



PERGAMON

Personality and Individual Differences 28 (2000) 191–194

PERSONALITY AND
INDIVIDUAL DIFFERENCES

www.elsevier.com/locate/paid

Special Review

Intelligence: A New Look; Hans J. Eysenck, Transaction Publishers, New Brunswick, NJ, 1998, 227 pp, ISBN: 1-56000-360-X.

Hans Eysenck's final thoughts on intelligence

It is fitting that Eysenck's last book is about human intelligence. He has claimed that this subject was his first interest in psychology. It attracted him, he said, because intelligence was the first important mental trait susceptible to measurement, a most important point for Eysenck. Objective measurement and quantitative treatment of data were, in his view, essential for advancing psychology as an empirical natural science. Although Eysenck's major research was in personality, abnormal psychology, and behavior therapy, he periodically returned to the subject of intelligence, writing three books about it, editing two multi-authored books, and publishing many articles on the subject in psychological journals. His 1967 article in the *British Journal of Educational Psychology* (Vol. 37, 81–98) did much to revive Galton's basic paradigm for intelligence and encouraged new research along Galtonian lines. This viewpoint, though not popular, has predominated in professional circles in recent years. Eysenck's contributions are actually an extension of Galtonian ideas combined with the quantitative and biological approach associated with the so-called 'London School', which was inspired by Darwin and Galton and further implemented methodologically by Charles Spearman, the inventor of factor analysis and the discoverer of psychometric *g*.

This book's subtitle, *A New Look*, refers not to any essentially new formulations or ways of thinking about intelligence, but to recent developments and extensions of the essential paradigm of the London School. This is cumulative science, in marked contrast to the passing parade of ephemeral fads witnessed in the popular literature on intelligence in recent years. For those who want the shortest, the most readable, the least technical, and at the same time the most authoritative book that explains how the vast majority of the leading scientists working in this field actually view it, this book surely fills the bill. Although I have kept in close touch with the research literature on mental abilities during the past 40 years, I found reading this book not only informative but also enjoyable, as an example of how to write about a complex subject in a style suitable for lay persons and students with little background in the technical aspects of this field. Eysenck is a master expositor of psychological subjects, combining the talents of both a working scientist and a popular science writer. (The few typographical errors should be corrected in the book's second printing; the only error that is not obvious and is apt

0191-8869/99/\$ - see front matter © 1999 Published by Elsevier Science Ltd. All rights reserved.

PII: S0191-8869(99)00056-2

to puzzle nonspecialist readers is on p. 57, where apparently a word-processor's spell checker incorrectly changed "the *eduction* of relations and correlates" to "the *education* of..." etc.—by far the most common typographical error in the whole literature on intelligence!)

The basis of fact and theory from which modern research on human intelligence operates and the kinds of questions presently considered important for further research are laid out here in a clear and even entertaining style. Unlike the typical college textbook, which today, at least in psychology, attempts to maintain a neutral and uncritical 'balance' between widely differing viewpoints in the field, regardless of their theoretical coherence or empirical support, Eysenck presents a definite and scientifically coherent picture, concisely and forthrightly expressed. He pulls no punches in opposing empirically unsupported, extra-scientific, ideologically based, or misleading claims about intelligence and mental tests, such as we see too often promoted by the popular media.

Eysenck begins by crediting Sir Francis Galton as "The person most directly responsible for making intelligence a scientific and measurable concept... His major contribution to differential psychology [the study of individual differences] arose from his conviction that all human characteristics, both physical and mental, could ultimately be described quantitatively... He conceived of intelligence as a general ability, largely inherited, and best measured in terms of speed of mental processes... [He was] firmly convinced that general cognitive ability was by far the most important influence on a person's life achievements." Eysenck then tells how these Galtonian ideas have played out during the recent revival of the Galton paradigm for research on mental ability. It turns out that Galton's reasoning and scientific intuition have proved remarkably correct regarding his original conjectures quoted above.

The topics explicated in the book are indicated by the fifteen chapter titles: The Paradox of Intelligence and Its Measurement, Origin and Meaning of IQ, Nature and Nurture: The Great Partnership, Intelligence, Reaction Time, and Inspection Time, The Biological Basis of Intelligence, What is the Use of IQ Tests?, Can We Improve IQ?, Many Intelligences?, Creativity in History: What is Genius?, Creativity and Intelligence, Conditions for Excellence and Achievement, Genius and Heredity, Psychopathology and Creativity, Cognition and Creativity, Much Ado About IQ. The appendix includes an important document that originally appeared in the *Wall Street Journal* (December 13, 1994) and was reprinted in the psychological journal *Intelligence* (1997, Vol. 24). Titled *Mainstream Science on Intelligence*, this statement lists 25 points summarizing the present scientific knowledge about intelligence and signed by 52 professors known for their research in this field. This statement allows readers to judge for themselves whether Eysenck's account is consonant with 'mainstream science'. It certainly is, but Eysenck also takes up new topics closer to the frontier of the science, where there is naturally less certainty and consensus of expert opinion.

Before mentioning 'The New Look' aspects of recent intelligence research that Eysenck presents, it should be noted that in this popular, nontechnical book, Eysenck has mercifully eschewed any attempt to explain the field's principal research tool, *factor analysis*, just as a popular book on, say, relativity theory, would not try to explain tensor calculus. But what Eysenck is really writing about is more accurately and precisely called the *g* factor, or psychometric *g*, rather than *intelligence*, a word which, as Spearman once remarked, has so many meanings that finally it has none. The *g* factor defies description in psychological terms, because it is really not an ability at all, but something that empowers all other psychologically

describable mental abilities. Psychometric *g* is at the apex of the factor hierarchy. At the strata of the hierarchy below *g* are a number of independent *group factors*, each of which is common to only certain types of quite similar tests, such as various distinctly verbal, or spatial, or numerical tests. The *g* factor, however, accounts for more of the common factor variance than any other common factor (independent of *g*), and in many test batteries *g* accounts for more of the variance than all the other residualized factors combined. Because IQ tests reflect the *g* factor to a very high degree (about .80) and usually reflect certain group factors as well, particularly a verbal factor (but to a far less degree than *g*), Eysenck is justified in using the more popular term IQ as a stand-in for *g*.

Briefly, here are some of the *New Look* points about IQ (or *g*) explained in this book. Little of it has yet gotten into most of the modern psychology textbooks. It has long been known, of course, that IQ is highly heritable (and *g* is even more heritable than IQ), based on studies of twins and other genetic kinships. Yet this fact is still debated in some circles. But now behavioral geneticists, led by Professor Robert Plomin at the Institute of Psychiatry, are discovering the precise loci of the genes for IQ by comparing the DNA of groups of exceptionally high IQ persons with that of groups with average IQ. Several such genes have already been identified and the search for more continues apace. These findings mean there can no longer be any argument about the genetic component in IQ differences. Even the influence of environment is governed to a considerable extent by the genes, in that individuals select and create different environments so they are compatible with their own genotypic propensities. Studies of siblings and adopted children show that differences between the family environments per se have exceedingly little influence on individual differences in IQ. The modern paradigm is not ‘nature *or* nurture’ but ‘nurture *via* nature’.

Galton was also finally proven right on another point explained by Eysenck. It is now firmly established that IQ is correlated with the speed of information processing as measured by various tests of choice and discrimination reaction time. Such tests do not depend on acquired knowledge or skills; each trial on such tests typically takes less than one second, and virtually everyone above about three years of age can take these tests. The critical measure is reaction time, or decision speed, which discriminates significantly between groups at different levels of IQ, even within the population of high-IQ university students. A biological basis of IQ is indicated by recent research on its purely physical correlates, such as brain size, the brain’s electrical potentials, brain glucose metabolic rate, nerve conduction velocity, and biochemical factors such as hormones and neurotransmitters.

IQ level also plays a crucial role in achievements outside the testing room, in school, college, occupations, income, and genius and creativity. But a superior IQ alone is not sufficient to result in any outstanding and socially valued intellectual achievements. For this, IQ must also interact favorably with a number of variables in the environment and especially in the personality sphere. A large part (36%) of this book deals with the role of intelligence in creativity and genius. The fascinating ‘new look’ here is the modern research on the ancient belief that genius and madness are closely allied. A fairly high IQ is a necessary but not sufficient condition for genius. Another probably necessary (but certainly not sufficient!) condition is what Eysenck terms *trait psychoticism*. This is not a psychiatric illness, but a particular constellation of largely inherited personality characteristics, which can be measured by the P scale of the Eysenck Personality Questionnaire. Some or all of these High P

characteristics are seen in many of the world's most famous geniuses—too numerous to mention in this review. The book's three chapters on genius and creativity summarize the theory and research presented in far greater detail in one of Eysenck's most important works, *Genius: The Natural History of Creativity* (1995).

The chapter titled 'Can We Improve IQ' will probably be considered the most controversial, yet it is the most potentially fruitful if further research bears out the promise of the still rather tentative findings, namely, that vitamin and mineral supplements given to certain children over a period of months, can raise their IQs by up to 10 points or more. These children were not socioeconomically deprived, but middle-class Americans and Britons. But the children most susceptible to benefit from the vitamin supplements must be specially selected for specific deficiencies. Blood tests to detect deficiencies in essential vitamins were able to predict which children would actually benefit from the supplements. Usually the child that benefits is the only one in a given family who shows a critical deficiency, while that child's siblings who do not show any deficiency receive no benefit from the supplements. It is a matter of *individual differences* in particular vitamin requirements rather than just a generally poor diet as is often associated with families living in dire poverty. Considering the repeated failures of strictly educational and psychological interventions to have any lasting effects in raising IQ, the type of nutritional treatment indicated by Eysenck surely merits much further research. If large-scale research on nutrition and IQ replicates the preliminary findings cited by Eysenck, it would add one more blow against the popular doctrine that socioeconomic factors are the paramount cause of individual differences in IQ and its many educationally and socially important correlates. This widely held but false belief would lose public acceptance if the general public comes to understand the scientific facts concerning the nature of human mental abilities, so well presented in Eysenck's book.

Arthur R. Jensen

University of California, Berkeley, USA