

# Piotr Galperin's Contributions to Historical-Cultural Psychology and consequences for Education: an integrative review

Contribuições de Piotr Galperin à Psicologia Histórico-Cultural e os  
desdobramentos para a Educação:  
uma revisão integrativa

*Leilani Fossa*<sup>1</sup>

*Izabel Hazin*<sup>2</sup>

*Pâmela Cadima Coelho*<sup>3</sup>

*Hansel Soto Hernández*<sup>4</sup>

*Sarah Lima*<sup>5</sup>

---

## ABSTRACT

Brazilian education has faced obstacles of a diverse nature, from socioeconomic issues to structural and methodological issues. In these circumstances, it is essential to advance in the dialogues between Education's theory and practice and, consequently, to make progress in proposing solutions to the main dilemmas. In the midst of this challenge, this article aimed to present the Theory of Step-by-Step Formation of Mental Actions and

## RESUMO

A educação brasileira tem enfrentado entraves de natureza diversas, desde questões socioeconômicas quanto questões estruturais e metodológicas. Nessas circunstâncias, faz-se essencial avançar nas interlocuções entre a teoria e a prática e, conseqüentemente, progredir nas proposições de soluções para os principais dilemas enfrentados. No bojo deste desafio, o presente artigo teve como objetivo apresentar a Teoria de Formação das Ações Mentais por Etapas,

---

<sup>1</sup> Master's student at Universidade Federal do Rio Grande do Norte, Psychology, Brazil. Orcid: <https://orcid.org/0000-0003-2647-3298>. E-mail: [leilani.psicologia@hotmail.com](mailto:leilani.psicologia@hotmail.com).

<sup>2</sup> Professor at Universidade Federal do Rio Grande do Norte, Psychology Department. Brazil, Orcid: <https://orcid.org/0000-0002-4045-8628>. E-mail: [izabel.hazin@gmail.com](mailto:izabel.hazin@gmail.com).

<sup>3</sup> Ph.D. student at Universidade Federal do Rio Grande do Norte, Psychology, Brazil. Orcid: <https://orcid.org/0000-0001-5553-872X>. E-mail: [pamelacadima@gmail.com](mailto:pamelacadima@gmail.com).

<sup>4</sup> Ph.D. student at Universidade Federal do Rio Grande do Norte, Psychology, Brazil. Orcid: <https://orcid.org/0000-0001-6536-1585>. E-mail: [hanselsoto91@gmail.com](mailto:hanselsoto91@gmail.com).

<sup>5</sup> Master's student at Universidade Federal do Rio Grande do Norte, Psychology, Brazil. Orcid: <https://orcid.org/0000-0002-9517-3363>. E-mail: [saraholiveira319@gmail.com](mailto:saraholiveira319@gmail.com).

Concepts, developed by Galperin, based on contributions by Vigotski and Leontiev. Galperin joined the Soviet School of Psychology and developed a theory that consists of a methodological approach to the process of internalizing formal concepts. It provides for the dialectical transformation of external actions into internal ones, underlining the importance of mediation of the guiding activity in the teaching-learning process. The main ideas formulated by Galperin are presented, the criticisms they have received, as well as the contributions to the domains of psychology and education. Among these, the active dimension that the student assumes in the learning process will be highlighted, expanding his formal concepts and engaging in the creation of knowledge, learning to learn, thus preparing himself for the changes and uncertainties that characterize the XXI century.

**Keywords:** Keywords. Historical-cultural psychology. Galperin. Learning. Literature review. Education.

desenvolvida por Galperin, a partir de contribuições de Vigotski e Leontiev. Galperin integrou a Escola Soviética de psicologia e desenvolveu uma teoria que consiste numa abordagem metodológica relativa ao processo de internalização de conceitos e ações. Esta prevê a transformação de ações externas em internas, sublinhando a importância da mediação da atividade orientadora no processo de ensino-aprendizagem. São apresentadas as principais ideias formuladas por Galperin, as críticas que estas têm recebido, bem como as contribuições que oferecem para os domínios da psicologia e da educação. Dentre estas, será ressaltada a dimensão ativa que o aluno assume no processo de aprendizagem, ampliando os seus conceitos formais e engajando-se na criação de conhecimento.

**Palavras-chave:** Psicologia Histórico-cultural. Galperin. Aprendizagem. Revisão de literatura. Educação

## 1 Introduction

Piotr Yakovlevich Galperin (1902-1988) was a psychologist and physician, best known for investigating the theoretical principles of the learning process, more specifically the mechanism of internalizing external actions. The central question of his studies was the origin of mental concepts and representations, as well as understanding how humans learn to act rationally. As a result of his studies, he systematized the process of concept internalization into stages—known as the “Theory of the formation of mental actions and concepts by stages” (ENGENESS; THOMAS; PODOLSKIY, 2021).

His theory represents an extension of Lev Semionovich Vigotski's central principle of internalization and describes the stages of the internalization process and the changes that an action undergoes during this process. In general, Galperin's theory provides support for the organization and regulation of the teaching-learning process. Furthermore, it emphasizes the importance of formal and informal education

as a basic factor in children's cognitive development (NÚÑEZ, 2009).

Galperin's theory has been a reference for the proposal of numerous instructional programs. These programs have been created and implemented for at least 30 years, with the main objective of teaching students of various ages different subjects, such as mathematics, physics, chemistry, biology, language, etc. (HAENEN, 1996).

Galperin was a contemporary of Vigotski and Alexei Nikolaevich Leontiev and shared with them central ideas of historical-cultural psychology. However, Galperin's contributions are not widely known in Western psychology. From I. Núñez's perspective, considering the historical-cultural approach by limiting it to Vigotskian contributions, disregarding other authors from the Soviet School, notably those who dedicated themselves to the study of scientific concepts in school, can lead to a simplified view of this process (NÚÑEZ, 2009). In this sense, this article aims to minimize this risk and contribute to the dissemination of Piotr Galperin's findings and his Theory of Mental Actions and Concept Formation by Stages, highlighting his contribution to pedagogical practice and other areas.

## **2 Historical and biographical considerations**

Piotr Yakovlevich Galperin (1902-1988) was a Soviet psychologist, disciple, and collaborator of Vygotsky who graduated in medicine from Kharkov University. In 1928, he joined the Department of Psychology at the Academy of Psychoneurology in that city, working alongside a group of Soviet researchers, notably A. N. Leontiev, A. R. Luria, and A. V. Zaporozhetz (NÚÑEZ; FARIÑAS; RAMALHO, 2020). During this period, until the mid-1930s, Galperin devoted himself to studying the differences in the use of tools between humans and other animals and their impact on the development of the human psyche, conducting his experiments at the Kharkov School.

However, between 1936 and 1937, Vygotsky's work became the target of criticism, and pedology, the science of child development, was abolished as a

discipline in the Soviet Union. As a result of this decree, the “Kharkov School” was dissolved (ENGENESS; LUND, 2020).

In 1945, Galperin began his teaching career at Mikhail Lomonosov State University in Moscow, investigating theoretical problems in psychology and related sciences. His work focused on the theme of child development, which he studied until his death. At this institution, Galperin headed the Ontogenetic Development Laboratory, teaching in the Department of General and Applied Psychology, with equal emphasis on the period in which he was Director of the Chair of Psychology of Ages, developing a creative methodology, considered as General Genetic Psychology, which enables the articulation between developmental psychology and education (NÚÑEZ; FARIÑAS; RAMALHO, 2020).

Vygotsky's ideas were one of the main influences on Galperin's work, who recognized himself as a continuator of his ideas. Galperin develops his theoretical-methodological corpus in an attempt to advance the knowledge developed by the historical-cultural approach in relation to understanding the process of assimilation of external cultural tools and concepts, as well as the activities necessary for the appropriation and internalization of social experiences (NÚÑEZ; FARIÑAS; RAMALHO, 2020; TALYZINA, 1968).

### **3 Vygotsky, Leontiev, and Galperin: the continuity of contributions**

Galperin proposed a theory directly influenced by the philosophy of historical-dialectical materialism. To this end, he articulated concepts from K. Marx and V. Lenin and, in psychology, Leontiev's conception of activity and Vygotsky's perspectives on the social environment, language, and internalization (NÚÑEZ; FARIÑAS; RAMALHO, 2020). In this sense, to situate Galperin within the theoretical framework of Soviet psychology, we will revisit Leontiev's Theory of Activity and Vygotsky's concept of internalization, seeking to articulate Galperin's notes on both ideas.

### 3.1 Activity as a unit of human life

Galperin was a close collaborator of Leontiev, and his inquiries into activity as a psychological construct stem from the musings of both men at the Kharkov School. The idea was to inaugurate a new psychology with objective methods, overcoming “abstract” methods, such as the exclusive use of self-observation as a resource for psychological investigation (GALPERIN, 1992a).

Leontiev and Rubinstein developed the Theory of Activity, in which they proposed that it is not concepts, but rather real activity, that unites the subject and reality (NÚÑEZ, 2009), and therefore it should be the main object of study in psychology. In this sense, a dialectical unity was established between the psyche and activity. In Leontiev and Galperin's conception, the psychic phenomenon, at all its levels, has the role of “signaling” or “guidance”; it can be said that the psyche expresses itself in activity and vice versa (TALIZINA; SOLOVIEVA; ROJAS, 2010).

In this approach, activity is a process that mediates the relationship between humans and objective reality, the subject-object relationship, allowing them to modify it, as well as to modify themselves. It is mediated by the psychic reflection of reality, and its main characteristic is its objectual nature; that is, activity guides the subject in the world of objects. The objectual nature of activity is not restricted to cognitive processes, but extends to the realm of needs and emotions. It is not a reaction, but a system that has structure, sequence, and development (LEONTIEV, 1978/2000).

For Leontiev, all human activity originates from a motive, which is the conjunction between a need and a corresponding object, which may be material and/or ideal but is always capable of satisfying the need. Structurally, activity consists of a set of coordinated actions, triggered by the motive for the activity, whose objective is to respond to a specific purpose. Action is the minimum unit of activity and responds to a conscious objective. Its structure includes operations, which are actions that have been learned and automated and are no longer performed on a conscious level (SANTOS; ASBAHR, 2020; LEONTIEV, 1989;

LEONTIEV, 1978). For example, within an activity for learning mathematical concepts (angle, circumference, perpendicular line, etc.), the student can perform multiple actions: recognition, comparison, classification, deduction of consequences, among others. These, in turn, include different operations: highlighting the necessary and sufficient characteristics of the objects in the given class; establishing whether the given object has the identified characteristics, etc. (TALIZINA, 2017).

The activity takes place within the system of social relations and always forms part of a system that cannot be reduced to the sum of its elements. It is made up of several links that are constantly connected to respond to the problem situation established before the subject. The following were identified as structural links of the activity: motive, objective, guiding basis, means of execution, and result (TALIZINA; SOLOVIEVA; ROJAS 2010).

Galperin (1992a) warned that not all activities would constitute the object of study of psychology, but specifically meaningful activity. This considers that behavior and mental activity are interrelated, both in their origin and structurally, constituting a unity. In this way, the human mind could be studied through the subject's productive activity in relation to its meaning, thus enabling the establishment of general foundations for the process of internalization of mental functions (GALPERIN, 1992a).

Meaningful activity expressed the intention to consider all forms of mental activity, even the most seemingly involuntary ones (perception, memory, habits), as expressions of some unconscious, but intentional and objective-substantive, active effort for the subject. 'Meaningful activity' considers the person as an active actor in the world, interpreting, in some way, how things were and defining their tasks and their capabilities. (GALPERIN, 1992b, p.40)

Thus, Galperin (1992b) proposed that the main task of psychology is to study the structure, laws, and conditions of guiding activity, its development, its distinctive characteristics, and its capabilities, considering the different stages of an individual's development. In this way, he believed that it would

be possible to access the mind and mental activity (HAENEN, 1996). In this sense, he proposed that the object of study of psychology is not the activity itself, but the process of guiding the subject during the performance of intellectual actions (GALPERIN, 1992b). For him, activities are initially formed on the external plane, therefore materialized in the course of social activities, and later transferred to the internal plane, therefore idealized, through the dialectical process of internalization (ENGENESS; THOMAS; PODOLSKIY, 2021).

### **3.2 The concept of internalization from Vygotsky's perspective**

According to Galperin, the concept of internalization originated in the French School of Sociology and meant inserting “ideological elements into the primordial biological consciousness of the individual” (GALPERIN, 1967). Vygotsky introduces the concept of internalization into the core of Soviet psychology as a process in which external forms of social exchange give rise to higher mental functions.

Vygotsky emphasizes that the process of internalization is based on the “General Law of Cultural Development,” in which each function in cultural development appears on two levels, first as an interpsychic category and then as an intrapsychic one, and where the social nature of any psychological function is represented by internalized social relations and preserved when internalized, appearing in the individual at a later stage (VYGOTSKI, 1931/1960). However, the true structure of psychological functions can only be revealed in their genesis, for example, from the mediation exercised by language.

This raises pertinent questions about this process. How do non-mental forms become mental through internalization? Would this, therefore, be a dualistic meaning? Would Vygotsky be making a distinction between an external and an internal plane? These are challenges for which answers have been proposed, many of which are associated with the propositions of Galperin, one of the authors who endeavored to resolve this conflict.

In seeking to offer a position on this dilemma, it is essential to distinguish between the terms “dualism” and “duality.” The former means an exclusive separation between the external and internal planes. The latter, in turn, refers to an inclusive separation of terms, approaching a dialectical perspective of development (VALSINER, 1998). In this regard, it is necessary to consider that for Vygotsky, the external and internal planes do not exist as separate planes. The dialectical foundations that underpin his theory allow us to consider the terms ‘individual’ and ‘society’ simultaneously, that is, in their separation and in their unity. Understanding psychological phenomena is only possible by considering their evolutionary history. In the case of internalization, conceiving the irreducible tension between external and internal processes is fundamental to understanding development, as well as to proposing solutions to central problems in psychology, such as the formation of concepts (ESPINOZA; BALMACEDA, 2020).

In the field of concept formation, especially those developed in the context of formal education, Galperin (1967) proposes that the translation between the material and mental planes suggests the mediation of language. First, there is a conversion of objects from the external material plane into oral language (“external social speech”), developed in relation to others. It is through others that children can regulate their actions in accordance with real rules, and, considering this, their consciousness develops. Then, with the development of consciousness, the function of speech, which regulates the relationship between children and others, is transferred to the intellectual plane through “external speech to oneself.” This performs the function of regulation, but of the child with themselves, and is indispensable for the formation of an internal plane of consciousness and the acquisition of a system of signs. The process continues until the physical sound is reduced and reproduces “auditory images” for themselves, becoming internal language (GALPERIN, 1967).

However, the formation of intellectual actions does not end with the transfer to the intellectual plane. The assimilation of abstract concepts does not mean the

completion of knowledge acquisition; it is necessary to apply them in the solution of specific problems, ensuring the dialectical flow between the concrete and abstract planes (NÚÑEZ, 2009).

Mastery of the activity is slow, and the action is only mastered when a generalized structure is formed that enables the application of a corresponding variant of action and consequent automation. It should be noted that this is not a simple act of transfer, but rather an ongoing process. The changes that occur in the action are present throughout the process, beginning to develop within a structure of orientation and executive operations. Different intellectual actions are formed internally and join the system of older intellectual actions, leading to the emergence of a different structure that is not merely additive (GALPERIN, 1967). Thus, we have an “internal world” that is different from the “external world,” but dialectically constituted.

In his research and writings, Galperin presented a theory that allows for the investigation and intervention in the process of forming internal activity based on external activity, highlighting the decisive role of each of the functional moments of activity-orientation. Thus, his theory contributes methodologically and scientifically to the educational process, being considered an application and continuation of the methodological bases underlying the propositions of Vygotsky and Leontiev (NÚÑEZ, 2009).

#### **4 The Theory of the Formation of Mental Actions and Concepts in Stages**

From Galperian perspective, learning is the activity that enables the formation or acquisition of new qualities in knowledge and skills. Two propositions underlie this theory: 1) that to obtain knowledge and skills of a defined quality, students must perform specific actions that act as a means of learning; 2) that the subject cannot immediately perform any new action internally, “for themselves.” External, material, or materialized action is the initial form of any internal, ideal action (GALPERIN; TALYZINA, 1965).

In this sense, the initial challenge is to find an appropriate form of action, then to find the material form of representation of the action, and finally to transform the external action into an internal one. The theory of the formation of mental actions and concepts in stages consists of a systematization of the teaching-learning process and the definition of essential parameters that allow for the control of the formation of mental actions and concepts. Each of these factors will be outlined below.

#### **4.1 Sequential procedure**

The procedural line developed by Galperin was systematized into six stages that progress from the appropriation of a materialized, external action to a mental action. These are as follows: motivational stage; orientation stage; stage of forming the action on the materialized plane; stage of forming the action on the external language plane; stage of forming the action on the internal language plane; and mental stage (NÚÑEZ, 2009; HAENEN, 1996; GALPERIN, 1992).

The first, the motivational stage, seeks to provide the learner with an introduction to the action, with the aim of developing the necessary disposition for learning. At this stage, the student receives a ‘motivator’ for the action, being explicitly presented with its objective. It is considered a phase before preparation for the assimilation of knowledge, so it must be present at the beginning of the action or activity to be performed, and may permeate all other stages. (NÚÑEZ, 2009; HAENEN, 1996; TALYZINA, 1982).

Next, in the orientation stage, all the structural and functional parts of the activity model will be highlighted. This stage is essential to provide the student with all the information necessary for the correct execution of the activity. This phase assumes that human action is carried out because of some guidance, whether adequate or not (GALPERIN, 1992). The “guiding basis of action” (GBA) refers to the set of guiding elements that guide the learner in the execution of an action. However, the “complete scheme of the guiding basis of action” (CSGBA) is the ideal scheme for obtaining the desired form of guidance that leads to the correct execution of the action. (HAENEN, 1996; GALPERIN, 1978/1992)

The objective structure of the action is adapted to the dimensions of the “step” that the student is capable of performing. The “complete scheme of the guiding basis of action” (CSGBA) incorporates everything a student must ‘understand’ in the task before them, and this “understanding” is expressed by the action: the student systematically (not randomly) executes all the instructions in the scheme correctly in the tasks, which vary substantially. This response indicates that the student is being guided by the essential relationships in the tasks and that their actions are rational (GALPERIN, 1989b).

The main essence of this stage is to explain the CSGBA in such a way that the student will use it in the future as a cognitive map for their basic orientation. The initial position with which the formation of a new action begins in this method consists of the following: the CSGBA is explained to the subject and presented to them written on a card; then they receive tasks that they must perform using this scheme (GALPERIN, 1992). The GBA represented on the orientation card is a tool for the student, which helps them do what they would not be able to do on their own. The GBA becomes a tool for guiding oneself in a task; it is a means for mental activity (GALPERIN, 1989b).

Although Galperin emphasizes the use of a complete and generalized orientation such as CSGBA, the type of guiding base should be chosen according to the student's needs. In addition, different types of GBA can be used in the same learning process (HAENEN, 1996).

The third stage refers to the stage of forming the action in the materialized plan. It is assuming that the initial stage of human thought is characterized in terms of concrete actions. After the learner becomes familiar with the previous phase, they will begin to manipulate the physical representation of the object of knowledge. Thus, the materialization and visualization of the properties and relationships of real objects increase the possibility of executing the action. According to Talyzina (1968), this form of action is necessary for the formation of new mental actions, both in basic education and in adult education (TALYZINA, 1968).

When the action is appropriate, with practical or materialized objects, it will be necessary to separate the action from the support material and transfer it to the sphere of discourse. In this phase, the stage of action formation in the external language plane, linguistic signs will be created that acquire meanings and become internalized, independently of the presence of the object. At this point, the action is no longer materialized, but it is not yet 'internal', as it constitutes a moment between these two stages. This is because external language is intrinsic to social communication and is conceived as a mediator of materialized content to the plane of discourse. (GALPERIN, 1987).

Gradually, students should be encouraged to use speech for self-regulation, which is, incidentally, the goal of the fifth stage, that of forming action at the level of internal language. However, for this stage to be effective, students should be encouraged to whisper to themselves rather than speak aloud. At this point, "talking to oneself" requires semantic and grammatical transformations, thus enabling transformations in the structure of discourse, until reaching the mental stage in which the action is expressed silently. Language for oneself becomes a mental function and provides the student with new means of thinking. The mental action "disappears" from the field of consciousness, becoming inaccessible to observation, and words become images and concepts. Finally, as a result of the processes of appropriation, generalization, abbreviation, and mastery, the action reaches its internalized form (GALPERIN, 1967).

In other words, a method of planned, step-by-step training imposes requirements not only on the formation of the learning process, but also on the formation of the material to be learned. The initial requirement is the creation of a model for performing a new action. To develop such an action, overcoming the trial and error scheme, it is necessary to give the student an objective basis for guidance in a problem situation (GALPERIN, 1992).

## 4.2 Guidance

The theory of mental actions in stages, defined by Galperin (1992), proposes that to acquire knowledge and skills, it is necessary to perform operations that function as the basis for learning. The learning process is based on the learner's activity, since knowledge and skills can only be learned as a result of a set of operations of their actions. The quality of knowledge mastery depends on the nature of these operations and the systems of action that correspond to the demands of knowledge and skill mastery to analyze and, consequently, control the learning process.

The main link between educational activity and learning is programmed instruction, which refers to the technical device whose objective is, first and foremost, to program the learning process, that is, to control the course of the knowledge studied. The main characteristic of programmed instruction is that it must be progressive and not mechanical, as progression allows for the optimization of control over the learning process (LEONTIEV; GALPERIN, 1965).

Galperin's research allowed him to systematize the elements that make up the learning activity, proposing that it consists of three parts: orientation, execution, and control. According to this model, orientation is of particular importance in any learning activity, requiring careful planning in terms of the type of orientation to which students will be exposed in the executive part of learning. Galperin understood guidance as the necessary information about the activity in which students should engage; the potential of available resources; and how students should engage in the learning activity (ENGENESS; THOMAS; PODOLSKIY, 2021).

All human action is performed based on some specific guidance that also determines its quality. For example, in a first stage, solving a problem situation consists not only of carrying out a “preliminary conception of the task” (that is, of what must be done and of the action itself) but also necessarily requires a notion of the system of characteristics of the new material or of essential properties that it carries, which, if considered, will make it possible

to correctly execute the indicated action. This system is known as the guiding basis for an action, which can be formed in various ways: completely or incompletely, systematically or randomly, with or without an understanding of how it is constituted (GALPERIN, 1989a).

Within this perspective, there are three basic prerequisites for developing an educational program. The first is to determine precisely what will be learned/taught. Defining the object of knowledge is the basis of any curriculum component. The second requirement is to clarify the criteria or skills necessary for the appropriation of the object of knowledge – which will be used later to control and evaluate the effectiveness of the instruction process (GALPERIN; TALYZINA, 1965). In this regard, Galperin and Talyzina (1965) criticize instructional programs based on the principles of Burrhus Frederic Skinner's behaviorism, called “linear programs” (stimulus-response). These programs focus on simple perception activities and sequence memorization. However, memorizing and associating elements is not synonymous with learning, since knowledge serves to solve problems and not just to reproduce situations identical to those in which mechanical memorization occurred.

Although it is possible, for example, to force a child to simply memorize the multiplication table, that is, to form and strengthen the corresponding associative links, they will not master the operation of multiplication. Therefore, before giving the child the multiplication table, it is necessary to first teach them how to perform the multiplication action itself, offering the student the guiding basis for performing the multiplication of quantities with the external support of a slide rule, for example. Only after completing the previous step is it possible to lead the child to the reduced version of this action: the multiplication table (LEONTEV; GALPERIN, 1965). In other words, “the formation of relationships such as  $2 \times 3 = 6$ ,  $2 \times 4 = 8$ , should be the result, the final product, of the reduction and automation of the corresponding arithmetic operations, but cannot serve as a means, a mechanism, for mastering these operations” (LEONTEV; GALPERIN, 1965).

The third basic prerequisite for the development of an educational program consists of planning and constructing a course of the learning process, determining its regularities, or, if this is not possible, assuming some hypothetical notion that can serve as a guide. This “guide” is represented by the term “guiding basis of action,” and its structure depends on the content studied and may vary according to the student's demand. (LEONTEV; GALPERIN, 1965).

The guiding basis for an action (GBA) is the key issue in Galperian's model, as it refers to the guiding elements that the learner uses to guide themselves in performing a particular action. The learner can discover for themselves what type of GFA they need to construct to assimilate the content studied. However, when they are unable to discover the GFA for themselves, the teacher should help them. The GFA can have different structures, but four main types are commonly identified, labeled I to IV (NÚÑEZ, 2009).

In type I GBA, in general, the assimilation process is incomplete and slow, in which the mediation tools and essential characteristics of the concept are identified by students through trial and error. In this type, the transfer of knowledge is limited (NÚÑEZ, 2009). Additionally, the learning activity is extremely sensitive to the slightest changes in the conditions of presentation and execution of tasks (ENGENESS; THOMAS; PODOLSKIY, 2021). In type II GBA, the assimilation process is complete, and students are informed about all the essential characteristics of the concept necessary to solve a specific problem. However, these essential characteristics are specific and can only be used in one case, for example, when solving a specific problem. Learning takes place quickly and with minimal errors; however, the skills formed in the course of such activity can only be used when there is proximity and similarity in learning situations. This type is characteristic of traditional teaching. The formation of the action occurs briefly, with few errors, in an elaborate way, but the transfer is still limited (ENGENESS; THOMAS; PODOLSKIY, 2021; NÚÑEZ, 2009).

Type III GBA is characterized by a theoretical orientation, containing the invariant essence of the activity. In this type, knowledge is constructed by students following the approach offered by the teacher, aiming to identify the essential

characteristics of the concept to be learned. Learning happens quickly, with minimal errors, and the skills formed during this activity can be transferred to other learning and other situations. Finally, type IV GBA differs from type III GBA in only one aspect, the orientation, which, despite being complete and generalized, is prepared in advance (ENGENESS; THOMAS; PODOLSKIY, 2021; NÚÑEZ, 2009).

Galperin emphasized that Type II GBA develops empirical thinking in students without delving into the essence of phenomena, while Types III and IV GBA reveal the essence of learning and promote abstract-theoretical thinking. Types III and IV offer a unified approach to learning and form the basis for creating links between subjects. By applying these types of guidance, students master the essence of learning through the study of a phenomenon that takes on a new function: no longer as studied content, but as a tool that enables advancement in the learning process. Galperin considered the guiding part of a learning activity to be a “management device,” while the executive part was considered a “working device,” transferring the activity from the external to the internal plane (ENGENESS; THOMAS; PODOLSKIY, 2021).

### **4.3 Action parameters**

Galperin (1957) proposes that, in order to ensure success in the learning process, it is necessary to evaluate the qualities of the actions performed by children, as well as their specific characteristics. In other words, this system includes control of the learning process. To this end, the author suggests four parameters of action for teaching, namely, the level of appropriation, level of generalization, level of abbreviation, and level of automation. These parameters constitute subsets of prerequisites for the systematic formation of actions during the performance of activities that promote learning of a given content or skill (GALPERIN, 1957).

The level of appropriation refers to the performance of the activity. If the child performs the activity, they can do so at three basic levels: materialized, verbal, or mental (Galperin, 1957). The materialized level consists of using

concrete objects to perform an action (for example, using fingers, colored chips, or sticks to count); at the verbal level, the object is no longer necessary, with speech being the main tool for carrying out actions (e.g., stating the procedures while performing an arithmetic calculation); and finally, the mental level, characterized by “internal performance” (e.g., doing “mental arithmetic” or resorting to a numerical fact) (HAENEN, 1996).

The level of generalization is related to the essential properties of the object of the action, that is, the ability to distinguish which variables are decisive for completing the task. For example, when children generalize phoneme-grapheme relationships during literacy training, they can read words with different levels of difficulty, simple and complex syllables. The third property is the level of abbreviation, which indicates how many operations the child needs to perform to complete a task. For example, there is a significant difference between the levels of abbreviation of a child who, to read a word, first joins the letters to form syllables and then joins the syllables to form the word (syllabic reading) and another child who reads the word as a whole (automated reading). Finally, the level of automation is identified, which reveals how agile, or not, a child is in performing a task. It is a measure inversely proportional to the time the child needs to complete the activity (GALPERIN, 1957).

In order for the teaching-learning process to be able to provide the formation of mental actions and concepts, it is necessary to evaluate all these qualities of the activity. Therefore, the four parameters allow us to control, guide, and correct actions in various situations that require the child to perform a new action and, consequently, optimize the process of developing new skills.

## **5 Criticism of the theory of mental action formation and concepts by stages**

Galperin's instructional theory was not developed solely based on his empirical studies; it is important to highlight the crucial role played by criticism of his model. Such criticism played an important role in its improvement. Part of the evolution of his theoretical thinking was directly inspired by the comments of his critics (VAN DER VEER, 2000).

One of the recurring criticisms of Galperin's theory is that the design of the method does not promote the development of creative thinking, since external instruction plays a crucial role in this process. This is partly because the main focus of its systematization is to avoid error and optimize the learning process. Thus, the model did not establish a stage aimed at stimulating heuristic skills, mobilized for the discovery or investigation of content. (ENGENESS; THOMAS; PODOLSKIY, 2021). Regarding this criticism, Haenen (1996) provokes contemporary researchers by stating that these issues have great potential for those who continue to develop the Theory of Mental Action Formation.

At different times, Galperin had the opportunity to respond to this type of criticism, considering this aspect of creative thinking an area to be explored in depth within his approach (GALPERIN, 1975). However, the author states that providing students with a means to solve new problem situations encourages their independence. The task of step-by-step planned teaching “is not to communicate finished knowledge, but to induce the student to acquire new knowledge independently through systematic investigation prepared by an instructor but conducted by the student himself” (GALPERIN, 1992, p.74).

Another point of discussion is the focus on instruction, which could give rise to misconceptions by conceiving the structure of the theory as rigid, instrumental, and hermetic (HAENEN, 1996). However, it can be argued that the development structure proposed by Galperin is flexible, in that it is subject to changes in the type of guidance used—different types of instructions can be used concurrently or at different times, and it is possible to “skip” steps during the learning process. The process will depend on the needs and progress of each student, a characteristic that led Galperin to suggest conducting an assessment before applying the instructional program (HAENEN, 1996).

Finally, it is worth highlighting the criticism that considers that the theory is not a general description of the principles and regularities that attempt to explain the dynamics of the development of human mental activity, but rather a set of techniques and instructions on how to teach. This interpretation can reduce

and transform the approach into a kind of “absolute” knowledge (ENGENESS; THOMAS; PODOLSKIY, 2021). However, his theory is not limited to instructions and stages of the learning process but encompasses reflections based on the contributions of Vygotsky and Leontiev, operationalized for educational practice and research (GALPERIN, 1992a; 1992b; 1982; 1967). Galperin's theory comprises a learning approach that explains new types of learning activities to bring about qualitative changes in students' psychological functions and development.

Despite the criticism leveled at the Theory of the Formation of Mental Actions in Stages to date, the theory remains consistent and has many supporters. Galperin's orientation study, as well as his understanding of learning as a process of transforming external social activity into an internal process, has considerable implications for current educational research and practice.

## **6 Contributions of the Theory of Stage-by-Stage Formation of Mental Actions to educational psychology**

Galperin's contribution has several implications for psychology and, above all, for educational practice. The systematization of the stages of transformation from external to internal activity, as well as the entire theoretical foundation that underpins this systematization, was developed and tested over decades of work in schools in various countries (ENGENESS; LUND, 2020; LEÓN, 2019; RIVERA; SOLOVIEVA; QUINTANAR-ROJAS, 2019; LUNA; SILVA, 2018; NÚÑEZ; RAMALHO, 2015).

At this point, it is worth noting that the ultimate goal of any theory should be its adoption and use by professionals, either as guidance or as a tool to support practical decision-making. To this end, the greatest challenge lies in transposing it and making it understandable to professionals.

In this sense, scholars argue that Galperin's approach is particularly useful for education professionals and others. This is because it integrates a theoretical analysis of the development of higher mental functions with a careful program of intentional development of mental actions (ENGENESS; THOMAS; PODOLSKIY, 2021).

Despite the criticisms described in the previous section, it is necessary to consider that Galperin's theory offers an understanding of learning as a process of transformation in which students are not passive but rather occupy a prominent place throughout the process, gradually developing the acquisition of concepts and, consequently, becoming independent in the teaching-learning process. This journey continues throughout the life of the individual, who articulates learning and teaching as a single entity within the same system of activities, providing a more comprehensive view of learning and development.

Conceiving the learning process as a gradual flow of development, considering material and social resources, has important methodological implications for the classroom, as it is up to the teacher to introduce material support resources, provide social support, and design activities that favor the transition from the guidance they provide to reflective thinking. In this sense, Galperian theory provides support for educators to structure the content to be taught in a systemic way, highlighting essential aspects and organizing a didactic sequence that favors the formation of scientific-school concepts.

The involvement of students in these different forms of activity in the learning process offers an innovative analysis of teaching practices. Based on different types of cultural tools and types of instructions, it supports the construction of new types of activities based on activity as an active process, which supports the overall development of students. Therefore, it establishes the basis for a learning approach that can be applied in different contexts and subject areas.

This action in the world and the learner's protagonism are marked by the idea of using manipulable materials or actions and the centrality of language as a tool for social interaction and behavioral regulation. However, one of the most important tools in the learning activity is its guidance resource. Guidance is a typically human activity and involves creating a system for executing and controlling a task to optimize the teaching process (LEONTIEV; GALPERIN, 1965). Guidance is one of the most important contributions of Galperin's theory,

which criticizes fragmented teaching and proposes a conceptual framework that will guide the student through the teaching-learning process until skills or concepts are properly internalized.

Finally, it is important to emphasize that Galperin's theory should not be understood as a rigid theoretical guideline that must be repeated, as one would do with a recipe. It is essential to consider its flexible dimension and the different variables that permeate the learning process, such as content, student age, and prior knowledge of the concept, among others (ENGENESS; THOMAS; PODOLSKIY, 2021).

## 7 Final considerations

The purpose of this article was to present Galperin's Theory of the Formation of Mental Actions in Stages, developed from contributions by Vygotsky and Leontiev, and to outline some of its implications for psychology and pedagogy. Starting from the foundations of historical-cultural theory, Galperin advances by operationalizing and transposing the concepts of 'activity', its structure, and the process of 'internalization' to the classroom.

Galperin's main contribution focused on the question of how mental activity emerges from external activity. His teaching and learning methodology was systematized by the detailed decomposition of the process of internalizing external actions into internal ones, as well as the guiding functions that have the mission of highlighting the essential characteristics of a concept to be learned. Additionally, students can orient themselves independently based on an action scheme, supplanting trial and error responses with the emergence of reflective thinking.

Galperin's theory offers an instructional methodology for studying and controlling the learning process, which can be used as a theoretical-methodological principle for the design of educational programs and psychopedagogical and neuropsychological interventions. In the area of neuropsychological assessment and intervention, for example, empirical and results-centered methods still prevail (with little study of the psychological structure underlying the proposed tasks), as well as dynamics that encourage trial-and-error solutions. In the historical-cultural approach, the theory of

the Formation of Mental Actions by Stages may be one of the alternatives to overcome this scenario. This knowledge can be used during assessment to create different types of assistance for subjects in solving tasks, to construct instructions that favor the process of guidance in the problem situation, and, in the case of intervention, to design individualized programs focused on the neuropsychological needs of each case, relying on dynamics that include GBA types III and IV.

In addition to the above elements, Galper's model can be configured as an educational tool in the current health crisis scenario triggered by the Covid-19 pandemic. Faced with the need to rethink new ways of working and learning, this theory can contribute to the design of strategies that guarantee the quality of the teaching-learning process in new contexts and favor the psychological development of the subject in a comprehensive manner.

## References

- ENGENESS, I.; THOMAS, G.; PODOLSKIY, A. Demands and realities: Significance and implications of Galperin's legacy for learning and teaching in 21<sup>st</sup> century. *Culture Psychology & Education*, 14, 105-126, 2021. DOI: <https://doi.org/10.1007/978-3-030-64022-4>.
- ENGENESS, I.; LUND, A. Reprint of: Learning for the future: Insights arising from the contributions of Piotr Galperin to the cultural-historical theory. *Learning, Culture and Social Interaction*, v. 27, 2020. DOI: <https://doi.org/10.1016/j.lcsi.2020.100476>.
- ESPINOZA, A.; BALMACEDA, C. El concepto dialéctico de internalización em Vygotski: aproximaciones a un debate. *Psicología, Conocimiento y Sociedad*, v. 8, n. 1, p. 5-35, 2020. DOI: <https://doi.org/10.26864/pcs.v8.n1.2>.
- GALPERIN, P. Y. Stage-by-Stage Formation as a Method of Psychological Investigation. In: S. N. GALPERIN, P. Y. ZAPOROZHETS, A. V. & KARPOVA (Ed.), *Current problems in developmental psychology. Course materials*, p. 93–110. Moscow University Publishers, 1978.
- GALPERIN, P. Y. An Experimental Study in the Formation of Mental Actions. In B. Simon (Ed) (1957). *Psychology in the Soviet Union IIs*. London: Routledge & Keagan Paul, p. 213-225, 1957.

GALPERIN, P. IA. Changing Teaching Methods Is One Prerequisite for Increasing the Effectiveness of the Schooling Process, *Soviet Education*, v. 17, n. 3, p. 87-92, 1975. DOI: <https://doi.org/10.2753/RES1060-9393170387>.

Galperin, P. I.; Talyzina, N. F. Control of the Learning Process is Basic. *Soviet Education*, v. 7, n. 12, p. 19–24, 1965. DOI: <https://doi.org/10.2753/RES1060-9393071219>.

GALPERIN, P. Y. *Indroducción a la Psicología*. La Habana: Editorial Pueblo y Educación, 1982.

GALPERIN, P. Y. Linguistic Consciousness and Some Questions of the Relationship between Language and Thought, v. 13, n. 4, p. 37–41. 1992a. DOI: <https://doi.org/10.2753/RPO1061-0405300481>.

GALPERIN, P. Y. Mental Actions as a Basis for the Formation of Thoughts and Images. *Soviet Psychology*, v. 27, n. 3, p. 45–64, 1989a. DOI: <https://doi.org/10.2753/RPO1061-0405270345>.

Galperin, P. Y. Organization of Mental Activity and the Effectiveness of Learning. *Soviet Psychology*, v. 27, n.3, p. 65–82, 1989b. DOI: <https://doi.org/10.2753/RPO1061-0405270365>.

GALPERIN, P. YA. On the Notion of Internalization, *Soviet Psychology*, v. 5, n. 3, p. 28-33, 1967. DOI: <http://dx.doi.org/10.2753/RPO1061-0405050328>.

GALPERIN, P. Y. The Problem of Activity in Soviet Psychology. *Journal of Russian & East European Psychology*, v. 4, n. 30, p. 37–59, 1992b. doi: <https://doi.org/10.2753/RPO1061-0405300437>.

HAENEN, J. Introduction : Piotr Gal’perin and the Content of Soviet Psychology. *Journal of Russian & East European Psychology*, v. 30, n. 4, p. 3–21, 1992. DOI: <https://doi.org/10.2753/RPO1061-040530043>.

HAENEN, J. *Piotr Gal’perin: Psychologist in Vygotsky’s Footsteps*. New York: Nova Science Publishers, 1996.

HAENEN, J. Piotr Gal’perin’s Criticism and Extension of Lev Vygotsky’s Work Jacques. *Journal of Russian & East European Psychology*, v. 2, n. 34, p. 54–60, 1996b. DOI: <https://doi.org/10.2753/RPO1061-0405340254>.

LEÓN, G. F. Galperin revisitado do pensamento complexo: auto-organização da aprendizagem e desenvolvimento humano. *Linhas Críticas*, v. 24, 2019. <https://doi.org/10.26512/lc.v24i0.20243>.

- LEONTIEV, A. El problema de la actividad en la psicología. In: Colectivo de Autore. *Temas sobre la actividad y la comunicación*. Psicología Social. La Habana: Editorial de Ciencias Sociales, p. 259-298, 1989.
- LEONTIEV, A. *O desenvolvimento do Psiquismo* (2 ed.). São Paulo: Centauro Editora, 1978.
- LEONT'EV, A. N.; GAL'PERIN, P. IA. Learning Theory and Programmed Instruction, *Soviet Education*, v. 7, n. 5, p. 7-15, 1965. DOI: <https://doi.org/10.2753/RES1060-939307057>.
- LUNA, E. R. M.; SILVA, P. B. A teoria de Galperin no ensino de polialelia: formação dialética de habilidades e conceitos. *Revista De Ensino De Biologia Da SBEnBio*, v. 11, n. 1, p. 139-156, 2018. DOI: <https://doi.org/10.46667/renbio.v11i1.147>.
- NÚÑEZ, I. B.; RAMALHO, B. L. A Teoria de P. Ya. Galperin como Fundamento para a Formação de Habilidades Gerais nas Aulas de Química. *REDEQUIM*, v. 1, n. 1, 2015. <http://www.journals.ufrpe.br/index.php/REDEQUIM/article/view/1260>.
- NÚÑEZ, I.B.; FARIÑAS, G. L.; RAMALHO, B.L. Apresentação: O Sistema Galperin-Talízina na Didática Desenvolvimental: Elementos iniciais de uma contextualização. *Obutchénie*, v. 4, n. 1, p. 9-31, 2020. DOI: <https://doi.org/10.14393/OBv4n1.a2020-56541>.
- NÚÑEZ, I. B. *Vygotsky - Leontiev - Galperin - Formação de Conceitos e o Princípios Didáticos*. Brasília: Liber Livro, 2009.
- RIVERA, Y. R. SOLOVIEVA, Y.; QUINTANAR-ROJAS, L. Método de solución de problemas para favorecer la formación conceptual en niños escolares. *Revista Educação Em Questão*, v. 57, n. 54, 2019. DOI: <https://doi.org/10.21680/1981-1802.2019v57n54ID19159>.
- SANTOS, M. & ASBAHR, F. A teoria da atividade de A.N. Leontiev: uma síntese a partir de uas principai obras. *Revista Brasileira da Pesquisa Sócio-Histórico-Cultural e da Atividade*, v. 2, n. 2, p. 2-23, 2020.
- TALIZINA, N. F. La formación de los conceptos matemáticos. In TALIZINA, N. F.; SOLOVIEVA, Y.; QUINTANAR L. (Eds.) *Enseñanza de las matemáticas desde la teoría de la actividad*, pp. 87–105, Ciudad Nezahualcóyotl: Ediciones CEIDE, 2017.
- TALYZINA, N. F. The Stage Theory of Formation of Mental Operations and the Problem of the Development of Thought. *Soviet Education*, v.10, n. 4, p. 38–42, 1968. DOI: <https://doi.org/10.2753/RES1060-9393100438>.

TALYZINA, N. F. The Theoretical Bases of the Elaboration of Teaching Programmes. *Programmed Learning and Educational Technology*, v. 19, n.1, p. 6–17, 1982. DOI: <https://doi.org/10.1080/0033039820190102>.

TALIZINA, N.; SOLOVIEVA, Y.; ROJAS, L. Q. La aproximación de la actividad en psicología y su relación con el enfoque histórico-cultural de L. S. Vigotsky. *Reflexión y Debate*, n. 230, p. 4–8, 2010. [http://emas.siu.buap.mx/portal\\_pprd/work/sites/neuropsicologia/resources/LocalContent/108/1/Actividad\\_psic.pdf](http://emas.siu.buap.mx/portal_pprd/work/sites/neuropsicologia/resources/LocalContent/108/1/Actividad_psic.pdf).

VALSINER, J. Dualisms Displaced: From Crusades to Analytic Distinctions. *Human Development*, v. 41, n. 5/6, p. 350-354, 1998.

VAN DER VEER, R. Some reflections concerning Gal'perin's theory. *Human Development*, n. 43, n. 2, p. 99–102, 2000. DOI: <https://doi.org/10.1159/000022>.

VYGOTSKY, L. S. *Obras Escogidas Tomo III: Historia del desarrollo de las funciones psíquicas superiores*, 1931/ 1960.

Received in June 2021.

Approved in March 2022.