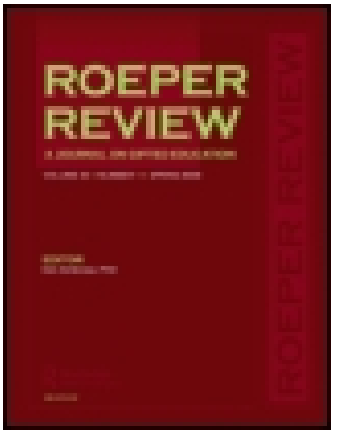

Roeper Review
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/uror20

The roots of creativity: Cognitive ability or personality trait?

Hans J. Eysenck [a]
[a] Professor of Psychology , University of London ,
Published online: 20 Jan 2010.

Norms technical manual. Princeton, New Jersey: Personnel Press, 1966.
Torrance, E. P. "Creatively gifted and disadvantaged gifted students." in J. C. Stanley, W. C. George, & C. H. Solano (Eds.), *The gifted and the creative: A fifty year perspective.* Baltimore: Johns Hopkins University, 1977, pp. 173-186.
Torrance, E. P. *The search for satori and creativity.* Buffalo, N.Y.: Creative Education, 1979.
Torrance, E. P., Bruch, C. B., & Morse, J. A. "Improving predictions of adult creative achievement of gifted girls by using autobiographical information." *Gifted Child Quarterly,* 1973, *17,* 91-95.
Treffinger, D. J. "The progress and peril of identifying creative talent among gifted and talented students." *Journal of Creative Behavior,* 1980, *14,* 20-33.
Treffinger, D. J. "Fostering independent learning." *G/C/T,* 1979, *7,* 3-6; 64.
Treffinger, D. J., & Poggio, J. P. "Needed research on the measurement of creativity." *Journal of Creative Behavior,* 1972, 6, 253-267.
Wallach, M. A. "Creativity." in P. H. Mussen (Ed.), *Carmichael's manual of child psychology,* (3rd ed.). New York: John Wiley & Sons, 1970.
Wallach, M. A. "Tests tell us little about talent." *American Scientist,* 1976, *64,* 57-63.
Wallach, M. A., & Kogan, N. *Modes of thinking in young children: A study of the creativity-intelligence distinction.* New York: Holt, Rinehart & Winston, 1965.
Wallach, M. A., & Wing, C. W. *The talented student: A validation of the creativity-intelligence distinction.* New York: Holt, Rinehart & Winston, 1969.
Witty, P. A. (Ed.), *Reading for the gifted and creative student.* Newark, DL: International Reading Association, 1971.

The Roots of Creativity: Cognitive Ability or Personality Trait?

Hans J. Eysenck

***Hans J. Eysenck** is Professor of Psychology, University of London.*

Originality and creativity are often taken to be cognitive traits, i.e. aspects or parts of intelligence. Thus intelligence tests are often divided into measures of **convergent** and **divergent** thinking, with the latter being more closely associated with originality and creativity. An alternative view, which is taken in this article, is that originality and creativity are not by themselves aspects of intelligence, but rather are traits of **personality,** i.e. are non-cognitive. Great achievement, on this account, would be due to a combination of high intelligence and the appropriate personality configuration. This view, which was originally put forward by Spearman (1927) requires empirical support, and such support has recently been forthcoming in a series of studies, most of which were conducted by British psychologists.

Some of this work took its origin from the widely held hypothesis that genius and madness may be closely allied. This common observation suggests that people who are highly original and creative may differ from the ordinary run of people by showing personality qualities often associated with schizophrenics and other psychotics. A number of genetic studies have indeed supported such a view. Heston (1966) studied offspring of schizophrenic mothers raised by foster-parents, and found that although about half showed psychosocial disability, the remaining half were notably successful adults, possessing artistic talents and demonstrating imaginative adaptations to life to a degree not found in the control group. Karlsson (1968, 1970) in Iceland found that among relatives of schizophrenics there was a high incidence of individuals of great creative achievement. McNeil (1971) studied the occurrence of mental illness in highly creative adopted children and their biological parents, discovering that the mental illness rates in the adoptees and in their biological parents were positively and significantly related to the creativity level of the adoptees. Findings such as these clearly support speculations, such as those by Hammer and Zubin (1968) and by Jarvik and Chadwick (1973) to the effect that there is a common genetic basis for great potential and for psychopathological deviation.

Recently, Eysenck & Eysenck (1976) have published in book form an account of their investigation into the personality trait of *psychoticism.* They base their work on the hypothesis that there is a continuum between normality and psychosis (Eysenck, 1950, 1952) and that it should be possible to measure this dimension by means of a questionnaire. A long period of development resulted in a clarification of this concept, and the production of a psychoticism inventory which was found to correlate minimally with other major dimensions of personality such as extraversion-introversion and stability-neuroticism. The development of this questionnaire, and the attempts to establish its reliability and validity are dealt with in detail in the book, and need not detain us here. The questionnaire, published under the title of Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) has been experimented with and validated in many different countries, and it has been found that the three major personality dimensions of P (psychoticism), E (extraversion-introversion), and N (neuroticism-stability) emerge very strongly from an analysis of intercorrelations of questionnaire items in all these countries (Eysenck & Eysenck, 1982).

Assuming for the moment that the P scale does measure, at least to some extent, the essence of the continuum from normality to psychosis, and assuming for the moment that the hypothesis linking creativity and originality with mental abnormality possesses some virtue, then we should be able to test this hypothesis in a variety of ways. It was first tested, in an unpublished study referred to by Eysenck & Eysenck (1976), by D. W. Kidner.

He administered several of the Wallach & Kogan (1965) tests of originality to male and female students, nurses and teachers, and found significant relationships between originality and creativity, on the one hand, and high P scores on the other. He also found that *acceptance of culture,* i.e. agreement with cultural cores, was negatively correlated with P, and also with creativity and originality.

Other studies more marginally relevant to the hypothesis under investigation are reported in the book by Eysenck & Eysenck (1976), but we will turn now rather to a more recent study by Woody & Claridge (1977) which is particularly impressive.

The subjects of their study were 100 university students at Oxford, both undergraduate and graduate. The students constituted a wide sampling of the various fields of specialization at the university. They chose students as their subjects because of evidence that creativity is significantly related to I.Q. up to about I.Q. 120, but that it becomes independent of I.Q. above this level (Canter, 1973). The tests used by them were the EPQ (Eysenck & Eysenck, 1975) and the Wallach-Kogan Creativity Tests, somewhat modified and making up five different tasks (instances, pattern meanings, uses, similarities, and line meanings). Each task was evaluated in terms of two related variables: the number of unique responses produced by the subject, and the total number of responses produced by the subject.

The Pearson product moment correlation coefficients between psychoticism and creativity scores for the five tests are as follows P with number of unique responses scores: Instances = 0.32; Pattern Meanings = 0.37; Uses = 0.45; Simi-

larities = 0.36; Line Meanings = 0.38. P with uniqueness scores: 0.61, 0.64, 0.66, 0.68, 0.65. It will be seen that all the correlations are positive and significant, and those with the uniqueness score (which is of course the more relevant of the two) are all between .6 and .7. These values are quite exceptionally high for correlations between what is supposed to be a cognitive measure, and a test of a personality trait, particularly when general intelligence has effectively been partialled out from the correlations through the selection of subjects. There were effectively no significant correlations between E and N, on the one hand and creativity on the other. It is interesting to note, however, that the L score of the personality questionnaire, which up to a point is a measure of social conformity, showed throughout **negative** correlations with creativity scores, seven out of ten being statistically significant. L is known to correlate negatively with P (Eysenck & Eysenck, 1976).

Studies not using the P scale have come up with traits of *creative* persons not dissimilar to those characteristic of the high P scorer. Getzels and Jackson (1962) found that *divergers* were unconventional and independent of judgment. (See also Torrance (1962). Hudson (1966, 1968) also noted the conformity of the converger, and the rebelliousness of and failure to *fit in* of the *diverger*.

It might be said in criticism of the studies so far reviewed, that they deal with psychological tests of creativity and originality in normal and not very distinguished people, and that what is normally understood by originality and creativity demands something more than that. The objection is a reasonable one, although it should not be taken to infirm the remarkable success achieved by Woody & Claridge's empirical testing of the hypothesis linking P and creativity. The only study of what most lay people would consider genuine creativity has been reported by Gotz & Gotz (1979a,b). Their work significantly extends that of other investigators who tried to link creativity in the arts with personality (e.g. Csikzentmihalyi & Getzels, 1973; Barron, 1972; Eysenck, 1972; Eysenck & Castle, 1970; and Drevdahl, 1956). Some of these studies are difficult to interpret, but we may note that Eysenck (1972) and Eysenck & Castle (1970) found that art students were significantly more introverted and neurotic than non-art students. Gotz & Gotz (1973) pointed out in criticism that art students in general may not be particularly creative, but when a group of highly gifted art students were compared with less gifted and ungifted subjects, they found that the highly gifted students also had low scores on extraversion and high scores on neuroticism.

In the study under review Gotz & Gotz (1979a, b) administered the EPQ to 337 professional artists living in West Germany, of whom 147 male and 110 female artists returned the questionnaire; their mean age was 47 years. One outstanding result of this work was that male artists were significantly more introverted and significantly more neurotic than non-artists, while for females there was no difference on either of these dimensions. As the authors suggest, it is perhaps true that in our Western World it is mainly women with average or higher scores on extraversion who have the courage to become artists, while the more introverted and possibly more artistically gifted women do not dare to enter the precarious career of the artist.

We must now turn to scores on psychoticism. Here the results are very clear; male artists have much higher P scores than male non-artists, and female artists have much higher P scores than female non-artists. As Gotz and Gotz point out, these results suggest that certainly many artists may be more tough-minded than non-artists. *Some traits mentioned by Eysenck & Eysenck may also be typical for artists, as for instance they are often solitary, troublesome and aggressive, and they like odd and unusual things.* (p. 332).

The work of Gotz & Gotz (1979a,b) thus offers important support for the results of Woody and Claridge, and the other authors cited above, in that this more recent work uses actual artistic achievement as a criterion for the measurement of creativity and originality. In doing so they give credence to the validity of divergent thinking tests as measures of creativity and originality, and the fact that both in the artistic and in the non-artistic population studied by other investigators significant correlations are found between psychoticism and creativity and originality very much strengthens the hypothetical link between the personality trait and the behavioural pattern. We may thus be justified in concluding that originality and creativity are the outcome of certain personality traits, rather than being cognitive variables or abilities. This is an important conclusion which is somewhat in contrast with assumptions usually made in this field.

The Gotz & Gotz study is the only one which actually used the Psychoticism scale, but other studies implicated traits in creative people which are clearly part of the P syndrome. Thus work of the Institute for Personality Assessment and Research at Berkeley, under the direction of MacKinnon (1962), was concerned with creativity in architects, writers and mathematicians. As described by MacKinnon et al. (1961), and Barron (1969), creative people showed traits of individualism and independence, lack of social conformity, unconventionality, and lack of suggestibility (Crutchfield, 1962); they were also below par in sociability and self control. Responses on tests like word association were odd and unusual, almost like those of schizophrenics.

Most important, the creative studied by the I.P.A.R. group consistently showed greater psychopathology on the Minnesota Multiphasic Personality Inventory depression, hypochondriasis, hysteria, psychopathy and paranoia scales than did the controls. Lytton (1971) concludes that: *It is difficult... to deny that there is more than a chance association between psychiatric difficulties and creative powers.* (p. 63). This psychopathology is countered, however, by greater *ego-strength*, as also shown on the MMPI scales.

The position of Introversion and Neuroticism in the creativity field needs a little further discussion. Introversion seem to be implicated both for artists and for scientists (Gotz & Gotz, 1979a, b; Cattel & Drevdahl, 1955; Roe, 1952, 1953; Andreani & Orio, 1972), although perhaps more for scientists than for artists (Hudson, 1966). Neuroticism, however, is clearly more associated with the arts than the sciences (Wankowski, 1973; Eysenck, 1978). It is unfortunate that most empirical studies have used interviewing techniques and test which do not always enable the reader to make clear distinctions between P, E and N; the use of standard tests like the EPQ would seem to make strict comparisons between studies possible, in a way that the random use of different inventories does not. Nevertheless, the major trends are unmistakable.

Of course it should not be assumed that this personality trait of P, even when found in conjunction with high N and low E, can by itself produce original work of consequence. A certain reasonably high amount of intelligence and/or artistic ability is obviously required in order to enable a person possessing high creativity and originality to produce anything worthwhile. It is obviously important to separate the successful use of personality traits such as those mediating creativity and the unsuccessful use degenerating into mere oddity and possibly psychotic deterioration. For the future study of gifted children, it seems desirable that personality tests such as the Junior EPQ (Eysenck & Eysenck, 1975) should be included in order to measure the influence that personality traits have on the manifestations of creativity and originality. Creativity and originality are such important aspects of human endeavour that a better understanding of their relation to both temperament and cognition seems vital, and no doubt future research will clarify these relations even further.

For the moment, bear in mind these results in looking at the education of original and creative children. The findings

discussed in this paper suggest that such children will be particularly difficult to deal with; they will be troublesome, unusual, difficult to reach, behaving in possibly odd ways that may not appeal to the teacher, or their peers; their very originality may upset the even running of the classroom, and may produce difficulties for the teacher trained to insist on standard responses. Getzels and Jackson (1962) noted that their creative children were not particularly popular with teachers; this is perhaps not to be wondered at in view of what has been said above. Possibly more important than special methods of educating original and creative children would be special ways of educating their teachers in the appreciation of the value of originality and creativity, and in the ways that children are likely to behave (or misbehave!). Essentially such children tend to go their own way, and in a culture geared to uniformity this is a pattern not easily accommodated in school. All the more important, then, the teacher should make allowances, and should learn to value the independence shown by such children.

REFERENCES

Andreani, O & Orio, S Le radici psicologiche del Talento Bologna Societa Editrice il Mulino, 1972

Barron, F The Creative Person and the Creative Process New York Holt, 1969

Barron, F Artists in the Making New York Seminar Press, 1972

Canter, S Some aspects of cognitive function in twins In G S Claridge, S Canter, W I Hume (Eds) Personality Differences and Biological Variation A Study of Twins Oxford Pergamon, 1973

Cattell, R B & Drevdahl, J G A Comparison of the personality profile (16PF) of eminent researchers with that of eminent teachers and administrators and of the general public British Journal of Psychology, 1955, 46, 248-261

Crutchfield, R S Conformity and creative thinking In H E Gruber, G Terrell & M Werkheimer (Eds), Contemporary Approaches to Creative Thinking New York Etherton Press, 1962

Csikszentmihalyi, M & Getzels J W The personality of young artists an empirical and theoretical exploration British Journal of Psychology, 1973, 64, 91-104

Drevdahl J E Factors of importance for creativity Journal of Clinical Psychology, 1956, 12, 21-26

Eysenck H J Criterion analysis An application of the hypothetico-deductive method to factor analysis Psychological Review, 1950, 57, 38 53

Eysenck, H J Cyclothymia and schizothymia as a dimension of personality II Experimental Journal of Personality, 1952, 20, 345-384

Eysenck, H J Personal preferences, aesthetic sensitivity and personality in trained and untrained subjects Journal of Personality, 1972, 40, 544-557

Eysenck, H J Personality and learning In S Murray-Smith (Ed) Melbourne Studies in Education, p 134-181 Melbourne University Press, 1978

Eysenck, H J & Castle, M Training in art as a factor in the determination of preference judgements for polygons British Journal of Psychology, 1970 61, 65-81

Eysenck, H J & Eysenck S B G Manual of the Eysenck Personality Questionnaire San Diego Edits, 1975

Eysenck H J & Eysenck, S B G Psychoticism as a Dimension of Personality London Hodder & Stoughton 1976

Eysenck, H J & Eysenck, S B G Recent advances in the cross-cultural study of personality In C Spielberger & J Butcher (Eds), Advances in Personality Assessment, Hillsdale, New Jersey Lawrence Erlbaum, 1982

Getzels, J W & Jackson, P W Creativity and Inteland Intelligence New York Wiley, 1962

Gotz, K O & Gotz, K Introversion-extraversion and neuroticism in gifted and ungifted art students Perceptual and Motor Skills, 1973, 36, 675-678

Gotz, K O & Gotz, K Personality characteristics of professional artists Perceptual and Motor Skills, 1979, 49, 327-334

Gotz, K O & Gotz, K Personality characteristics of successful artists Perceptual and Motor Skills, 1979b, 49, 919-924

Hammer, M & Zubin, J Evolution, culture and psychopathology. Journal of General Psychology, 1968, 78, 154-175

Heston, L L Psychiatric disorders in foster home reared children of schizophremic mothers British Journal of Psychiatry, 1966, 112, 819-825

Hudson, L Contrary Imaginations London Methuen, 1966

Hudson, L Frames of Mind Ability, Perception and Self-Perception in the Arts and Sciences London Methuen, 1968

Jarvik, L F & Chadwick, S B Schizophrenia and survival In M Hammer, K Salzinger & S Sutton (Eds), Psychopathology, New York Wiley, 1973

Karlsson, J L Generalogic studies of schizophrenia In D Rosenthal & S S Kety (Eds), The Transmission of Schizophrenia Oxford Pergamon, 1968

Karlsson, J L Genetic association of giftedness and creativity with schizophrenia Hereditary, 1970, 66, 177-182

Lytton, H Creativity and Education London Routledge & Kegan Paul, 1971

MacKinnon, D W The nature and nurture of creative talent American Psychologist, 1962, 17, 484-95

MacKinnon, D W et al Proceedings of the conference on "The Creative Person " University of California Alumini Centre, Lake Tahoe, 1961

McNeil, T F Prebirth and postbirth influence on the relationship between creative ability and recorded mental illness Journal of Personality, 1971, 39, 391-406

Roe, A A psychologist examines sixty-four eminent scientists Scientific American, 1952, 187, 21-25

Roe, A A psychological study of eminent psychologists and antoropologists and a comparison with biological and physical scientists Psychological Monographs, 1953, 67, No 352

Spearman, C The Abilities of Man London Macmillan, 1927

Torrance, E P Guiding Creative Talent Englewood Cliffs New Jersey Prentice Hall, 1962

Wallach, M A & Kogan, N Modes of Thinking in Young Children New York Holt, Rinehart & Winston, 1965

Wankowski, J A Temperament, Motivation and Academic Achievement Birmingham University of Birmingham Educational Survey and Counseling Unit, 1973

Woody, E & Claridge, G Psychoticism and thinking British Journal of Social and Clinical Psychology, 1977, 16, 241-248