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***Mario Seccareccia***

# IQ CONTROVERSY

Four issues dominate debate about IQ: how intelligence should be defined and measured; genetic versus environmental factors; group differences; and the degree to which IQ stratifies individuals and groups by class and occupation.

## INTELLIGENCE DEFINED AND MEASURED

Science suggests a distinction between pre-theory and post-theory definitions. The transition from classical to modern astronomy marked a shift from one pre-theory concept to another, that is, from the notion that planetary motions should be reduced to circles to the notion of forces that are a function of mass and distance. The latter notion was more fruitful but had no advantage over the former in terms of clarity or quantification. Adding those attributes is the job of competing theories, each of which transforms the broad pre-theory concept into a post-theory concept. René Descartes said the sun turned on its axis and created a whirlpool; Isaac Newton said the sun attracted the planets in proportion to its mass and inversely as the distance squared; Albert Einstein said the sun warps space (and time) in its vicinity, and the planets follow the path of the resulting curved space. All accepted that they should pay attention to mass and space, but none thought that this concept should hand them specificity and measurability—that was their job.

Arthur Jensen (1998) gave up using the word *intelligence* because it lacked the specificity and measurability of his theory-embedded concept of *g*. He was asking a pre-theory concept to exhibit the characteristics that only a post-theory concept can have. In fact the architects of IQ tests have a perfectly satisfactory pre-theory concept to guide them: Intelligence is greater the greater the speed and quality of learning (where all have an equal chance and are positively disposed); and intelligence involves solving problems and therefore requires not only on-the-spot acuity but also working memory, information processing, a reasonable vocabulary, a reasonable fund of general information, basic numeracy, and so forth. IQ tests such as the Wechsler Intelligence Scale for Children (WISC) incorporate this notion of intelligence with subtests (Vocabulary, Information, and Coding), whose names betray their origins.

This concept was formulated in modern industrial societies. Those assessing intelligence in other social contexts should consult the Piagetian anthropologists. Some theorists recommend a broader concept. Robert Sternberg (1988) says we need not only analytic skills but also creativity and the practical intelligence to deal with problems such as a difficult coworker. Howard Gardner (1993) adds musical talent and athletic ability to the list of "intelligences." Daniel Goleman (1995) includes the character traits, such as empathy, temperance, and self-esteem, needed to solve "human" problems.

In response we need only amplify the pre-theory concept to make it plain that "speed and quality of learning" and "problem-solving skills" must be broad enough to allow various thinkers and students of various cultures to evidence just what skills and traits are relevant to socially valued problem solving. These empirical questions will not be settled by debate about whether we have an "adequate" definition of intelligence.

## GENES VERSUS ENVIRONMENT

Twin studies show that genes are powerful and environment weak in affecting individual differences in intelligence. Massive IQ gains over time (average IQ has risen as much as 20 points in a single generation) suggest environmental factors of enormous potency. To resolve this paradox, we must distinguish between the dynamics of individual differences within a cohort and trends between cohorts.

As an example, John and Joe are identical twins separated at birth. Identical genes make them both taller and quicker than average. John goes to school in one city, plays basketball a bit better on the playground, catches the eye of the grade school coach, plays on a team, and goes on to play in high school, where he gets really professional coaching. Joe goes to a different school, in a city 100 miles

away. However, precisely because his genes are identical to John's, precisely because he is taller and quicker than average to the same degree, he is likely to have a similar life history. In contrast, Mark and Allen are separated twins whose identical genes make them both a bit shorter and stodgier than average. They too have similar basketball life histories, except in their case both play little, develop few skills, and become mainly spectators.

Turning to IQ, one child is born with a slightly better brain than another. Which of them will tend to like school, be encouraged, start haunting the library, get into top-stream classes, and attend a university? And if that child has a separated identical twin who has much the same academic history, what will account for their similar adult IQs? Not identical genes alone—the ability of those identical genes to co-opt environments of similar quality will be the missing piece of the puzzle.

Between generations, the effect of environment is hugely potent because persistent environmental factors seize control of a powerful instrument that multiplies their effects. With the invention of television, basketball got a mass audience, and the pay of professional players soared. Wider and keener participation raised the general skill level, and that higher average performance fed back into play. Those who learned to shoot baskets with either hand became the best—and then they became the norm—which meant you had to be able to pass with either hand to excel—and then that became the norm—and so forth. In other words, rising average performance became a potent causal factor in its own right, and there was a huge escalation of basketball skills in a single generation.

As for IQ, after the Industrial Revolution, when a grade school education became the norm, middle-class aspirations dictated a high school diploma. When a high school diploma became the norm, people wanted a university education. Economic progress created new expectations about hands-on parenting, highly paid professional jobs in which we are expected to think for ourselves, and more cognitively demanding leisure activities. No one wants to seem deficient as a parent, unsuited for promotion, or boring as a companion. Everyone responds by enhancing his or her performance, which pushes the average higher, so all respond to that new average, which pushes the average higher still.

The paradox is resolved. Within a generation, genetic differences use feedback processes to magnify IQ differences between individuals. Between generations, environmental trends use feedback processes to escalate mean IQ over time. It all depends on whose hand is on the throttle.

This has implications for interventions designed to raise IQ, which must be persistent, or the tendency of genes to match environmental quality will slowly erode their effects. However, genes do not pin each of us to a place on the IQ hierarchy. Similarly people can improve on their physical endowment for running. Either circumstances force you to train throughout life, or you develop a love for running and train without compulsion. There will be some who beat me even though I train more than they do, but I can run rings around every couch potato within twenty years of my age.

## GROUP IQ DIFFERENCES

Factor analysis suggests two sorts of IQ differences: differences between racial or ethnic groups, and differences between groups separated by social trends over time. Often subjects take a whole battery of IQ tests; for example, the ten subtests of the WISC measure cognitive skills ranging from information, vocabulary, and arithmetic to coding, solving puzzles, and seeing what concepts have in common. Subjects who do better than average on one tend to do better than average on all. Factor analysis measures this tendency and calls the result the "*g* factor." Above-average subjects open up a wider gap over the average person on some tasks than on others, and these tend to be more cognitively complex. So cognitively complex tasks have higher "*g* loadings" than simple tasks, such as rote memorization. This is why Jensen thinks *g* a good measure of intelligence. It identifies those tasks on which intelligent people tend to do best. Some people excel to an unusual degree on verbal, or mathematical, or spatial tasks, and factor analysis also measures these tendencies and calls them "subordinate factors."

American whites outscore blacks by 5 to 17 IQ points, and the gap increases from ages five to twenty-five. The subtest differences are factor invariant, that is, the racial score gaps tend to mimic the *g* loadings. Indeed there is a tendency for the gaps to widen the higher the *g* loading. However, when a generation outscores the last by 9 to 20 points, subtest differences are wildly at variance with factor loadings. The Vocabulary and Similarities subtests are close for *g* loadings, and yet the latter shows a 24-point gain compared to a 2-point gain.

Another sports analogy: Factor analysis of the ten events of the decathlon produces a *g* because at a given time and place, someone who is superior on one is better on all. Different events get various *g* loadings because superior athletes perform further above average on some than others. The 1,500 meters has a low loading because endurance is not very necessary in the other events. The 100 meters, the hurdles, and the high jump all have large and similar loadings. However, over time social priorities change. People become obsessed with the 100 meters (which determines the "world's fastest human"). Over thirty years, performance escalates by a full standard deviation (SD) in the 100 meters, half an SD in the hurdles, and not at all in the high jump. The trends do not mimic

the relative *g* loadings of the "subtests." After thirty years, we do another factor analysis, and lo and behold, *g* is still there. Although average performance has risen "eccentrically" on various events, superior performers still do better than average on all ten events and are about the same degree above average on various events as they were thirty years before.

Athletic coaches lament that everyone prefers the 100 meters and do not take other events seriously. They point out that sprint speed may be highly correlated with high jump performance, but past a certain point it is actually counterproductive—if you hurl yourself at the bar at maximum speed, your forward momentum cannot be converted into upward lift, and you will time your jump badly. They are not surprised that increased sprint speed has made some contribution to the hurdles, because speed between the hurdles is important. But it is only half the story: You have to control your speed so that you take the same number of steps between hurdles and always jump off the same foot.

In the WISC subtests the *g* factor was a bad guide to which real-world cognitive skills are merely correlated and which are functionally related. Assume that science has engendered a sea change. Once we used logic primarily with concrete referents: All toadstools are poisonous; that is a toadstool, therefore it is poisonous. Now we use logic with the abstract categories provided by science: Only mammals bear their young alive; rabbits and dogs both bear their young alive; therefore they are both mammals. This would bring huge gains over time on the similarities subtest, which demands that we classify in terms of abstractions.

But on subtests that sample the core vocabulary and information of everyday life, this causal factor would not trigger large gains. Indeed changing social priorities might include both a more scientific outlook and less time for reading, in which case huge gains on the Similarities subtest would be accompanied by losses on the Vocabulary and Information subtests. Real-world functional skills would assert their autonomy from one another and from the straitjacket of factor loadings. IQ differences are not factor invariant, but they are not trivial. They just have a different real-world significance.

When blacks gained 5.5 IQ points on whites between 1970 and 2000, the gains were not *g* gains. Gains on various subtests did not tally with their *g* loadings. Despite this, the 2000 IQ gap between the races was still a *g* gap and had diminished by 5.13 points, largely because the difference in *g* loadings on WISC subtests are small. If further environmental progress eliminates the black-white IQ gap, blacks will probably match whites for *g* as well as for IQ.

Debate about whether the black-white IQ gap is genetic or environmental has shifted. It used to cite the work of Klaus Eyferth, who found that the offspring of black American soldiers in Germany had no IQ deficit; Sandra Scarr, Richard Weinberg, and Irwin Waldman (1993), who found that black children adopted by white parents show only small gains at maturity; and Jensen (1998), who emphasized that the racial gap was a *g* gap. Now the black loss of ground on whites with age is central. After all, the gap is only 4.6 points at age four (perhaps 1 point at nine months). If the decline with age were arrested, that would be that. Few would argue that the races enjoy complete environmental equality at present. Adherents of environment and genes both believe they can supply the causes of the decline.

## STRATIFICATION BY IQ

There are IQ thresholds for various occupations. Someone with an IQ below 100 is unlikely to qualify as a professional, manager, or technician.

Blacks and whites have similar thresholds. Therefore as long as their IQ gap persists, only the top one-sixth of blacks will qualify for jobs open to the top one-half of whites. Chinese Americans develop a character structure such that they can qualify for these occupations with an IQ threshold of 93. They also capitalize more effectively on the pool of those who score above this threshold, and as a group they behave as if they had a bonus of 20 IQ points. Despite similar IQs, females outperform males academically. At age seventeen, the girl's median for written composition is at the boy's 75th percentile. The girl's median for reading is at the boy's 67th percentile. Female advantage in academic achievement does not translate into a better occupational profile because of larger investment in child rearing.

Measures of self-discipline, such as saving money, are better predictors of grades than is IQ. Noncognitive factors, such as self-esteem and the degree of control people feel they have over their fates, are as important as cognitive skills in predicting not only wages and productivity but also teenage pregnancy, smoking, marijuana use, and criminal behavior. When black women are matched with white women with the same IQs, the black women are about three times as likely to be single parents, have been on welfare, and be in poverty. They suffer from a marriage market in which for every 100 black women of marriageable age, there are only 57 black men in steady work.

Some predict a nightmarish scenario. As industrial societies equalize opportunity and environments, only talent will count, and because genes drive individual differences in talent, good genes will go to the top and we will have a caste system based on "merit." The least successful will become a permanent underclass. Because this scenario assumes people driven by wealth and status, it seems problematic that such people will finance the equalization of

environments. If an underclass does develop, their children will hardly profit from equal environments and opportunities. A meritocracy that engendered an underclass would be inherently unstable. Social stratification by genes or IQ is unlikely to make a radical break with the past.

**SEE ALSO** *Determinism; Determinism, Biological; Determinism, Genetic; Flynn Effect; Heredity; Intelligence; Meritocracy; Nature vs. Nurture; Science; Stratification; Twin Studies; Underclass*

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# IRA

**SEE** *Irish Republican Army.*

# IRAN-CONTRA AFFAIR

The Iran-Contra affair is a political scandal that occurred during the second term of Ronald Reagan's (1911–2004) presidency. The scandal encompassed two secret programs coordinated by the National Security Council: (1) the sale of arms to Iran in contravention of U.S. policy and without congressional approval; and (2) the diversion of the proceeds from the weapons sales to support the activities of the anticommunist Contra rebels in Nicaragua, in violation of the 1982 Boland Amendment ban on military aid.

In October 1986 the government of Nicaragua shot down an American cargo plane carrying military supplies to Contra forces and captured an American employee of the Central Intelligence Agency. One month later, a Lebanese news magazine, *Ash-Shiraa*, revealed a secret program for the sale and transfer of military weapons to Iran in exchange for the release of U.S. hostages being held in Lebanon. Iran, at war with Iraq for six years and in need of American-made military equipment, purchased weapons in exchange for securing the release of American hostages. In response to these reports, President Reagan denied on national television that any arms had been traded to Iran, but one week later he admitted the Iranian arms transfer occurred.

It was quickly discovered that the United States had begun negotiating with Iran in secret, while the country was allegedly neutral in the Iran-Iraq War and maintained a policy against trading for hostages. In early 1986 Reagan's first national security adviser, Robert McFarlane, and his successor, Admiral John Poindexter, shipped weapons, including surface-to-air and antitank missiles, from Israel to Iran's revolutionary government without congressional approval, diverting the proceeds from the sales to the Contras, who sought to overthrow the Sandinista government in Nicaragua. Reagan's attorney general, Edwin Meese, was directed to investigate the arms sales and requested the appointment of an independent counsel. In December 1986 Lawrence E. Walsh was appointed to investigate the weapon sales and the process by which the proceeds were diverted to the Contras.

In December 1986 President Reagan appointed former Republican senator John Tower (1925–1991) to investigate the Iran-Contra affair and issue a report on the actions of the National Security Council. The *Tower Commission Report* found Poindexter responsible for authorizing the illegal sale of arms to Iran in exchange for the release of the U.S. hostages, as well as for the diversion of the profits to support the Contras. The report also named Marine colonel Oliver North as the main negotiator. Both the sale of weapons to Iran and the funding of the Contras were found to be in violation of Congress, particularly the Boland Amendment and the 1976 Arms Export Control Act. The report faulted President Reagan for not properly supervising his subordinates and stated that ultimate responsibility for the events were the president's alone.