

# The g Factor: The Science of Mental Ability

Arthur R. Jensen

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Few scientists have effects or laws named after them. Arthur Jensen's name is listed in a number of dictionaries as an "ism!" The Random House and Webster's Unabridged Dictionaries contain the following entry:

**Jen-sen-ism** (jen'se niz'em), *n.* the theory that an individual's IQ is largely due to heredity, including racial heritage. [1965-1970]; after Arthur R. Jensen (born 1923), U.S. educational psychologist, who proposed such a theory; see **-ism**—**Jen'sen-ist**, **Jen'sen-ite'**, *n.*, *adj.*

The "theory" attributed to Jensen has, in fact, been around since the time of Francis Galton (1822-1911), whose *Hereditary Genius* (1869) predated by exactly one century Jensen's famous *Harvard Educational Review* article that led him to be labeled a "hereditarian." The dictionary definition cannot be overly derided, however, as Jensen's (1969) review of the evidence that IQ is heritable and that genetic factors are involved in the Black-White IQ gap had enormous impact.

Jensenism, one of the great heresies of twentieth-century science, is partly responsible for getting the Darwinian-Galtonian paradigm back on track in differential psychology after it had been derailed in the behavioral sciences for at least a generation following World War II. In a brilliant 40-year career that has earned him a place among the most frequently cited figures in contemporary psychology, Arthur Jensen has systematically researched and extended Charles Spearman's (1927) seminal concept of *g*, the general factor of intelligence. *The g Factor* is an awesome and monumental exposition of the case for the reality of *g*. It does not draw back from its most controversial conclusions—that the average differences in IQ found between Blacks and Whites has a substantial hereditary component, and that this difference has important societal consequences.

However, *The g Factor* is not about race, as such. The first five chapters deal with the intellectual history of the discovery of *g* and various models of how to conceptualize intelligence. Other chapters deal with the biological con-

lates of *g* (excluding race), its heritability, and its practical predictive power. The fact that psychometric *g* has many physical correlates proves that it is not just a methodological artifact. Among biological variables, *g* loads on heritability coefficients determined from twin studies and inbreeding depression scores calculated in children born from cousin-marriages. *g* is also related to brain size measured by Magnetic Resonance Imaging (MRI), brain evoked potentials, and intracellular brain pH levels. It (*g*) is a product of human evolution and is also found in nonhuman animals.

Despite these caveats, *The Bell Curve affair* allows one to safely predict that *The g Factor's* coverage of race will strike many as of central importance. All the issues Jensen raised in 1969 are still with us today. Indeed, much of the opposition to IQ testing and heritability would probably disappear if it were not for the stubborn and unwelcome fact that, despite extensive well-funded programs of intervention, the Black-White difference refuses to go quietly into the night. Chapter 11 of *The g Factor* fully documents that, on average, the American Black population scores below the White population by about 1.2 standard deviations, equivalent to 18 IQ points. (This magnitude of difference gives a median overlap of less than 15%, meaning that less than 15% of the Black population exceeds the White average of 50%).

The difference between Blacks and Whites in average IQ scores has scarcely changed over the past 80 years (despite some claims that the gap is narrowing) and can be observed as early as three years of age. Controlling for overall socioeconomic level only reduces the mean difference by 4 IQ points. Culture-fair tests tend to give Blacks slightly *lower* scores, on the average, than more conventional tests, as do nonverbal tests compared with verbal tests, and abstract reasoning tests compared with tests of acquired knowledge. On average, Blacks also score 1 standard deviation below Whites in academic achievement throughout the period from grades 1 through 12 (and also considerably below all other disadvantaged minorities tested—Puerto Rican, Mexican-American, and American Indian).

## International IQ Distribution

Inspired by "Jensenism," researchers like Richard Lynn and Philip E. Vernon not only pushed the envelope, but extended the "outside of the envelope" and made the race-IQ debate

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international in scope with their findings that East Asians average higher on tests of mental ability than do Whites, whereas Caribbeans (and especially Africans) average lower. East Asians, measured in North America and in Pacific Rim countries, typically average IQs in the range of 101 to 111. Caucasoid populations in North America, Europe, and Australasia typically have average IQs from 85 to 115 with an overall mean of 100. African populations living south of the Sahara, in North America, in the Caribbean, and in Britain typically have mean IQs from 70 to 90. (Blacks in sub-Saharan Africa score about 2 standard deviations [approximately 30 IQ points] below the mean of Whites on nonverbal tests.)

### Spearman's Hypothesis

But the 18-point IQ difference between American Blacks and Whites is only an average. On some subtests the Black-White difference is smaller and on other subtests the Black-White difference is larger. Black-White differences are markedly smaller on tests of rote learning and short-term memory than on tests of reasoning and those requiring transformation of the input. For example, on the Forward Digit Span Test, in which people are asked to recall a series of digits in the same order as that in which they were presented, Black-White differences are quite small, but on the Backward Digit Span Test, in which people recall a series of digits in the *reverse* order to that in which they were presented, they are quite large. One day, while rereading Spearman's (1927) *The Abilities of Man*, Jensen tells us that he noted the suggestion (which appears on page 379) that Black-White differences on various tests are a function of each test's *g* loading. Here, Jensen thought, was the essential phenomenon that would explain, in much broader, more fundamental terms, the specific psychometric phenomenon that gave rise to the variation in the Black-White average differences.

*The g Factor* summarizes the results of numerous investigations of Spearman's hypothesis on a wide variety of psychometric tests administered to large representative samples of Whites and Blacks. Chapter 11, for example, describes the results from 17 independent data sets on a total of nearly 45,000 Blacks and 245,000 Whites derived from 171 psychometric tests. *g* loadings consistently predict the magnitude of the Black-White difference ( $r = +.63$ ). Spearman's hypothesis is borne out even among three-year-olds administered eight subtests of the Stanford-Binet. The rank correlation between the *g* loadings and the Black-White differences is  $+.71$  ( $p < .05$ ).

These *g*-related race differences are not due to factors such as the reliability of the test, social class differences, or tautologies based on some inevitability of factor analysis. Indeed, it is not even universally true that all groups that differ, on average, in their overall score on a test battery will conform to Spearman's hypothesis. In South Africa,

although the nearly 1 standard deviation difference between Whites and East Indians showed no correlation between *g* loadings and standardized mean differences, the 2 standard deviation difference between Whites and Blacks showed a correlation of  $+.62$ .

Spearman's hypothesis even applies to the *g* factor extracted from performance on elementary cognitive tasks. In some of these studies, 9- to 12-year-olds are asked to decide which of several lights is illuminated and move their hand to press a button that turns that light off. All children can perform the tasks in less than one second, but children with higher IQ scores perform faster than do those with lower scores, and White children, on average, perform faster than Black children. The correlations between the *g* loadings of these types of reaction-time tasks and the Black-White differences range from  $+.70$  to  $+.81$ .

Jensen also applied Spearman's hypothesis to East Asian-White comparisons using these same reaction-time measures. The direction of the correlation is *opposite* to that in the Black-White studies, indicating that, on average, East Asians score higher in *g* than do Whites. No one so far seems to have looked at East Asian-White differences on conventional psychometric tests as a function of their *g* loadings. From the study just mentioned, however, Jensen's prediction is clear: One should find the reverse of Spearman's hypothesis for Black-White differences.

### Are Race Differences Heritable?

Chapter 12 presents Jensen's technical arguments for why he believes that race differences are about 50% heritable. He emphasizes the fact that it is precisely those components of intelligence tests that are most heritable and that most relate to brain size which most profoundly differentiate Blacks from Whites. Thus, Black-White differences on 11 subtests of the Wechsler Intelligence Scale for Children are predicted by the amount of inbreeding depression on the same 11 subtest scores from Japan ( $r = +.48$ ). The inbreeding prediction was a sufficiently robust predictor to overcome generalization from the Japanese in Japan to Blacks and Whites in the United States. There really is no non-genetic explanation for the inbreeding effect and its ability to predict Black-White differences in scores on IQ tests.

*The g Factor* also cites the evidence of transracial adoption studies. Three studies have been carried out of Korean and Vietnamese children adopted into White American and White Belgian homes. Though many had been hospitalized for malnutrition, prior to adoption, they went on to develop IQs 10 or more points higher than their adoptive national norms. By contrast, Black and Mixed-Race (Black-White) children adopted into White middle-class families typically perform at a lower level than similarly adopted White children. In the well-known Minnesota Transracial Adoption Study, by age 17, adopted children with two White biological parents had an average IQ of 106; adopted children with

one Black and one White biological parent averaged an IQ of 99; and adopted children with two Black biological parents had an average IQ of 89.

*The g Factor* also devotes a fair amount of space to racial differences in brain size. Chapter 6 reviewed the literature that found that the brain-size/IQ relation was most clearly shown using Magnetic Resonance Imaging ( $r = .44$  across eight separate studies). Chapter 12 documents the three-way racial gradient in brain size established by aggregating data from studies using four kinds of measurements: (a) wet brain weight at autopsy, (b) volume of empty skulls using filler, (c) volume estimated from external head sizes, and (d) volume estimated from external head measurements and corrected for body size. East Asians and their descendants average about  $17 \text{ cm}^3$  ( $1 \text{ in}^3$ ) larger brain volumes than do Europeans and their descendants, whose brains average about  $80 \text{ cm}^3$  ( $5 \text{ in}^3$ ) larger than do those of Africans and their descendants. Jensen calculated an "ecological" correlation (widely used in epidemiological studies) of  $+0.99$  between median IQ and mean cranial capacity across the three populations of "Mongoloids," "Caucasoids," and "Negroids."

*The g Factor* also considers the race differences from an evolutionary perspective. Jensen endorses the "Out-of-Africa" theory, that *Homo sapiens* arose in Africa about 100,000 years ago, expanded beyond Africa after that, and then migrated east after a European/East Asian split about 40,000 years ago. Since evolutionary selection pressures were different in the hot savanna where Africans evolved

than in the cold Arctic where Mongoloids evolved, these ecological differences had not only morphological, but also behavioral effects. The farther north the populations migrated "Out of Africa," the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children during prolonged winters. As these populations evolved into present-day Europeans and East Asians, they underwent selective pressure for larger brains.

In recent years, the equalitarian dogma has run headlong into some bad karma. In the wake of the success of *The Bell Curve* (Herrnstein and Murray, 1994), and other recent books about race (including my own) to provide race-realist answers to the question of differential group achievement, there has been an intense effort to get the "race genie" back in the bottle, to get the previously tabooed toothpaste back in the tube. By firmly establishing the psychometric, neurophysiological, behavior genetic, and comparative evidence for the existence and importance of Spearman's *g*, Jensen's *The g Factor* makes it near certain that such efforts will end up shredded by Occam's razor.

## References

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The g Factor: The Science of Mental Ability is a 1998 book by psychologist Arthur Jensen. The book is about the topic of the general factor of human mental ability, or g. The book traces the origins of the idea of individual differences in general mental ability to 19th century researchers Herbert Spencer and Francis Galton. Charles Spearman is credited for inventing factor analysis in the early 20th century, which enabled statistical testing of the hypothesis that general mental ability is required. Mental ability, which ranges widely in every large population, is normally distributed, and various human races differ, on average, in mental ability. 17. The g factor is found to be relatively invariant across different batteries of diverse tests of mental ability. This fact justifies the postulation of a true g (analogous to true score in classical measurement theory), of which the g obtained in any empirical study is an estimate. 18. The g factor is also found to be ubiquitous and relatively invariant across various racial and cultural groups. 19. The form of the population distribution of g is not known, because g cannot yet be measured on a ratio scale, but there are good theoretical reasons to assume that the distribution of g approximates a normal distribution.