

# Intelligence and the American Ambivalence Toward Talent

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"First Gene for High IQ Found" was the headline of a recent news story in *The New York Times* (Wade, 1998). The journalist clearly treated the news as a significant scientific discovery, and as a prelude to many more on the molecular genetics of intelligence. The scientists he interviewed all properly cautioned that the discovery was only a small first step, but a very important one. There was no note of skepticism or hostility, no sly suggestion that the science was not credible.

Researchers in intelligence are used to expecting quite the opposite from the media. The most mainstream conclusions in the field are commonly dismissed as pseudoscience and renowned scholars portrayed as crackpots. Media hostility towards mainstream intelligence research has been the rule, not the exception, for decades. Even the best reporting tends to convey an exaggerated sense of controversy and skepticism. A 1987 survey showed, in fact, that science editors and reporters tend to believe and report the opposite of what intelligence experts have concluded (Snyderman & Rothman, 1988). For example, it has been settled for almost two decades now that the major mental tests are not culturally biased against American blacks, but editors routinely publish the contrary view instead.

Certain ideas about intelligence—such as multiple intelligences—invariably receive good press despite far less empirical grounding and more skepticism among intelligence scholars. As I shall show, such exceptions prove the rule that the media are ambivalent about, if not explicitly hostile to, the conclusion that general intelligence is a biologically-grounded phenomenon with important social consequences. My point, however, will be that the media's hostility toward this conclusion reflects and resonates with a deep American ambivalence toward talent itself. The field of intelligence simply bears news about talent that many Americans do not want to hear.

The unwelcome message is that we are not all equally able. We are born unequal in intellectual potential, and these differences portend social inequality in any reasonably free society. We may all be equal before the law and in the eyes of God, but we differ greatly in our abilities to perform well in school, work, and everyday life. Mother nature, it turns out, is not an egalitarian. Gifted children are a stark reminder of this fact. As such, they too must contend with the resentment and fear that differences in talent arouse in a society that professes egalitarianism.

Advocates for the gifted, like many intelligence researchers, try to dampen resentment and criticism partly by "democratizing" intelligence, that is, by suggesting that all people are talented in some way. While understandable, such self-protective measures can further muddy the public

picture of what scientists know about intelligence and undermine relevant social policy, including education of the gifted. After reviewing conclusions that are considered mainstream by leading scholars of intelligence, I describe the new scientific and social questions sparked by those well-established findings.

## Basic Findings about Intelligence

I focus here on conclusions that are so well established that they are considered basic foundational knowledge in the field of intelligence. I do not mean to imply that there are no disputes over these matters, that every intelligence researcher subscribes to them, or that future research might not modify them. But to the extent that any basic knowledge is beyond serious dispute, the following conclusions are. Normally, one goes to the leading journals (e.g., *Intelligence*) and textbooks (e.g., Brody, 1992; Jensen, 1998) to discern degree of scientific consensus and strength of evidence on particular issues. Because the most basic knowledge about intelligence is often hotly disputed in the public arena, I also rely here on a public statement by 52 leading intelligence researchers, entitled "Mainstream Science on Intelligence" (Arvey et al., 1994; reprinted in Gottfredson, 1997a). The experts first published this statement in the *Wall Street Journal* during the media frenzy over *The Bell Curve* (Herrnstein & Murray, 1994) in an effort to correct the considerable amount of nonsense appearing in the media about intelligence.

This basic knowledge is usefully divided into two categories: individual differences vs. group differences, that is, differences among individuals within the same racial-ethnic groups vs. average differences *between* groups. The first focuses on the variability among individuals under the IQ bell curve for any group; the second examines differences in the bell curves for different groups, principally in where each is centered along the IQ continuum.

This discussion concerns the ways in which people *differ* in mental capabilities, not the *common* processes that characterize the mental growth and functioning of all individuals and all groups, such as how people learn or how practice enhances performance. This distinction is parallel to that between investigating the source and consequences of *differences* in physical prowess within any one age group vs. studying *typical* processes in physical maturation or functioning. When intelligence researchers speak of "intelligence" and its importance, they are generally using the term intelligence as a short-hand for *differences* in intelligence. Although both are important, it is the study of differences, not commonality, in mental development that elicits egalitarian fears and thus stirs such emotion.

*Within-group differences.* Individual differences in intelligence can be summarized as real, stubborn, and important. By real I mean that mental tests measure a reliable psychometric phenomenon. That phenomenon not only accords with what people generally mean when they say that some people are smarter than others, but it also correlates with various elementary biological phenomena. Intelligence level correlates moderately, for example, with speed of neural transmission, less glucose use by the brain during problem solving, complexity of brain waves, and brain size (Jensen, 1998). Whatever intelligence tests measure, it is linked to biological differences among individuals.

General intelligence is identified more precisely as psychometric *g*. People who do well on one mental test usually do well on others, regardless of what particular type of ability the tests are meant to gauge, say, verbal, mathematical, spatial, or analytical aptitude. This “positive manifold” indicates that some common ability underlies good performance on all mental tests. That common factor can be isolated in any diverse set of mental tests through the statistical procedure called factor analysis. The term *g* is short for the general mental ability factor identified in this way. All mental tests measure mostly this *g*, but IQ tests measure it best, although not all of them do so equally well. Most intelligence researchers today specifically mean *g*, the general factor, when they speak of intelligence.

Intelligence is a very general ability. This is perhaps the single most important thing to know about it. The “Mainstream” statement conveys this sense of generality (Arvey et al., 1994):

Intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings—“catching on,” “making sense” of things, or “figuring out” what to do.

In short, it is critical thinking skills or, most generally, the ability to process information. As the “Mainstream” statement notes:

While there are different types of intelligence tests, they all measure the same intelligence. Some use words or numbers and require specific cultural knowledge (like vocabulary). Others do not, and instead use shapes or designs and require knowledge of only simple, universal concepts (many/few, open/closed, up/down).

In other words, the same general intelligence can be measured by very different vehicles or manifest test content. The active ingredient in IQ tests is the cognitive complexity of the tasks to be performed.

Next, individual differences in intelligence are stubborn, meaning that they are not easily changed. Individuals grow in mental capability during childhood and early adolescence, of course, and people accumulate knowledge and perhaps wisdom throughout their lives. However, few of them change much in IQ rank relative to their age mates. That is what standardized IQ scores mean—general mental capability relative to one’s age peers. Substantial changes in IQ are few and transient (Moffitt et al., 1993). No intervention has yet been found, despite considerable effort for over a century (Spitz, 1986), that permanently raises intelligence or prevents mental retardation among those at risk for it. Past failures do not rule out potential future successes, but they do suggest that any successful intervention will have to differ markedly from anything tried so far.

Much research now shows conclusively that individual differences in phenotypic (observed) intelligence within Western societies are due substantially to the genotypic differences

among us. This is true for all racial-ethnic groups studied. Differences in intelligence are modestly heritable in early childhood and affected substantially by differences in family environments. However, the heritability of intelligence rises to 60% by adolescence, at which point shared family effects on IQ have disappeared. Heritability rises to 80% by mid-to-late adulthood. In other words, our phenotypic differences in intelligence gradually shift to more closely reflect our genotypic differences as we become more independent of our families and begin to fashion our own niches in life. Genes can cause change as well as stability in development. Research indicates, however, that genes contribute mostly to stability of IQ (Plomin et al., 1997).

When researchers say that *g* is important, they are referring to its demonstrated practical importance. Being a highly general capability, *g* turns out to be positively correlated with many good things in life (such as holding a high status job) and negatively correlated with problematic behaviors (such as committing crimes and bearing children out of wedlock; Herrnstein & Murray, 1994; Jensen, 1998). The seeming ubiquity of *g*'s effects across so many arenas of life should not be surprising, because virtually all life activities require some reasoning, problem solving, and decision making. Recall that the active ingredient in IQ tests is the cognitive complexity of their demands. That same complexity suffuses life. Life itself, not just mental tests, is *g* loaded, that is, demanding of *g*.

High intelligence does not guarantee success and low intelligence seldom precludes living a happy and useful life. Other things matter, from personality to family connections to pure luck. However, intelligence level greatly shifts the odds of success and failure. And although it tilts the odds much less in some arenas of life than others, the odds always favor the more intelligent. Being high in *g* is like having the dice always loaded in your favor.

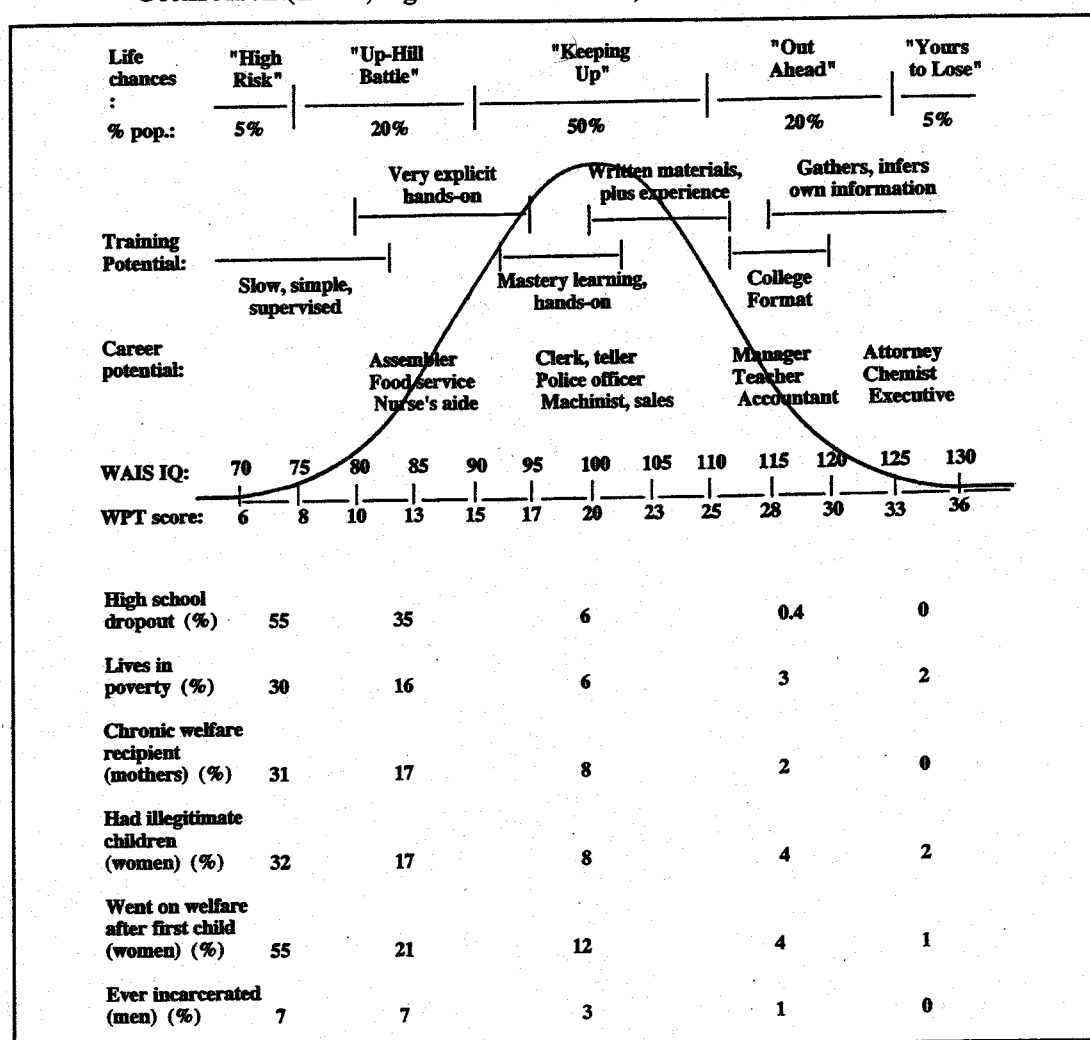
As stated by the "Mainstream" signatories (Arvey et. al, 1994):

IQ is strongly related, probably more so than any other single measurable human trait, to many important educational, occupational, economic, and social outcomes. Its relation to the welfare and performance of individuals is very strong in some arenas in life (education, military training), moderate but robust in others (social competence), and modest but consistent in others (law-abidingness). Whatever IQ tests measure, it is of great practical and social importance.

Research shows that *g* is most important when the tasks are most complex (Gottfredson, 1997b). For example, mental test scores correlate about .2 with performance in simple jobs, .4-.5 with performance in jobs in general, and up to .8 in high-level professional and executive work. The odds thus not only tilt towards the more able, but often especially so when particularly desirable outcomes are at stake. The *g* factor correlates highly with standardized academic performance in unrestricted samples (.8), but less so with years of education completed (.6), probably because the latter is more influenced than the former by other personal traits, such as persistence and conscientiousness. The correlation of IQ with crime and delinquency is about -.25, low but still highly meaningful (especially if we consider that this correlation is higher than that of social class background with delinquency; Gordon, 1997).

Figure 1 gives a concrete sense of the advantages conferred on individuals by high intelligence and the many risks created by low intelligence. This figure represents the IQ bell curve for the general population in the United States. The average score is set at IQ 100. Most people cluster around the average, with about half the population having an IQ between 90 and 110. Few people are either very bright or very dull. About 5% fall above IQ 125 and 5% below IQ 75. IQ 130 is often considered the threshold for giftedness and IQ 70 the threshold for mental retardation, each threshold marking off less than 3% percent of the general population.

**FIGURE 1. Life chances at different levels of the IQ continuum. Figure adapted from Gottfredson (1977b, Figure 3 and Table 10).**



The figure provides an array of information for each of five ranges of intelligence: the lowest 5% (IQ 75 and below), the next 20% (IQ 76-90), the middle 50% (IQ 91-110), the next higher 20% (IQS 111-125), and the highest 5% of the population (above IQ 125). These five ranges represent very different life chances overall, labeled here as "high risk," "uphill battle," "keeping up," "out ahead," and "yours to lose." The upper part of the figure shows the sorts of occupations that routinely recruit from successively higher IQ ranges and the types of training that are most effective for individuals in those ranges. As can be seen, trainability and employability rise markedly with IQ level. Training can be increasingly abstract, theoretical, and self-guided at higher IQ levels. Job options range from nil at the lowest IQ levels to virtually unlimited (with regard to intelligence) at the highest levels. The lower part of the figure provides rates of negative outcomes for each of the five IQ ranges. The data are for young white adults, the group for which there is the best data. As can be seen, rates of pathology tend to double at each successively lower level of the five, meaning that these sorts of social problems are rare among the most intelligent but common among the least able. For example, rates of living in poverty and bearing illegitimate children rise from 2% in the highest IQ group to about 4% in the above average IQ group, 8% in the average IQ group, 16% for those below average in IQ, and finally to near 32% in the low IQ group.

Life is very difficult at the bottom end of the bell curve, as ethnographic studies of low-IQ individuals and communities so poignantly reveal (Koegel & Edgerton, 1984; Gazaway, 1969). No jobs in the modern economy routinely recruit workers from IQ 75 and below. Nor can any of these individuals enter the military, because the military services are prohibited by law, except in times of war, from recruiting anyone in the bottom 10% of the ability distribution (roughly to IQ 80). Training for these low-IQ individuals must generally be one-on-one, slow, highly repetitive, broken into the simplest of steps, and highly supervised. Survey data show that most young white adults in this range marry, work, and have children (Herrnstein and Murray, 1994), but, as Figure 1 shows, they are nonetheless at great risk of living in poverty (30%), bearing children out of wedlock (32% among women), and becoming chronic welfare dependents (31%, if mothers). More than half drop out of high school. Many in this "high-risk" IQ range eventually lead satisfying lives, but only with the help of a benefactor or strong support network. In short, a low IQ drastically reduces the odds of success in many arenas of life. Below IQ 75 it is difficult to live independently in modern societies.

Life is easier and more stable, but still an "uphill battle," for the next 20% of the bell curve (IQ 76-90). More job opportunities are available, but they generally consist of low-paying work that is also atypically dangerous, physically difficult, and performed in unpleasant conditions. Typical jobs include manual laborers, factory assemblers, food service workers, and nurses aides. Fewer than half the high school graduates and none of the dropouts in this IQ range would meet the military's minimum enlistment standards (which it currently sets at about IQ 85). Rates of poverty and other negative outcomes are halved by comparison to the "high-risk" group, but are still high enough to suggest that socioeconomic progress and stability remain tenuous for adults of below-average intelligence.

The middle 50% of the population is readily trained for the bulk of jobs in society: clerks and secretaries, skilled trades and protective service workers, dispatchers, insurance sales repre-

sentatives, and other midlevel work. Rates of pathology are much lower than for individuals in the "battling uphill" IQ range, for example, poverty, illegitimacy, and chronic welfare dependence all falling by over half compared to the below-average IQ group.

The next higher 20% of the IQ bell curve (IQ 111-125) is "out ahead" as far as life chances go. Most occupations are within reach cognitively, because these individuals learn complex material fairly easily and independently. None would be barred from even the most selective occupational specialties in the military on the basis of inadequate g. Rates of poverty, illegitimacy, incarceration, and chronic welfare use among these individuals, who are somewhat above average in IQ (111-125), are only 15% to 25% the rates for individuals who are somewhat below average in IQ (76-90). It clearly is advantageous to be somewhat above rather than below average in intelligence.

For individuals of IQ 125 and above, success is "yours to lose." They are highly sought after as employees, both because they are easily trained and because they can handle the most complex jobs, which often involve high levels of responsibility (Gottfredson, 1997b). These are the elite of the "symbolic analysts" that ex-U.S. Secretary of Labor Robert Reich (1992) argues are increasingly prized by employers in the global information age. Few if any jobs are outside the reach of individuals at the right tail of the bell curve, at least for reasons of inadequate intellectual ability. Such individuals may lack other traits (e.g., spatial ability, persistence) necessary for success in some high-level work, but their intelligence opens up to them myriad opportunities. Their rates of school dropout, poverty, incarceration, illegitimacy, and welfare use are minuscule.

Recall that Terman's sample of gifted individuals averaged about 150, more than 20 IQ points beyond the highest level indicated in Figure 1 (IQ 130). Those individuals' superior educational and occupational attainments are entirely consistent with the gradients of success and pathology shown in Figure 1. One can also easily grasp from this figure how alien extremely gifted individuals can feel, and be perceived by others, because they are so far off the chart of common experience. Individuals of IQ 160 are in some sense as different from individuals of IQ 130 as the latter are from persons of IQ 100.

There are, of course, many causes of the good and bad outcomes listed in Figure 1. General intelligence is only one, as intelligence experts are quick to point out. Other personal traits and circumstances are too, from personality and persistence to local employment and training opportunities. But, as noted, no other single trait or circumstance yet measured appears so important.

Social scientists have often argued that social class background is the key determinant of social outcomes. They have attributed inequalities in everything from wealth to health primarily to differences in the power, privileges, and resources associated with family background. As illustrated in the recent debate over *The Bell Curve*, they have generally argued that intelligence is not real, not stubborn, not important, or all of the above. However, IQ turns out to be more highly correlated with most social outcomes, including criminal behavior, than is social class background (Herrnstein & Murray, 1994). Moreover, social class is itself to some extent a proxy for intelligence, because parental education, occupation, and income are partly products of the parents' intelligence level and because the genes affecting parental IQ are passed in part to the children (Plomin et al., 1997).

Charles Murray (1997a, b) has recently provided an especially compelling demonstration that a favorable family background does not negate the practical consequences of having a below-average IQ. He compared siblings who were either above average ("bright") or below average ("dull") in IQ to their siblings of average IQ ("normal"), all from families whose income was in the top 75% and whose parents stayed together for at least the first seven years of the younger sibling's life. The proportions of children born illegitimate to the bright, normal, and dull siblings were, respectively, 10%, 21%, and 45%. Although from the same families, 56% of the bright siblings obtained university degrees whereas only 21% of the normal and 2% of the dull siblings did so. Income levels and poverty rates were similarly discrepant. Neither IQ differences nor their real-world effects are prevented by living in the same, relatively advantaged family environments. As behavioral genetics has shown in other ways, providing middle class environments to all children will do nothing to change differences in their eventual IQ levels (Rowe, 1997). Indeed, siblings differ two-thirds as much in IQ (12 IQ points), on the average, as do complete strangers on the average (17 IQ points), and mostly for genetic reasons. Genetics creates intellectual and social inequality within, as well as between, families.

*Between-group differences.* Average IQ differences between racial-ethnic groups are also real, stubborn, and important. Group differences are real in the sense that they are consistently documented on unbiased tests of intelligence. The major mental tests are not culturally biased against native-born English-speaking subgroups in the United States, including blacks (Jensen, 1980). In fact, as normally used, mental tests are somewhat biased *in favor* of lower-scoring groups because they *overpredict* how well members of those groups will perform in school and on the job (that is, the tests overstate their future performance). Average group IQ differences are also real in the sense that the test score differences translate into commensurately large competency differences in non-psychometric activities calling directly on *g*, for example, academic and job performance. The same IQ score means the same thing psychometrically, academically, and on the job for all native-born American subgroups.

As often noted, the subtests within IQ test batteries tap a variety of more specialized abilities such as spatial, verbal, quantitative, and memory. IQ tests thus are not pure measures of *g*, which raises the question of whether racial differences in IQ really represent differences in *g*. Evidence suggests that they do. For instance, black-white differences in test scores are greatest on subtests that correlate most highly with the *g* factor, that is, on those that are most *g* loaded, regardless of their manifest cultural content. This generalization, called "Spearman's Hypothesis," has been confirmed repeatedly for blacks and whites (Jensen, 1998).

Two other kinds of data indicate that racial-ethnic IQ differences actually measure "real" differences in general mental ability. One is that average IQ differences between American racial groups mimic age differences among whites. The racial difference thus appears to represent an average developmental lag in some groups (including blacks) and an average acceleration in others (Asian-Americans) relative to whites in the same process of mental growth that characterizes all groups. The second kind of data is that race differences on non-psychometric measures of mental functioning and capacity parallel race differences in average IQ. These are the same nonpsycho-



metric differences that occur among whites of different IQ levels. For example, both average brain size (per body size) and average IQ levels are greater for Asian-Americans and smaller for American blacks than for American whites. Choice reaction time is also faster among Asians and slower among blacks than whites (Jensen, 1998). Elementary cognitive tasks such as choice reaction are so simple that third-graders can do them accurately, and performance must be measured in terms of the milliseconds needed to apprehend the stimuli (for example, which of two lights has been illuminated or which of two lines briefly revealed is the longer).

Racial-ethnic differences in IQ are merely differences in averages, that is, in where bell curves are centered on the IQ continuum. As the "Mainstream" statement describes (Arvey et al., 1994):

Members of all racial-ethnic groups can be found at every IQ level. The bell curves of different groups overlap considerably, but groups often differ in where their members tend to cluster along the IQ line....The bell curves for some groups (Jews and East Asians) are centered somewhat higher than for whites in general. Other groups (blacks and Hispanics) are centered somewhat lower than non-Hispanic whites.

Ashkenazi Jews average about one standard deviation (15 IQ points) above Gentile whites, that is, approximately IQ 115. American blacks average about one standard deviation below the white mean, for an average IQ of about 85. East Asians average somewhat above the white average, although the exact distance is still a matter of much dispute, and both American Hispanics and Native-Americans fall midway between whites and blacks. It should be noted, however, that all racial-ethnic groups contain subgroups that differ among themselves in IQ, sometimes considerably so. For example, there are substantial differences among different Native-American tribes, African tribes, Hispanics from different countries of origin, and whites from different parts of Europe. Group IQ differences truly are the rule, not the exception, around the world as well as within the United States.

As with individual differences, group differences also turn out to be stubborn. Average racial IQ differences in the United States are the same when youngsters leave high school as when they enter grade school. The average difference between American blacks and whites is the same today as it was when first measured early in the century, despite considerable narrowing of racial disparities in social conditions and years of education attained. Although raw IQ scores have risen steadily during this century (Flynn, 1984), the black-white difference has remained unchanged. (Comparable historical data are not available for other groups.) And, according to the "Mainstream" experts (Arvey et al., 1994):

There is no persuasive evidence that the IQ bell curves for different racial-ethnic groups are converging. Surveys in some years show that gaps in academic achievement have narrowed a bit for some races, ages, school subjects and skill levels, but this picture seems too mixed to reflect a general shift in IQ levels themselves.

As the "Mainstream" experts state, "there is no definitive answer to why IQ bell curves differ across racial-ethnic groups." Most IQ scholars believe, however, that both environmental and genetic differences are involved. The "Mainstream" statement goes on to say that (Arvey et al., 1994):

Racial-ethnic differences are somewhat smaller but still substantial for individuals from the same socioeconomic backgrounds. To illustrate, black students from prosperous families tend to score higher in IQ than blacks from poor families, but they score no higher, on average, than whites from poor families.

Evidence remains largely circumstantial for genetic involvement in racial IQ differences. Nor does the pertinent research indicate much yet about the degree to which the racial differences in IQ phenotypes might be due to racial differences in their members' typical genotypes. Finally, as with individual differences, the fact that group differences have been stubborn and not yet narrowed in response to intervention does not rule out the possibility that they are remediable.

Racial-ethnic differences in bell curves are large enough to have noticeable and important consequences in national life. Figure 1 gives a rough sense of what those consequences are.

Comparing Jews and blacks to Gentile whites in the United States provides an example. The IQ bell curves for the three groups are centered at IQ 115, 100, and 85, respectively, for American Jews, Gentile whites, and blacks. Consulting Figure 1, this means that the average member of each group can be expected to work in occupations that are, respectively, moderately high level (e.g., accountant), middle level (e.g., crafts or clerical work), and low level (e.g., food service worker). On the basis of general ability, no more than half of blacks would meet current minimum mental standards for enlistment in the military (roughly IQ 85) whereas about 85% of Gentile whites and virtually all Jews would. Just as rates of positive outcomes can be expected to be successively much higher for Jews than Gentiles and for whites than blacks, so too can the reverse be expected for rates of negative outcomes, such as living in poverty, being incarcerated, and dropping out of school. These expectations are broadly consistent with observed rates, for example, with Jews being greatly overrepresented and blacks greatly underrepresented (absent racial preferences) in elite universities.

Other factors affect the fate of groups, as is indicated by the higher average IQ but lower socioeconomic levels for Native-Americans and Hispanics relative to blacks. And the size of racial gaps can vary across different sorts of outcomes for the same two groups. For example, black-white differences are smaller than expected on the basis of IQ for some outcomes (educational and occupational level), bigger than expected for others (illegitimacy and crime; Herrnstein & Murray, 1994), but basically as expected for yet others (performance in school and on the job). Nonetheless, it is clear that subgroups whose members cluster near the left tail of the IQ distribution will exhibit relatively low rates of educational and occupational success and high rates of social problems. Groups with members clustered near the right tail will be characterized by the reverse pattern, all else equal.

A low IQ poses serious challenges in all social groups, whatever a person's race or ethnicity. Life is simply more difficult in many ways. Low IQ is thus a non-racial problem that affects a higher proportion of people in some groups than others, for reasons that are as yet unclear. What it means, however, is that big racial disparities in social well-being can be expected in the absence of racial discrimination. These disparities in turn have enormous political ramifications. They have highly predictable effects in employee selection, college admissions, and eligibility for gifted and talented programs. Just as the effects of an individual's level of *g* reverberate through his or her life, so too do the effects of group differences in *g* reverberate through national life.

## New Questions

The research findings just reviewed are old news in the science of intelligence. They are hardly without controversy, especially in the public arena, but they are usually treated by intelligence experts as largely settled matters. Once it became firmly established that individual and group differences are real and important, research moved from that foundational platform both downward toward the biological roots of intelligence and also outward into the social realm to follow the cascades of effects that such differences have. Jensen (1998) characterizes these as the "vertical" and "horizontal" researches into intelligence.

The biological frontier includes the study of how people differ in the physiology of brain function and mental processing, for example, differences in the size, density, complexity, and electrical and metabolic activity of the brain. The biological category would also include the behavioral and molecular genetics of mental abilities (Plomin et al., 1997), for example, research on the timing of genetic effects in the development of intelligence over the life span (developmental behavioral genetics), the degree to which different abilities have common genetic roots (multivariate behavioral genetics), and the degree to which differences in rearing environments are genetic in origin (environmental behavioral genetics).

This last area of research—the nature of nurture—is an extraordinarily interesting and important line of research. We can no longer assume that so-called measures of environment measure strictly nongenetic influence. Research has shown that rearing environments, for example, partly reflect the genotypes of the children being reared. Children shape their own environments, either actively or reactively, that is, by their distinctive traits eliciting different responses from their caregivers. This is clearly seen in accounts of how many gifted children essentially force their parents and friends to feed their passion for math, music, reading, or whatever their gift may be (Winner, 1996).

Whereas the biological frontier pushes deeper into the brain and genes, the sociology of intelligence traces the ramifications of phenotypic differences in *g*, both individual and group, further outward into the social arena. For example, it examines how disparities in intelligence shape interpersonal influence processes (Gordon, 1997), the evolution of particular social practices (employment testing; Gottfredson, 1986) or institutions (such as the division of labor; Gottfredson, 1985), the epidemiology of healthy and unhealthy behavior (Lubinski & Humphreys, 1997), race relations (Gordon, 1997), and the evolution of cultures and subcultures (Gordon, 1997). It also

includes behavioral genetics because, although many people do not realize it, behavioral genetics is a powerful tool for studying the impact of environments on development. To illustrate, researchers are using behavioral genetic methods to identify particular environmental influences that make siblings less alike in intelligence, personality, psychopathology, and the like (Dunn & Plomin, 1990). As it turns out, it is the events and environments that siblings do not share (say, illness), not those that they do share (such as parental income and rearing style), that have the most enduring effects on their intelligence and other personal traits. Stated another way, family environments tend to make siblings less alike, not more alike.

This, too, is an extraordinarily interesting and important discovery. It turns out that even behavioral geneticists had been wrong about how the environment influences fundamental personal traits such as ability and personality. It is *not* the so-called shared effects, which had for so long been presumed important (such as family income, education, or values), that have lasting effects. We have learned that we were looking in the wrong place for environmental effects. The action is with *nonshared* effects, that is, environmental factors that influence one sibling but not others. The challenge now is to identify them.

As different as the vertical and horizontal frontiers may seem to be at first glance, they actually are beginning to converge. This conjunction opens up a fascinating new territory in the study of intelligence: the biological roots of social organization. IQ variability characterizes all human populations. How, then, does that common biological characteristic of populations, their bell curves, shape the ways in which societies do or could organize themselves?

An example may help to illustrate this line of inquiry. The major distinction among occupations today is their cognitive complexity. The common occupational prestige hierarchy found round the world is at heart an intelligence hierarchy among occupations that is created and sustained by the great variability in *g* within populations and a rough sorting of people to jobs on the basis of general intelligence. If all people were equal in intelligence, occupations would look very different and the occupational status hierarchy, if there were one, would have to arise from and be sustained by variability in something other than *g*, perhaps one of the other personal traits on which humans differ (physical strength, interpersonal competence, artistic talent, Machiavellianism, etc.). Social inequality would not disappear if people were identical in *g*, if only because inequality is not sustained solely by differences in *g*, but it would have a different basis.

The questions raised by this marriage of the biological and sociological include, among others: How much might a society be able to narrow occupational or educational inequalities despite this biological underpinning for at least some portion of them? To what extent does the biologically-grounded dispersion in *g* (and other traits) influence or constrain the development of other social processes and institutions, from racial politics to the diffusion of innovation? And just what are the constraints in the delivery of effective health and welfare services that are created by variation in intelligence, especially when individuals tend to be geographically and socially segregated by intelligence level?

## The Democratic Dilemma

It is precisely this marriage of biological and social policy thinking that the critics of intelligence research seem to fear most and try to render taboo. Consider the three most viciously attacked publications on intelligence in the last three decades: Arthur Jensen's 1969 article in the *Harvard Educational Review*, "How much can we raise IQ and academic achievement?," Richard Herrnstein's 1971 "I.Q." article in *The Atlantic Monthly*, and Herrnstein and Murray's 1994 book *The Bell Curve*. What was distinctive about the three among publications meant for non-specialists was that they specifically traced educational, occupational, and other social inequalities partly to genetic differences in intelligence. All suggested explicitly that genetic differences constrain the nation's ability to redistribute social opportunities and outcomes more evenly. Two suggested that genetic differences between racial-ethnic groups might account for some of the seemingly intractable racial inequalities in success and pathology. The third, Herrnstein's 1971 article, ignored race altogether, but paralleled the other two in suggesting that social class inequality (within any race) has a sizeable genetic basis.

The media tended to dismiss all three works as the products of fools or knaves, but in any case dangerous to the body politic. The general danger, it was suggested, was that the authors' claims about the natural order would damage the moral order. To be sure, the finding that some inequality is natural can be exaggerated and harnessed to evil ends. So too, however, can the false claim that humans are infinitely malleable and that the state can mold them however it pleases. After all, the world has had its Stalins and Maos as well as its Hitlers.

As the signatories to the "Mainstream" statement point out (Arvey et al., 1994):

The research findings [on intelligence] neither dictate nor preclude any particular social policy, because they can never determine our goals. They can, however, help us estimate the likely success and side-effects of pursuing those goals via different means.

Rowe (1997), for example, has described how both liberal and conservative social policy can be consistent with the evidence on genetic differences in intelligence. To illustrate, natural differences might be used to justify either egalitarian social engineering or laissez faire individualism depending on one's political priorities. As Rowe also describes, however, much current policy for reducing social inequality is grounded in demonstrably false assumptions about human capabilities (e.g., that differences in learning result solely from differences in exposure to information) and is thus bound always to fail and frustrate (e.g., equalized instruction yields unequal learning). Moreover, policies grounded in falsehoods and fantasy can do great harm (e.g., see Gordon, 1997, and Lubinski & Humphreys, 1997, on black-white tension and inequality).

Neither fools nor knaves, the three scholars had provoked public ire by offending certain political sensitivities, even if inadvertently. The public controversy had nothing to do with the actual quality of their science (which would be entirely mainstream today), but everything to do with the painful American dilemma the authors had exposed and which the critics sought to deny. The dilemma is that differences in native talent create a conflict between two basic American principles.

On the one hand, Americans love equality. As Alexis deTocqueville (1840/1990, p. 97) observed in the 1830s, they have a deep distaste for aristocracies.

I think that democratic communities have a natural taste for freedom; left to themselves, they will seek it, cherish it, and view any privation of it with regret. But for equality their passion is ardent, insatiable, incessant, invincible; they call for equality in freedom; and if they cannot obtain that, they still call for equality in slavery. They will endure poverty, servitude, barbarism, but they will not endure aristocracy.

In short, Americans are egalitarians. They have a taste for social leveling and equality of condition. They are wary of differences in intelligence because they create social inequality, encourage claims to superiority, and threaten to sustain a cognitive aristocracy, or, as Herrnstein and Murray (1994) call it, a cognitive elite.

On the other hand, Americans also pride themselves for their individualism. They honor highly the principle that people should be free to rise (or fall) in society on the basis of their individual abilities and efforts without regard to their social origins. They love the self-made man and cheer the kid from the wrong side of the tracks who made it on the basis of guts and brains alone. This is the merit principle, the freedom to pursue one's destiny by dint of one's own individual ability and effort.

We celebrate both principles—equality of condition and individual freedom—but they sometimes conflict. If we allow people to advance as far as they are able, some will advance further than others. Disparities in wealth and social condition will develop. Moreover, because intelligence is substantially genetic, the social stratification that differences in intelligence produce each generation is thereby partly genetic, too. Behavioral genetic modeling has confirmed this (Lichtenstein & Pedersen, 1997). Ironically, the principle of individual merit is a recipe for hereditary stratification. Although children do not directly inherit their parents' social position in a meritocracy, they do inherit many of the genes that helped their parents rise or fall to the social position they occupy.

If we want a more level social plane, it must be socially engineered. We must suppress operation of the merit principle. Americans frequently do this by hobbling the swift and lifting the least competitive or by muddying or rejecting distinctions between the high and the low in human affairs. Doing so, however, curbs human freedom, stifles individual initiative, and promotes a deadening mediocrity.

The tension between equality and freedom leads the nation to ceaselessly debate whether institutions should allow individual differences in ability to emerge or whether they should impede such emergence. We struggle over whether we should encourage flights of talent or restrain "elitism," to be pleased by extremes of talent or embarrassed. We value talent and comb society to find it, but resent it when it appears immoderate and immodest or, as some would say, "undemocratic." We want talent to rise—but not much above the rest of us. When talent appears to be distributed unevenly across racial-ethnic groups, we become all the more hostile toward drawing distinctions in talent. Americans prefer to imagine that they inhabit Lake Wobegon, the land where all the children are above average.

The mixed emotions about talent assert themselves clearly in the continuing contentious debates over ability grouping and tracking in schools. Proponents argue that grouping is necessary for all students to develop to their potential. Without it, fast students are held back and slow students are left behind in the common classroom. On the other hand, opponents argue that grouping and tracking maintain or exaggerate the achievement differences among students, widening the gaps between advantaged and disadvantaged children. Although both sides argue in the name of self-fulfillment, social equality, and national welfare, the proponents of grouping stress individual freedom, equal opportunity (fair competition), and excellence whereas the opponents stress non-competition, equal outcomes, and interventionist government action to redistribute opportunities and outcomes, especially by race.

We should hardly be surprised, then, that the public schools are conflicted about gifted education. Indeed, gifted students epitomize our ambivalence over talent. These children are the natively gifted who remind us starkly that we are not all equally capable, no matter how many hours we study or practice. There have been periods of educational reform when education of the gifted and talented became a high priority, for example, in the 1950s after the Soviet Union successfully launched Sputnik, putting that nation first into space. Bright children were considered an important national resource then, one that if invested in science and engineering would help our nation advance in the world. However, the public schools' commitment to education of the gifted and talented has been intermittent and fragile compared to their commitment to special education for the least able. Advocates for the gifted are familiar with the sentiment that gifted children can make it quite well on their own. Many people argue that such youngsters don't need any special attention from the schools and, moreover, that such attention would constitute a form of elitism. The rich would merely get richer, and feel superior for it, besides.

There might be less resentment of the gifted and talented if we all won equally wondrous gifts in the genetic lottery. Howard Gardner (1983) and others argue, in fact, that there are multiple co-equal intelligences. It is true, of course, that there is a variety of ways in which children and adults can be gifted. However, the widespread eagerness to embrace "multiple intelligences" reflects mostly a desire to democratize intelligence, to expunge the awkwardness that we are unequal in a trait people prize second only to good health. We can eat our cake and have it too. With multiple intelligences we can all be smart but just in different ways. No one is better than anyone else. Gone is the conflict between individualism and egalitarianism. Is it any wonder that Gardner's "multiple intelligences" are so popular and Spearman's *g* so reviled or belittled in the media and much of academe, despite the evidence concerning their practical value in life being nil for the former and overwhelming for the latter? If there are many hierarchies of talent, none can be special. The *g* factor is dethroned. The specter of a natural aristocracy of intellect vanishes.

But it vanishes in appearance only. Consider what even Gardner says about the exemplars for his eight "intelligences"—T. S. Elliot (linguistic), Albert Einstein (logico-mathematical), Pablo Picasso (spatial), Igor Stravinsky (musical), Martha Graham (bodily-kinesthetic), Sigmund Freud (intrapersonal), Mahatma Gandhi (interpersonal), and Charles Darwin (naturalist). He concedes that the lowest IQ anyone could have and still enter his pantheon of exemplars would be about IQ 120

(Jensen, 1998, p. 128), which excludes 90% of the population. Relatively high levels of *g* may not be sufficient for greatness, but they appear to be the necessary platform from which to develop any specialized talent. Multiple intelligences appear to be mostly the playground of the cognitively rich.

Gardner has thus created an egalitarian mirage, namely, one where freedom and equality do not conflict because everyone is smart in some way. The conflict between the two principles remains in the real world, of course, because substantial differences in human capability remain. Equal opportunity to develop and use unequal talent leads to unequal outcomes. The illusion that *g* is not special among abilities in today's complex, information-intensive world is rather like declaring that greater physical strength and stamina were of no particular practical advantage in pre-technological societies. Such illusions may profit their purveyors, but they do nothing to nullify contrary facts.

The fiction of multiple co-equal intelligences nourishes misunderstanding and unworkable social policy. With regard to the gifted, in particular, overstating the multidimensional nature of talent encourages school districts to broaden the definition of gifted and talented into meaninglessness. Worse yet, the false belief that all people are by nature equally able transforms the stubborn, natural inequalities that emerge within a free society into *prima facie* evidence of stubborn, unnatural restrictions by that society on individuals' pursuit of life, liberty, and happiness. The solution is then thought to involve opposing so-called "elitism" in all places at all times and limiting the presumptively unfair gains of the "advantaged." The myth of natural equality in human capability thus promises to fetter talent with the heaviest of egalitarian chains. As Tocqueville warned, Americans "call for equality in freedom; [but] if they cannot obtain that, they still call for equality in slavery." They readily limit freedom in the name of equality. The egalitarian myth, therefore, not only endangers talent development but is also pernicious to human freedom.

The democratic dilemma is real, stubborn, and important because *g* is real, stubborn, and important. Moreover, equal opportunity will never produce equal outcomes in a free society because ability differences are substantially genetic in origin. Not all inequality is due to individual differences in personal traits, of course, and *g* is not the only genetically grounded trait that influences socioeconomic attainment (Lichtenstein & Pedersen, 1997). Nonetheless, *g* seems to be at the center of the causal nexus for many good and bad outcomes in life. This reality will remain whatever we choose to believe about it. Life becomes no easier for low-IQ citizens when we assert that IQ is no barrier to them and high-IQ no advantage to us. The delivery of social services is no more effective when we deny that some citizens are harder to reach and assist.

Absent the means to equalize *g*, the possibility of which seems remote, the democratic dilemma will remain and so too will the national ambivalence towards talent. The challenge is to deal with these tensions in ways that help all persons to fulfill their potential, minimize resentment, and allow excellence to flourish (J. Gardner, 1984). Acceding to the egalitarian myth, as short-term political expedience leads many to do, accomplishes the opposite. Advocates of the gifted must be sensitive, to be sure, to the political and human difficulties created by intellectual inequality and to the importance of finding "valued places" for people of all ability levels (Herrnstein & Murray, 1994). They must assert without hesitation or embarrassment, however, the possibilities of unfet-



tered human excellence. They must resist the forces for regimented sameness that would stifle the human spirit. The fate of more than gifted education rests on such advocacy.

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# TALENT DEVELOPMENT IV

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