



Schoolology as a proposal of an Antipoffian pedagogy for teacher education in Minas Gerais in the 1930s¹

A Escolologia como uma proposta da pedagogia Antipoffiana para a formação de professores em Minas Gerais na década de 1930²

La Escuelología como una propuesta de la pedagogía Antipoffiana para la formación de profesores en Minas Gerais en la década de 1930

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Abstract

The innovative proposal of a new field of research called schoolology – the science of the school – initiated by psychologist and educator Helena Antipoff at the Escola de Aperfeiçoamento de Professores de Belo Horizonte in the 1930s is examined through an archival study. Schoolology relied on the concepts of child psychology and experimental pedagogy developed by Édouard Claparède, as well as on the method of natural experimentation invented by the Russian psychologist Alexander Lazursky. The purpose was to obtain an objective synthesis of the relationships between the multiple factors intervening in children's learning at schools: their physical, mental, and social development, the social origins and the cultural practices of their families, the pedagogical procedures used by teachers, and the institutional functioning of schools. The schoolological studies made it possible to identify several factors that influenced the academic performance of students, such as the retention rates in the first years of schooling, the hygienic and nutritional conditions of the children, the pedagogical methods, the organization of the schools, and the socioeconomic and cultural conditions of the families.

Keywords: Teacher Education. Helen Antipoff. Schoolology.

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Resumo

A proposta inovadora de uma nova área de pesquisa denominada Escolologia – a ciência da escola - proposta pela psicóloga e educadora Helena Antipoff na Escola de Aperfeiçoamento de Professores de Belo Horizonte, nos anos de 1930, é examinada através de investigação documental. A Escolologia apoiava-se em conceitos da Psicologia da Criança e da Pedagogia Experimental, de Édouard Claparède, e no método de Experimentação Natural, de Alexander Lazursky, visando obter uma síntese objetiva das relações entre o desenvolvimento físico, mental e social dos escolares, suas origens sociais e as práticas culturais de suas famílias, os procedimentos pedagógicos adotados e o funcionamento institucional das escolas. Os estudos escolológicos permitiram identificar os múltiplos fatores que influenciavam no aproveitamento escolar dos alunos, tais como: o alto índice de retenção no primeiro ano de escolarização, as condições de higiene e nutrição das crianças, o método pedagógico, a organização escolar e as condições socioeconômicas e culturais das famílias.

Palavras-chave: Formação de Professores. Helena Antipoff. Escolologia.

Resumen

La propuesta innovadora de una nueva área de investigación llamada Escuelalogía - la ciencia de la escuela - iniciada por la psicóloga y educadora Helena Antipoff en la Escola de Aperfeiçoamento de Professores de Belo Horizonte, en la década de 1930, se examina a través de la investigación documental. La escuelalogía se basó en conceptos de Psicología Infantil y de la Pedagogía Experimental, de Édouard Claparède, y en el método de Experimentación Natural, de Alexander Lazursky, con el objetivo de obtener una síntesis objetiva de las relaciones entre el desarrollo físico, mental y social de los estudiantes, sus orígenes sociales y prácticas culturales de sus familias, los procedimientos pedagógicos adoptados y el funcionamiento institucional de las escuelas. Los estudios escuelológicos permitieron identificar los factores que influyeron en el rendimiento académico de los estudiantes, tales como: la alta tasa de retención en el primer año de escolaridad, las condiciones de higiene y nutrición de los niños, el método pedagógico, la organización de la escuela y las condiciones socioeconómicas y culturales de las familias.

Palabras clave: Formación de Profesores. Helena Antipoff. Escuelalogía.

Introduction

This article presents the results of a documentary investigation aimed at understanding the pedagogical strategies used by the Russian-Brazilian psychologist and educator Helena Antipoff (1892-1974) in the education of elementary school teachers at the Escola de Aperfeiçoamento de Professores de Belo Horizonte (the Belo Horizonte Teachers College) in the 1930s. In order to know better Antipoff's pedagogical proposals we seek to identify how the advanced training of teachers was conducted under her supervision, through the mediation of practical activities offered at the Psychology Laboratory of the College. These activities were called by her "schoolological studies" and aimed at building the science of the school, considered as a complex and multi-layered institution that should be looked at from different angles, focusing on the elements that together promote education in the school environment. To understand Antipoff's proposal, it was necessary to describe the context in which she came to Brazil, as well as the pedagogical concepts that underpinned her work in the elementary school sector in Minas Gerais. In dialogue with the guidelines of the New School Movement then being developed in Europe and the US, with a transnational dimension, Antipoff advocates for the scientific study of the different factors that influence school dynamics and educational outcomes, seeking both the efficiency of the educational process and the development and satisfaction of students (Campos & Cruz, 2021).

Through the schoolological studies, Antipoff managed to introduce educational research as part of the experience of her students at the Belo Horizonte Teachers College, most of whom were already working in the elementary school system of Minas Gerais. The idea was to focus the school as a real, rather than an ideal institution. Educational psychology courses, in the author's view, should be essentially practical, with theory taught as an introduction to research on school factors relevant to the promotion of learning. In a February 1930 letter to her master Claparède, talking about her experiences as a teacher in Belo Horizonte, Antipoff declared that she and her students were beginning a new pedagogical study of the city's schools, with the goal of producing monographs on school classes similar to those already tried out in the Geneva schools where she was his assistant between 1926 and 1929, but more complete. These monographs were expected to:

comprise the global and detailed study of the whole life within the class, seen as a society whose behavior is determined by all possible physical and psychological conditions, including the study of the school building, the furniture, all hygienic and material conditions, all influences emanating from the teacher, the school regime and method, the interactions between children, the record of the types of children – the latter done after the individual study of each child (physical, social, psychological). The duration of this study is one semester, five hours per week (Ruchat, 2010, p. 71, our translation)³.

³ "comprendre l'étude globale et détaillée de toute la vie dans cette classe, envisagée comme une société dont la conduite est déterminée par toutes les conditions physiques et psychiques possibles: l'étude du bâtiment scolaire, du mobilier, de toutes les conditions hygiéniques et matérielles; de toutes des influences qui émanent du maître, du régime et de la méthode scolaire; des interactions entre enfants, du relevé des types d'enfants – celui-ci fait après l'étude individuelle de chacun d'eux (étude physique, sociale, psychologique). Le temps de cette étude est d'un semestre pendant 5 heures hebdomadaires," (Antipoff to Claparède, letter of February 21, 1930, in Ruchat, 2010, p. 71).

This article is presented in three parts. The first part contextualizes the academic background and professional achievements of Helena Antipoff, as well as her arrival in Minas Gerais, where she worked at the Belo Horizonte Teachers College. The second part presents the methodology of the empirical research, which deals with the concepts and pedagogical approaches developed by Antipoff. The links between Antipoff's thinking and the proposals of psychologists and educators Édouard Claparède (1873 – 1940) and Alexander Lazursky (1874 – 1917) are discussed to show the theoretical-practical sources that inspired the development of the schoolological studies. The last part includes the analysis and discussion of the data. The hypothesis is that schoolology was one of the strategies for teacher education, from which Antipoff built her own concepts, proposing experiences of field research within the schools in order to understand their problems and only then being able to act on them, contributing to the construction of an experimental pedagogy, that is, a pedagogical science based on systematic empirical studies.

Regarding the value of science in solving human problems, Antipoff quotes the philosophers Auguste Comte (1798 – 1857) and Francis Bacon (1561 – 1626). Comte inspires her by proposing a “positive education” based on scientific knowledge of the developmental laws of the human spirit and the functioning of the physical and social world. Bacon, considered the founder of modern science, would have emphasized the need for more accurate judgments about the phenomena under study to ensure the success of the practices they propose. In his view, this scientific attitude could contribute to the “benefit of education, which suffers precisely from [...] the ‘more or less’ of judgments and the subjectivism of everything related to pedagogy” (Antipoff, 1992b, p. 116).

Helena Antipoff – a teacher since an early age

Helena Antipoff, born March 25, 1892, in Grodno, Russia, spent most of her childhood in St. Petersburg. She was a diligent child and could read before she went to school, being taught by her mother. She helped her sister to read and write and proved to be a gifted teacher at an early age. In high school, Helena Antipoff became interested in scientific experiments and spent many hours of her day in laboratories and libraries. She considered as true only what was objectively verifiable. During this time, she was also interested in art as a means to study the culture of peoples: theaters, museums, handicraft products (Antipoff, D., 1996).

At the University of Paris, the Sorbonne, she had contact with conferences on psychology: “a new science that caught the attention of students and intellectuals through the research results and discoveries presented by the laboratories set up in several European universities” (Campos, 2012). She did her internship in the laboratory on *Granges-aux-Belles* Street in Paris under the supervision of the psychiatrist Théodore Simon (1873-1961), co-author of the Binet-Simon⁴ scale, a test for measuring intelligence. There she met Édouard Claparède, a neurologist, psychiatrist, and psychologist who would greatly influence her formation as a psychologist and educator. With the founding of the Jean-Jacques Rousseau Institute in Geneva in 1912, she was invited by Claparède to continue her studies there. Later, between 1926 and 1929, she served as professor at the Rousseau Institute, which was already part of the University of Geneva.

⁴The metric scale for measuring intelligence, known as the Binet-Simon Scale, was proposed by Alfred Binet and Théodore Simon in 1908 and was intended to provide an objective criterion for selecting children considered retarded in their intellectual development and to record gifted children, in order to direct them to special institutions or classes in France (Antipoff, 1992a).

At the invitation of the state government of Minas Gerais, Antipoff worked as a psychology professor at the Teachers College of Belo Horizonte from 1929 to 1944. The school was established to comply with the proposals of the 1927 reform of the educational system of Minas Gerais – the Francisco Campos/Mário Casasantia Reform. According to Ruchat (2008, p. 193), Antipoff's work at the school helped spread Claparedian theories in Brazil: "psychological experimentation, functional pedagogy, new pedagogy, and active pedagogy".

As head of the Psychology Laboratory established in the school, the educator promoted an extensive and varied research program on the mental development, ideals, and interests of the children of Minas Gerais. The results of these studies promoted the systematic introduction of intelligence tests in elementary schools with the aim of supporting the process of homogenization of classrooms according to intellectual level. At that time, Helena Antipoff pondered the relationship between the socioeconomic environment and the mental development of children, proposing to the schools of Minas Gerais the introduction of programs of mental orthopedics⁵. She believed that this proposal could help even out the chances of students from disadvantaged social backgrounds who tended to score poorly on intelligence tests for cultural reasons. Her reflections were based on observations she had made during her schoolological studies in schools in Belo Horizonte, as we will see below.

Methodology

The documentary analysis proposed in the study is guided by the theoretical and methodological debates of contemporary historiography, which examines facts, people, and institutions relating to the scenario and time under study (Campos, 2010). Helena Antipoff's writings published in the *Collections of the Written Works of Helena Antipoff*, especially Volumes I (Experimental Psychology), II (Foundations of Education), and IV (Rural Education), as well as the educator's correspondence with Édouard Claparède, served as sources (Antipoff, 1992a, 1992b, 1992c; Ruchat, 2010). The correspondence contains letters addressed to Claparède, in which Antipoff exchanges with the master about her initiatives in Belo Horizonte.

Bulletin No. 9, "Monograph of a School Class of Belo Horizonte, Schoolological Study of 1931," published in 1932 by the General Inspectorate of Education of Minas Gerais of the Secretariat of Education and Public Health, also served as source for the study (Antipoff, 1932), as well as excerpts from the schoolological monographs of 1930 selected, organized, and published by Helena Antipoff in the issue of *Revista do Ensino* for the months of October, November, and December 1930 (Antipoff, 1930).

To understand the concept of schoolology, we also identified the works of the theorists with whom Antipoff was in dialogue, particularly the proposals of Experimental Pedagogy by Claparède and the Natural Experimentation, a method of systematic observation of behavior, personality, and human interactions proposed by the Russian psychologist Alexander Lazursky. Édouard Claparède's book, *Psychology of the Child and Experimental Pedagogy* (1956), was one of our most important sources. In this book, Claparède discusses the importance of studying the psychology of the child as a means of suggesting and improving teaching and learning strategies and methods. Antipoff's reports on Alexander Lazursky's Natural Experimentation method were researched in the volumes II and III of the above collections.

⁵ The term mental orthopedics was created in 1910 as an analogy with the medical specialty dedicated to the corrections of deformities of the body to ensure normal functioning of the organism. According to Antipoff (1992c, p. 67), Alfred Binet extended this analogy to certain exercises designed to straighten, train, and strengthen mental faculties. Binet's optimistic view of experimental psychology led him to conclude that: "Everything that is thought and functions in us is capable of development".

Experimental Pedagogy

The *Psychology of the Child* is a child of necessity: it was born of the need to respond to the requests of teachers, students at the Seminar of Educational Psychology that Claparède directed in 1904, students at the J. J. Rousseau Institute, and the countless people who repeatedly asked him to clarify the many aspects of childhood. This work cannot be suspected of being artificial or useless, let alone rigid. “Science is a living and moving thing, says Claparède, somewhat ephemeral, but always progressing and to be conquered” (Antipoff, 1956, p. 16).

The book *Child Psychology and Experimental Pedagogy* (Claparède, 1956) is based on a series of newspaper and magazine articles by Édouard Claparède that the author had collected in a pamphlet begun in 1905. In 1909, a volume was published that was planned to be the first treatise on the psychology of childhood. Claparède emphasizes that this book is not a manual, and this idea is reinforced by Helena Antipoff in the preface of the edition translated into Portuguese in 1956. For her, the book aims to present the intense movement of the psychological science of the child: “Very often psychology textbooks are terribly abstract and vague, touching mental life and human processes from the top of a tower so high that it does not allow to distinguish the living being and its real manifestations” (Antipoff, 1956, p. 16).

The book presents the characteristics of the traditional pedagogy used up to that time. It is emphasized that educators did not know their students, and it is stated that pedagogy should be based on the knowledge of the child, just as horticulture is based on the knowledge of plants. It is recommended that the book should not be viewed as a teaching program to be followed, but as a necessary tool for those who wish to study child psychology as a pedagogical science. For Helena Antipoff and her students-teachers at the Belo Horizonte Teachers College, this could be considered the main point made by the book. Claparède had already stated: “Now, to perfect teaching methods, it is necessary to know, be it a little, the psychology of the child” (Claparède, 1956, p. 24).

For Claparède, traditional pedagogy was based on the common belief that one must possess one or more of three skills to become a teacher: common sense, aptitude, and daily practice (Claparède, 1956). However, he thought that these skills are insufficient to meet the complex task of teaching, an argument that supports his justifications for Experimental Pedagogy:

Since common sense, aptitude, and practice alone are incapable of solving the problems confronting the educator, something else must be sought, and this something else, of course, can be nothing other than experience in the scientific sense, which, to distinguish it from mere personal experience, we shall call systematic experience or experimentation (Claparède, 1956, p. 43).

In this way, Claparède explained the demand of the time for Experimental Pedagogy, which aimed to empirically study teaching processes in concrete situations to develop the science of education, as in the following excerpt:

An investigation belongs to experimental pedagogy if it emphasizes only the objective part of the problem and is not concerned with the psychological conditions. While the aim of psycho-pedagogy is mainly to study the spirit of the pupil and to try to formulate in psychological terms the state of his development or the effect that a certain educational process has on him, experimental pedagogy considers only pedagogical processes and formulates its results in pedagogical terms (Claparède, 1956, p. 123).

In the text "*Édouard Claparède Homem e Educador*" (Édouard Claparède, Man and Educator), written after the author's death, Antipoff describes the importance that the theorist had attached to the problems of education. For him, every pedagogical action should be a response to an issue. Both Helena Antipoff and her mentor believed that a new conception of education required a complete change in teacher formation, and this preparation should first be psychological (Antipoff, 1992b). According to Claparède, for these reforms to take place, research on child psychology and scientific training of educators themselves should be encouraged:

1) Intensification of scientific research on the child and her mental development; 2) Special preparation of future educators from two points of view: first, to acquaint them with the results of psychological research and the new norms that have emerged for education and teaching; and second, to instill in the educators themselves, as far as possible, a scientific spirit, that is, the ability to be surprised by the facts of their everyday professional life and the desire to investigate these facts and seek answers to them through methodical observation and experimentation. (Claparède, 1956, p. 196-197).

The goal of experimental psychology was to study the psychological profile of the student through observation and experimentation. Through these observations, the intellectual level of the child was to be found out, whether he or she was mentally or academically retarded or had problems related to affectivity, memory, or intelligence that would affect learning. For Claparède (1956), these questions were crucial, and it was not only a matter of determining the pupil's level of intelligence, but also of identifying her weaknesses and strengths, and of finding out on which aspects educators should base themselves to obtain results in their pedagogical proposals, founded on an education based on the pupil's activity and initiative, on her real interests.

In line with Claparède on the aims of experimental psychology, Antipoff asks: "What are these observations good for? - First and foremost, to get to know children, and even before that, this training will teach us to observe. Observation is the most fruitful method of psychology. What would we know if we limited ourselves only to experiments, to tests? – Nothing." (Antipoff, 1992a, p. 60-61). Based on Antipoff's questioning of the assessment of children's intelligence using tests alone, the next section discusses Alexander Lazursky's concept of Natural Experimentation.

Natural Experimentation: Alexander Lazursky's Observation Method

Upon her arrival in Minas Gerais, Helena Antipoff was charged with promoting research on intelligence measurement and the relationship between intelligence and learning in Minas Gerais classrooms. As head of the Psychology Laboratory of the Teachers College and passionate about the field of psychology, she promoted a diversified research program on children's mental development, ideals and interests⁶, aiming at the pedagogical improvement of schools. The results of these studies led to adjustments in the use of intelligence tests in elementary schools, and to an expansion of the process of classroom homogenization (Antipoff, 1992a).

Antipoff proposed to organize homogeneous classrooms in which children would be grouped according to their mental development, and to combine this with a rational organization of systematized work by an adequately trained pedagogical team. With the help of experimental procedures, she wanted to select the appropriate teacher for each type of class, thus ensuring greater success in the organization of pedagogical work. The educator had already observed successful experiences with homogeneous classrooms in European countries. However, she was cautious about the results of this organization in Minas Gerais elementary schools and closely followed the results of the experiment in the schools of Belo Horizonte, examining step by step the effects they would produce and guiding the Teachers College graduates in this analysis.

In Antipoff's view, classifying children according to their level of intellectual development could lead to good results, as it would ensure students a tailored education and teaching, if the personality of each child would be taken into account. In order to intervene in education, it would be necessary to expand knowledge of the students' intellectual capacities and personal traits, since "all advanced pedagogy is theoretically based on knowledge of the child in general and of the child as an individual. Without this knowledge, the 'tailored school' is not possible" (Antipoff, 1992a, p. 29).

The "tailored school" would be a school adapted and organized according to the inclinations and interests of the students, as proposed by Claparède (1956). In this work, the author defines interest as a relationship of convenience between the subject and the object, as a symptom of a psychobiological need of the subject, and then explores its various manifestations. Among them, the Law of Momentary Interest stands out, which, according to the theorist, establishes two conditions for human action: at every moment, all action consists in achieving the end that matters to us at the moment considered, and interest is what causes the activation of certain reactions. Added to this is that at each moment the organism follows the "line of its greatest interest" (Claparède, 1959, p. 29; Ottavi, 2009).

The concept of interest outlined by Claparède would be essential for learning. According to the psychologist, nothing should be taught until a need for knowledge has been awakened, a need for action has been roused by the child's interest, as it is

⁶ In 1930, the first report on research conducted in the Laboratory of the Belo Horizonte Teachers College was published. It contained the results of a study of the ideals and interests of the children of Minas Gerais and some pedagogical proposals that Antipoff had prepared with the help of her students. This study was conducted every five years until Antipoff ended her work at the Training School in 1944. Unpublished documents indicate that the research was replicated again in 1954 by a team linked to the Minas Gerais Institute of Education (Instituto de Educação de Minas Gerais), which housed the teacher education course for educators previously offered by the Belo Horizonte Teachers College (Antipoff, 2002/1930, unpublished manuscript, s/d).

on interests that the educator must rely. If they are alive, nothing remains but to propose to the child the activities that interest him; if they are still dormant, it is necessary in the first place to devote oneself to make them vibrate. [...] the success of the educational action, organized, according to the hypothesis, as a function of the child and his interests, depends practically on the abilities of the educator, his knowledge, his ingenuity, and his love (Claparède, 1959, p. 101-102).

In adapting the Binet-Simon method and introducing intelligence testing to schools in Minas Gerais, Helena Antipoff recognized the importance of expanding data collection tools to better understand children. According to her findings, "intelligence tests only provide information about intellectual functions as a whole" (Antipoff, 1992a, p. 129).

Based on sound theories, Helena Antipoff questioned the artificiality of data obtained by psychological testing in controlled, laboratory-like situations and by intuitive observation of teachers. Therefore, she sought in the Natural Experimentation method of Russian psychologist Alexander Lazursky a more systematic observational tool that could overcome the limitations of tests or spontaneous observations. In her opinion, even if schools tried to record "the mental development of their students by means of the Binet-Simon method" or even used "other tests to evaluate their intelligence," [...] these studies "could not capture the whole personality of the child, since they are sporadic and incomplete" (Antipoff, 1992a, p. 29).

Helena Antipoff probably became acquainted with the psychological method developed by Lazursky between 1916 and 1924, when she returned to Russia to search for her missing father, who had served in the Russian army before the Revolution. In 1916 and 1917, while caring for her father, she experienced the devastating effects of World War I (1914-1918) and also the political crisis that led to the Communist Revolution of 1917. In St. Petersburg⁷, despite the uncertainty that prevailed in the city, the educator got a job as the head of a sort of home for abandoned children (Antipoff, D., 1996; Antipoff, 1931). The psychologist's task was to conduct the psychological examination of the children and to plan their re-education. Well-known tests and the Lazursky's technique of personality study, the Natural Experimentation, were used for the psychological evaluation.

Another experience Antipoff had in connection with the Natural Experimentation method was working at the *Maison des Petits*, a kindergarten affiliated with the Jean-Jacques Rousseau Institute, founded in 1913, where the author worked as an educator during her studies and later, when she was Claparède's assistant at the University of Geneva between 1926 and 1929, conducted research with children aged 7 and 8 years. The children were methodologically observed doing manual activities such as weaving, carpentry, modelling, sewing, embroidery, drawing in notebooks, painting, etc. using the Lazursky's method. The author states that the observations "made it possible to follow the psychological profile of each of them through the activities" (Antipoff, 1992a, p. 40).

Lazursky himself presented his method at the Russian Congress of Experimental Pedagogy in St. Petersburg in 1911. On that occasion, the theorist explained the principles of the method of Natural Experimentation: "We experiment, he said, with the natural forms of the external environment. We study the individual through life itself and the child through the objects of school teaching" (Lazursky apud Antipoff, 1992a, p. 40).

⁷ Founded by Peter the Great in 1703, St. Petersburg became the capital of Russia in 1712. As the main site of the 1917 Communist Revolution, it was renamed Petrograd until 1924 and Leningrad from 1924 to 1991, in honor of revolutionary leader Vladimir Ilyich Ulyanov (Lenin). After the fall of the communist regime in 1991, the city returned to its old name of St. Petersburg (*Le Petit Larousse Illustré*, 2002, p. 1655).

According to Lazursky's method, the observation of the child would have to take place in the child's natural environment, in the activities of daily life, to avoid the artificiality of laboratory techniques. This observation should be accompanied by continuous notes on the behaviors, which should be classified and interpreted in broad categories (movements, feelings, imagination, perception and memory, thinking, will).

The Russian psychologist, together with his associates, worked with some children in a school that was put available to him. He examined and observed the children during lessons in various subjects and prepared exercises to study their personality and mental characteristics. The aim of the systematic observations was to describe the child's personality in its psychomotor, affective, cognitive, and volitional aspects in the school environment. The study was to be carried out in all primary school subjects: "Language; Arithmetic; Natural History; Gymnastics and Games; Drawing and Manual Work". For each subject, more relevant exercises would be developed from a psychological perspective, which would certainly show the researcher the child's personality (Antipoff, 1992b, p. 340).

Antipoff pointed out that the method proposed by Lazursky of observing the activities of children and adolescents in their daily lives was particularly important for pedagogy. In her texts, Antipoff repeatedly reminds the educator of the commitment to functional education⁸, as recommended by Claparède, and the contribution that the Lazursky's method can make to achieve a full realization of education. With this, Antipoff wanted to express that the application of the Natural Experimentation method would offer significant support to make the teacher more aware of the needs and the psychological and psychosocial characteristics of the learner, a fundamental component of functional education (Antipoff, 1992b; Assis and Bravo, 2017; Campos, 2010, 2012).

The Concept of Schoolology

Schoolology is a term created by Helena Antipoff to refer to the study of the school in its entirety, and of the specificities of all of its parts. These studies were carried out in the elementary schools of Belo Horizonte, and their results were published as monographs in the *Revista do Ensino* in 1930, 1931, and 1932, as seen below:

The excerpts from the papers published now are part of an experimental psycho-pedagogical study, to which we will give the name schoolology. This neologism shows that the object of our study is the school and everything connected with it: school administration, school buildings, school hygiene, didactic material, school regime, class organization, teaching characteristics, didactic methods, various supporting institutions, and finally [...] - the pupil, his economic and social environment, his physical condition (health and physical development), his level of mental development, his interests and aspirations, his various physical talents, and finally, his knowledge and schooling (Antipoff, 1930, p. 146).

According to Antipoff (1930), students in the psychology course at the Teachers College in Belo Horizonte conducted a detailed study during one semester in the elementary grade classrooms of six schools in the city. In doing so, they followed a previously prepared plan and studied in detail the school life of the children in these classes.

⁸ Functional education would respond to the needs and interests of the child (Claparède, 1956).

Data were collected through observations, examinations, and tests, and at the end of the six-month internship, the results were compiled in the form of monographs. Each monograph recorded the size of the classroom, its equipment, decoration and hygiene, the number of children and attendance, the social and economic situation of each family, the physical development and health, and the mental level of the children. Attention, memory, observation, and testimony tests were also administered to assess academic skills in reading, writing, spelling, essay writing, arithmetic, etc. Teachers' professional behavior and pedagogical work were also observed. In the end, the results were evaluated as positive or negative, considering the academic performance and social development of the students.

The students, by having sufficient information about the material conditions of the class under study and about the pedagogical work, thorough knowledge of the social background of the children, their mental condition and intellectual abilities, as well as their academic performance, should write monographs that:

make known the school as a whole: the school district in which it operates; its psychological, social and economic environment: the physical environment, the building, the space devoted to teaching, recreation and games; the school hygiene, the furniture, especially desks, the didactic material, its quality and quantity; the general school system: the organization of classes, the school facilities (libraries, school accountants, museums, clubs, associations, etc.); the teaching staff; the budget (building and material costs and annual expenditures); the pedagogical methods used (Antipoff, 1992a, p. 113).

Antipoff proposal was to conduct a systematic investigation to observe the conditions and facts of children's school life, the means of education and the results obtained thereby, the frequent relationships between cause and effect; in short, what she considered "the laws of real pedagogy." For her, "the schoolological studies carried out by the students of the Teacher College [...] were aimed above all at their professional training, in the sense of looking at pedagogical facts from the point of view of science [...]" (Antipoff, 1992a, p. 116).

Schoolological Monographs - The Practice of Experimental Pedagogy

Some excerpts from the schoolological monographs prepared by the staff of the Psychological Laboratory between February and August 1930 were published in the *Revista do Ensino* (The Teaching Journal) in December 1930. The journal was published by the General Inspectorate of Education of the Government of Minas Gerais, which at that time was subordinate to the Secretary of State for the Interior.

The publication of the studies is preceded by an "Introduction" informing the reader that the monographs "give an idea of the admirable work that has been done there", at the Teachers College. Regarding the College's objectives, the text highlights their critical perspective relating to the situation of the Brazilian school system and the valorization of the technical and scientific advice relating to education:

The Teachers College School was established for the purpose of educating teaching technicians. Without technicians, good work cannot be done. Because we do not have technicians, we cannot do anything right in Brazil in terms of teaching. For this reason, the Government of Minas Gerais decided at the right time to begin its work at the root, i.e., to educate those who can lead, promote, and guide a comprehensive educational reform (Presentation, 1930, p. 1).

Therefore, the main objective of the school was to provide teachers with the latest information and prepare them for research in psychology and teaching methodology, focusing on knowledge about the Brazilian child, as the following excerpt shows:

Finally, all the information that we considered essential for the formation of a good teacher was imparted to teachers, recruited after careful selection criteria from all regions of the State (of Minas Gerais). [...] In addition to the teaching itself, in which the important aspects of the various subjects are treated in a lively and interesting way, there is a fruitful research work in the field of psychology and methodology, from which much is expected, not only for the introduction of new teaching processes, but also for the knowledge of the Brazilian child, which is fundamental in any educational organization (Presentation, 1930, p. 2).

The articles included in the publication are papers written by students in the areas of teaching methodology of various school subjects (language, geography, history, natural sciences, arts) and excerpts from the schoolological monographs, the latter entitled "Essays on Experimental Pedagogy". In the introduction to the monographs, the supervisor of these works, Helena Antipoff, explains that these are essays that are part of a psycho-pedagogical study she calls schoolology (Antipoff, 1930). In outlining the goals of schoolological studies and their relationship with educational theory, the author states that:

Like the naturalists, we wanted to study the school as it is. The most beautiful and harmonious theories, when formulated by thinkers or decreed by laws, must, as soon as they are applied, be rigorously verified, not in an empirical way, by proofs "*à vol d'oiseau*"⁹, but rather by a systematic and thorough research, in order to know exactly their real value (Antipoff, 1930, p. 146).

Quite critical of the pedagogy of that time, the author quotes the statement of Alfred Binet, who considered it a pseudoscience "that always only asserts without ever proving anything". According to this author, with whom Antipoff agrees, "the educational practice, partly because of the difficulty of verification, was little concerned with checking its performance and the quality of that performance by objective methods" (Antipoff, 1930, p. 146).

In Antipoff's view, the results of education, especially public education, depend on a variety of factors, the most important of which are, in this order: the methods used, the preparation of teachers, the material resources made available for teaching, and finally, the abilities of the students themselves, which would reflect heredity and the social environment. The task of scientific pedagogy would be to promote the systematic study of these factors:

We believe that pedagogy will benefit enormously from these systematic investigations, conducted with a genuine sense of inquiry, with the purpose of discovering, between the conditions and facts of school life, between the educational means and the results obtained by them, constant cause and effect relationships, that is, the laws of genuine pedagogy (Antipoff, 1930, p. 147).

⁹ French expression that means "superficially".

The first schoolological studies were part of the program of the second year of the Educational Psychology course at the Belo Horizonte Teachers College. Between February and August 1930, the students visited six schools in Belo Horizonte every week in groups of two, totaling 32 classes and about a thousand children, and wrote 32 monographs (Antipoff, 1930). In 1931, 16 more monographs were added to those of the previous year, so that the Laboratory of Psychology had school records of 48 classes in which a total of about 1500 children were studied (Antipoff, 1932).

Monographs should describe each school in its entirety, focusing on 1) the region of the city in which it is located and its physical, social, and economic environment; 2) the physical aspects: type of building, learning, recreational and games facilities, furniture, teaching aids; 3) the school rules, the organization of teaching, supporting facilities (libraries, school accounts, museums, clubs, leagues, etc.); 4) the teachers and the teaching methods used; 5) the school budget; and 6) physical, psychological and social information on the schoolchildren, the results obtained in classes (Antipoff, 1930).

Children's characteristics were described in terms of family social background and economic, social, and cultural conditions (parents' nationality and occupation, number of children in the family, economical means, cultural level, education, occupations, and leisure); children's physical condition, which included data on their physical development and health; children's mental level, measured by general intelligence tests, followed by systematic observations to validate quantitative results. Individual and class profiles were created based on these data. Data from the tests were then aggregated to create age and gender tables for this population. By observing children's educational work and classroom activities, information was collected on the type of discipline imposed on students (passive or active) and the mental functions (attention, memory, initiative, responsibility) that were most engaged. The totality of the results was then analyzed to verify academic achievements and the social development of the students (Antipoff, 1930).

To justify the work done, Antipoff cites two positivist authors who strongly defended the systematic observation of reality and experimentation as the basis of modern science: Auguste Comte and Francis Bacon. The idea was to promote the application of the principles of the scientific method defined by these two authors in the construction of educational science. In Antipoff's words:

Science offers the possibility of making more accurate and precise judgments about the phenomena under study, independent of personal feelings. This is of great importance for the benefit of education, which suffers precisely from the opposite, the "more or less" of judgments and the subjectivism of everything related to pedagogy (Antipoff, 1930, p. 151).

Following this, some extracts are presented from the schoolological studies carried out in 1930 by a group of teacher-students of the Teachers College whose names were registered together, without mentioning the monograph to which they referred. To maintain professional confidentiality, the names of the teachers and the children in the classes observed were also kept secret. The extracts are examples of the data collected, their organization, and the conclusions drawn on the quality of the educational process based on the information obtained.

The following sections present the content analysis of excerpts from the monographs published in 1930, organized on the basis of the variables identified and studied by the authors.

About the environment and social background of students

The first monograph cited presents a school located in a central neighborhood of Belo Horizonte, classified as an industrial and commercial area. According to the report, the neighborhood was lively but noisy due to the mills, factories, and the large number of vehicles circulating there. There were numerous bus and streetcar lines that connected it to the outermost points of the city. Most households were inhabited by workers such as shoemakers, saddlers, tailors, hatters, and others.

The population of the neighborhood consisted essentially of low-income workers, artisans, and merchants. It was observed that most of the children were barefoot and played in the street after school. There were no suitable places in the neighborhood such as gardens or parks where the children could play. Most of the students in the studied school lived in the school district, while others lived in other neighborhoods and even in very distant parts of the city. There were 603 children enrolled in the institution, of which two-thirds were children of Brazilians and one-third were children of immigrants (Italians, Portuguese, Spaniards, Turks, Syrians, and Asians). The table on parent occupations shows the following data:

Table 1 - *Occupations of Parents of the Students of School X, Belo Horizonte, 1930*

Laborers (131 unskilled. 121 skilled).....	252 (48.83%)
Merchants.....	134 (25.95%)
Employees.....	66 (13.80%)
Industrialists, owners.....	31 (6%)
Liberal professions.....	16 (3.1%)
Soldiers, guards.....	11 (2.1%)
Other.....	8 (1.1%)

Source: Antipoff, 1930, p. 154.

The report notes that most children come from working-class families with rather modest income levels. Regarding other occupations, the report notes that the categories used by the school to classify occupations do not sufficiently differentiate children by income level. For example, the merchant category could include both shopkeepers and street vendors. The same is true for the employee category, which could include both the school's janitor and a high-ranking government official. Given these inaccuracies, the authors suggest a better occupational classification system to make it as meaningful as possible concerning the level of household financial resources.

At the end of the description, a question is asked: What is the relationship between the socioeconomic status of the students and their general development, that is, their physical, mental, and social development? This is one of the questions that schoolological studies attempt to answer (Antipoff, 1930, p. 154). This question has recurred in Antipoff's work since she lived in Soviet Russia, where she had the opportunity to observe children and adolescents from families with different socioeconomic and cultural levels and study how these conditions affect their mental development and academic achievement. At that time, Antipoff proposed the concept of "civilized intelligence" to describe the intellectual abilities measured in intelligence tests, noting that it is not a "natural" trait, but rather one that has already been refined by the action of society and culture. The author thus includes the civilizing effect of better living conditions in the concept of intelligence. These considerations will be more clearly expressed in the research report published

in 1931 on the mental development of children in Belo Horizonte, based on a series of data on the intelligence level of Belo Horizonte's students, obtained in the framework of these schoolological studies and supplemented by studies on students of the local Normal School (Antipoff, 1931; Campos, 2012; Masolikova and Sorokina, in press).

The following are excerpts from the monograph of a third-grade class composed of 20 boys and 21 girls, aged 8 to 12, who attended a school with a "high social environment". In this class, the questionnaire on the characteristics of the children and their families and the questionnaire on the ideals and interests of the children were also used¹⁰, and the following data were collected:

- The age/grade ratio (considering children aged 9-10 as regular 3rd grade students) - of the 41 students, only 22 were in the regular age group, 13 were ahead, and 6 were academically behind;
- The ethnic origin of the families – the majority were Brazilian, with a minority of immigrants (Spanish, Italian, Portuguese, French). Two girls “showed traces of the black race”;
- Attendance: class attendance varied between 71 and 100%. Absenteeism was due either to illness or to “the excessive concern of parents who consider school work excessive and fear harming their children's health.”;
- Number of siblings and the child's position in the family. It is noted that “there were no single children, which contributed to the social development of the class”;
- Social environment: it was considered high, and the report stated that the parents held prestigious positions of high economic value, the children were "in frequent contact with other families and in frequent contact with society." It was noted that the culture of the parents encouraged their children to study and prepare for careers similar to those of the adults in the family. In these wealthier families, parents followed their children's academic performance with interest. Only three children in the class were considered poor, two of whom received support from the school fund (clothing and medication);
- Leisure: the report stated that most of the children participated in excursions, including sea travel, and film shows, "experiences that contributed to their social and even intellectual development" (Antipoff, 1930, p. 181).

About the organization of school classes and the performance of children

The data illustrating the observations on the organization of classes and on children's performance were taken from another monograph and referred to another school in Belo Horizonte. In this school, 688 children were enrolled at the beginning of the school year, and 603 students were still registered in June, indicating that about 85 children left or transferred to another school. The children were divided into two shifts: 420 went to school in the morning and 183 in the afternoon, distributed in 20 classes with the following distribution: ten first-grade classes with 292 children, four second-grade classes with 128 children, three third-grade classes with 103 children, and finally three fourth-grade classes, with 74 children, for a total of 597 children added from the teachers' lists, although these data did not correspond to the enrollment records.

¹⁰ Research on children's ideals and interests was begun by Helena Antipoff in 1929 with a questionnaire that included questions on favorite classes and work in school, favorite work at home, favorite books and toys, indication of people they would like to resemble or not, career choice, and money management. The questionnaire was used regularly from then on and also seems to have been part of the schoolological investigations (Antipoff, 2002/1930; Lourenço, 2011).

The monograph reports the perception of an imbalance in the organization of classes and the distribution of students as a result of the great retention of students in the first grade, which gradually decreases up to the fourth grade. The data on the organization of classes are presented as follows:

Table 2 – *Distribution of students by grade, School Group Y, Belo Horizonte, 1930*

Grade	Nº of classes	Nº of children	Percentage of total students per grade	Percentage of students in Belo Horizonte's School Group per grade
I	10	292	49.0%	39.1%
II	4	128	21.4%	27.3%
III	3	103	17.2%	19.9%
IV	3	74	12.4%	13.7%
TOTAL	20	597	100.0%	100.0%

Source: Antipoff, 1930, p. 155-156.

There was a high concentration of students in the first grade, which conditioned the distribution of students in the following grades, and this was repeated in other schools in the city. The age of students in the ten first grades ranged from 6 to 12, and many children were held back in first grade, repeating it two, three, or four times. The authors wondered what caused this disparity: learning difficulties or dropping out of school after the first grade.

When the teachers of each class were interviewed, the following causes for repetition were found: change of school, illness, absenteeism, failing in one or more subjects, difficulty in comprehension, delay in mental development, and others. It has been suspected that there may be other reasons for failure in school, perhaps concealed by teachers out of shame: teacher absenteeism, leaving the class behind, and inadequate competence for the job (Antipoff, 1930).

About the Physical, Psychological and Social Conditions of Children

The part of the schoolological studies dealing with children is the most thorough. It deals with aspects of physical development (nutrition, hygiene, appearance, muscle tone, posture, anthropometric measures such as height, weight, height/weight ratio, head and chest circumference, respiratory capacity, muscular strength, physical resistance, hearing, and vision); mental development (intelligence, intelligence ratio, intelligence/social environment, attention, memory, judgment, ideals, and interests); family characteristics (parents nationality, educational level, occupation, and religion, number of children, type of home, space available to the child at home), type of home education (participation in housework, punishment, toys, leisure activities, trips), and type of pedagogical work in the classroom (activities proposed by the teacher, children's behavior during class, psychological and psychosocial aspects related to each activity). For each observed element, specific research instruments were used, some of which were developed by the staff of the Psychology Laboratory, while others were already known and used in other countries, which we describe below.

Physical development and health status of children

Regarding the living conditions of children at home, the researchers show objective data on nutrition (presence of foods such as meat and milk in the composition of meals), personal cleanliness and cleanliness of clothes, and the space they occupy in the house. They observe that the diet is generally deficient (about 50% of children did not consume meat daily and about 30% never had milk). Data were collected on the frequency of changing clothes (from 25% who

changed every day to 15% who did not know when they changed). Regarding housing conditions, data were collected on the number of rooms in the house and the space occupied by the child, as well as his or her position in the family. The data were apparently collected through questionnaires answered by the children or through observations in the classrooms.

From the reports on one of the observed classes, it appears that the nutrition in the average class was poor. There is information on the number of children per family, indicating an average of 6 children per couple. In addition to parents and siblings, there were relatives who shared the bedroom with the children, and many reported being beaten by their parents. The children reported working in the household or as apprentices in their parents' jobs. Most parents were literate and helped their children with homework. Few children owned a toy, and many reported not leaving the house on Sundays. The data indicated that some children went to the movies, the circus, and soccer games, and that many never left Belo Horizonte. All reported coming from a Catholic family, but some attended Sunday church service more often than others.

One of the classes had a lower mean score for social and family environment, and the data described that children had a weak appearance and a low muscle tone. It was noted that such signs could indicate a lower level of mental development in these students. The children were measured and weighed, and the results revealed that they were underweight compared with those of the other classes. The children's muscle strength was measured using the Collin dynamometer¹¹.

Physical endurance was measured with the statue test, in which the child stands still with arms open for as long as possible. The children stood for three minutes on average.

It was reported that a thorough examination of the children's hearing was not possible because of the environmental conditions - too much noise from the other rooms, from the street, the stairs, and the playground. In the auditory attention experiment, in which a pencil is tapped lightly on the table and the children are asked to write down the results on a piece of paper, it was found that no student had a severe hearing loss. The children had good vision, except one myopic student who caught the researchers' attention because of the way she read and wrote. The teacher had not noticed the child's deficiency, and the child was taken to the school doctor, who prescribed glasses. Most of the children's absences from school were caused by illnesses such as influenza, measles, toothache, and headache (Antipoff, 1930).

Objective anthropometric measurements (height, weight, head and chest circumference) were also performed for each child. The relationship between height and weight was calculated using the Quetelet Index (weight/height). The indices of each school were summed and the average of the class was calculated, which was compared with the average of the other classes of the same grade. The average values of the head and chest circumference were also calculated for all children in the studied classes. The individual head and chest indices were used to determine possible developmental abnormalities. Individual measurements of respiratory capacity were also made using a so-called "dry Barnès spirometer". The measurement procedures were described in detail, and class averages were calculated and compared. At the end, an Average Anthropometric Profile of the class is presented with aggregated data on height, weight, head and chest circumference, vital capacity indexes (measured with the spirometer), and muscle strength.

All of these thorough measures were aimed at both detecting possible abnormalities and identifying the need for improvements in children's physical health to make schoolwork more efficient. The goal of these studies was also to establish tables for the physical development of

¹¹ The Collin Elliptical Dynamometer is an instrument used to measure strength. The test is performed in a standing position. The person holds the instrument between the thumb and the four fingers, extends the arm at shoulder level and presses on the dynamometer with all their strength, while the other hand is on the hip (Campos, 2002, p. 54).

the city's school population. These tables were to be used in comparative studies and in the identification of schools in which the physical health status of the children indicated a need for more targeted interventions by the school (Antipoff, 1930).

Intellectual and socio-moral development of children

As for children's mental development, the main factor studied was the degree of intelligence, defined as the faculties of “comprehension, judgment, and perceptiveness with which our class was endowed”, as stated in the report from one of the classes. The authors confirm their curiosity in the text, “When we enter a class, a question arises quickly and anxiously: is this an intelligent class or not?” At the same time, they are interested in the relationships between teaching and children's intellectual development: “We wanted to know how the teacher develops the intelligence of these children and how the class responds to the knowledge acquisition” (Antipoff, 1930, p. 168). This statement shows that they viewed intelligence as an ability that could be changed by the actions of the educator, thus rejecting the innatist perspective on intellectual ability. This is a very progressive position, contrasting with the tendencies of Social Darwinism, which was widespread in Brazil at the time (Schwarcz, 1993).

The authors report that the evaluation of children's intelligence level was done in a spontaneous and impressionistic way right at the first contact with the class, using the criteria commonly used in the community to evaluate intelligence - brilliance, coordination in work, originality:

From the first days of contact with a class we begin to formulate: today X is smarter for a brilliant answer; tomorrow Z, for a well-coordinated work; then A, for the manifestation of original ideas, and so we go on and on and reach a conclusion, sometimes without knowing the truth (Antipoff, 1930, p. 169).

Soon after, however, the authors note that more reliable methods should be used for evaluation, such as observation and tests “that can give us, if not a perfect, at least an approximate idea of the general intelligence of a child”. The tests in use at the time were Dearborn's collective test, Goodenough's test, and Ballard's 100-questions test, named after their authors, psychologists Walter Fenno Dearborn and Florence Goodenough (North Americans), and Philip B. Ballard (English). The Dearborn test consists of 17 questions and “contains only what any child can perceive, observe, and understand, with no experience beyond what a child can do, however poor”. The Ballard test is considered more complex because it challenges children's “insight, memory, attention, writing, and general knowledge.” The test was rated as strenuous, with the researcher stating that:

Since our children are used to receiving knowledge aimed more at filling the memory store than developing judgment and observation skills, I found this test a bit difficult, especially for second grade students (Antipoff, 1930, p. 169).

The third test, the Goodenough test, consists of the examinee drawing the human figure. It is classified by age, considering the number of elements and details of the human body and clothing in the drawing¹². The authors comment on this test as follows:

¹² The classification of drawings was made by Florence Goodenough based on earlier observations of sample drawings of children arranged by age. Based on the number and types of elements present in the drawings of children of each age, the typical drawings were identified by year. In this way, a table was created for each child

At first glance, it seems impossible to get an idea of intelligence from the drawing of a human figure. At second glance, however, one can be convinced that it is to a certain extent a very interesting test. What the child is doing is representing the inner image that he has in his brain. It is then very interesting to observe which points the child is able to distinguish and reproduce from the human body as a whole (Antipoff, 1930, p. 169-170).

The results of using the three tests are then presented in a table, which shows that the best results were obtained with the Dearborn test, followed by Goodenough. Students obtained the worst results in the Ballard test. Next, the agreement between test results and classroom observations by the teacher and by the researchers were compared. Observations focused on children's characteristics, such as "clarity of ideas, fairness of small arguments, conversations with peers, solutions for difficulties, daily class work" (Antipoff, 1930, p. 170), demonstrating the care with which the assessment criteria were established, probably using the Lazursky method. It was found that the Dearborn test was closest to the results of observations, and that teachers' observations often matched those of the researchers. Subsequently, the results of some children who were conspicuous for either above- or below-average scores were subjected to closer and more detailed analysis. Personality traits also emerged in these descriptions. One child with above-average scores is described as "always quiet, but with ready and clear answers, with great reading ability, easy comprehension, and very regular attention." Another high-scoring child is described as "always quiet, often criticizing the actions and ideas of others, just by the look on his face". Other children show "sharpness and great social development". The class as a whole is largely composed of "curious, lively, and very approachable minds," with a few students described as "soft and indecisive". Some special talents emerge from observations, such as skills in drawing, literary writing, and mathematics.

In summary, the application of tests and the observations seem to have been highly appreciated by the authors of the monographs. The analyses performed are very thorough and respectful to the children, and some of the children's responses seem to amuse them. The comments also indicate the usefulness of these procedures for the general direction of the class and for identifying special problems or talents that require intervention by educators. The Rousseau ideal - know the child to better educate her – seems to be eagerly pursued by students in the Teachers College Psychology Laboratory, as indicated in the report.

Relationship between intelligence and social environment

In another monograph, there is an interesting analysis of the correlation between intelligence and social environment. The method used to calculate the correlation involved a comparison of extremes. Children classified as very intelligent, with percentiles above 75% on the Dearborn and Goodenough tests, and children classified as "weak" or "very weak"

tested for comparison. If the drawing contained the elements expected for that age, the child's intelligence was classified as normal, i.e., age-appropriate. If it contained more elements, more details than expected, the intelligence was classified as above average. If it contained fewer elements, it could be considered below the group average. The application of the Goodenough by the students of the Teachers College allowed the construction of a specific table for the children of Belo Horizonte, and the test was therefore considered adapted to this population. For a detailed discussion of the adaptation process of the intelligence tests used by the Psychological Laboratory for the Belo Horizonte population (see Antipoff, 2002).

(percentiles below 25%) were compared, and these results were consistent with the observations of the teacher and the researchers. The results are presented in a table relating the assessments and the social environment from which the children came:

Table 3 - Correlation between intelligence and social environment in public school students, Belo Horizonte, 1931

Intelligence	High social environment	Low social environment
Very strong	9 (a)	1 (b)
Very weak	1 (c)	5 (d)

Source: Antipoff, 1930, p. 173.

Concerning the 95%¹³ association coefficient found between the two factors (intelligence and social environment), the authors state that the relationship between intelligence and social environment is very high, reaching almost a perfect correlation.

The monograph offers no explanation for such a high correlation. Antipoff, however, in another publication of the period, presents her hypothesis to explain why children from low-income neighborhoods scored lower on average on intelligence tests, a relationship that is repeated when the data from the various schoolological monographs are combined. In a 1931 research report on the mental development of Belo Horizonte children, the psychologist defined intelligence measured in tests not as a natural predisposition determined by heredity and age, but as the result of several factors:

(Intelligence) is a more complex product that emerges as a function of several factors that include, in addition to innate intellectual dispositions and biological growth, the overall character and social environment, with its living conditions and culture, in which the child develops, and finally, the pedagogical action, education and instruction to which the child is exposed both at home and at school (Antipoff, 2002, p. 85).

Thus, she argues that the results obtained in the tests are the result of a "civilized intelligence, showing that the tests address the mental nature of the individual, which is refined by the action of the society in which he or she lives and develops according to the experience he or she acquires over time" (Antipoff, 2002, p. 85). The concept of "civilized intelligence" used to interpret test results was an important and original contribution by Helena Antipoff to the debate at the time about the origins and development of children's intellectual abilities. In a letter to Claparède dated July 9, 1930, commenting on the results of the schoolological monographs, the psychologist points out the weight of sociological variables in educational processes in the classroom: "The psychological field, studied under these conditions of social life, loses more and more its independent and intrinsic character to be integrated and included in the social field" (Ruchat, 2010, p. 92).

These considerations will also accompany the part of the schoolological monographs dealing with the relations between the pedagogical work in the classroom and the psychological and psychosocial development of children, as we will see below.

¹³ The coefficient of association was calculated according to the following formula: $ad-bc/ad+bc = (9 \times 5) - (1 \times 1) / (9 \times 5) + (1 \times 1) = 0.95$ (Antipoff, 1930, p. 173).

Relationship between pedagogical work and children's psychological development

An important focus of schoolological research is the relationship between teachers' pedagogical work in the classroom and children's psychological development. To establish this relationship, data were collected on:

- 1) Frequency of the suggested didactic activities, based on the teacher's notes in the "lesson notebook". The example from one of the monographs shows the percentage of activities carried out in language (written composition, letter writing, dictation, correction of essay errors on the chalkboard, explanations of grammar, various games); arithmetic (games, problems, exhibitions); geography (explanations on the map, cartography, games); and hygiene (explanations through stories).
- 2) Observations of children's behavior during each activity: for each class observed, children's actions and reactions to the teacher's suggestions and instructions are recorded in detail. For example: the children observed during a writing activity are described as "obeying the teacher with a certain slowness, writing, asking a question or two from time to time"; in a "storytelling" class taught by a TA, when the children were allowed to move their desks, they "moved quickly and laughed a lot, happily, forming a circle with the desks, sitting down and looking at the teacher". Similar observations are reported for each specific class (arithmetic, science, geography, geometry, etc.).
- 3) Functional and characterological analysis of behavior during teaching. This analysis, which seems to be inspired by the Lazursky method, appears in a table that presents the observed psychological aspect (e.g., positive interest), the activity that triggered it (a game in arithmetic class), and the observed reaction that allowed the described conclusion ("the child rubs his hands together and smiles happily"). Observed psychological aspects include the nature of interests (positive, negative, competitive), observed habits and automaticity, and reactions expressing discipline, dependence, obedience, passivity, initiative, solidarity, impatience, pleasure or dislike of work, attention (spontaneous, divided), memory, curiosity, and so on. The reactions associated with each observed aspect are described in detail. For example, the behavior expressing negative interest is described as follows: "When the teacher asks the child to do an exercise, a child angrily exclaims: - oh"! Tiredness in the face of a long question on the chalkboard is expressed by "children fidgeting, looking to the side, running their hands over their faces, yawning." Obedience is shown when "at the teacher's direction, the child goes and stands by the chalkboard for punishment." Spontaneous attention is shown when "the child, while listening to a story, stares quietly at the teacher, his mouth hanging open, and so remains" (Antipoff, 1930, p. 177-179).

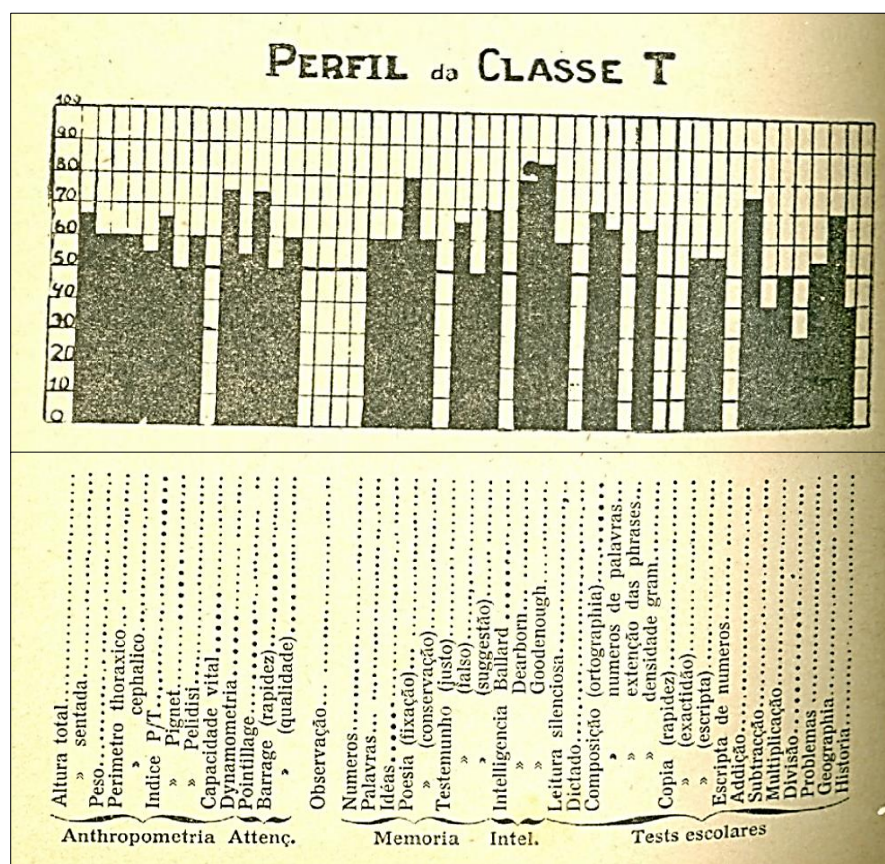
Summary of the schoolological observations

At the end of the article, the summaries of the observations made in classes in three different schools are presented, with a synthesis of the data on the number of boys and girls, the age, the social environment, the level of intellectual development, the profile and actions of the teacher, the type of class discipline, the pedagogical work carried out, and the results obtained in terms of academic performance and psychological aspects.

The overall profile of the class is presented in a chart that includes the results of the class on anthropometric measures, attention, memory, and intelligence tests, and on school-based assessments. In addition, examples of pedagogical profiles of some children are presented, with a quantitative and qualitative synthesis of the results of measurements and tests, followed by a dense and in-depth assessment of children's physical, psychological, and psychosocial characteristics, their interests and ideals, their personalities, and their academic results.

The profile shows the children's scores on anthropometric measurements, attention, memory, intelligence, and school tests. The class T has higher than average scores on anthropometric measurements and higher scores on intelligence tests. After the profile is presented, the main positive and negative factors that are considered determinants of academic performance are listed. Among the positive factors are the intellectual level of the children, their physical development, the social and economic background of the families, the experiences children had through reading, going to the movies, field trips, lectures and excursions, the cooperation of parents, medical and dental care, and the agreement between teachers and the principal. Among the negative aspects, the shortfalls of teachers stand out (lack of understanding of students' needs, repetitive methods, excessive focus on preparing students for exams, harsh criticism, and favoritism). The profile of one of the classes surveyed, Class T, whose data we have already mentioned, is shown in the following chart:

Figure 1 – Profile of Class T - Schoolological Observations



Source: Antipoff, 1930, p. 208.

Data from another monograph show how the "effectiveness quotient" of schoolwork, measured by a formula proposed by American educator Elwood Cubberley, was calculated. The effectiveness quotient is obtained by dividing the "school quotient" (the school age divided by the actual age of the children) by the intellectual quotient (the intellectual age determined in intelligence tests divided by the actual age).

If the school quotient is higher than the intelligence quotient and the effectiveness quotient is greater than one, it means that the educational work was effective. If the school quotient is lower than the intelligence quotient, it means that the educational work was poor. The conclusion is that the measurements carried out in the framework of the schoolological work are useful to evaluate the quality of education provided to children. The author of the monograph states that "the work of scientific pedagogy thus creates the possibility of making objective, precise judgments about schoolwork, independent of personal judgements, and approximate assessments" (Antipoff, 1930, p. 213).

The author states at the end of the article that the studies presented were an initial test aimed at making first-year students interested in schoolological investigations and how to clearly formulate research problems and develop appropriate methods to find answers to the formulated questions. Antipoff also pointed out that during the research process, some of the methods used proved imperfect and deficient, and that efforts should be made to improve the methodology the following year, when the work would be resumed by the incoming new students of the Teachers College, thus promoting continuity in the search for knowledge about the educational system under study.

Concluding reflections

In this article we focus on one of the teacher education strategies promoted by psychologist and educator Helena Antipoff in the early 1930s at the Belo Horizonte Teachers College. We believe it is important to highlight the contributions of schoolology, an innovation in the scientific analysis of schooling that Antipoff developed under the influence of her training in Europe, particularly in the Experimental Pedagogy proposed by Édouard Claparède and the Natural Experimentation of the Russian psychologist Alexander Lazursky. Would schoolology be a combination of these two perspectives on education and the observation of the characteristics of children's subjectivity in dialogue with psychology? This is perhaps one of the many possible readings for this new field of knowledge introduced by Antipoff. The idea was that school is a complex institution that deserves its own field of study.

Schoolology aimed to combine science and education and thus to develop a scientific proposal for pedagogy. The educational phenomenon, as a result of school activity, is considered as a synthesis of the different aspects of the school process. Coherent interventions can be proposed only on the basis of observation and detailed analysis of these different aspects. In this sense, the education of students through schoolological research is considered essential.

The analysis of the documents revealed that Natural Experimentation and Experimental Pedagogy were the main inspirations for the schoolological studies. The results show how the studies were systematized and how the elements that make up the school as an institution were studied by the students of the Teachers College, most of whom were female teachers who were already working in elementary education at that time. The data indicate that Antipoff's proposal for the training of the teacher-students was based on psychological and pedagogical research aimed at understanding the educational problems through systematic observation of the students

and through the study of the field work, i.e., the school, integrating the aspects of school organization, the teachers, and the students, especially their psychological characteristics, social environment, their origins and family habits.

Based on these studies, the authors of the monographs were able to broaden their perception of the positive and negative factors that operate in schools, leading to (or not) satisfactory results in promoting the physical, mental, emotional, and social development of students. They were also able to broaden their view of the results of intelligence tests, learn more about children's intellectual abilities, and contribute to the process of classroom organization. It was also important to listen to the children's ideals and interests and to observe their talents and personality traits and take them into account in the organization of school activities. The dialog with the Claparedian proposals of functional education and tailored schooling is present in the schoolological research.

Among the negative factors observed in the schools of Belo Horizonte, the schoolological monographs indicated a high repetition rate in the first grade. Some factors that may have influenced the repetition of students were pointed out, such as malnutrition and pedagogical methods often considered foreign to the social and cultural context of the children. The schoolological reports emphasized the effect of sociocultural factors on children's development, both from the point of view of physical health and from psychological and psychosocial aspects, which opposed the innate tendencies in educational thinking at the time.

Wouldn't schoolology, the art of studying the school, be a good model to understand the educational problems also today? The contact with the analyzed sources and the dialog about them with our students made us reflect on the fact that teacher training today does not offer opportunities for contact with the school. The supervised internship in teacher education could be inspired by the connection between science and education proposed by Antipoff in the Belo Horizonte Teachers College, thus strengthening the practice of research in teacher education. Research practices could be complemented to teacher shadowing in early childhood education and in early years of basic education conducted during internships in Pedagogy courses to suggest future interventions in a more fruitful dialog between academia and school. Recent experiences of replication and updating of the schoolological research practices recommended by Helena Antipoff have shown promising results in current educational planning (Duarte, Cassemiro, and Almeida, 2017). We hope that the presentation of the first schoolological research conducted in Belo Horizonte in 1930 can inspire new studies on this topic, using innovative experiences such as those conducted by Helena Antipoff and her student-researchers in Brazil.

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