H. J. Eysenck's Contribution to the Study and Analysis of Creativity

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Professor H. J. Eysenck's contributions to scientific psychology are monumental. In particular, his theoretical and research efforts have significantly impacted the study of personality and individual differences. Introversion-extraversion and neuroticism are the most familiar of the three biologically based source traits or superfactors. More recently, Eysenck expanded his views on the third major personality dimension termed psychoticism and included it in the Eysenck Personality Questionnaire. One of the most interesting works-in-progress was the hypothesized links between psychoticism and creativity which are outlined in this paper. This work also serves to illustrate the creative genius of Professor Eysenck.

We marvel at those individuals who are able to reach beyond the realms of normal accomplishments and give us not only extraordinarily good or excellent 'products', but who 'create' something unique, novel, that has not existed before, whether an idea, a cure for a disease, a painting, or a musical score. It seems especially fitting in any tribute to Professor Hans Eysenck to consider his creative genius as a psychologist and his theoretical contributions to describing and understanding creativity and the creative process.

Eysenck in many ways served as a model or prototype of the creative psychologist whose contributions spanned across almost all domains and areas of psychology at both the theoretical and applied levels. He was able to draw his ideas from an extensive knowledge not only of psychology but from physics and mathematics to history and art. The result was an extraordinary level of creative productivity. This is attested to in a curriculum vitae that includes numerous awards

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and honors, hundreds of significant publications in books and journals, published personality questionnaires such as the *Eysenck Personality Questionnaire* (Eysenck & S. B. G. Eysenck, 1975), together with the founding of key psychological journals such as *Personality and Individual Differences*, and the professional association, *The International Society for the Study of Individual Differences (ISSID)*. But Professor Eysenck's achievements were much more than a massive volume of publications and research studies. His rich theoretical writings laid the foundation for literally thousands of experimental studies that continue to test the various hypotheses generated by these theories. His personality theory (e.g., Eysenck, 1970, 1991, 1992; Eysenck & M. W Eysenck, 1989) that has so comprehensively described the three major personality dimensions of Extraversion (E), Neuroticism (N), and, more recently, Psychoticism (P) has been one of the most studied and researched trait factor models along with the Big 5 of Costa and McCrae (1992) and the 16 Personality Factors of R. B. Cattell (Cattell, Eber, & Tatsuoka, 1970). The international psychology community recognizes that Professor Eysenck was indeed a brilliant and creative person and psychologist.

The respect, admiration, and awe in which his colleagues held him was most clearly shown at the recent ISSID meeting held in Arhus, Denmark in July, 1997. Professor Eysenck's health was so poor that no one expected him to make the journey from England to Denmark to be present with his close friends and colleagues and take his rightful place at the conference events. However, during the afternoon session, the door to the auditorium opened and all eyes turned in that direction. Professor Eysenck, seated in a wheelchair and accompanied by his son Darrin, was greeted with applause and tears of emotion. Throughout that evening at a banquet in his honor and the next day, in spite of his advanced illness and loss of speech, it was evident that he enjoyed being with us as much as we were overjoyed by his presence. And then he returned home to be with Sybil, his wife, best friend, and colleague.

Of his many major forays into psychology, Eysenck's theoretical and research writings on personality and individual differences must stand out as some of the most important and substantial contributions of this century. This work has ensured his place with the great names of psychology, past, present and future. Although always fascinated with human genius and creativity, it was in more recent years that Professor Eysenck described a potentially key link between his personality model and creativity. These ideas were further developed in his 1993 paper entitled "Creativity and Personality: A Theoretical Perspective" and more recently in 1995 in a book chapter "Creativity as a Product of Intelligence and Personality" and his book *Genious: The Natural History of Creativity*.

To follow is an overview of Eysenck's theory of the relationship between personality and creativity. Eysenck began his 1995 chapter in the *International Handbook of Personality and Intelligence* (Saklofske & Zeidner, 1995) by stating that little progress had been made by psychology in the study of creativity. He suggested this was in large part due to two problems; research efforts that lacked a grounding in the methods of scientific psychology (i.e. experimental and psychometric); and research that was often disconnected from both the theoretical writings and experimental
knowledge of psychology. But most conspicuously lacking was a theory of creativity. More than once Eysenck was heard to echo Lewin's view that "there is nothing as practical as a good theory". Being a true 'Renaissance' person, Eysenck created a theory which now awaits us to test the hypotheses that it has generated.

**Intelligence and Creativity**

Creativity has commonly been studied as a part of intelligence. Although Guilford's (1967) Structure of Intellect model defined creativity as a particular kind of cognitive operation called divergent thinking, in contrast to convergent thinking and other cognitive processes, it was often suggested that creativity was associated with high levels of general intelligence or $g$. However the research tended to suggested that creativity and intelligence showed only a modest correlation of about .3 (Barron & Harrington, 1981). As Zeidner (1995) summarized:

> Reviewers of the literature have concluded that whereas creativity is significantly related to IQ up to about 120..., after that creativity becomes independent of IQ, and the IQ-creativity relationship drops to near zero (p. 308).

These finding suggest that an understanding of creativity should not exclude intelligence as a factor in its determination, Rather intelligence is not the only factor, and further that its impact is diminished as one moves from high average into the superior ranges of intelligence.

**Personality and Creativity**

Creativity has been described as a cognitive ability but also as a personality correlate. While there is some agreement that creativity requires at least an average to above average amount of intelligence, there has also been a search to determine the relationship between creativity and personality. Case studies have been used to describe the personality attributes of famous artists, usually from a more psychodynamic perspective. Various personality trait descriptions of creativity have resulted from correlational studies but for the most part, we are left with only descriptive relationships. As well the findings are not always clear or consistent. For example, Pamula (1993) observed non-significant correlations between the EPQ-R factors and a measure of divergent and convergent thinking; however while spatial intelligence was also uncorrelated with personality, verbal IQ showed a significantly negative correlation with ($N$). The lack of a theoretical basis for both driving and interpreting personality and creativity research has severely limited our progress.
Intelligence and Personality

Zeidner (1995) suggests that creativity holds an intermediate position between intelligence and personality. The products of creativity must certainly reflect an ability to think fluently and flexibly as well as an inclination to do so. The relationship between personality and intelligence has been examined in a number of studies following Eysenck's assertion that personality and intelligence are uncorrelated. Eysenck's 3 major personality dimensions have been correlated with various measures of intelligence in samples of both children and adults. Eysenck (1971) reported correlations of essentially zero between extraversion (E) and neuroticism (N) and such ability measures as the Raven's Progressive Matrices and the Mill Hill Vocabulary Tests for adults. These findings for E and N but also P were replicated with samples of children using the Jr. EPQ and more psychometrically complex measures including the WISC-R and K-ABC (e.g., Saklofske, 1985; Saklofske and Kostura, 1990). Other studies have found small but statistically significant differences (e.g., White, 1973) as well as noting some relationships between personality and intelligence as a function of age (Eysenck & Cookson, 1969) and the kind of intelligence (e.g., verbal vs. performance IQ) in relation to the extremes and middle of E dimension (Robinson, 1985, 1986).

In all, these findings tend to suggest that personality and intelligence are either independent factors or not highly correlated and therefore and not likely to underlie creativity in some direct, additive, or even simple interactive way.

Eysenck's Theory of Creativity

Eysenck has developed a theory which does what any good theory must do; it provides a set of testable hypotheses which, when researched, will either offer support for the theory, result in modifications to the theory, or lead to its demise. Drawing from the efforts described above and from his own theory building relating to personality, Eysenck engaged in this remarkable analysis and synthesis which is now outlined.

Eysenck recognized that creativity was likely the result of a number of synergistically acting factors or causes including those shown in Figure 1. But in order to understand the causal basis of creative achievement in contrast to just high achievement, Eysenck defined and described creativity by distinguishing between trait and achievement creativity. The former is a normally distributed latent trait underlying actual creative behavior or accomplishments. The latter is the socially useful product or result of this trait and other factors and is distributed like a J curve. Thus a factor akin to 'trait creativity' was necessary, along with the many other factors suggested by Figure 1, for creative achievement.
In order to further develop this idea of trait creativity, Eysenck next turned to the large research literature exploring the relationship between personality traits and creativity.

**Creativity, Personality and Psychopathology**

The psychological literature but also historical writings, biographies and autobiographies provide evidence of a link between creative genius and mental illness. There is a much higher incidence of psychopathology amongst persons deemed to be creative. Further while there appear to be a number of personality traits associated with creativity (e.g., Welsh 1975), some of these traits are also associated with psychopathology. However, actual psychopathology is negatively related to creativity. Thus it would appear that while some personality traits are linked with both creativity and psychopathology, creative genius and mental illness are not synonymous. In fact while creative persons tend to show elevated patterns of MMPI scores related to psychosis (McKinnon, 1978), there is also good evidence to indicated that they are not psychotic but rather also manifest a number of other 'favorable' personality traits (e.g., ego-strength) that may then also be hypothesized to underlie creativity.
Psychoticism (P) and Creativity

Eysenck's dimensional theory of personality has been extensively developed and researched over a period of some 50 years. The major factors of extraversion-introversion and neuroticism-stability are the best known of the three super factors but tend to show only small correlations with creativity. However the evolution of psychoticism (P) (Eysenck & Eysenck, 1976) as a third personality superfactor opened a potential new avenue for the study of creativity Eysenck (1995) stated that:

*a possible answer to the obvious paradox of genius and psychopathology may be found in the concept of psychoticism, conceived as a latent trait underlying a variety of functional psychotic disorders ... as well as schizoid, psychopathic and other borderline spectrum disorders* (p. 234).

The nature of P is shown in Figures 2 and 3. In Figure 2, the nature of P is described along a continuum of low to high P characteristics including, at the extremes, functional psychosis. As can be seen in Figure 2 and contrary to some misunderstanding of this factor, P is not equivalent to psychosis; rather P is the personality trait that underlies psychotic disturbance. Thus individuals with extremely high P scores have an increased probability of developing a psychosis. This position has received support in various experimental and clinical studies (Eysenck, 1992). The various correlated traits that comprise P are shown in Figure 3.

*Figure 2:* Psychoticism as a personality variable. P_A indicates probability of psychopathology at various levels of P. From Eysenck (1992).
Given the links between P and psychopathology, and between psychopathology and creativity, research further suggested that P was highly associated with creativity as both a trait (Woody & Claridge, 1977) and as an achievement (Goetz & Goetz, 1979 a, b). However persons diagnosed as schizophrenic did not earn perform well on tests of creative thinking This led Eysenck to suggest that:

*creativity demands a combination of high P and high ego strength; there is considerable evidence for the necessity of combining these two apparently antithetical properties...psychosis should never be identified with psychoticism; the former is an illness, the latter a predisposition* (p. 237).

**P, Mental Processes, and Creativity**

Eysenck's observation of the links between P, psychosis, and creativity led further to a search for the basis of these findings. A promising start was to examine the cognitive styles or mental processes common to the creative process, and characteristic of high P persons as well as psychotics. Mednick (1962) had earlier argued that creativity is the result of an 'associative process' so that creativity could
be defined as "the forming of associative elements into new combinations ... the more mutually remote the elements of the new combination, the more creative the process or solution". Of course there was the recognition that the result of this new association should meet some criterion for creativity or usefulness. Mednick further suggested that creative persons have a shallow or more flat associative gradient. This allows the person a wider interpretation of relevance as far as responses to stimuli are concerned. Eysenck argued that creativity was not random or chance associations but rather 'relevant' associations.

Extending his analysis further to psychotic thinking, Eysenck drew from Cameron's (1947) notion of overinclusion. Cameron and others have shown the schizophrenics overgeneralize to the extent that they are unable to maintain conceptual boundaries. Thus they may incorporate many elements into their concepts that may be associated but are not an essential part. Payne's (1960) reformulation of this theory of overinclusion suggested that it may be akin to extreme stimulus generalization due to a breakdown in the 'filter mechanism' that cuts out or inhibits irrelevant stimuli. A further parallel is found in the 'allusive thinking' of schizophrenics (McConaghy & Clancy, 1968). Eysenck also recognized the relationship and relevance of Rapaport's (1945) suggestion that the thought disturbances in schizophrenics were of two kinds: concrete and looseness of thinking. Here the distinction between the thinking of the creative individual and the schizophrenic becomes potentially more clear with looseness being more linked with P and essential to creativity but concreteness being more associated with psychosis and contradictory to creativity. Following from the above examination, Eysenck suggested that there was considerable similarity in the thinking of schizophrenics and highly creative, but normal persons.

The research on overinclusion has suggested that it is highly correlated with creativity, is highly characteristic of schizophrenic patients, and is also correlated with P. Given these promising links, Eysenck has extensively described the 'causes' of overinclusiveness, namely negative priming and latent inhibition. As stated by Eysenck:

Both fulfill the role to an extent indicated by a great deal of experimental work; both have been shown to be linked with schizophrenia... and both have been shown to be equally related to psychoticism... there has not been any direct study of these variables in creative as opposed to noncreative people...the theory underlying negative priming and latent inhibition, however, presents a possible answer to our problem as well as an experimental paradigm that can be used to test the theory... (p. 239).

Lastly, Eysenck has implicated the relevance of cortical arousal together with personality in creativity. Research examining how both creativity and P are related to lower levels of arousal may add further to understanding of the cortical substrates and physiological influences on both trait and achievement creativity.
Summary

The study of creativity presents a host of complex research difficulties. Without a theoretical paradigm, our research efforts may be very much like the schizophrenic's thinking in which we simply keep randomly looking for correlations/associations and eventually become overwhelmed by overinclusive thoughts and even chance correlations. Much like the neurologist who became excited at the opportunity to 'study the thing (i.e. brain) that studies', the study of creativity requires that we look for and examine relevant associations between the findings from experimental psychology, the experiences of the clinical psychologist, descriptions of psychopathology, current theories of personality and intelligence, and more. From there a theory may be built that provides testable hypotheses and a scientific framework for evaluating the findings generated from the ensuing research. Hans Eysenck's creative genius has given us just such a theory of creativity. In the process he has exemplified both trait creativity and achievement creativity. The challenge of testing this theory now falls to us.

References


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**Doprinos Hansa Ajzenka izučavanju i analizi kreativnosti**

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Doprinosi profesora Ajzenka naučnoj psihologiji su monumentalni. Njegovi teoretski i istraživački napori značajno su uticali na izučavanje ličnosti i individualnih razlika. Introverzija-ekstraverzija i neuroticizam su najpoznatije biološki zasnovane izvorne crte ili superfaktori. U skorije vreme Ajzenk je proširio svoje poglede na treću glavnu dimenziju ličnosti nazvanu psihoticizam i uključio je u EPQ. Jedan od najinteresantnijih tekućih radova bile su pretpostavljene veze između psihoticizma i kreativnosti koje su prikazane u ovom radu. Ovaj rad takođe ima za cilj da ilustruje kreativni genije profesora Ajzenka.

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**Вклад Ханса Айзенка в изучение и анализ творческого воображения**

ДОНАЛЬД Х. САКЛОФСКЕ

Вклад профессора Айзенка в научную психологию монументальный. Его теоретические и исследовательские усилия оказали значительное влияние на изучение личности и индивидуальных различий. Интроверсия - экстраверсия и нейротизм - это самые известные биологически обоснованные черты или сверхфакторы. Впоследствии Айзенк расширил свои взгляды на третью основную величину личности, названную психотизмом, и включил ее в EPQ. В одной из самых интересных новейших работ рассматриваются
предпосылочные связи между психозом и творческим воображением которые обрабатываются и в настоящей работе. Задачей этой работы ставится, также, проиллюстрировать творческую гениальность профессора Айзенка.