits which have been found to correlate with creativity, and based on the general tenor of these lists scales measuring impulsivity, venturesomeness, and extraversion, which were predicted to correlate *positively* with creativity, and scales measuring social desirability (conformity), which was predicted to correlate *negatively* with creativity were included. Also included was an empathy scale for which no prediction was made, although its known negative correlation with psychoticism would suggest a negative correlation with creativity.

The prediction, then, is of a clearly defined pattern, with high psychoticism, high word association uniqueness of responses, high preference for complex designs on the Barron-Welsh Scale, impulsivity, venturesomeness, and extraversion on the one side, and neuroticism, conformity (as measured by the Lie scale), and common word association responses on the other. Previous work suggested that intelligence would not enter into this picture (Welsh, 1975). It was decided that the best test of a predicted profile or configuration would be provided by *dimensional scaling* (smallest space) analysis, and accordingly this was chosen as the method to be employed.

Method

The population tested consisted of 100 adult nonacademic subjects (mean age = 34) of whom 37 were male and 63 were female. They were originally reached by adverts, word-of-mouth, and notices left at the Labour Exchange; all had taken part in earlier

studies of intelligence and personality as related to psychophysiological measures of averaged evoked potential. Hence their IQ (verbal and performance) on the Jackson (1985) scales were known, as well as their personality test scores on the EPQ-R (Eysenck, Eysenck, & Barrett, 1985) and the I₇ (Eysenck & Eysenck, 1992), a test which contains scales of impulsiveness, venturesomeness, and empathy. The EPQ-R contains scales of psychoticism, neuroticism, and extraversion, as well as a lie scale which serves as a measure of conformity when subjects are not motivated to dissimulate. The personality measures were repeated on the occasion of the experiment to be described, two years after the original testing, so that test-retest correlations could be calculated. The IQ test was not repeated, so the values were obtained two years prior to the actual experiment.

The sample is a convenience one, varying widely in socioeconomic status and education, although neither appeared to affect results very much as Runco and Albert (1986) suggested; contrary to the view that creativity tests are correlated with IQ in samples with IQs below 120, they found no such correlation in samples with IQs below 120.

Central to the experiment was the Barron-Welsh Art Scale, which is part of the Welsh Figure Preference Tests (Welsh, 1949), but was given as a separate test. This consists of 86 drawings, some of which are *simple* and some *complex*. Subjects are required to say "like" or "dislike" for each drawing; the complexity score is made up of the number of complex drawings liked plus the number of simple drawings disliked. Liking for complexity has been found to be correlated with creativity (Barron, 1953; Welsh, 1975).

For the word association test the Kent-Rosanoff (1910) stimulus words were used, with the usual instructions to respond with the first word that came into mind. Scoring

was based on the norms derived from the subjects themselves, because there were no population norms which could be applied to this group. Three scores were derived: A—the number of times the subject gave the *most frequent* response; B—the number of times the subject gave the *least frequent* response; and C—the number of times the subject gave a response that had been made by two or three others (i.e., a rare but not unique response).

Results

Table 1 gives means and standard deviations for all relevant variables. The IQ tests failed to show any correlations of interest or significance; verbal IQ correlated .70 with performance IQ, which is fairly typical considering the available range of talent. On the

Table 1.
Means and Standard Deviation of Variables Used

	<i>M</i>	<i>SD</i>
Word Association		
A Responses	48.19	10.19
B Responses	7.24	6.75
C Responses	8.90	3.96
Barron-Welsh		
Like Response	13.07	6.94
Dislike Response	7.73	7.92
Total Score	20.80	12.79
IQ		
Full IQ	110.03	12.12
Verbal	111.00	12.38
Performance	108.61	13.64
Personality, second testing		
Psychoticism	6.16	4.36
Extraversion	15.05	5.81
Neuroticism	11.74	5.81
Lie Scale	6.49	4.00
Impulsiveness	8.02	4.63
Venturesomeness	8.35	4.51
Empathy	13.35	3.84

Note. A responses represent the number of the most frequent responses; B responses represent the number of least frequent responses; and C responses represent rare but not unique responses.

personality side, test-retest correlations were quite high, considering the 2-year gap: $P = .86$; $E = .89$; $N = .82$; $L = .86$; Impulsivity = $.85$; Venturesomeness = $.85$, and Empathy = $.78$. For the Barron-Welsh Scale, the correlation between L (like) and D (dislike) was $.37$; $p < .01$. Some of the scales were clearly heavily skewed; inspection of the scatter diagrams suggested that any observed correlations were not due to outliers.

Results for the Word Association Test are given in some detail in Table 2. It will be seen that correlations between odd and even items, except for C, were reasonable: $A = .64$; $B = .76$; and $C = .33$. A correlated negatively with B and C, while B and C correlated positively throughout. Adding odd and even item scores, A_T correlated $-.74$ with B_T , and $-.70$ correlated with C_T ; B_T correlated $.49$ with C_T , where the subscript refers to total (odd and even) scores. These data suggest that all the tests behaved lawfully and in a manner similar to that observed in previous studies.

For a consideration of the between-test correlations, Table 3 shows correlations between personality and word association. As predicted, psychoticism correlated very significantly with A (negatively) and with B (positively); the positive correlation with C was significant on a one-tail test. Impulsiveness showed a similar pattern, although

Table 2.
Correlations Between Frequent, Rare and Unique Item Scores for Odd and Even Words on the Word-Association Test

		Odd items			Even items	
		A	B	C	A	B
Odd Items	A					
	B	-.71				
	C	-.55	.39			
Even Items	A	.64	-.60	-.35		
	B	-.55	.76	.35	-.66	
	C	-.51	.42	.33	-.64	.32

Table 3.
Correlations Between Personality and Word-Association Tests

	A	B	C
P	-.25**	.27**	.17
E	-.14	-.06	.17
N	.07	.02	.02
L	.04	-.03	-.09
Venturesomeness	-.12	.01	.07
Impulsiveness	-.21*	.14	.26**
Empathy	.04	-.02	-.00

* $p < .05$. ** $p < .01$.

Table 4.
Correlations Between Personality and the Barron-Welsh Art Scale

	Like	Dislike	Total
P	-.20*	.06	.16
E	.35**	-.11	.13
N	-.17	.01	-.09
L	-.11	.05	-.03
Venturesomeness	.39**	.16	.32*
Impulsiveness	.19	.04	.13
Empathy	-.10		-.06

* $p < .05$. ** $p < .01$.

here the correlation was with C rather than with B.

Table 4 shows the results for the relationship between personality variables and the Barron-Welsh Art Scale. Psychoticism correlated significantly with the L score, but only on a one-tail test with the total score. Extraversion showed a curious discrepancy between L and D scores which makes interpretation hazardous. Venturesomeness was very significantly correlated with preference for complexity. Correlations for Impulsiveness, Neuroticism, and Conformity (Lie scale) were usually in the predicted direction, but very low. Altogether correlations were nearly always as predicted, but they cannot be said to be high enough to give strong support to the theory; a more inclusive test is indicated.

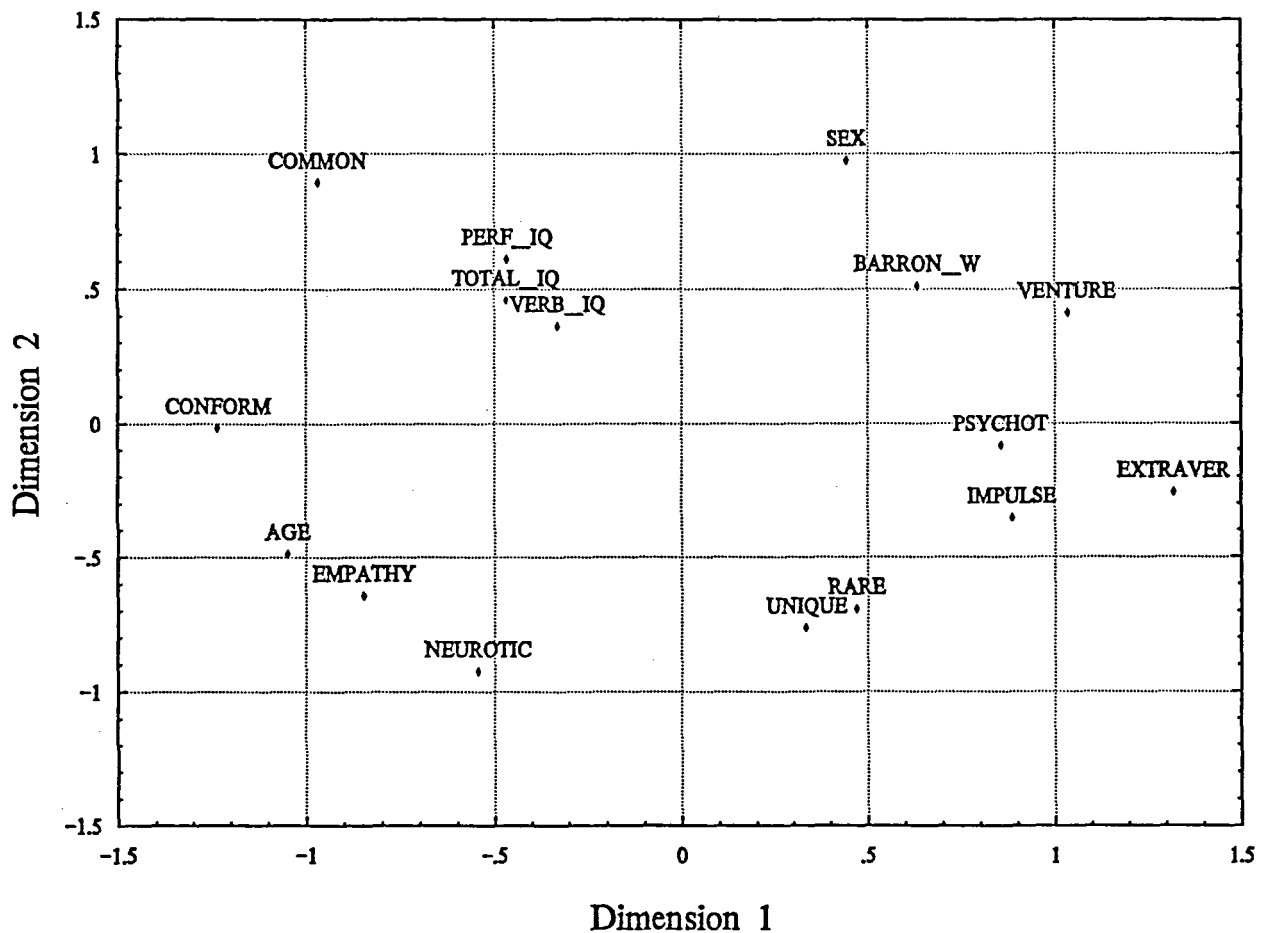


Figure 1. Multidimensional Scaling Analysis of Test Scores.

Concerning the major test of the theory, namely the multidimensional scaling (smallest space) analysis, the initial matrix of Pearson correlations gave a stress value of 0.15, and the two-dimensional figure is given below. It is somewhat dangerous to interpret the dimensions of such an analysis, but Dimension 1 clearly separates the postulated creativity measures—Barron-Welsh Scale, word association unique and rare responses, psychoticism, impulsiveness, venturesomeness, and extraversion—from the noncreative measures—common association on the Word Association Test, conformity, neuroticism (low ego-strength), and empathy.

The IQ test measures were quite separate from all the other measures; on a three-

dimensional solution, they would vanish into the third dimension. The profile furnished by multidimensional scaling thus supports the main predictions made on the basis of previous studies of the general theory linking personality and creativity (Eysenck, 1993). Many of the correlations are quite small, suggesting that P, the Word Association Test, and the Art Scale determine somewhat different inputs of creativity; a combination of these measures with divergent-thinking measures might give a much better picture of creativity than any of them by themselves. If, as the literature indicates, the Word Association Test and the Barron-Welsh Scale individually correlate .50 with creative achievement in architects, and if,

as the present data suggest, the correlation between the measures is fairly low, the multiple R should be around .70. Future research will have to determine how realistic such a prediction may be.

Conclusions

The predictions made at the beginning of the experiment were that connections would be found between *personality* variables, particularly high psychoticism scores, low neuroticism scores, low conformity scores, and high impulsivity and venturesomeness, on the one hand, and recognized measures of *creativity*, such as preference for complexity on the Barron Welsh Art scale, and rare and unique responses on the Word-Association Test on the other hand. It is clear from the multidimensional-scaling analysis that these predictions are all borne out by the results. Although individual correlations are not high, the pattern of relations turned out very much as predicted. It was also predicted, and found, that measures of intelligence would not form part of the patterns, and indeed intelligence did not correlate significantly with any of our measures of personality or creativity.

Sex and age were included in the analysis, and *maleness* and *youth* were found to form part of the creativity complex. Because neither formed part of the prediction, and because sex and age were included in the analysis only as a precaution, these results should not be taken too seriously, although of course they align with the frequent observation that creativity in science and the arts seem to be observed most frequently in young people, and that males are represented to an overwhelming extent among creative geniuses.

Predictions and results must be viewed against the background of the general theory of creativity that was suggested elsewhere (Eysenck, 1993), based on the ar-

gument that creativity is not an *ability* variable, but a *personality* one (Eysenck, 1983, 1989). The data presented here appear to support this view. As predicted, the personality trait of psychoticism was found to be linked with two acknowledged measures of creativity, namely Word Association Uniqueness and Barron-Welsh Complexity Preference. The correlations are not very high, but of course the population tested did not include any highly creative subjects. In spite of this, the pattern of relations that was found was very much in line with current theories.

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