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INFLUENCE OF EVOLUTIONARY BIOLOGY IN THE EARLY DEVELOPMENT OF EXPERIMENTAL PSYCHOLOGY IN ARGENTINA (1891-1930)

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ABSTRACT: Argentina's first laboratory of experimental psychology was founded in 1891 by the educational psychologist Víctor Mercante. Other laboratories were then opened in several universities during the following forty years, giving rise to a considerable development of experimental psychology. The emphasis on experimentation was a common feature of psychology in many other countries, including some Latin American ones. However, Argentine psychology differed from that of other Spanish-speaking countries in the relatively important influence of evolutionary biology on the thinking of several of the most influential psychologists, including José Ingenieros, Horacio G. Piñero, Víctor Mercante, and Rodolfo Senet, whose ideas and work are described in this paper.

RESUMEN: El primer laboratorio argentino de psicología experimental fue creado en 1891 por el psicólogo educacional Víctor Mercante. Otros laboratorios fueron abiertos en varias universidades durante los siguientes cuarenta años, dando lugar a un considerable desarrollo de la psicología experimental. El énfasis en la experimentación fue un rasgo común de la psicología en muchos otros países, incluyendo algunos latinoamericanos. Sin embargo, la psicología argentina difirió de la de otros países de habla hispánica en la influencia relativamente importante de la biología evolutiva en muchos de sus más influyentes psicólogos, incluyendo a José Ingenieros, Horacio G. Piñero, Víctor Mercante, y Rodolfo Senet. Sus ideas y contribuciones se describen en este artículo.

An historical review of the antecedents and development of experimental psychology in Argentina, from the arrival of Europeans in the 16th Century to the present, suggests that experimentalism was the dominant view between 1891 and 1930 (Foradori, 1935; Ingenieros, 1919a; Papini, 1976, 1978, 1987; Papini & Mustaca, 1979). Several factors contributed to the dominance of experimental psychology, including first, the strong influence from European psychology which had started by that time to move toward an increasingly experimental position (i.e., Wilhelm Wundt, George Dumas, Theodule Ribot, Herbert Spencer, C. Lombroso, etc.); second, the impact of "transformism," that is, the theory of evolution from common ancestors, as developed by Jean-Baptiste Lamarck, Charles Darwin, Herbert Spencer, Ernest Haeckel, and others, which placed psychology into a closer contact with the natural sciences where observational and experimental methods were well established; and third, a local philosophical tradition that began early in the 19th

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century with Juan C. Lafinur (1797-1824), Manuel Fernández de Agüero (1772-1840), and Diego Alcorta (1801-1842). A brief description of this local tradition and of some of the main political and social factors characterizing Argentina's history during the last century, will be useful to set up the framework within which experimental psychology developed toward the end of the 19th Century.

The importance of Lafinur, Fernández de Agüero, and Alcorta lies in their rejection of traditional scholastic philosophy in favor of ideology, a French movement initiated by Etienne de Condillac, Pierre Cabanis, and Antoine Destutt de Tracy. In the present context, it is the emphasis on sensory experience as the source of human knowledge that was central to the ideologists. Lafinur was appointed as Professor of Philosophy at the Colegio de la Unión del Sur de Buenos Aires, where he lectured between 1819 and 1821. His rejection of traditional philosophical ideas was so extreme that he was finally expelled from the Colegio. This college became the basis for the foundation of the University of Buenos Aires in 1821. Lafinur was followed by Fernández de Agüero, who lectured on ideology from 1822 to 1827, and who was in turn followed by Diego Alcorta, also an ideologist, who remained in this position until his death in 1842. These three philosophers were not extremely original, as Torchia Estrada (1961) has shown. They should be properly considered as professors of philosophy. However, they had a profound effect in the cultural movement both during their time and toward the end of the century, when positivism was at its height. Particularly important was Fernández de Agüero's book *Principles of Ideology* (1940) in which he suggested, following Cabanis, that psychology should be based on the study of sensory processes and nerve function. These ideas, although not very original at that time, served to set up a tradition that was later to influence some of the proponents of experimental psychology (e.g., Ingenieros, 1919a).

There were several political and social factors that undoubtedly influenced the emergence of experimental psychology. Between 1860 and 1930, Argentina's political system was relatively stable, and the country's economy, based on agriculture, was growing. Two aspects of the social life are perhaps of importance in relation to the expansion of universities: the relatively large educational investment based on the principle of equal opportunity for access to a free, non-religious system and on European culture, and the large immigration of people from several European countries, mainly Italy, which further strengthened the contact between Argentina and Europe. The new nation that was emerging out of internal conflicts was modeled from the ideas of Juan B. Alberdi (1810-1884) and Domingo F. Sarmiento (1811-1888). Alberdi played an important role in the political organization of the nation, whereas Sarmiento set up the basis for Argentina's educational projects. Both were pragmatic and both saw science as a main route for social

progress. Their ideas were so close to what was to be known as positivism, that it has been suggested that they actually developed an autochthonous Argentine positivism (Korn, 1949; Romero, 1952). Sarmiento was responsible for a number of projects about education that he carried out in his several public positions. During his presidential period (1868-1874), the universities expanded and several research institutes were created, such as the astronomical observatory of Córdoba (Babini, 1963). Argentina was rapidly growing and needed an effective educational system based on the particular features of its increasingly heterogeneous population. In addition, the influence of positivism naturally encouraged an empirical approach to education, and psychology benefited from this state of affairs. Wundt's experimental approach to psychology had a broad influence in Europe, the United States, and some Latin American countries, but the influence of evolutionary biology on psychology was far less impressive and general, particularly in Spanish-speaking countries (Ardila, 1982, 1987; Foradori, 1954). In this connection, however, Argentine psychology was an exception.

In this paper I describe some features of the early historical development of experimental psychology in Argentina. I concentrate on some of the psychologists who developed their activities at the Universities of Buenos Aires (founded in 1821) and La Plata (founded in 1897) not because these were the only Universities where experimental psychology was dominant (see Papini, 1976), but rather because of their wider influence in both academic and cultural activities and the discussion of social issues such as elementary education and mental health.

In 1891, Víctor Mercante (1870-1934) set up a small laboratory in a secondary school at San Juan, to study the psychology of children and apply this knowledge to improve educational practices. His main research topics concerned the development of reading and writing abilities, and the use of mental tests as research tools. Notice that Mercante's laboratory was founded only twelve years after Wundt's. Experimental laboratories were soon opened in other schools and universities, giving rise to a period of rapid growth and development of experimental psychology (Papini, 1976).

Mercante continued his research at the University of La Plata in 1906, with his main colleague, Rodolfo Senet (1872-1938). They set up a laboratory for the study of psychological functions in children with direct implications for education. Mercante and Senet carried out an extensive research project which emphasized the study of large samples of children and the use of statistical methods to describe the results and reach scientific conclusions. Mercante published *Psicología de la Aptitud Matemática [Psychology of Mathematical Skills]* in 1904, and *La Crisis de la Pubertad y sus Consecuencias Pedagógicas [The Crisis of Puberty and its Educational Consequences]* in 1918, with an extensive review of original research. In a similar vein, Senet published

his book *Elementos de Psicología Infantil [Elements of Child Psychology]* in 1911. Although Mercante and Senet were applied researchers, they believed that psychology should be based in evolutionary biology. For example, Mercante began his book on the crisis of puberty with a review of psychological development in animals, and pointed out that: "Survival is but a need to protect the offspring in the best possible way, against all kinds of risks and, in turn, to prepare it for the sexual act" (Mercante, 1918, p. 20). Mercante believed that the crisis of puberty was not exclusively observed in humans, but common to the reproductive stage of development of many species.

Moreover, Mercante and Senet placed a major emphasis on physical anthropology and neurobiology. They developed an extensive series of studies on the relationship between mental evolution and cephalic indices, and wrote about current theories of human evolution (cf. Mercante, 1918, pp. 55-99; Senet, 1909).

Between 1898 and 1901, Horacio G. Piñero (1869-1919) set up a laboratory at the University of Buenos Aires with equipment acquired in Germany (in 1901) and France (in 1902). The first university course in experimental psychology, with laboratory exercises, was then offered in 1901 by Piñero. The course emphasized the anatomical and physiological basis of emotions, attention, perception, memory, thinking, and language. Students had to carry out a research project as a complement to the course. In 1916 Piñero edited a two-volume book containing most of the research carried out by the group. The volumes were entitled *Trabajos de Psicología Normal y Patológica [Works on Normal and Pathological Psychology]*. The research carried out between 1905 and 1914, and published in the first volume of these Works, included 50 papers on topics such as memory (15 papers), attention (17), psychophysiology (11), and perception and psychophysics (7).

Piñero's view of experimental psychology was largely based on the biological sciences and on the Darwinian hypothesis of psychological continuity between species:

Experimental psychology does not exclusively mean laboratory psychology, but natural, objective psychology, with experience, observation, and study of the life and habits of animals and man, isolated and in groups. (Piñero, 1916, p. 10.)

It seems that Piñero's course attracted the attention of many students who were interested in the "new" experimental psychology. The University then decided to offer a second course. Felix Krueger, one of Wundt's disciples, moved to the University of Buenos Aires to teach this second course in 1906. Piñero's course was then oriented toward the experimental, physiological, and clinical aspects of psychology, whereas Krueger's dealt with higher mental functions and the relationship between psychology, philosophy, and the social sciences. Krueger

returned to Germany in 1909 and the course was offered by José Ingenieros (1877–1925), perhaps the most influential Argentine psychologist during this period, who had been appointed as Professor of Experimental Psychology in 1908. Krueger's presence was not an isolated event; many European psychologists lectured at the University of Buenos Aires during the period between 1900 and 1930, such as George Dumas, Pierre Janet, Stanley Hall, and Wolfgang Kohler.

Ingenieros was not a laboratory scientist but a philosopher with broad interests in the natural sciences (Lipp, 1969). His book on psychology, published in 1911 and entitled *Psicología Genética [Genetic Psychology]*, was the result of a series of articles he wrote during 1910 for the medical journal *Argentina Médica*. This book was later published in Spain and France as *Principios de Psicología Biológica [Principles of Biological Psychology]* in 1913, and in Germany and Argentina as *Principios de Psicología [Principles of Psychology]* (Ingenieros, 1919b).

Ingenieros was deeply influenced by Darwin's theory of evolution and by Spencer's idea of evolutionary progress. His *Principios* shows the extent to which he integrated evolutionary thinking and psychology. Ingenieros extended the idea of evolution from phylogeny to the individual organism (ontogeny), and to human societies (sociogeny):

Psychology studies the *natural formation of psychological functions* in the evolution of living species, in the evolution of human societies, and in the evolution of individuals. (Ingenieros, 1919b, p. 9.)

According to Ingenieros, psychological functions are adaptive reactions of organisms to environmental conditions; they evolve as any other biological character through the action of natural and sexual selection and through the inheritance of acquired skills. He conceptualized psychology as a branch of the biological sciences whose object of study was the development of psychological functions in individual organisms (Ingenieros, 1919b, pp. 323–324). Ingenieros was concerned about the lack of interest in evolutionary biology shown by psychologists of his time, and placed a major emphasis on comparative psychology as a basic substrate of psychology as a whole (Papini, 1985).

Ingenieros realized that non-human animals could not be studied by the classic subjective methods, and suggested that comparative psychologists should measure the behavior of organisms as an objective assessment of psychological functions:

The *psychological phylogeny* can only be reconstructed through the observation of the behavior of living beings, that is, by studying the means of expression of their psychological functions. (Ingenieros, 1919b, p. 301.)

Ingenieros went on to point out that objective observation was the main tool for studying not only the comparative, but also the develop-

mental and social roots of mental capabilities. Introspection was not a useful technique when studying infants or adults from "primitive" societies. His emphasis on behavior and on objective methods is not original, but it does not seem to have been developed out of behaviorism since there is no reference to J. B. Watson even in the last edition of his *Principios* (Ingenieros, 1919b). Ardila (1982) suggested that Ingenieros was the first Latin American psychologist who proposed an original and coherent conceptualization of psychology, one based on evolutionary principles and which he called "genetic psychology."

Neurobiology, in Argentina, was developed by the German scientist Christofredo Jakob (1866-1956), who arrived in the country in 1899 hired by the University of Buenos Aires as director of the Clinical Psychiatric Laboratory. His main research projects were carried out in the Neuropsychiatric Hospital in Buenos Aires, where he was appointed as director of the Laboratory of Neurology in 1912. He also held faculty positions at the Universities of La Plata (between 1922 and 1933) and Buenos Aires (between 1913 and 1944).

Jakob was interested in the evolution of the brain in general and of the cerebral cortex in particular. His approach to these topics was exclusively neuroanatomical and it was based on the study of species from the Argentine fauna. Jakob summarized his contributions in a series of volumes entitled *Folia Neurobiologica Argentina*. Some of these volumes dealt with topics such as the human brain, the frontal lobe, and the origin of the neocortex, whereas others described the neurobiology of some species typical of the Argentine fauna. For instance, his theory of the phylogenetic origin of the neocortex was based on a series of histological studies on the brain hemispheres of a small apod reptile, *Amphisbaena* (Jakob, 1945).

In collaboration with Clemente Onelli (1864-1924), an Italian scientist also working in Argentina, Jakob published in 1913 the *Atlas del Cerebro de los Mamíferos de la República Argentina [Atlas of the Brain of Argentine Mammals]*, in which they intended to establish the biological basis of psychological phenomena. Jakob and Onelli (1913) pointed out that the comparative study of the structure and function of the central nervous system would eventually explain psychological phenomena; otherwise, psychology would be limited to the descriptive method.

There were several empirical studies on comparative psychology during this period, most of which can be characterized as anecdotal observations of the behavior of several species. Examples of these studies are Onelli's (1905) observations on the reproductive behavior of *Rhea americana*, including the role of males in parental care, and Fonticelli's (1905) observations on the behavior of Southern sea lions. There was also some interest in the intellectual capacities of animals in general (Kermes, 1893), and of monkeys in particular (Holmberg, 1893).

Unfortunately, none of these works developed into a coherent research program.

During the initial two decades of this century, experimental psychologists were in close intellectual contact with a group of paleontologists from the University of La Plata. The leader of this group was Florentino Ameghino (1854-1911), who is best known because of his studies and theories on the origin of mammals and on human origins. Ameghino's ideas were extensively described by some of the experimental psychologists such as Ingenieros (1956) and Senet (1909). Ameghino himself published a review of his results in a volume of the *Anales de Psicología [Annals of Psychology]* (Ameghino, 1910) and was a member of the Buenos Aires Society of Psychology, founded in 1908 by Ingenieros, Piñero, Mercante, and others.

In conclusion, the leading Argentine experimental psychologists of this period were all influenced by evolutionary biology. They firmly believed that psychology could achieve a scientific level if it could be established on the basis of evolutionary biology and the experimental method. This was not only a theoretical conceptualization of a discipline, but also served as a fundamental step toward the solution of the social problems of that period. For example, the educational endeavors of President Sarmiento were an important source of inspiration for these psychologists. Their contribution to the success of the educational program was the idea that it must be developed on the basis of the characteristics of Argentine children, and that these could best be determined by an empirically oriented experimental psychology that was developmental and biologically, i.e., evolutionarily, based.

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