



# Hans Eysenck: A research evaluation

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## ABSTRACT

Hans Eysenck made outstanding contributions to the description of human personality with his identification of three orthogonal personality dimensions although his approach was less exhaustive than that of subsequent researchers. He also proposed an ambitious agenda for developing comprehensive theoretical explanations based on the experimental approach and the biological underpinnings of major personality dimensions. Subsequent theories have followed his blueprint. Hans Eysenck's higher-level theoretical assumptions have stood the test of time better than his lower-level ones. However, a general limitation was his de-emphasis of cognitive processes and structures. He was less successful at implementation and interpretation than theory generation. This occurred in part because of his preference for a lawyer-like approach to research rather than a more scientific and objective one.

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## 1. Introduction

Hans Eysenck (my father) had a very long and phenomenally productive career. It would be absurd of me to pretend to have a detailed familiarity with all this work. In any case, it would be impossible to discuss it all in a single article. Instead, I have focused on his major contributions as well as his approach to research. My relationship with my father is discussed in *M. Eysenck (2013)*.

### 1.1. Dimensions of personality: historical context

It is important to consider Hans Eysenck's taxonomic approach to individual differences in personality within the relevant historical context. American psychologists typically assumed the optimal approach was to identify a fairly large number of correlated or primary factors. For example, *Guilford (1939)* argued that there were probably approximately 20 important primary traits.

In practice, Guildford identified 11 personality traits or factors. In similar fashion, Cattell developed his Sixteen Personality Factor (16PF) Questionnaire that identified 16 traits or factors, many dissimilar to those identified by Guildford.

This approach can be contrasted with Hans Eysenck's emphasis on identifying a small number of orthogonal or second-order factors. It was plausible a priori to prefer the former, primary-factor approach be-

cause in principle it should come closer to capturing the richness of human personality. In the words of *Cattell, Eber and Tatsouka (1970, pp. 111–112)*:

“The primary factors give one most information, and we would advocate higher-strata [second-order] contributors only as supplementary concepts.”

In practice, this putative advantage of the primary-factor approach was not manifest for two main reasons. First, it proved very difficult to replicate the primary factors identified with any given personality test. For example, *Barrett and Kline (1982)* conducted several different factor analyses on the 16PF. They found between seven and nine factors in these analyses, and these factors were tenuously linked to Cattell's 16 factors. Second, it proved impossible to achieve consensus on the number and nature of the primary factors of personality.

It was also typically assumed (sometimes implicitly) that individual differences in these primary factors depended almost entirely on environmental influences. This assumption derived in part from the excessively environmentalist behaviorist approach prevalent at the time, and was subscribed to by later social learning theorists such as Rotter and Bandura. Intriguingly, *Guilford (1934, p. 337)* argued that, “most writers have regarded I–E [introversion–extraversion] as primarily a matter of heredity”, however, he failed to test this hypothesis.

Many American personality researchers in the 1930s and 1940s relied heavily on factor analysis in their studies of individual differences in personality. This technique provides suggestive evidence concerning the number and nature of personality factors. However, the personality

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factors identified by factor analysis are not necessarily the most important ones. Much additional research was required (but rarely carried out) to establish their importance and validity and to provide explanatory accounts.

## 2. Dimensions of personality

Hans Eysenck's approach to personality was distinctively different from previous ones. He advocated focusing on large, second-order factors. His early contention that extraversion and neuroticism are the most important and readily replicable personality factors has stood the test of time. Similar factors had previously been identified on both sides of the Atlantic Ocean. However, nearly all American personality theorists (and Freud) assumed extraversion was negatively correlated with neuroticism/anxiety and so often failed to distinguish clearly between the two dimensions. Of interest, Jung (1923) argued that the two dimensions were independent of each other. In fact, there is a moderate negative correlation between extraversion and trait anxiety (Gray, 1981) but the neuroticism dimension was designed to be orthogonal to extraversion.

In England, Burt (1915) identified a factor of general emotionality resembling neuroticism. Burt (1940) replicated his earlier findings and also identified "a bipolar factor making for aggressive behavior when positive and for inhibited or introverted behavior when negative" (p. 374). However, Burt's research was limited in scope and methodology.

Evidence supporting the notion that extraversion and neuroticism are of special importance has come from re-analyzing data from personality questionnaires not explicitly assessing these dimensions (e.g., Saville & Binkhorn, 1976, 1981). There is a thorough discussion of this research in Eysenck and M. Eysenck (1985) and it would be otiose to repeat that discussion. Of particular importance is subsequent research based on the fundamental lexical hypothesis (the notion that all salient individual differences in personality are represented by single words in language). Researchers (e.g., Goldberg, 1990) using this hypothesis to discover the main personality factors have consistently identified factors resembling extraversion and neuroticism even though their approach differs radically from Hans Eysenck's.

Support for the special importance of extraversion and neuroticism has come from studies comparing the structure of personality and of mood. Meyer and Shack (1989) compared the two-dimensional model of mood (positive affect and negative affect) with the two-dimensional model of personality (extraversion and neuroticism). The two models shared a structural identity: extraversion aligned with positive affect and neuroticism aligned with negative affect.

There is much less consensus that Hans Eysenck's third orthogonal factor, psychoticism, is of major importance (e.g., van Kampen, 2009). The dominant approach to personality is the five-factor model (e.g., Costa & McCrae, 1992; McCrae & Costa, 1985). The Big Five factors identified within this model do not include psychoticism. Two of the five factors (agreeableness and conscientiousness) correlate negatively with psychoticism although the correlation between conscientiousness and psychoticism is relatively modest.

The above findings suggest agreeableness and conscientiousness might be primary factors associated with the higher-order factor of psychoticism (Eysenck, 1992a,b). However, there is no compelling support for this interpretation. It is noteworthy that essentially the same five factors have been found using several very different methodologies and across numerous cultures (McCrae & Costa, 1997).

Another reason for doubting the fundamental importance of psychoticism (P) is the fact that its nature changed considerably over the years: Claridge, Robinson and Birchall (1983) found the correlation between the original P scale and that in the Eysenck Personality Questionnaire (EPQ) was only +.19. Finally, the mean scores on the 25-item psychoticism scale on the EPQ were very low: 2.63 for females and 3.78 for males. These low means (and a strong positive skew in

the distribution) imply that the P dimension is not directly relevant to much of the healthy population.

In spite of the above doubts about whether psychoticism qualifies as one of the main personality dimensions, it is clearly important in many contexts. For example, Corr (2010) discussed much evidence of commonality between psychoticism and psychopathy. More specifically, he argues persuasively that psychoticism and psychopathy have similar deficits involving the behavioral approach system, the behavioral inhibition system, and the fight-flight-freeze system.

## 3. Explanations of personality

Hans Eysenck adopted a more ambitious and systematic approach to human personality than any previous theorist. The essence of his approach (Eysenck, 1994, pp. 7–8) was as follows:

"In order to qualify as a major dimension of personality, any concept should be based on a general theory which has its antecedents in DNA (genetic analysis), and advances through biological intermediaries (psychophysiological, hormonal, etc.) to the dimensional and factorial analysis of behavior and trait patterns. It should from there proceed to the experimental testing of the general theory, making deductions from the theory as to how people at various positions on the relevant personality dimensions would behave in carefully designed experimental situations. And finally one would expect that the theory, and the knowledge acquired through experimental study, should enable us to make predictions as to the general social behavior of people in carefully defined situations."

Below some of these aspects of Hans Eysenck's approach are discussed. For reasons of space, it is not feasible to address all of them.

### 3.1. Heritability of personality

One of Hans Eysenck's key contributions to personality theory was his emphasis on the major role played by genetic factors in accounting for individual differences in personality. He argued (Eysenck, 1979, p. 525), "Using measures of the major personality dimensions P, E, and N, and calculating heritabilities along the lines of modern biometrical genetical analysis, we get figures in the band from 60% to 80%, when test unreliability has been allowed for."

Vukasović and Bratko (2015) recently reported a comprehensive meta-analysis of twin, family, and adoption studies of personality. They assessed the percentage of individual differences in each Eysenckian dimension due to genetic factors: for extraversion, it was 39%, for neuroticism it was 42%, and for psychoticism it was 30%.

The above findings indicate genetic factors are less important than assumed by Hans Eysenck. However, an early study by Eysenck and Prell (1951) is inconsistent with that conclusion. They reported a very high heritability estimate of 81% in a twin study on neuroticism assessed by a gallimaufry of unreliable tests including the body-sway and Rorschach tests. An attempted replication of Eysenck and Prell's study by Blewett (1953) was notably unsuccessful: several tests failed to intercorrelate as predicted, there was no clear neuroticism factor, and there was scant evidence of any hereditary determination (Shields, 1954).

### 3.2. Biological underpinnings

As mentioned earlier, most early American personality researchers focused on using factor analysis applied to questionnaire data to provide descriptive accounts of human personality. This approach is intrinsically limited. Hans Eysenck pointed out that explanatory accounts of personality could be developed by relating individual differences in personality to their biological underpinnings. This approach was a substantial advance, and has had a major impact (e.g., Cloninger, Svrakic, & Przybeck, 1993; Gray, 1981; Pickering, Cooper, Smillie, & Corr, 2013).

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