The value of IQ tests has also been called into question by recent theories that define intelligence in ways that transcend the boundaries of tests chiefly designed to measure abstract reasoning and verbal comprehension. For example, Robert Steinberg’s triarchic model addresses not only internal thought processes but also how they operate in relation to past experience and to the external environment. Harvard University psychologist Howard Gardner has posited a theory of multiple intelligences that includes seven different types of intelligence: linguistic and logical-mathematical (the types measured by IQ tests); spatial; interpersonal (ability to deal with other people); intrapersonal (insight into oneself); musical; and bodily-kinesthetic (athletic ability).

Critics have also questioned whether IQ tests are a fair or valid way of assessing intelligence in members of ethnic and cultural minorities. Early in the 20th century, IQ tests were used to screen foreign immigrants to the United States; roughly 80% of Eastern European immigrants tested during the World War I era were declared “feeble-minded,” even though the tests discriminated against them in terms of language skills and cultural knowledge of the United States. The relationship between IQ and race became an inflammatory issue with the publication of the article “How Much Can We Boost IQ and Scholastic Achievement?” by educational psychologist Arthur Jensen in the Harvard Educational Review in 1969. Flying in the face of prevailing belief in the effects of environmental factors on intelligence, Jensen argued that the effectiveness of the government social programs of the 1960’s War on Poverty had been limited because the children they had been intended to help had relatively low IQs, a situation that could not be remedied by government intervention. Jensen was widely censured for his views, and standardized testing underwent a period of criticism within the educational establishment, as the National Education Association called for a moratorium on testing and major school systems attempted to limit or even abandon publicly administered standardized tests. Another milestone in the public controversy over testing was the 1981 publication of Stephen Jay Gould’s best-selling The Mismeasure of

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**GENDER DIFFERENCES IN MATH**

In the late 1970s, political scientists Sheila Tobias and others called attention to the trend for girls to avoid and feel anxiety about math, a fact she attributed to social conditioning. Girls historically were discouraged from pursuing mathematics by teachers, peers, and parents.

In the early 1990s, two studies suggested that there might be differences in how boys and girls approach mathematics problems. One study, conducted by researchers at Johns Hopkins University, examined differences in mathematical reasoning using the School and College Ability Test (SCAT). The SCAT includes 50 pairs of quantities to compare, and the test-takers must decide whether one is larger than the other or whether the two are equal, or whether there is not enough information. Groups of students in second through sixth grade who had been identified as “high ability” (97th percentile or above on either the verbal or quantitative sections of the California Achievement Test) participated in the study. The boys scored higher than the girls overall, and the average difference between male and female scores was the same for all grade levels included in the study. Another study by Australian researchers at the University of New South Wales and La Trobe University gave 10th-graders 36 algebraic word problems and asked them to group the problems according to the following criteria: whether there was sufficient information to solve the problem; insufficient information; or irrelevant information along with sufficient information. (There were 12 problems in each category.) Students were grouped into ability groups according to prior test scores. Boys and girls performed equally well in identifying problems containing sufficient information, but boys were more able than girls to detect problems that had irrelevant information, or those that had missing information. Next, the researchers asked the students to solve the problems. Girls performed as well as boys in solving problems that had sufficient information, but no irrelevant information. On the problems that contained irrelevant information, girls did not perform as well as boys. The researchers offered tentative conclusions that perhaps girls are less able to differentiate between relevant and irrelevant information, and thus allow irrelevant information to confuse their problem-solving process. The researchers hypothesized that this tendency to consider all information relevant may reflect girls’ assumption that test designers would not give facts that were unnecessary to reaching a solution.

Some researchers have argued that offering all-girl math classes is an effective way to improve girls’ achievement by allowing them to develop their problem-solving skills in an environment that fosters concentration. Others feel this deprives girls of the opportunity to learn from and compete with boys, who are often among the strongest math students.
Man, which critiqued IQ tests as well as the entire concept of measurable intelligence.

Many still claim that IQ tests are unfair to members of minority groups because they are based on the vocabulary, customs, and values of the mainstream, or dominant, culture. Some observers have cited cultural bias in testing to explain the fact that, on average, African-Americans and Hispanic-Americans score 12-15 points lower than European-Americans on IQ tests. (Asian-Americans, however, score an average of four to six points higher than European-Americans.) A new round of controversy was ignited with the 1994 publication of The Bell Curve by Richard Herrnstein and Charles Murray, who explore the relationship between IQ, race, and pervasive social problems such as unemployment, crime, and illegitimacy. Given the proliferation of recent theories about the nature of intelligence, many psychologists have disagreed with Herrnstein and Murray’s central assumptions that intelligence is measurable by IQ tests, that it is genetically based, and that a person’s IQ essentially remains unchanged over time. From a sociopolitical viewpoint, the book’s critics have taken issue with The Bell Curve’s use of arguments about the genetic nature of intelligence to cast doubt on the power of government to remedy many of the nation’s most pressing social problems.

Yet another topic for debate has arisen with the discovery that IQ scores in the world’s developed countries—especially scores related to mazes and puzzles—have risen dramatically since the introduction of IQ tests early in the century. Scores in the United States have risen an average of 24 points since 1918, scores in Britain have climbed 27 points since 1942, and comparable figures have been reported throughout Western Europe, as well in Canada, Japan, Israel, Australia, and other parts of the developed world. This phenomenon—named the Flynn effect for the New Zealand researcher who first noticed it—raises important questions about intelligence testing. It has implications for the debate over the relative importance of heredity and environment in determining IQ, since experts agree that such a large difference in test scores in so short a time cannot be explained by genetic changes.

A variety of environmental factors have been cited as possible explanations for the Flynn effect, including expanded opportunities for formal education that have given children throughout the world more and earlier exposure to some types of questions they are likely to encounter on an IQ test (although IQ gains in areas such as mathematics and vocabulary, which are most directly linked to formal schooling, have been more modest than those in nonverbal areas). For children in the United States in the 1970s and 1980s, exposure to printed texts and electronic technology—from cereal boxes to video games—has been cited as an explanation for improved familiarity with the types of maze and puzzle questions that have generated the greatest score changes. Improved mastery of spatial relations has also been linked to video games. Other environmental factors mentioned in connection with the Flynn effect include improved nutrition and changes in parenting styles.

**Further Reading**


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**Interdisciplinary treatment**

Patient care plan that involves healthcare professionals from a wide variety of areas.

Holistic healthcare, the concept that the body is not just a collection of separate and distinct parts but rather an assemblage of interrelated components that form a unified whole, is at the root of interdisciplinary treatment. The holistic viewpoint is that mental health is related to and interdependent on physical well-being, and vice-versa. An interdisciplinary treatment team has the ability to pool their knowledge and expertise towards the recovery of the whole individual, not just his or her disease.

The members and make-up of the interdisciplinary team are tailored to the patient and his or her physical, emotional, and functional needs. Team members may include, but are not limited to, physicians (from a variety of medical specialties), nurse practitioners, surgeons, psychologists, psychiatrists, social workers, school counselors, nutritionists, physical therapists, vocational counselors, occupational therapists, and creative therapists (i.e., art therapists, music therapists).

**Origins and applications**

Interdisciplinary treatment was first introduced to mental healthcare in the United States in the late 1940s.