

Environmental and Genetic Impact on the IQ

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The long-standing discussion surrounding the multidimensional concept of IQ no longer revolves around the rudimentary controversy over its validity in numerically representing one's intelligence. The discourse has instead shifted to the more nuance, and arguably more political, question of whether certain racial groups are genetically prone to predetermined levels of intelligence. Evaluating the two opposing theories--the genotypic disadvantage and the environmental disadvantage--transitions into the debate of whether IQ is inherently based on genetics, controlled by nurture, or both. Decades of research points to one logical conclusion: The primary source of the racial IQ gap lies in the exogenous environmental factors related to one's socioeconomic status, thereby negatively impacting the beneficial resources that would typically foster high cognitive ability. Yet genetic influence on intelligence proves to be far more pertinent when examining the intelligence of people on an individual basis, disregarding the racial group he or she belongs to altogether. Nevertheless, there exists an undeniable mutual dependency between genes and environmental factors in shaping someone's intelligence.

Research collected over the course of several decades revealing noticeable racial IQ gaps among Black and white people may serve as credible rationale for one to assume that IQ differences are indeed inherently genetic. Among 1,102 Chicago children in the fifth and sixth grade, white middle class boys had an average IQ of 107.6 while Black middle class boys had an average of 100.2 (Gordon, 1976). Likewise, in an analysis of 319 Black students and 163 white students, the average IQ of a handful of white students who fell below the mean IQ of the entire white student sample surpassed the above-average IQ score of Black students (Scarr-Salapatek, 1971). Such a polarizing statistic supports the possible presence of a racial genetic difference as it leads one to question: If these Black and white students are being educated in the same school,

why is there such a notable discrepancy in cognitive ability? The findings can at first be attributed to one possible genetic explanation discovered by Arthur Jensen, the pioneer of the hereditary theory: There is an observable difference in the frequency of blood-groups found between white and Black Americans, where 40% of a certain blood-group found in Caucasians are nearly absent in that of Africans (Rushton, Jensen, 2005). Regardless of how genetics may influence a certain race's blood composition, the relevance of blood-groups can nonetheless be discredited in the context of the discussion of IQ. A study conducted by Loehlin, Vandenberg, and Osborne in 1973 involved obtaining and analyzing blood work of 20 pairs of black twins and, after a series of 19 cognitive tests, discovered a negative correlation between the blood-group associated with whites and high IQ test scores (Flynn, 1980). Given the lack of evidence to support genetic differences among races affecting IQ, we are then compelled to confront the potential socioeconomic causes instead.

Evaluating the social and economic status of the racial group may provide an alternative hypothesis as to why the IQ gap phenomenon occurs. Schools operating under varying levels of economic frameworks across a variety of towns in the United States implement varying levels and methods of intellectual stimulation. Hence, where one receives an education thus affects how he or she procures a level of intellect measured by IQ tests. In other words, an environment exposed to a greater degree of economic shortage naturally lacks the resources needed to foster well-developed educational institutions. Given that Black Americans have the greatest poverty rate in the U.S of 27.4%, they statistically fall the greatest victim to this imbalance in educational availability (Walton, 2018). Consequently, they have been deprived of sufficient access to the consistent social and educational conditions essential to constructing the cognitive skills IQ tests measure (Gordon, 1976). The results of this socioeconomic disparity is demonstrated in an

extensive 9-year long longitudinal study done on 1,746 public school students in Pittsburgh that measured several environmental factors potentially responsible for impacting a student's IQ: the number of siblings the students had, how many parents they lived with, and the socioeconomic status of the parents and school. After creating a system that numerically represented one's socioeconomic status, a student who had a socioeconomic rating of 53 had an IQ score that was 12.7 points higher than someone with a socioeconomic rating of 23 (Kadane, et al., 1977). This trend is consistent among other countries other than the United States as well, such as China and Turkey, where the economic climates that create large disparities between the rich and the poor lead to the correlation between socioeconomic status and IQ scores (Nisbett, 2009). Because Black Americans experience the greatest amount of economic shortage, they thereby have significantly reduced access to attitudinal and structural resources necessary to cultivate higher cognitive abilities IQ tests aim to measure.

The socioeconomic status that influences the level of an individual's cognitive abilities comes with physical and psychological health implications as well. Various studies have concluded that vast amounts of health and lifestyle factors that come with poverty prevent an individual from reaching optimum development (Scarr-Salapatek, 1971). Such health and lifestyle factors range from nutrition, exercise, and child-rearing practices. Children who grew up in a lesser economically developed environment have reduced access to food of nutritional value, from the womb through development (Antonow-Schlorke et al., 2011). There also exists psychological health implications where cognition has proven to be negatively harmed by the financial burden that comes with enduring poverty. In 2013, researchers from four universities including Harvard and Princeton deduced that the cognitive strain caused by coping with financial difficulty equated to a 13-point deficiency in IQ (Watson, 2018). The participants of the

cognitive tests living under poverty psychologically lack the ability to think logically and critically at the level deemed "average," which may very well have a physiological root: Among a nationwide brain scan study of composed of 1,100 individuals from three to twenty years of age, those who grew up in a household that had an average income of \$25,000 or less had six percent smaller frontal cortices than the individuals with a familial income of over \$150,000 (Simon, 1978). It is thus apparent that an individual's cognitive development is prone be influenced by the physical and psychological implications associated with his or her socioeconomic status.

However, the relevancy of genetics in the development of someone's intelligence proves to be far greater when shifting the focus from the macro perspective of race to the micro perspective of the individual. That is, though large amounts of evidence suggest that genetics do not predispose *races* to a certain level of intelligence, they do suggest that *individuals* on a case-by-case basis are affected by genetics. It is thus imperative to recognize that white people are therefore not genetically superior to the Black community in terms of inheriting genes that naturally predispose them to intellectual superiority, but certain individuals could potentially be superior to other individuals due to inheriting their parents' genes, regardless of race. When analyzing the IQ test scores of adopted children with their adopted parents and biological parents, a higher correlation was found between the children and their biological parent (Myers, DeWall 2018). This is explained by the increasing apparency of genetic influences as individuals develop, from thirty percent during one's childhood to fifty percent in adulthood. A psychological concept worth considering in the discussion of IQ is one that answers the question of which genes ultimately control intelligence. The answer to this lies in the concept of polygenic DNA. This term refers to the fact that intelligence is controlled by multiple genes, shown in a

study where data analyzed from 126,559 people revealed every gene variation accounted for two percent of educational achievement difference (Myers, DeWall 2018). Such a conclusion was further enhanced with a British follow-up study that found nine percent of school achievement variation in sixteen-year-olds were able to be predicted by genetics (Selzam et al., 2016). Thus with the presented research, there exists evidence supporting the notion that genetics do indeed play a role in an individual's inborn intelligence.

The interplay between genetics and environmental factors remains to be an essential aspect in the discussion of the influences of one's intelligence. Research conducted by various psychologists and neuroscientists reveal an IQ gap by race, most notably between Black and white people. There also exists strong evidence supporting the genetic influence on one's IQ. Upon examining the psychological and sociological evidence from this paper, it is reasonable to conclude that genetic differences between racial groups placing white people intellectually superior to Black people are practically nonexistent, as the socioeconomic status of an individual is far more impactful. However, individuals are indeed genetically predisposed to a level of intelligence when excluding race from the discussion. We can only hope for the continuation of additional psychological research in the discovery of overlooked influences on one's IQ.

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