

## EDITORIAL

# Mainstream Science on Intelligence: An Editorial With 52 Signatories, History, and Bibliography

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### Mainstream Science on Intelligence

Since the publication of "The Bell Curve," many commentators have offered opinions about human intelligence that misstate current scientific evidence. Some conclusions dismissed in the media as discredited are actually firmly supported.

This statement outlines conclusions regarded as mainstream among researchers on intelligence, in particular, on the nature, origins, and practical consequences of individual and group differences in intelligence. Its aim is to promote more reasoned discussion of the vexing phenomenon that the research has revealed in recent decades. The following conclusions are fully described in the major textbooks, professional journals and encyclopedias in intelligence.

#### The Meaning and Measurement of Intelligence

1. 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.

2. Intelligence, so defined, can be measured, and intelligence tests measure it well. They are among the most accurate (in technical terms, reliable and valid) of all psychological tests and assessments. They do not measure creativity, character, personality, or other important differences among individuals, nor are they intended to.

3. 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). Other do not, and instead use shapes or designs and require knowledge of only simple, universal concepts (many/few, open/closed, up/down).

4. The spread of people along the IQ continuum, from low to high, can be represented well by the bell curve (in statistical jargon, the "normal curve"). Most people cluster around the average (IQ 100). Few are either very bright or very dull: About 3% of Americans score above IQ 130 (often considered the threshold for "giftedness"), with about

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the same percentage below IQ 70 (IQ 70–75 often being considered the threshold for mental retardation).

5. Intelligence tests are not culturally biased against American blacks or other native-born, English-speaking peoples in the U.S. Rather, IQ scores predict equally accurately for all such Americans, regardless of race and social class. Individuals who do not understand English well can be given either a nonverbal test or one in their native language.

6. The brain processes underlying intelligence are still little understood. Current research looks, for example, at speed of neural transmission, glucose (energy) uptake, and electrical activity of the brain.

### Group Differences

7. 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.

8. The bell curve for whites is centered roughly around IQ 100; the bell curve for American blacks roughly around 85; and those for different subgroups of Hispanics roughly midway between those for whites and blacks. The evidence is less definitive for exactly where above IQ 100 the bell curves for Jews and Asians are centered.

### Practical Importance

9. 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.

10. A high IQ is an advantage in life because virtually all activities require some rea-

soning and decision-making. Conversely, a low IQ is often a disadvantage, especially in disorganized environments. Of course, a high IQ no more guarantees success than a low IQ guarantees failure in life. There are many exceptions, but the odds for success in our society greatly favor individuals with higher IQs.

11. The practical advantages of having a higher IQ increase as life settings become more complex (novel, ambiguous, changing, unpredictable, or multifaceted). For example, a high IQ is generally necessary to perform well in highly complex or fluid jobs (the professions, management); it is a considerable advantage in moderately complex jobs (crafts, clerical and police work); but it provides less advantage in settings that require only routine decision making or simple problem solving (unskilled work).

12. Differences in intelligence certainly are not the only factor affecting performance in education, training, and highly complex jobs (no one claims they are), but intelligence is often the most important. When individuals have already been selected for high (or low) intelligence and so do not differ as much in IQ, as in graduate school (or special education), other influences on performance loom larger in comparison.

13. Certain personality traits, special talents, aptitudes, physical capabilities, experience, and the like are important (sometimes essential) for successful performance in many jobs, but they have narrower (or unknown) applicability or “transferability” across tasks and settings compared with general intelligence. Some scholars choose to refer to these other human traits as other “intelligences.”

### Source and Stability of Within-Group Differences

14. Individuals differ in intelligence due to differences in both their environments and genetic heritage. Heritability estimates range from 0.4 to 0.8 (on a scale from 0 to 1), most thereby indicating that genetics plays a bigger role than does environment in creating IQ differences among individuals. (Heritability is the squared correlation of phenotype with genotype.) If all environments were to

become equal for everyone, heritability would rise to 100% because all remaining differences in IQ would necessarily be genetic in origin.

15. Members of the same family also tend to differ substantially in intelligence (by an average of about 12 IQ points) for both genetic and environmental reasons. They differ genetically because biological brothers and sisters share exactly half their genes with each parent and, on the average, only half with each other. They also differ in IQ because they experience different environments within the same family.

16. That IQ may be highly heritable does not mean that it is not affected by the environment. Individuals are not born with fixed, unchangeable levels of intelligence (no one claims they are). IQs do gradually stabilize during childhood, however, and generally change little thereafter.

17. Although the environment is important in creating IQ differences, we do not know yet how to manipulate it to raise low IQs permanently. Whether recent attempts show promise is still a matter of considerable scientific debate.

18. Genetically caused differences are not necessarily irremediable (consider diabetes, poor vision, and phenylketonuria), nor are environmentally caused ones necessarily remediable (consider injuries, poisons, severe neglect, and some diseases). Both may be preventable to some extent.

### **Source and Stability of Between-Group Differences**

19. 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.

20. Racial-ethnic differences in IQ bell curves are essentially the same when youngsters leave high school as when they enter first grade. However, because bright youngsters learn faster than slow learners, these same IQ differences lead to growing disparities in amount learned as youngsters progress from grades one to 12. As large nation-

al surveys continue to show, black 17-year-olds perform, on the average, more like white 13-year-olds in reading, math, and science, with Hispanics in between.

21. The reasons that blacks differ among themselves in intelligence appear to be basically the same as those for why whites (or Asians or Hispanics) differ among themselves. Both environment and genetic heredity are involved.

22. There is no definitive answer to why IQ bell curves differ across racial-ethnic groups. The reasons for these IQ differences between groups may be markedly different from the reasons for why individuals differ among themselves within any particular group (whites or blacks or Asians). In fact, it is wrong to assume, as many do, that the reason why some individuals in a population have high IQs but others have low IQs must be the same reason why some populations contain more such high (or low) IQ individuals than others. Most experts believe that environment is important in pushing the bell curves apart, but that genetics could be involved too.

23. 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.

24. Almost all Americans who identify themselves as black have white ancestors—the white admixture is about 20%, on average—and many self-designated whites, Hispanics, and others likewise have mixed ancestry. Because research on intelligence relies on self-classification into distinct racial categories, as does most other social-science research, its findings likewise relate to some unclear mixture of social and biological distinctions among groups (no one claims otherwise).

### **Implications for Social Policy**

25. The research findings 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.

*The following professors—all experts in intelligence and allied fields—have signed this statement:*

- Richard D. Arvey**, University of Minnesota
- Thomas J. Bouchard, Jr.**, University of Minnesota
- John B. Carroll**, Un. of North Carolina at Chapel Hill
- Raymond B. Cattell**, University of Hawaii
- David B. Cohen**, University of Texas at Austin
- Rene V. Dawis**, University of Minnesota
- Douglas K. Detterman**, Case Western Reserve Un.
- Marvin Dunnette**, University of Minnesota
- Hans Eysenck**, University of London
- Jack Feldman**, Georgia Institute of Technology
- Edwin A. Fleishman**, George Mason University
- Grover C. Gilmore**, Case Western Reserve University
- Robert A. Gordon**, Johns Hopkins University
- Linda S. Gottfredson**, University of Delaware
- Robert L. Greene**, Case Western Reserve University
- Richard J. Haier**, University of California at Irvine
- Garrett Hardin**, University of California at Santa Barbara
- Robert Hogan**, University of Tulsa
- Joseph M. Horn**, University of Texas at Austin
- Lloyd G. Humphreys**, University of Illinois at Urbana-Champaign
- John E. Hunter**, Michigan State University
- Seymour W. Itzkoff**, Smith College
- Douglas N. Jackson**, Un. of Western Ontario
- James J. Jenkins**, University of South Florida
- Arthur R. Jensen**, University of California at Berkeley
- Alan S. Kaufman**, University of Alabama
- Nadeen L. Kaufman**, California School of Professional Psychology at San Diego
- Timothy Z. Keith**, Alfred University
- Nadine Lambert**, University of California at Berkeley
- John C. Loehlin**, University of Texas at Austin
- David Lubinski**, Iowa State University
- David T. Lykken**, University of Minnesota
- Richard Lynn**, University of Ulster at Coleraine
- Paul E. Meehl**, University of Minnesota
- R. Travis Osborne**, University of Georgia
- Robert Perloff**, University of Pittsburgh
- Robert Plomin**, Institute of Psychiatry, London
- Cecil R. Reynolds**, Texas A & M University
- David C. Rowe**, University of Arizona
- J. Philippe Rushton**, Un. of Western Ontario
- Vincent Sarich**, University of California at Berkeley
- Sandra Scarr**, University of Virginia
- Frank L. Schmidt**, University of Iowa
- Lyle F. Schoenfeldt**, Texas A & M University
- James C. Sharf**, George Washington University
- Herman Spitz**, former director of research E.R. Johnstone Training and Research Center, Bordentown, N.J.
- Julian C. Stanley**, Johns Hopkins University
- Del Thiessen**, University of Texas at Austin
- Lee A. Thompson**, Case Western Reserve University
- Robert M. Thorndike**, Western Washington Un.
- Philip Anthony Vernon**, Un. of Western Ontario
- Lee Willerman**, University of Texas at Austin

## HISTORY

Rarely do scientists join in making statements to the public about the state of their discipline. As a rule, they do not readily agree among themselves or speak in the public arena.

There is, of course, no dearth of public pronouncements from scientific associations and committees. It is unusual, however, for a broad spectrum of unaffiliated (and often unacquainted) scientists to issue a public statement (see Page, 1972, for an example concerning human heredity). It is unprecedented that one should coalesce as quickly as did the "Mainstream" statement. A fuller understanding of this event is provided by recounting its origins.

The controversy over *The Bell Curve* (Herrnstein & Murray, 1994) was at its height in the fall of 1994. Many critics attacked the book for supposedly relying on outdated, pseudoscientific notions of intelligence. In criticizing the book, many critics promoted false and highly misleading views about the scientific study of intelligence. Public miseducation on the topic is hardly new (Snyderman & Rothman, 1987, 1988), but never before had it been so angry and extreme.

I therefore approached the editorial features editor, David Brooks, at the *Wall Street Journal* to see if he would be interested in my writing an essay on the rising crescendo of misinformation on intelligence. He was not. He said he would, however, consider a short statement signed by 10 to 15 experts on what knowledge they do, in fact, consider to be mainstream in the study of intelligence. Timeliness required that any statement be submitted within 2 weeks.

### Invitations

In the next few days, I drafted a statement that addressed the most common claims and misconceptions in the public media, whether in book reviews, opinion pieces, letters to the editor, or in TV and radio commentary. I wanted to fashion a primer of sorts by outlining briefly the most basic, well-accepted conclusions in the field. The draft was faxed to half a dozen leaders in the field (including the editor of the journal *Intelligence*), with a request that they review its accuracy and suggest revisions. I also solicited comments on the draft's comprehensibility from several nonexperts.

In the meantime, I compiled a list of experts who could be invited to sign the statement. The aim was to gather a large group of highly knowledgeable researchers who represented a wide spectrum of disciplines and perspectives in the scientific study of intelligence. Names were obtained from four sources: (1) lists of individuals elected as fellows (for their distinguished contributions to psychology) by relevant divisions of the American Psychological Association such as educational psychology; school psychology; industrial and organizational psychology; and evaluation, measurement, and statistics; (2) lists of editorial board members of *Intelligence*; (3) tables of contents of books and journals devoted to

the science of intelligence; and (4) suggestions from other people more knowledgeable than I am about some of the subdisciplines in the study of intelligence. The final list ranged from individuals I was sure would sign to those I was sure would not (I was sometimes wrong on both counts). I invited only academics, because nonacademic researchers are often constrained in the public statements their employers allow them to make. The experts represented a variety of disciplines, including anthropology, behavior genetics, mental retardation, neuropsychology, sociology, and various specialties in psychology such as psychometrics, child development, educational psychology, and personnel selection.

Early the next week, my assistant and I began faxing the statement to individuals for whom we could obtain fax numbers. My one-page letter recounted the *Wall Street Journal* editor's suggestion for such a statement and invited their signatures. Recipients were advised that the deadline for my submitting the signed statement to the *Journal* was that Friday at 5:00 p.m. and that the statement would also be published as a signed editorial in *Intelligence*. Invitees were given no opportunity to revise the statement. Nor was anyone told (and only one person asked) who else had been invited or who had already signed.

The letter of invitation asked recipients to return an accompanying signature form, regardless of whether they chose to sign it, so that I could confirm that the invitation had been received. We attempted to telephone all individuals from whom I did not receive a response within 24 to 48 hr.

No inferences can be drawn about who declined to sign the statement, because many worthy scholars were either inadvertently omitted from the list or were unavailable the week I attempted to contact them.

### **Responses**

A total of 131 invitations was issued, and 100 responses were obtained by the deadline. The signature form asked respondents to check either "yes" or "no," and if "no," to check one of three options explaining why they declined to sign: "I don't agree that the statement represents the mainstream," "I don't know enough to say for sure," and "other reason." Many nonsigners wrote comments or letters explaining their decision. Those comments will be discussed here. No comments were solicited from signers, but about two thirds either telephoned or wrote brief comments; these were usually praise, appreciation, or rewordings they would have preferred.

Table 1 shows that, of the 100 individuals who responded, 48 declined to sign—7 because they thought the statement did not represent the mainstream, 11 because they did not know whether it did, and 30 for other reasons. The bottom panel of Table 1 categorizes the nonsigners (excluding the 11 individuals who "do not know enough") according to the major reason each gave for not signing the statement. It is clear that declining to sign the statement did not necessarily mean disagreement with it.

**TABLE 1**  
**Responses to Invitation to Sign “Mainstream” Statement**

<b>Responses From the Experts Successfully Contacted (N = 100)</b>	
Signed the statement	52
Decided not to sign the statement	
Statement does not represent the mainstream	7
Do not know enough to say	11
Other reasons	30
(Not located before deadline)	(31)
<b>Reason for Not Signing the Statement (N = 37)<sup>a</sup></b>	
Disagreed with 1 or 2 specific items	3
Disagreed with 3–5 specific items	2 <sup>b</sup>
Disagreed with statement’s conception of intelligence	4 <sup>c</sup>
Disagreed in general or vague way	2
Did not dispute content of statement, but disagreed with its mode of presentation	6
Agreed with statement, but feared that signing it would jeopardize their position or project	4
Mostly agreed with statement, but uncomfortable being associated with it or potential signers	4 <sup>b</sup>
Did not want to sign “at this time”	2
Gave no explanation	10

<sup>a</sup>Excludes the 11 individuals who “do not know enough.”  
<sup>b</sup>Two individuals marked “does not represent mainstream.”  
<sup>c</sup>Three individuals marked “does not represent mainstream.”

Of the 27 who gave a reason, 11 explicitly disagreed with the content of the statement (or that its claims are “mainstream”). In three cases the individuals disagreed with only 1 or 2 of the 25 items. Two disagreed with 3 to 5 items, another 4 disputed the concept of general intelligence itself (“it is not a useful concept”), and 2 expressed nonspecific disagreement (“I agree with part but not all,” “much . . . is oversimplified, does not adequately represent what is known, and incorrect”).

Fourteen individuals declined to sign the statement despite seeming to agree, sometimes strongly, that its content is “mainstream.” Six of them disagreed with the way the statement was written (submitting that it did not mention enough complexities and qualifications) or how it was published (as a group statement) or where (a newspaper, nonscientific, or “conservative” outlet). Four nonsigners were specific about the possible political repercussions to them of signing it (such as loss of funding or other support). Another four expressed discomfort with the possibility of being caught up in controversy (“getting in a no-win fight”) or seeming to associate with certain unnamed individuals (“about whom I have serious reservations”). Two other individuals, by stating that they “did not want to

sign at this time,” also seemed to signal that they agreed with the statement but thought it prudent not to endorse it.

### **Conclusions**

“Mainstream Science on Intelligence” is a collective statement that was first issued in order to inject some scientific rigor into an increasingly vitriolic and wrongheaded controversy concerning intelligence. That it garnered such immediate support from so many highly regarded scholars testifies to their confidence both that it represents the mainstream and that their joint testimony to that effect was needed in the public realm.

No individual or group has systematically rebutted the statement. Some people might construe the 24-page “Intelligence: Knowns and Unknowns” (Neisser et al., 1996) to be an alternative. However, that report was the result of 6 months’ work by an 11-member task force created by the American Psychological Association’s Board of Scientific Affairs. (Three of the task force members were also signers of the “Mainstream” statement.) That report differs in purpose, emphasis, and degree of equivocation, but its conclusions only reinforce the claim that the contents of the “Mainstream” statement are squarely within the mainstream. It too concludes, for example, that differences in intelligence exist, can be measured fairly, are partly genetic (within races), and influence life outcomes.

It is obviously not the case that there is no disagreement about these important issues or that scientific truth is a matter of majority rule. A significant minority of the experts who were contacted disagreed in part or in whole with the statement, and many of the signers would have written the statement somewhat differently. Rather, the lesson here is that what have often been caricatured in the public press as discredited, fringe ideas actually represent the solid scientific center in the serious study of intelligence. As Snyderman and Rothman’s (1988) survey of IQ experts and journalists revealed, the media, among others, have been turning the truth on its head.

Many of the conclusions outlined in “Mainstream” are ones that many scholars have reached only recently and reluctantly (Gottfredson, 1996). The mainstream shifted slowly but steadily in recent decades as accumulating research evidence changed our understanding of the nature, measurement, origins, and consequence of differences of intelligence. The press and public have yet to catch up to the new mainstream.

Social and political pressure, both internal and external to the field of intelligence, continues to make scholars reluctant to share their conclusions freely. Over one third of the individuals who declined to sign the “Mainstream” statement expressed reasons that signal such reluctance.

It is also understandable that some respondents wanted the statement’s 25 items to be stated with a fuller account of their complexity. It is difficult for knowledgeable and precise scientists to make simple summary statements that do not do full

justice to the topics they know so well, especially ones subject to controversy. Indeed, many books have been written about most of the individual items in the “Mainstream” statement. As a practical matter, people are more likely to reach consensus on general principles than highly particular ones. More importantly, it is sometimes wiser to focus on the forest than the trees—certainly when public perceptions are 180 degrees in the wrong direction.

Furthermore, only a strong collective voice is likely to be heard when popular opinion has been aroused against particular ideas, as had been the case with intelligence for some years. For many of us who signed the “Mainstream” statement, this joint effort was the only corrective letter of the many we individually wrote to the media that was ever published.

Scientists should not have to issue public statements about what is most basic in their fields. However, responsibility to science and society sometimes demands that they do so. What effects such statements have is uncertain—except that pundits can no longer assert their falsehoods without fear of contradiction.

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The following bibliography is provided as an entry point into the vast literature on intelligence. It samples the major books since 1980 (with the addition of one 1975 classic). Consulting any subset of entries will quickly reveal many other important works.

Some of the books listed here examine issues that are now considered settled for the most part (e.g., test bias), and others represent newer, quickly evolving fields of inquiry (e.g., biological bases of intelligence). Date of publication is therefore a fallible guide to currency.

Some of the volumes synthesize work on a single major question (e.g., Jensen, 1980; Spitz, 1986); others survey the variety of expert opinion on an issue (e.g., Detterman and Sternberg, 1982); yet others represent separate threads of research on a fast-breaking topic (e.g., Vernon, 1993). All, however, give a sense of the

ways in which researchers have tried to puzzle out the meaning and measurement of intelligence. By illustrating the kind and amount of evidence on particular questions, as well as debates over how compelling we should consider that evidence, these volumes help to illustrate not only what we know but also how we know it.

The bibliography provides general documentation for the “Mainstream” statement. It was culled from documentation for each of the statement’s 25 specific items, which, in turn, had been obtained by asking signers of the “Mainstream” statement to provide the best one or two citations for each item. That list of more than 150 book and journal citations (“Selected Documentation for 25 Items in ‘Mainstream Science on Intelligence’”) is available from the author.

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