**Begins a second career in the United States**

In 1966, Eccles turned sixty-three and university policy at the Australian National University required him to retire. Wanting to continue his research career, he accepted an invitation from the American Medical Association to become the director of its Institute for Biomedical Research in Chicago. He left that institution in 1968 to become professor of physiology and medicine and the Buswell Research Fellow at the State University of New York in Buffalo. The university constructed a laboratory for him where he could continue his research on transmission in nerves. Even at a late stage in his career, Eccles’s work suggested important relationships between the excitation and inhibition of nerves and the storing and processing of information by the brain.

In 1975, he retired from SUNY with the title of Professor Emeritus, subsequently moving to Switzerland. During the final period of his career, Eccles focused on a variety of fundamental problems relating to consciousness and identity, conducting research in areas where physiology, psychology, and philosophy intersect. He died at his home in Contra, Switzerland.

Eccles received a considerable number of scientific distinctions. His memberships included the Royal Society of London, the Royal Society of New Zealand, and the American Academy of Arts and Sciences. He was awarded the Götch Memorial Prize in 1927, and the Rolleston Memorial Prize in 1932. The Royal College of Physicians presented him with their Baly Medal in 1961, the Royal Society gave him their Royal Medal in 1962, and the German Academy awarded him the Cothenius Medal in 1963. Also in 1963, he shared the Nobel Prize for Physiology and Medicine with Alan Hodgkin and Andrew Huxley. He was knighted in 1958.

In 1928, Eccles married Irene Frances Miller of New Zealand. The marriage, which eventually ended in divorce in 1968, produced four sons and five daughters. One of their daughters, Rosamond, earned her doctorate and participated with her father in his research. After his divorce from Irene Eccles, Eccles married the Czech neurophysiologist Helena Ťabóriková in 1968. Dr. Ťabóriková also collaborated with Eccles in his scientific research.

See also Central nervous system

D. George Joseph

**Further Reading**


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**Echolalia**

Repetition of another person’s words or phrases.

Using a mechanical, robotlike speech pattern, an individual with certain mental disorders may repeat words or phrases spoken by others. Known as echolalia, this behavior is observed in children with autism, Tourette’s syndrome, schizophrenia, and certain other brain disorders.

**Educational psychology**

The study of the process of education, e.g., how people, especially children, learn and which teaching methods and materials are most successful.

Educational psychology departments in many universities provide training to educators, school psychologists, and other educational professionals. Applied research in this field focuses on how to improve teaching, solve learning problems, and measure learning ability and progress. Other concerns of educational psychology include cognitive development, the dynamics of pupil behavior, and the psychological atmosphere of the classroom. Educational psychologists devise achievement tests, evaluate teaching methods, develop learning aids and curricula, and investigate how children of different ages learn. They often serve as researchers and educators at teacher training institutions, in university psychology departments, on the staffs of educational research organizations, and also work in government agencies, business, and the military. An educational psychologist might investigate areas as diverse as the causes of dyslexia and the measures that can be taken to help dyslexics improve their reading and learning skills; gender differences in mathematical ability; anxiety in education; the effect of television on study habits; the identification of gifted children; how teachers affect student behavior; and creative thinking in children of a specific grade level or age.

Educational psychology in the United States has its roots in the pioneering work of the 1890s by two of the country’s foremost psychologists, William James and John Dewey. James—who is known for his 1899 volume, *Talks to Teachers on Psychology*—pioneered the concept of taking psychology out of the laboratory and applying it to problems in the real world. He advocated
the study of educational problems in their natural environment, the classroom, and viewed classroom interactions and observations as a legitimate source of scientific data. John Dewey, the country’s most famous advocate of active learning, founded an experimental school at the University of Chicago to develop and study new educational methods. Dewey experimented with educational curricula and methods and advocated parental participation in the educational process. His philosophy of education stressed learning by doing, as opposed to authoritarian teaching methods and rote learning, and his ideas have had a strong impact on the theory and practice of education in the United States. Dewey’s first influential book on education, The School and Society (1899), was adapted from a series of lectures to parents of the pupils in his school at the University of Chicago.

In the twentieth century, the theoretical and practical branches of educational psychology have developed separately from each other. The name most prominently associated with the scientific, experimental focus is that of Edward L. Thorndike, often called “the father of educational psychology.” Applying the learning principles he had discovered in his animal research to humans, Thorndike became a pioneer in the application of psychological principles to such areas as the teaching of reading, language development, and mental testing. His Introduction to the Theory of Mental and Social Measurements (1904) gave users of intelligence tests access to statistical data about test results. Although Thorndike’s emphases were on conditioning and scientific measurement, he was both directly and indirectly responsible for a number of curricular and methodological changes in education throughout the United States. Thorndike is especially well-known as an opponent of the traditional Latin and Greek classical curriculum used in secondary schools, which he helped to discontinue by demonstrating that progress in one subject did not substantially influence progress in another—the major premise on which classical education had been based.

The work of Thorndike’s contemporary, Charles Hubbard Judd (1873-1946), provided a marked contrast in its more pragmatic focus on transforming contemporary educational policies and practices. Judd served as director of the University of Chicago School of Education, where he disseminated his philosophy of education. His research interests were applied to the study of school subjects and teaching methods. Concerned with school organization as well, Judd recommended the establishment of both junior high schools and junior colleges and championed equal education opportunities for students of all backgrounds. His published books include Psychology of High School Subjects (1915), Psychology of Secondary Education (1927), and Genetic Psychology for Teachers (1939).

Other educational psychologists have focused their work on either measurement and learning theory or school and curriculum reform. The contributions of G. Stanley Hall (1844-1924) to the field of intelligence testing were especially significant and influential. He passed on his view of intelligence as an inherited trait to two of his most famous students, Arnold Gesell and Lewis Terman. It was Terman who introduced the Stanford-Binet Intelligence Scales in the United States in 1916, creating new norms based on American standardizing groups. Gesell also made important contributions to the study of human development, and by the 1930s, this subject had become a part of the standard educational psychology texts, and today it is a central area in the field. The learning process, a related area that is also traditionally studied, includes such issues as hierarchies of learning activities, the relationship of learning to motivation, and effective instructional methods.

The study of evaluation has remained a central part of the educational psychology and includes techniques for assessing learning, achievement, and behavior; analysis of individual differences; and methods of addressing learning problems. Another relevant area is that of mental health in the classroom (personality integration; adjustment problems; teacher-pupil interaction). In recent years, the trend has been toward a more “holistic” and humanistic approach that stresses the learner’s affective needs in the context of cognitive processes. A growing area of emphasis for all education professionals is educating individuals with special needs. Current psychological theory and practice—as well as federal law—rejects the traditional exclusionary approach in dealing with disabled or emotionally troubled children and adolescents. Mainstreaming such students is now common practice, with the goal of expanding boundaries and reducing the barriers between exceptional or atypical students and mainstream students. Educational psychology must now concern itself with such issues as systems for classification of children and teenagers as mentally retarded or deviant; creation of alternative educational environments and intervention programs that promote the development of the special needs population and the requisite teaching strategies and skills; and the creation, where necessary, of individualized educational plans.

Division 15 of the American Psychological Association (APA) is devoted to educational psychology. Its members are mostly faculty members at universities, although some work in school settings. In 1982, nearly 14 percent of the members of the APA were members of this division and identified themselves as educational psychologists. Professional journals in educational psychology include Journal of Educational Psychology, Educational Psycholo-