Summary

Evolutionary theory has existed in one form or another since the time of the early Greeks. Lamarck claimed that traits acquired during an individual's lifetime that are conducive to survival are passed on to the individual's offspring. Spencer originally followed Lamarck by saying that frequently used associations are passed on to offspring in the form of reflexes and instincts. Later, Spencer accepted Darwin's version of evolutionary theory and applied it to society, saying that society should allow enough freedom so that those most fit for survival could differentiate themselves from those least fit for survival. This was called social Darwinism.

After his five-year journey aboard the *Beagle*, Darwin realized that in different locations members of a species possessed different characteristics and that the characteristics of a species change over time. Darwin found support in Malthus's essay that noted a species always produces many more offspring than the food supply could support and that population size is kept in check by events such as starvation and disease. Darwin expanded this notion into a general struggle for survival in which only the fittest survive. According to Darwin, there are individual differences among offspring, with some offspring possessing traits that are conducive to survival, whereas others do not. Thus, there was a natural selection of those offspring whose traits are most conducive to survival under the existing circumstances.

Darwin demonstrated that the evolutionary process applies to humans as well as to other living organisms. Darwin defined fitness by the reproductive success of an individual. By changing the definition of fitness to mean an individual's ability to perpetuate copies of his or her *genes* into future generations, sociobiologists have been able to explain a vast array of human social behavior in terms of evolutionary theory. What was originally called sociobiology is now called evolutionary psychology.

Darwin's cousin Francis Galton had a passion for measurement. He equated intelligence with sensory acuity and, therefore, measured intelligence mainly by measuring the senses. Because he believed that intelligence is inherited, he urged the practice of eugenics, or selective breeding, to improve human intelligence. Galton found great individual differences in the ability to experience mental images. Galton also observed that although there is a tendency for children to inherit the traits of their parents, there is also a regression toward the mean. For example, extremely tall parents tend to have tall children, but the children tend not to be as tall as the parents. By demonstrating how two things tended to vary together, Galton invented the method of correlation. It was Pearson who created the formula that quantified the magnitude of a correlation by generating a coefficient of correlation (r). Cattell brought Galton's notion of intelligence testing to the United States and was the first to employ the term *mental test*.

In France, Binet took another approach to testing, asserting that intelligence consists of several different mental abilities such as memory, imagery, attention, comprehension, and judgment. Binet's goal was to devise tests that would directly measure these mental abilities. In response to the French government's request for an instrument that could be used to reliably distinguish between normal children and children with mental deficiencies, Binet and Simon offered their 1905 scale of intelligence. In 1908 Binet and Simon revised their scale so that it not only would distinguish between normal and subnormal children but also would distinguish levels of intelligence among normal children. They gave the scale to children between the ages of 3 and 13, and all tests that 75% or more of the children of a certain age passed were assigned to that age. In this way, it became possible to determine whether any particular child was performing at, above, or below the average performance of other children of his or her age. In 1911 Binet and Simon again revised the scale so that five tests corresponded to each age level. This allowed one-fifth of a year to be added to a child's score for each test he or she passed beyond the average for his or her age group.

Stern offered the term *mental age* and also the notion of intelligence quotient. Intelligence quotient was calculated by dividing a child's mental

age (score on the Binet–Simon scale) by the child's chronological age. It was Terman who later suggested that the quotient be multiplied by 100 to remove the decimal point and that "intelligence quotient" be abbreviated as *IQ*.

Binet believed that intelligence was not one mental faculty but many; he, therefore, opposed describing people's intelligence in terms of IQs. He also believed that, although intellectual potential may be inherited, most people function below their potential and could therefore benefit from education.

Spearman found high correlations among measures of sensory acuity and academic performance. Using a technique that came to be called factor analysis, Spearman concluded that intelligence consists of two factors. One factor (*s*) consists of specific abilities, and the other (*g*) consists of general intellectual ability. Furthermore, Spearman concluded that *g* is almost entirely inherited. Burt, a colleague of Spearman's, accepted Spearman's beliefs concerning *g* and suggested that education be stratified according to students' native intellectual ability. Burt was accused of falsifying his data, and a major scandal ensued.

Goddard translated the Binet–Simon scale into English and administered it to both children with mental retardation and to children in the New Jersey public schools. Appalled to find that many public school students performed at a level below their age norm, Goddard believed this poor performance reflected a deterioration in the nation's intelligence. To investigate the relationship between inheritance and intelligence, Goddard studied the family history of a girl with mental retardation. Goddard took his findings as support for the contention that intelligence is inherited. Many states instituted laws allowing for the sterilization of individuals with mental deficiencies as well as others who were socially undesirable. Fear of the "menace of the feeble-minded" directed attention to the immigrants entering the United States. Administration of the Binet–Simon test led to the conclusion that many immigrants had mental deficiencies, and they were deported back to Europe. The fact that poor test performance could have been due to educational, cultural, and personal experiences were initially considered by Goddard and rejected.

Terman revised the Binet–Simon scale, making it more compatible with U.S. culture and statistically easier to analyze. Terman's revision, called the Stanford–Binet, was used to isolate 1,528 intellectually gifted children who were then intensely studied throughout their lives. Through the years, it was found that members of this group of gifted individuals continued to score in the top 1% of the population in intelligence, participated in and excelled at a wide range of activities, and were outstanding academically. Because the study showed that the gifted children became well-adjusted, successful, healthy adults, it laid to rest the belief that gifted children were physically or psychologically handicapped as adults. Although Terman urged the use of mental tests to identify gifted children so that they could be groomed to be the future leaders of society, it was Leta Stetter Hollingworth who attempted to specify optimal educational experiences for the gifted. She also did much to improve the education of "subnormal" individuals. In addition, Hollingworth challenged many of the beliefs about women that were prevalent at the time—for example, the belief that women are intellectually inferior to men.

When the United States entered World War I, Yerkes and other psychologists developed an Army Alpha test for literate recruits and an Army Beta test for illiterate or non-English-speaking recruits. According to the results of the army's testing program, about half of the white males tested had a mental age of 13 or lower, and the situation was even worse for black males. Once again, proposals arose for widespread sterilization of individuals with mental deficiencies. At the time, however, a growing number of prominent individuals were wondering whether so-called intelligence tests actually measure genetically determined intelligence. They argued that test performance is determined more by education and personal experience than by inheritance.

In subsequent years, some U.S. psychologists revisited the idea that intelligence was best understood as one factor (Spearman's *g*). Several other American psychologists have made important contributions to psychometrics and statistics. For example, David

Wechsler introduced a new system for determining IQ scores in his tests—the WAIS and WISC. When *The Bell Curve* was published in 1994, it reignited more or less the same controversy that surrounded the Burt "scandal." Once again, the issues seemed to be as much moral, political, or philosophical as scientific. Efforts to define intelligence and to determine how best to measure it continue in contemporary psychology. Today, most psychologists believe that both inheritance and experience are factors in intelligence. The argument now mainly concerns the relative contributions of each.

Discussion Questions

1. Summarize Lamarck's theory of evolution.
2. Describe Spencer's social Darwinism and explain why it was so popular in the United States.
3. What is the Spencer–Bain principle?
4. Why did Darwin delay publication of his theory for so long? What finally prompted him to publish it?
5. Summarize Darwin's theory of evolution.
6. Compare Darwin's concept of fitness with the sociobiologists' concept of inclusive fitness. What are the implications of the difference between the two concepts for the explanation of human social behavior?
7. Summarize Galton's contributions to psychology.
8. In what ways did Binet's approach to intelligence testing differ from Galton's and Cattell's?
9. Describe the 1905 Binet–Simon scale of intelligence. How was the scale revised in 1908? In 1911?
10. What procedure did Stern suggest for reporting a person's intelligence? Why did Binet oppose this procedure?
11. Summarize Spearman's views of intelligence.
12. What was the Burt "scandal"? In what way did it reflect the age-old controversy concerning nature versus nurture?
13. What conclusions did Goddard reach when he administered the Binet–Simon scale to schoolchildren in the United States?
14. What prompted Terman's longitudinal study of gifted individuals? Summarize the results of that study.
15. Summarize Leta Stetter Hollingworth's contributions to psychology.
16. How did Yerkes suggest that psychologists help in the war effort? What was the effort that resulted from this suggestion?
17. What arguments were offered in opposition to the contention that intelligence tests were measuring one, innate, factor of intelligence (*g*)?
18. Describe some of the areas where U.S. psychologists have contributed to psychometrics.
19. Discuss the work of David Wechsler. What is the current status of intelligence tests?
20. Where do most psychologists today stand on the nature–nurture question as it applies to intelligence? In what way was the controversy surrounding the publication of *The Bell Curve* the same as that surrounding the Burt "scandal"?

Suggestions for Further Reading

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