

PHILOSOPHY OF MIND AND SOME LEARNING PARADIGMS
IN EDUCATIONAL PSYCHOLOGY*

Filosofía de la mente y algunos paradigmas
del aprendizaje en Psicología de la educación

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Abstract

The objective of this review is to give an organized account of the set of ideas that support the possible relationship between mind and learning, approached from the philosophy of mind, psychology and psychology of education. The mind is understood from different perspectives, however, if given the character of a set of faculties, it would point to the existence of a set of capacities and dispositions in human beings, which allow them to have beliefs, think, communicate, among other activities. These understandings allow teachers to have the opportunity to understand thought, and to communicate with others, i.e., to recognize that the other has a mind. For its part, representation refers to something that represents something else, and in these representations, mental states are subsidiary to a representational function. Thus, the relationship of medium and content representation has a substantial correlation that has important implications in teaching. Regarding learning, different currents have explained it, however, Piaget and Vigotsky, recognize the existence of a system in charge of configuring the representation of the world, in which the mediation of language is essential. It is concluded that the relationship between mind and learning, mediated by representation, is an opportunity to appreciate possibilities of linking a philosophy of mind with learning

Keywords

Philosophy, learning, psychology, education, representation, mind.

Resumen

El objetivo de esta revisión es dar cuenta de manera organizada de un conjunto de ideas que soportan las relaciones entre mente y aprendizaje, abordadas desde la filosofía de la mente, la psicología y la psicología de la educación. La mente es comprendida desde diferentes perspectivas, sin embargo, si se le da el carácter de conjunto de facultades, se señalaría la existencia de capacidades y disposiciones en los seres humanos, que les constituyen en sujetos que pueden tener creencias, pensar, comunicarse, entre otras actividades. Estas comprensiones permiten a los maestros tener la oportunidad de comprender el pensamiento, y de comunicarse con los demás, es decir, reconocer que el otro tiene mente. Por su parte, la representación hace referencia a algo que representa otra cosa y en estas representaciones, los estados mentales son subsidiarios de una función representacional, por esto, la relación de representación medio y contenido guardan una correlación sustancial que tiene implicaciones importantes en la enseñanza. Con relación al aprendizaje se reconocen las diferentes corrientes que lo han explicado, sin embargo, desde Piaget y Vigotsky, cognitivistas, se reconoce la existencia de un sistema encargado de configurar la representación del mundo, donde es fundamental la mediación del lenguaje. Se concluye que el establecimiento de una relación entre mente y aprendizaje, mediado por la representación, es una oportunidad para apreciar posibilidades de vinculación de una filosofía de la mente con el aprendizaje.

Palabras clave

Filosofía, aprendizaje, psicología, educación, representación, mente.

Introduction

In the last seven decades, interest in mental issues and in cognitive processes associated with learning in psycho-pedagogy has gained momentum and consolidated. In the perspective of Ferrater (2004), the construct of the mind in the history of humanity and in different contexts has been associated with concepts such as the soul, the spirit, the understanding, the intellect, and the psyche, normally linked to some philosophical tradition, historical period

or paradigm in science (or particularly in psychology) without there being a conceptual unification in this regard, since a semantic homogenization would reduce its polysemic potential and limit the understanding of this field of knowledge. In a similar perspective, one could speak of learning, but essentially in relation to what is meant by the term; thus, each paradigm denies, confirms, locates or refers in some way the faculty, power or place and defines it in terms of change, transformation, construction, evolution, association, modification of issues as diverse as behaviors, representations, thought schemes, models, ideas, competencies, skills, abilities, processes, capacities, associations, connections, among others.

In the last two years, in scattered periods of three and four months, the authors have been discussing relevant issues associated with the philosophy of mind and different psychological and pedagogical approaches to describe and explain learning. From these discussions, agreements and disagreements, understandings and questions have emerged helping intensively to build a set of ideas that are the ones that model this conceptual review.

The aim of this review is to present the set of ideas that support a possible relationship between mind and learning, guiding the discussion in the philosophy of mind, psychology, and psychology of education. To this end, initially, the mind as a construct is approached from philosophy and the theory of mind from psychology. The issue of representation is approached, allowing a logical link between the mind and two paradigms of learning in educational psychology. Finally, some educational implications are presented, and conclusions are drawn regarding the limitations of what has been exposed and future studies are presented for authors and potential readers regarding mind-learning relationship and a philosophical approach to mental issues and learning.

The mind

Any allusion to the mind or to the mental aspect seems to necessarily refer to the relation with some substance or to some property or to a set of properties. In some way, from the ontological point of view it leads to consider that things are types of substances and that the mind is one of them or that things have properties that can be of two types: physical and mental. The theory that supports these ideas is dualism, which, according to its orientation, can be considered either substantialist or of properties.

In the substantialist dualism the mind and the body are not identical, but they are different substances; in the dualism of properties, the

properties of things are physical and mental; the physical ones are associated with the features of physical objects such as length, volume and density present in a world considered as mechanical. The features of the mental are immaterial, they are associated in Lowe's perspective (2000) to what the person possesses as concepts, thoughts and sensations -conscious states- i.e., in the person as a subject of experience.

Both substantialist and property dualism show as a problem how mind and body are related or interact; or how one of the properties or substances is dominant in this relationship.

The matter can have different approaches in humans, as subjects of experiences. First, one could assume the denial that the physical exists as a property, that the mind, stage of reason, shelter of ideas, of will, of concepts, of language and thought, as well as of the so-called mental states, takes precedence in the constitution of what the person is; it is the mind that determines what the human being knows, a philosophical perspective that has been considered as idealism or spiritualism. Second, reducing the mental to the physical, one could assume the primacy of the physical, insofar as the source of knowledge and knowledge is based on a body that relates to the environment, that experiences in its relationship with it and in which such objective relationship is more determinant in the relationship of the person as a human being with the world, being a materialistic perspective. Thus, arguments could be extended in favor or not of one of these positions associated with the mind-body relationship or recognizing their interrelation, their interdependence, their interaction. As said, these three sides of the issue are part of the most current discussions in philosophy of mind.

Lowe (2000) affirms that Descartes' dualism is interactionist: "...it holds that the mental states of a subject or person can interact and often interact causally with the physical states of that person's body, both causing those states and being caused by them" (p. 27). And he does not fail to assign difficulties to it: a conceptual one (the physical and the mental are different entities, they do not have common properties) and an empirical one (by considering a location in the center of the brain –the pineal gland– of the interaction between the nonphysical and the body).

Any decision to side with one perspective or another is problematic. Even Putman (2012) refers to it. One or the other theory in the current state of the question may have support when dealing with the mind-body problem.

As professors, we are called to discuss about whether the mind has any localization; or if it is a kind of system without physical support. In taking a position, a position of localizationist criterion is evident, i.e.,



there is a research line from which it is believed that there is a physical, objective element, a thing called the brain, which is the deposit, the place where the mind is established in a well differentiated way; this questioning is still problematic as the physical characteristics of such an object, of the brain in terms of size, weight, capacity for connection, morphology and physiology would relate more to the physical, to the mechanical that can be explained by the sciences of nature, than to characteristics of subjective experience that are not the same that would be observed in physical phenomena. The increment in educational neuroscience studies is led by teachers who have opted for this physicalist, mechanical version of understanding the mind. Physical processes reduce the corresponding mental processes, which seems to eliminate the latter.

In this sense, according to very influential researchers from the neurosciences, such as Luria (1988), the existence of anatomical-functional correlates of cognitive and cognition processes in general has been postulated, what has been considered from some psychological and philosophical positions as Solms and Turnbull (2004) as the easy problem, with respect to the really difficult problem, still unexplained, which allows to point out how one, in the physiological, chemical and electrical activity of his brain, becomes a self, capable of being conscious and of realizing.

From a different perspective, it is considered that human subjectivity has no direct correlation with brain functions, since there is no objective explanation so far, no empirical data that enables us to locate beliefs, subjective experiences, thoughts, among other things. In this sense, Carter (1998) has pointed out that this is a question that modern 'imaging' could somehow debate or at least partially controvert.

Many others still imagine the ethereal existence of a kind of box (understanding, soul, consciousness, mind) in which the objects of thinking are located or lodged without empirical or objectual explanation. In this sense, researchers such as Murphy (2010) point out that the concept of mind is transferred to the concept of reason, i.e., ideas, which somehow combine producing increasingly complex or abstract ideas. Close to or far from this approach, there are those who affirm and those who deny innatism in the presence of such matters of thinking.

However, correlates -close to what is believed as mind with the body- are seen in teachers who have no need to understand the one, the physical reality as something different from the mental. The body is an indivisible unity. Thus, it is considered that the human being thinks, feels, makes judgments, has beliefs and all that occurs in the body, in a corporeality that behaves as a whole. Organs and senses, mental system allow un-



derstanding and transforming the world, establishing relationships with the world and internalizing it.

Another position for understanding the mind-body relationship is provided by psychology, with two perspectives that have been very influential: structuralism and functionalism. In the former, it was believed that in Schunk's (2012) perspective "human consciousness is a legitimate area of scientific inquiry, so they studied the structure or shaping of mental processes. They said that the mind is composed of associations of ideas" (p. 9). The method in this structuralist perspective is introspection and observation. However, it moves away from fragmenting reality and aims to understand it as an integrated set of relationships between its components.

In functionalism, following Schunk (2012) position, it was considered that adaptation is related with behaviors and mental processes. For functionalists "the functional factors were bodily structures, consciousness, and cognitive processes such as thinking, feeling, and judging...they were interested in how mental processes operate, what they accomplish, and how they vary according to environmental conditions" (p. 10). In other words, function is determined by the internal aspect that is observed in a physical state; it does not establish a metaphysical dichotomy between mind and body, nor does it affirm that they are a single substance, but rather functionalism conceptually distinguishes mind and body, which interact through representations evidenced in a physical organization defined in causal relationships constituted by environmental stimuli that cause a set of more or less complex internal processes that also interact causally and produce a set of behavioral outputs.

In Piaget, a mixture of functionalism and structuralism, it is possible to observe that schemas and operations are structures that are strengthened or transformed through processes of assimilation and accommodation. In this perspective, for Taborda (2006), the functional mechanisms that give them their special constructive character in learning are equilibration and awareness.

Fodor (1980) contextualized the discussion in two development stages in psychology. The first, psychological, oriented to "a functional characterization of the mechanisms responsible for behavior" (p. 43), without accounting for neurobiological mechanisms; and the second, associated by the same to the psychological-physiological. Thus, Fodor recognizes a relationship of dependence between the two explanations, the psychological and the neurobiological.

From what has been discussed so far, it is even possible to go further in the controversy, in which the customary mind-body dispute con-



tinues. It is a matter of taking sides in relation to the description of the mind and of the mental as a set of faculties or as a device.

If giving the mind a set of faculties, we are indicating that there is a set of duly organized capacities and dispositions in human beings that allow them to have beliefs, to think, to use symbols in order to communicate. Thus, such a faculty would also imply acting, and such acting links muscles, organs and functioning. We would thus be speaking of a faculty that, in order to express itself, would necessarily be linked to minimal physical entities such as those mentioned above. And in order to do so, would it not somehow need a unit, somewhere, that would make such action possible? For some researchers such as Llinás (2013) such a unit resides in the brain, architect of the coordination of mental functions and multiple functions that make it possible for the relationship to somehow have expression or exposure. The capacities are in the newborns; they are developing; the dispositions are there so that thinking, using language and having beliefs become effective and give a special, human character to the subject, as he is a subject with mental states. Likewise, for some, this faculty is different from the body, while others will try to give the body and its physical experience primacy over mental states housed in the mind, in the spirit, in the soul, the depository of the aforementioned faculty.

If the mind is seen as a device, it would be very close to the thinking of Philippe Johnson Laird (1983 cited in Rodríguez-Palmero, 2008) insofar as its procedures could be developed by a mind conceived as a computational mind. The mind, the mental system, is configured on the basis of what the author called effective procedures, i.e., procedures that a machine, a computer, a robot can perfectly develop, such as obtaining information, processing it, recording it, having it available in a file or memory, recognizing it, recovering it, operating with it, giving answers. Such functions would require a device that sends information by various paths or that receives it. In humans it is the brain; in a computer it is a central processor with a language suitably configured to respond to user requests. Simple functions that account for what up to now as human beings is attributed to objects called robots, pcs, etc., given that objects and devices are now attributed affections and feelings. Today it is possible to listen expressions of affection and feelings in various robots at international robotics trade fairs.

Such devices are then considered to be at the same time capable of representing diverse spheres of the world in the form of propositions, images and even structures or models. The mind, understood in a general way, is then considered to be housed in something like a device that is at

the same time something objective -it has length, size, density, etc.- but that fulfills functions and uses “meaningful” languages that cannot be objectively observed. If it is possible that a physical element can fulfill functions and have states that are considered subjective, in the same way in artificial intelligence it is possible to set activities, mental actions that were conceived as human in non-human devices, in objective, mechanical, physical devices built by man that can fulfill such functions. Computers would be an example of this. But, how would one answer, in this sense, to the questions: is there a mind available in computers? Could one speak of a theory of mind in material objects that show calculations, procedures, affections and feelings? Do these discussions about the mind-body relationship lead the human being to unwanted places in the humanity of humans? To recognize a mind in a computer is not the same as to recognize it as a valid interlocutor in moral, ethical or scientific and philosophical discussions?

In Dennett, following Thomson (2000) ‘it is possible to recognize orienting elements that could be indicating contributions in this direction.’

For Dennett consciousness consists of a very complex series of sub-tasks, and each of them is fundamentally mechanical or computational, which means that they can be syntactically represented by a formal system in a computer. If this is correct, then the computer is a good model of mental functions, because computers work with a very complex set of binary functions, which are mechanical and devoid of intelligence (cited by Thomson, 2000, p.122).

In *Consciousness Explained*, Dennett (1995) reveals his inclination to think that even a robot could have a self, a consciousness. The analogy of the mind with machines, with computers, is defended by Dennet in various passages of his work. For him, a virtual machine could explain mental phenomena, the phenomena of consciousness. Dennett (1995) says.

If the self is “no more” than the narrative center of gravity, and if all phenomena of human consciousness are explicable “only” as the activities of a virtual machine performed on the automatically adjustable connections of a human brain, then, in principle, a properly “programmed” robot with a brain based on silicon chemistry could be conscious, could have a self (p. 443).

The latter can contribute to answer some of the frequent questions in the context of cognitive sciences, about whether machines can think, or what guides Crane’s (2008) writing in *The Mechanical Mind* when he asks whether a computer can think, or whether the human mind is a computer, or whether some real mental states and processes are compu-



tational in nature? Lowe (2000) argues that “it would be unreasonable to deny intelligence to the machine, to the computer, after considering the plausibility of the Turing test” (p.155).

Currently, it is not possible to think that there is a conceptual unity around the mind-body relationship. However, the most current and scientifically supported developments provide the understanding of mental phenomena with invaluable material to relate the mind with physical instances such as the brain or processors, as it is considered that they can, and indeed do, account for mental functions; as either the human or animal brain or a computer has the capacity to operate together many of the cognitive processes, which can be conceived as a type of mind, in such a way that such instances would be something like hardware, and the mind would be considered as a special presence: the programs, the software.

Now, why should the professor know that there are different conceptions or ideas about the mind and the mind-body relationship? Several initial considerations should be considered at this point.

In the first place, it is useful to understand how, through the ages, a certain understanding of the mental has also defined understandings of the mind, the body and learning.

Secondly, it is possible to think that, if it exists, if we recognize something that is called mind, it operates in some way and such operation makes it possible to think. And in such a direction, understanding thought would be an important step for those who wish to understand the mind.

Thirdly, since the professor is a social and sociable being, communication is a process that is at the basis of the interaction between the professor and the community. Therefore, to communicate and to establish dialogue between humans imply that the person knows the ability to communicate to others, to know that the ideas that communicate come from a person like oneself, who has beliefs, emotions, feelings, i.e., who has mental states. Communication implies then that one recognizes that the others have a mind, and this is what psychologists Rivière & Núñez (2001) call ‘Theory of mind’.

In this sense, Rivière and Núñez (2001) say in ‘theory of mind’ a strange term to describe what is described, i.e., to account for the human mentalistic capacity. According to these authors:

In a fuller and more complete sense, a theory of mind is a conceptual system that includes the notion -at least implicitly- of beliefs, i.e., the idea that there may exist forms of representation capable of being true or false in other organisms, or in oneself. This notion, along with intention and desire, constitute the baseline of the theory of the mind (p. 20).

To such a conceptual system are also attributed intentions and desires, perceptions, hopes and fears called by Lowe (2000) as ‘mental states of propositional attitude and states of sensation such as pain or nausea’. Thus conceived, the theory of mind and its inferences would be the result of a process originating in emotions and affects, in intersubjective experiences that enable access to the intentions of others. Riviere and Nuñez (2001 cited in López & Fernández, 2006), affirm that the nature of “...the approach to the mind of others would be innate and would become evident very early on through the adaptations of face-to-face relationships with people who, for example, raise babies” (p. 2).

In this perspective, humans have a theory of mind, i.e., they have mental states such as those mentioned above and, in addition to this, as people they build with age the capacity to recognize that others have a mind; they are subjects with mental states of propositional attitude and sensation. It is believed that around four and a half and five years old, in relation to beliefs, children are ready to attribute mind to others, they are ready to understand states of false beliefs, a vital issue to account for a theory of mind, from inaugural experiments on false beliefs to try to demonstrate that mental states effectively constitute or are part of the conceptual system called mind.

The growing representational capacity of children accounts for the growing capacity of the ‘mind system’ to understand false belief states, to recognize intentionality of self and others, to identify fears of self and others, to orient desires in a certain direction.

The Theory of Mind accounts for a human capacity to understand mental states in oneself and in others, a capacity that is essential when trying to understand educational work, teaching, and the training relationship. Understanding this capacity has educational implications.

First of all, it mentions the understanding of an unequal relationship in the capacity to represent and in the whole of what children and young people represent in a training relationship. This being so, recognizing this mentalism will make it possible to design teaching based on the representations, on the mental states of the students at a given time.

Secondly, it makes it possible to identify levels of communication that should be assumed in the teaching relationship, i.e., the mind has an evolutionary characteristic and, in relation to this characteristic, the language used in class should be adapted to the lexical repertoire available to the learner. Riviere and Nuñez (2001) point out that it is necessary to attribute to students neither less nor more knowledge, neither more nor less representations than they have to adapt, accordingly, the teaching to the lexical repertoire available to them.

Thirdly, false beliefs are not simply an obstacle in education. They are powerful insofar as identifying them allows to help build solid knowledge that enables the student to progressively overcome naive or superficial thinking.

What has been said so far allows to point out the mind as a representational system and as a habitat of mental states. In this sense, the issue of representation is reviewed below, as it is at the basis of the system. For this purpose, it is described, characterized, and explained in order to establish plausible relations with the behavioral and cognitive paradigms of learning.

Representation

Representation is currently a construct of great interest in philosophy, psychology, linguistics, cognitive sciences, and artificial intelligence, (Crane, 2008; Lowe, 2000; Johnson-Laird, 1983; Rodríguez-Palmero, 2008; Perner, 1994; De Vega, 1995; Ibarretxe-Antuñano & Valenzuela, 2012), showing a relationship of directionality. For Perner (1994) this directionality is between an image, a word, a photograph, a gesture (representational medium) its sense, its meaning, its description (representational content) and the objects of the world, existing or not (representational object).

In Crane's perspective (2008) a representation is something that stands in place of something else, "something that represents something else" (p. 33). It has alluded in different contexts and times to ideas, schemes, propositions, concepts, models, etc., which are considered at the same time as objects of thinking that make it possible to think, judge, explain, make known. In another perspective, for Perner (1994) such representations can be internal or mental or be external representations of something thought or imagined by the subjects. Mental states explain action through a representational theory of mind, where mental states are subsidiary to a representational function in a functional relation between mental states and the world.

In *Understanding the representational mind*, Perner (1994) points out that in addition to the fact that a representation has the capacity to place itself in the place of something else to account for it, to signify it, it is possible to present other characteristics: asymmetry, singularity, the possibility of a representation being erroneous, and finally, the fact that the person can represent things that do not exist in his own mental system.

Such characteristics are related with the description of representation in terms of a representational relation between a representational

medium and a representational content. In such a perspective, the character of representation alludes to a representation that is a representation of something and of a particular something, not of something else; for example, a photograph of the mother refers to her and not to another lady. Asymmetry accounts for the distance that exists between the medium that represents and that which is represented insofar as they are not equal, they cannot overlap; a photograph is a photograph and not, as an example, the mundane object it represents. The possibility of a representation being erroneous is clearly expressed in that not everything that is represented is true; there are, as examples, common sense representations that are shared by the public and that are very far from being true, many of them are the result of misleading propaganda that reaches the subjects through different media. And the last characteristic is associated with the fact that although the person may not have an objective, empirical referent of something, it may be possible to represent it, examples of this would be characters such as: 'Dumbo, fairies, sprites, angels', etc.

What has been said is not only a presentation of the characteristics of the representation. They can be important clues when considering educational practice. In this sense, it can be pointed out that, in the relationship between representation medium and content, there is a substantial correlation that has important implications in teaching. If the words in use, if the images, if the diagrams have no meaning, if they are not accompanied by descriptions that justify their presence in the classroom, if they have no content for the students, such words, gestures or images will not contribute to the students' learning; the professor can use refine words, be recognized because of the abstractness of the thought without the students actually understanding what they are being told about, or what they are being referred to.

On the other hand, recognizing the possibility that a representation may be erroneous not only positively affects the search for truths in the sciences that surpass previous ones, insofar as they may inadequately account for what is accepted as truth; it also positively affects what Ausubel (1976) pointed out as the recognition of students' prior knowledge, that things that are represented are at a low level of knowledge, are learning opportunities, prior knowledge that can become fixed hypotheses and real epistemological obstacles to learning or, duly recognized, an opportunity to organize teaching by finding out what the subjects know, what they mistakenly conceive or misrepresent in order to act pedagogically accordingly.

Non-existence as a representation character leads the person to two equally significant places. To the distancing, since it is not necessary



to have a specific object or phenomenon in front of one in order to represent it (the case of the representation that can be seen in the School of Athens by Rafael di Sancio), or to the creation of subjects or objects that do not exist in the objective world but that beliefs, myths, fantasy, fiction may have helped to spread in the cultural context. In the condition and from the teacher's role, the teacher witnesses the presence of representations of this type in different spaces; moreover, many of the representations used in kindergarten and preschool classrooms seem to be supported by this special character of representation; likewise, fictional novel or dystopias, although some, such as the one presented by Orwell in his novel *1984*, seem to reflect a real issue in modern times.

Various types of representations have been mentioned at different times: simple ideas, complex ideas; primary, secondary, and meta-representations; mental models; internal representations, external representations, concepts, categories, and so on. They are ways of pointing out that the thought, the understanding, the mind, the spirit, operate with a set of propositions, images, analogies, metaphors, signs, and so forth.

Based on these discussions, it is considered that the greatest of them implies the innate or not innate character of representations, i.e., whether the person is born with ideas, with models of what is in the world, with even basic schemes of thought, or not.

On the side of those who could be called innatists, i.e., who consider that people are born with ideas, we can remember Plato (1999). The immortality of the soul is recalled in *Menon*, and it is said that it is the place of ideas. In this sense, humans are born with ideas. Learning for a human with soul that already has ideas is basically to make reminiscence, to learn is to remember: to bring, to update, to expose ideas that are in the soul, to make them explicit. The soul has ideas. In the *Menon*, Socrates shows his expertise; his method -the question, the interrogation- is fundamentally oriented to help humans who have ideas to remember, to bring them to the present.

-Socrates: And so it happens that, the soul being immortal, and having been born many times, and having seen both here and in Hades and all things, there is nothing that it has not learned, so that it is not surprising that it is able to remember about virtue and other things that already knew. Since the whole of nature is homogeneous, and the whole soul has learned it, there is nothing to prevent anyone who remembers only one thing (and that is what men call learning) from discovering all the others himself, if he is a courageous man and does not get tired of investigating (Plato, 1999, pp.104,105).

On the side of those who argue that ideas are not innate, but acquired, there are the most outstanding representatives of English empiricism: John Locke, David Hume and George Berkeley. With some differences among their approaches, they agree in presenting the importance of experience in the configuration of ideas in 'the understanding'.

For John Locke (2005) "The idea is the object of thought" (p. 21). Such ideas are based on experience. The philosopher says: "I call an idea anything that the mind perceives within itself or that is the immediate object of perception" (p. 95); in this sense, for Locke having ideas and perceiving them are the same. An idea or representation in Locke would relate to "resemblances of something existing in objects, in ideas of primary qualities" (p. 102). Simple ideas are combined, and the person has complex ideas from such a process. For Locke, simple and complex ideas have two sources: sensation and reflection (derived from internal mental operations).

For Hume (2010) immediate experience and sensation are the only way an idea can have access to the mind. More intense sensations define more intense ideas in the mind. The more proximity there is between a sensation and an idea, the firmer it can be in the understanding. In this sense, abstract ideas would be considered weaker, and would not be copies of any internal or external impression as they are mediated either by other ideas or are constituted from ideas derived from sensation; for Hume all sensation 'is strong and lively'.

In Berkeley (1985), the objects of human knowledge are the ideas impressed in the senses (the most firm and lasting ones) and those derived with the help of imagination and memory. An idea exists insofar as it is perceived; in this way he establishes differences between ideas caused by sensation and those produced by reflection. For Berkeley (1985):

...the ideas of the senses have a greater content of reality because they are more energetic, orderly, and coherent than those produced by the mind; but this does not mean that they can have extramental existence. They are also less dependent on the spirit, or thinking substance that perceives them, and in which they are provoked by the will of another more powerful spirit, but for that reason they do not cease to be ideas, since no energetic or weak idea can exist if it is not in a mind that perceives them (p. 87).

What has been said about the relationship between empirical experience and the acquisition of knowledge still has multiple applications today. Even in didactic principles, it is stated that the more senses are present in the apprehension of knowledge, the more stable, firm and lasting it will



be (Taborda, 2017). In practice, in educational institutions, appealing to experience as a strategy to anchor ideas and understandings about something is common; even in universities, when students do not comprehend, professors can resort to example as a special model to link common experiences, close to the students, to favor the understanding of some subject.

Discussions as to whether they are innate or acquired are still unresolved; there is no agreement on the matter. Even the recognition of one or the other is present in the history of ideas. Descartes (2012) highlights the existence of one and the other by considering the existence of fictitious ideas (I construct them with my mind), adventitious (derived from my experience in the world) and innate (he says: those that God puts in our soul with absolute clarity and distinction).

An additional and very current discussion in relation to the character of representations, beyond whether they are innate or acquired as a function of experience, is that associated with what can be considered as artificial constitution of ideas or constitution of artificial ideas, a question that fits well with instantiation proposals of human mental functions with development possibilities in the cognitive sciences. Thus, in the present article, artificial ideas are considered as those that, in the form of images, propositions, schemes, function flows, are instantiated in machines or computers. To describe such ideas in this way requires that a human programming determines the installation of such ideas, artificially, in external devices capable of operating with information intentionally provided by humans. This leads to the question of whether machines or computers have ideas or representations.

Johnson-Laird (1983) was one of those who placed himself directly on the side of the possibility of the instantiation of representations, and of the establishment of a plausible analogy between the human mind and the computational mind. For him, the mind has the capacity to represent the world; the mind has a computational character and in this sense functions in an analogous way compare to how a computer works; it uses effective procedures, i.e., those that a machine can use; such procedures can be registration, codification, response, coordination of tasks, recursive revision (going to a processor, to a memory system, rescuing information to use it). For Rodríguez-Palmero (2008), to consider the computer-mind analogy, to give it a computational character, is to consider that such computational mind, in Johnson-Laird perspective, gives rise to representations of three types: mental models, as structural analogues of the world, images as concrete visions of the world and propositions or types of representations that can be verbally expressible.

What has been mentioned about representation accounts for that with which the mind operates and which is the subject of work, under different names, in different descriptions and theories of learning. Whether they are denied or recognized as ideas, schemas, associations, etc., representation is the main issue in any discussion related to learning. What has been said about the mind, theory of mind and representations is useful to address the discussion about mind and learning, a discussion in which representation is an important link.

Mind and learning

The first experimental psychology laboratories with Fechner and later with Pavlov, with Wundt in Germany and James in the United States, were established with the aim of acquiring a scientific status, being considered the closest antecedents to psychological behaviorism. With Wundt and experimental psychology, psychology attempts to separate itself as a scientific discipline from philosophy. Encouraged by the promises of positivism, to reconcile the object of psychology (consciousness) with the methods of positive science, Wundt became the father of modern psychology, especially experimental psychology, and the forerunner of a radical psychology that went beyond his physiological psychology, which gave him a more precise, controllable, observable and measurable object, the future of psychology as a science of objective behavior and far, as possible, from the speculation of the preceding psychology.

It is John Watson -by following a knowledge derived from the experimentation on animal behavior developed by the Russian physiologist Ivan Pavlov- who is responsible for installing and promoting in psychology the development of a current generically called behaviorism; although the foundations of its developments can be justified on the basis of principles elaborated by English empiricists such as Locke, Hume, Berkeley (Bower & Hilgard, 2000), whose ideas are organized from two sources, sensation and reflection, and who give a very important value to experience in the constitution of ideas (Locke, 2005; Hume, 2010; Berkeley, 1985).

In this current -behaviorism- learning, is conceived as behavioral change. Environmental variables play a fundamental role in behavior. Consistent with this, the stimulus-response relationship was the basis for the whole set of processes supported by behaviorism (learning by contiguity, operant conditioning, classical conditioning).



Thorndike was one of the most named psychologists in behaviorism in the first decades of the twentieth century. A position that in Pavlov's perspective was considered from the stimulus-response association as an objective theory on the stimulus-response relationship associated with animal and human learning, and at the same time, this paradigm is considered as the first school of psychology, which refuses to study issues associated with consciousness, or to consider mental states as an object of study. For Thorndike (1968), it is possible to account for human behavior from observation, and it is experimentation, from the study of such observation that can become the object of study of the new psychology. If there is a connection between stimuli and responses, the study of such connections can give precise orientations regarding animal and human behavior. Edwin Guthrie (cited in Arancibia et al., 1999), following criteria derived from the support to the study of the stimulus-response relationship, as a plausible relationship for the study of the new psychology based on the study of human behavior, considers that "when two sensations occur together repeatedly, they end up being associated, so that subsequently when only one of these sensations (stimulus) occurs, the other sensation is also elicited (response)" (p. 51). This principle accepted as true to account for the association of stimuli close in time to the corresponding behaviors, tried to be extended to matters associated with memory, an issue that was criticized insofar as it implied recognizing that somewhere, in the consciousness, ideas were installed that would later be evoked, an aspect that recognized the existence of the mind, of the consciousness, and that would not be recognized in the scenario of radical behaviorism.

In Skinner, behaviorism, in trying to explain the phenomenon of learning, took a different variant to the original line derived from Pavlov's approaches. In the latter, the stimulus-response relationship placed greater emphasis on the stimuli. Thus, the change in behavior was defined by a logic in which it was initially essential to identify precisely which stimulus provoked which response to pair this stimulus with another and produce the same response; after such pairing, eliminating the original stimulus by the conditioned one resulted in a response, the original one, but already conditioned. Skinner, unlike Pavlov, emphasized the side of the responses and particularly the consequences of such responses, so that the relationship, linking such consequence, would be E-R-C type in which C accounts for the consequence.

The consequences mentioned in Skinner were referred to as reinforcers or punishments. Thus, an event that is delivered immediately after a response causes that response to continue to manifest is called reinforce-

ment, and an event that appears immediately after a behavior and makes it disappear is called punishment (Arancibia et al., 1999). On this basis, reinforcement can be considered as a new stimulus (reinforcing stimulus) that, duly introduced into the organism's environment, causes the behavior to be repeated, which can lead to the behavior being increased, maintained, or extinguished, for which, in a Skinnerian perspective, various reinforcement programs can be developed. According to Bower and Hilgard (2000), Skinner "...repudiates mentalistic or cognitivist explanations of behavior or those that attribute the causation of behavior to internal psychic forces of any kind" (pp. 216-217). Although, as Schunk (2012) says, Skinner "never denied the existence of attitudes, beliefs, opinions, desires, and other forms of self-knowledge (after all, he had them himself) but rather assessed their role" (p. 89), he only compared the organism to the metaphor of 'the black box' in which cognitions could probably be generated, even if no way of measuring them was available.

Pozo (2006) calls the long period of influence of behaviorism in the field of psychology as the 'long behaviorist glaciation'. In this regard, he states:

For many years, scientific psychology assumed that human beings, like other organisms, were mirrors of reality, of the organization of stimuli and responses in the environment, so that to study knowledge it was not necessary to imagine any intermediate structures between those stimuli and responses (p.122).

Estany (1999), to account for what Pozo refers to as the "long behaviorist glaciation", calls "death" the period in which behaviorism was imposed as the only way of studying psychology; as a substantial paradigm in this discipline, as the only one that could have the character of science. Consciousness was relegated and the mental states that could be sheltered in it were also relegated to the background.

Behaviorism, as a force in psychology, had skeptical researchers in relation to the methods of field study, including Wundt's experimental and physiological psychology, which sought to ingratiate with orientations arising from the same positive science. Introspection in this context was not considered as a scientific method, or as a source of knowledge about one's own mental states. Lowe (2000) summarizes the skepticism of behaviorism in this way:

Behaviorists argue that the only kind of data we can have concerning anyone's mental states, including our own, are to be found in externally observable behavior, both verbal and nonverbal. Behaviorists -scien-



tists- opt for this idea because they think that a science of mental states -which is what scientific psychology pretends to be-must only rely on objective empirical information that can be corroborated by multiple independent observers, whereas introspection is a private and subjective matter (p. 45).

What has been said made us think that there not in psychology a mentalistic position in behaviorism. The lack of concern with mental states on the part of behaviorism is seen in Skinner, Guthrie, Watson, Thorndike. Belief, desires, fears as subjective issues do not interest them. They are interested in fear, as a function of certain behaviors that can be associated with it as responses; they are interested in language as behavior, as objective evidence of something that may be internal; but behaviorists are not interested in this position of the first person. If behaviorists are not interested in consciousness, mental states, and the cognitive system, it is assumed that the thought, understanding, the cognitive system, or the mental system would not interest them either, i.e., the representational mind, in the sense that Perner (1994) defends this construct, was not interesting for a science that only focused its object of study and work on observable behavior.

A breakthrough that can be considered important in the recognition of inner processes or mental processes occurred in the late 1940s with the so-called cognitive revolution. In Estany's perspective (1999) two events sat a trend in this sense: the Hixon Symposium on brain mechanisms of behavior, promoted by California Information Technology in 1948, and the Symposium on Information Theory in 1956, which had a strong influence on what would become the true development project in cognitive science.

However, concerns did not precisely arise for the configuration of a referent in psychology that could announce the recognition of a structure or system in which knowledge or information could have a favorable place for its configuration and development. Piaget and Vygotsky, in the second decade of the 20th century began to lighten the scenario of cognitive psychology in open competition with the behaviorist current.

Piaget (2001a, 2001b) trusted in the possibility of establishing universal criteria that would account for the way in which subjects constructed knowledge. For this genetic epistemologist, knowledge is constructed from actions that subjects establish with phenomena, with the environment, with knowledge; in such a constructive process, subjects, according to special periods of development that they considered, made available already constituted schemes, i.e., according to such schemes

they assimilated the phenomena they faced. In Labinowicz's (1987) perspective, four issues were considered essential from Piaget's theory: experience, maturation, equilibration, and social interaction.

In Bringuier's perspective (2004), language as a form of representation progresses in children to account for objects, actions, phenomena by means of mental images and words. He distinguishes three representation levels in the constitution of language in children: the index, the symbol and the sign, which are part of a way of representing the world - language - as a component, in Piaget's view, of a great system of representation.

Knowledge constructed by subjects in Piaget implies adaptation. To learn in this way is to adapt a phenomenon mediated by assimilation processes of knowledge to thinking schemes that do not contradict it, or of accommodation if the new information available does not fit in precedent schemes, which would lead to the radical modification of a scheme or to the construction of a new scheme to interact with the objects of knowledge. In Tabora's perspective (2006), Piaget considers that two functional mechanisms are important in these processes, balancing and progressive awareness of the subject's relationship with objects or phenomena.

A contemporary of Piaget and with a different research program, Lev Semionovich Vygotsky, a psychologist who gave greater emphasis to the historical subject-context relationship, gradually became a referent of cognitivism, recognizing the relevance in the development of higher psychological processes of the interaction and negotiation of meanings of subjects in a specific sociocultural context. For Vygotsky (2000), knowledge is a process that implies internalization of culture. He elaborates, as part of his programmatic orientations, the notion of Zone of Proximal Development (ZPD) and the so-called law of double development. The notion of ZPD alludes to the distance that can be established between the zone of real development, given by what an individual can learn on his own, and the zone of potential development, given by the learning potential that is possible when a student learns from someone more expert and that marks his development. If in Piaget's view teaching should go hand in hand with development or, in other words, development precedes learning; in Vygotsky's view, teaching should be placed beyond, marking the developmental possibilities of the individual.

From the law of double development, also called the 'Crogenetic law of development', Vygotsky states that knowledge is first social or interpsychological, it is seen, it is given, it manifests itself in the social and cultural context and then, and only then, it becomes intrapsychological. Thus, in interpersonal relationships and scientific teaching, what is so-



cial becomes personal, intrapsychological. “This can apply equally to voluntary attention, to logical memory, and to the formation of concepts. All higher functions originate as relationships between human beings” (Vygotsky, 1979, p. 94). The above points to the fact that psychological processes and learning processes are attributable to groups as well as to individuals and that there is an inseparability between the intra- and inter-psychological aspects.

Piaget and Vygotsky are cognitivists, and they say that there is an entity, a system, responsible for configuring the representation of the world, of social and human phenomena in different ways, organizing what is known, in which the mediation of language is very important. They both conceive a cognitive system -a mind- capable of functioning symbolically through language, of thinking, and of representing the world.

Among the many cognitivist approaches in the second half of the twentieth century is the position of meaningful learning. In this perspective Ausubel (2002) points out that learning is constituted as meaningful verbal learning, a process by which new knowledge is integrated into the cognitive structure in a non-arbitrary and substantial way. But it does not do so as a whole but with special parts of it, which are called subsumers or anchor ideas. In such acquisition of knowledge, assimilation, of the same Piagetian type, plays a fundamental role and essential conditions are present: the material must be meaningful, the teaching must be meaningful and there must be a meaningful attitude towards learning.

On the other hand, it cannot be ignored the emergence of mentalistic approaches to learning in the 1960s that do not deny that instruction can be conceived as an external stimulus or event that has an impact on internal processes that, although unseen, can be inferred from external manifestations of the students. In this regard, Gagné (1979) and his theory of instruction designed a basic learning scheme in which the environment provides stimuli or requests that reach the sensory system, filter, and pass to a short-term memory system, in which they are short-lived; they pass to a larger long-term memory system, from which they can return to the short-term memory system as this is a working memory. The information is organized depending on the request of the medium in a response system and from this, through effectors, a response is given to the request of the medium. Two parallel processes accompany this statement: executive control and expectations (dependent, for example, on the value given to a task).

For Gagné, internal processes are linked to external processes in such a way that instructional events can be associated with learning

events by ensuring their expression. As examples, expectation and attention can be generated in the students' basic learning system, for example, if the name and purpose of an activity is made known or if its future usefulness is explicitly pointed out; a greater chance of permanence in the memory of a certain concept can be generated by showing it in its different expressions and repeating its rationale; it can be checked whether certain information remained in the memory system by reviewing what was taught, and so on.

Considering this basic learning scheme reminds us that, based on schemes such as this one, in which images, propositions and structures are stored, mentalistic proposals are being developed, establishing credible analogies between mind and computers, proposals that suggest a very promising future for the development of artificial intelligence. But, at the same time, the teacher should not be unaware that Piaget, Vygotsky and Ausubel ideas are still valid in multiple educational agendas in the world in which learning is constructed by students based on their experiences, their contacts with peers, their multiple relationships with social groups, with culture, with tradition.



Conclusions

Historically, learning has been part of the discourse of important referents in philosophy and psychology. Conceiving learning as a remembrance of ideas of the soul can be valued as one of the first philosophical presentations about learning, pointing out that such ideas are innate. To conceive ideas as derived in their origin from sensation and reflection, and the most vivid and lasting ones as derived from direct experience, accounts for ideas in their non-innate character. The presented versions place discussions that recognize innate and non-innate origin of ideas. In psychology and philosophy, the subject of representation has had different names: ideas, schemes, associations, mental models, concepts, symbols, mental representations, social representations, general motor program, conceptions, among others. Such names are somehow considered as objects of thought, of understanding, of consciousness that allow us to think, to have states of consciousness, mental states, to judge, to analyze, to solve problems, among others. In this way, representation could be considered as a link that allows to understand the 'mind-learning' relationship as it has been presented in the text.

From the analysis of this relationship in the behavioral paradigm of learning and in the cognitive paradigm, it is evident that in the former, the occupation with the mind and mental states in an internalist and first-person sense was not of interest insofar as the object of interest, “observable behavior” in terms of the E-R-C relationship, implied the ignorance of questions that, in the positive science of the time, had no possibility of empirical validation since they were not objects of public access. Neither consciousness, nor the mind, nor mental states were precisely interesting, marking a kind of ‘glaciation’, described as a ‘period of death for consciousness’ by Ana Estany.

In the cognitive paradigm, to which we relate programmatic stakes of Piaget and Vygotsky as valid narratives of interest in that paradigm, the recognition of a mental system is evident, a system for which processes of assimilation or internalization, or incorporation into the system of representations, concepts or knowledge to schemas or the cognitive system of socially constructed knowledge is considered essential.

This review represents a plausible relationship between mind and learning with the mediation of the construct representation, and the opportunity to appreciate, at least initially, possibilities to relate a philosophy of mind with learning, which is necessary to be understood by the teacher, as the person responsible in schools for promoting the formation of other individuals, and in such formation learning is associated, in part, as a mental process, thus seen from psycho-pedagogy. It is also pointed out that it is not necessary to take an openly realistic position on the concept of representation, since it is always possible to philosophically access the problem of the mind from a conceptual point of view, setting aside strong commitments with ontological and epistemological character.

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