

THE RELATION BETWEEN AFFECTION AND COGNITION: THEORETICAL PERSPECTIVES

Crístia Gonçalves Lopes Corrêa¹ 

ABSTRACT

This article aims to present the relation between affection and cognition from the Jean Piaget, neuroscience and Lev Vygotsky's theoretical perspectives. From Piaget's theoretical perspective, it emphasizes the concepts of interest and assimilation. From the neuroscience theoretical perspective, emphasis is placed on the biological bases of learning. Furthermore, it problematizes the place of Vygotsky's historical-cultural perspective, emphasizing the concepts of meaning and sense in the conceptual context of the relation between affection and cognition. Based on the selection made, it presents some possible contributions of such readings within the theme discussed regarding the relation between affect and cognition. It also argues that although they have differences, the three perspectives explain the importance of affect for cognition. In this direction, it concludes that the contributions made by reading Piaget, Vygotsky and neuroscience are relevant. The sources used are from the available literature about the topic.

Keywords: affect; cognition; Piaget; neuroscience; Vygotsky

La relación entre afecto y cognición: perspectivas teóricas afecto y cognición

RESUMEN

En el presente artículo se pretende presentar la relación entre afectividad y cognición en las perspectivas teóricas de Jean Piaget, de la neurociencia y de Lev Vygotsky. En la perspectiva teórica de Piaget, confiere énfasis a los conceptos de interés y asimilación. En la perspectiva teórica de la neurociencia, el énfasis está colocado en las bases biológicas del aprendizaje. Además, problematiza el lugar de la perspectiva histórico-cultural de Vygotsky, enfatizando los conceptos de significado y sentido en el contexto conceptual de la relación entre afecto y cognición. A partir del recorte, presenta algunas posibles contribuciones de tales lecturas dentro del tema estudiado concernientes a la relación entre afecto y cognición. Argumenta que, aunque comporten diferencias, las tres perspectivas explicitan la importancia del afecto para la cognición. En esa dirección, se concluye por la relevancia de las contribuciones dadas por las lecturas de Piaget, Vygotsky y de la neurociencia. Las fuentes utilizadas son de la literatura disponible sobre el tema.

Palabras clave: afecto; cognición; Piaget; neurociencia; Vygotsky

A relação entre afeto e cognição: perspectivas teóricas

RESUMO

O presente artigo pretende apresentar a relação entre afetividade e cognição nas perspectivas teóricas de Jean Piaget, da neurociência e de Lev Vygotsky. Na perspectiva teórica de Piaget, confere ênfase aos conceitos de interesse e assimilação. Já na perspectiva teórica da neurociência, a ênfase é colocada nas bases biológicas da aprendizagem. Ademais, problematiza o lugar da perspectiva histórico-cultural de Vygotsky, enfatizando os conceitos de significado e sentido no contexto conceitual da relação entre afeto e cognição. A partir do recorte feito, apresenta algumas possíveis contribuições de tais leituras dentro do tema trabalhado concernentes à relação entre afeto e cognição. Argumenta ainda que embora comportem diferenças, as três perspectivas explicitam a importância do afeto para a cognição. Nessa direção, conclui pela relevância das contribuições dadas pelas leituras de Piaget, Vygotsky e da neurociência. As fontes utilizadas são da literatura disponível sobre o tema.

Palavras-chave: afeto; cognição; Piaget; neurociência; Vygotsky

¹ Federal University of Viçosa – Viçosa – MG – Brazil; crlopes2001@yahoo.com.br

INTRODUCTION

The relation between affection and cognition constitutes a matter of significant relevance in the interface field between Psychology and Education, configuring a great contribution that Psychology can make to the educational field. In this conceptual context, the classic theoretical perspectives of Jean Piaget and Lev Vygotsky stand out regarding the relation between affect and cognition.

We know that in such a context an emerging theory guided by a biological perspective also takes place from which other contributions are extracted about the relation between affect and cognition. On the other hand, we also know that despite some new developments regarding a greater approach to the biological bases of learning, the neuroscience orientation about the way the brain learns and the relation between affect and cognition aligns with the Piagetian theory. This is because the contributions brought about the learning process by the neuroscience field corroborate "Piaget's assumption that neurological maturation is an important factor in cognitive development" (Papalia & Olds, 2013, p. 191). Furthermore, we can identify in neuroscience the effort to distance itself from the tendency to justify in a reductionist way the school's difficulty in dealing with differences through a pathologization of symptoms, which has had a consistent place for a long time (Franco, Carvalho, & Guerra, 2010).

Therefore, based on the analysis made, we present some possible contributions of such readings within the theme discussed regarding the relation between affect and cognition. We further argue that although there are differences, the three perspectives explain the importance of affect for cognition, concluding that the contributions made by Piaget, Vygotsky and neuroscience are relevant.

AFFECTION AND COGNITION IN PIAGET

Piaget (1953-54/2014) in *The relation of affectivity to intelligence in the mental development of the child* defines affectivity as: 1) Feelings themselves and, in particular, emotions; 2) The various tendencies, including the higher tendencies and, in particular, the will. He argues that although some authors draw a distinction between affective factors (feelings, emotions) and innate factors (tendencies, will), for him the difference seems to be only one of degree. He then argues for the need for a clear distinction between such affective functions and cognitive functions, "which range from perception and sensorimotor functions to abstract intelligence with formal operations" (p. 39). However, according to Piaget, the need to distinguish between these two functions occurs to the extent that they appear to be of a distinct nature, as they are inseparable in concrete conduct.

In this sense, Piaget argues that in the most general conduct characteristics, with the two adaptation poles:

assimilation and accommodation, there is no dissociation between cognitive and affective factors, because with regard to the affective factors of conduct, all conduct is an adaptation, just as every adaptation is the reestablishment of balance between the organism and the environment, to the extent that we only act when we find ourselves momentarily unbalanced. In this sense, Piaget takes up Claparède who showed the imbalance translation through the awareness of a need that Piaget qualifies as "a *sui generis* affective impression" (1953-54/2014, p. 41). For Piaget, conduct or action ends when the need is satisfied and, therefore, a return to balance. The return to balance between assimilating actions and accommodating actions is therefore marked by a feeling of satisfaction. Furthermore, Piaget indicates that while assimilation, in its affective aspect, is interest, accommodation is interest in the object while it is new, indicating the affective dimension of all conduct.

Regarding the cognitive dimension of conduct, Piaget argues that the so-called notion of balance has "a fundamental meaning from both an affective and intellectual point of view" (1953-54/2014, p. 41). Since what is aimed at by the outcome of the conduct is the balance between assimilating and accommodating actions, cognitively speaking, assimilation consists of incorporating the object into the previous schemes of conduct. Regarding accommodation, there is an adjustment of thought schemes to phenomena. If the object resists being assimilated, with it not fitting into any scheme, there is a need to carry out new work, transforming previous schemes that compromise the properties of the new object. Therefore, we can speak of balance when there is not too much resistance on the part of the object to be assimilated, but just enough for accommodation to occur (Becker, 2013; 2014).

Thus, Piaget (1953-54/2014) argues about a constant interaction between intelligence and affectivity, stating that affectivity and intelligence are inseparable. He states that it is impossible to find conduct arising only from intelligence operations without affective elements and vice versa. As a corollary, the first half of his thesis about the relations between affectivity and intelligence in the child's mental development can be presented as follows: There is no cognitive mechanism without affective elements. For Piaget, this first half of his thesis applies to: 1) Perception: in perceptual selection, pleasant or unpleasant feelings take place, with indifference itself constituting an affective tone; 2) Everyday acts of practical intelligence: in this dimension, the inseparability between intelligence and affectivity is even clearer, to the extent that there is always interest, intrinsic or extrinsic; 3) In the most abstract forms of intelligence: in these forms, affective factors always intervene.

When, for example, a student solves an algebra problem, or a mathematician discovers a theorem, there is at the beginning an intrinsic or extrinsic interest, a

need; during work, states of pleasure, disappointment, ardor, feelings of fatigue, effort, discouragement and others may occur; at the end of the work, feelings of success or failure; Finally, aesthetic feelings can also be added to this (in the coherence of the solution found) (Piaget, 1953-54/2014, pp. 39-40).

As for the second half of his thesis about the relations between affectivity and intelligence in the child's mental development, it can, in turn, be presented as follows: There is also no pure affective state, without cognitive elements. For Piaget (1953-54/2014), this second half of his thesis finds support in studies of the instincts of birds, which always respond to precise perceptual stimuli, and they are not triggered only by internal affective requests. In this sense, Piaget argues that equally, in the sphere of emotion, "perceptual discriminations are always found" (1953-54/2014, p. 40). He states that cognitive factors "thus play a role in primary feelings and, even more so, in more evolved complex feelings, where they are increasingly mixed with elements generated by intelligence" (p. 40).

After demonstrating the cognitive and affective factors of all conduct, Piaget (1953-54/2014) confirms the inseparability between intelligence and affectivity. He claims that such inseparability occurs not in the sense of the intervention of affectivity in the intelligence structures itself, taking it as a source of knowledge and original cognitive operations, as several authors maintain. Rather, the so-called inseparability occurs in the sense that affectivity interferes with the operations of intelligence, stimulating or disturbing them, taking it as "the cause of accelerations or delays in intellectual development, but which cannot modify the intelligence structures as such" (p. 37). He argues that affectivity does not create new structures on an intellectual level, nor does intelligence reciprocally create new feelings. He states that affectivity "would then play the role of an energetic source, on which the functioning of intelligence would depend, but not its structures; just as the functioning of a car depends on fuel, which drives the engine, but does not modify the structure of the machine" (Piaget, 1953-54/2014, p. 43).

In this sense, this is precisely the entirety of Piaget's thesis about the relations between intelligence and affectivity in the child's mental development: There is no cognitive mechanism without affective elements and there is also no pure affective state, without cognitive elements, a postulate that configures the inseparability of affective and cognitive factors in conduct. This is because affectivity constantly intervenes in the functioning of intelligence, and can be the cause of accelerations or delays in intellectual development (Corrêa, 2017). On the other hand, such an inseparable relation between cognitive and affective factors in all conduct, as it had already stated, does not mean that affectivity generates cognitive structures nor modifies the structures in

the functioning which it intervenes (Corrêa, 2015a, 2015b); nor does it mean that intelligence will create new feelings. For Piaget, the role of affectivity as a disruptor or accelerator of intelligence operations is undeniable. Something worth noting is that although the Piagetian reference used here is his Course given at the Sorbonne in 1953-54, as Souza (2011) rightly points out, he sometimes presented his hypothesis about the relation between affect and cognition, with this relation permeating all stages, from sensorimotor to formal operations.

Students who are motivated in class will have more enthusiasm for studying and will learn more easily. Among those who are weak in Mathematics, for example, more than half of the cases are undoubtedly due to an affective block, a feeling of special inferiority. Such a blockage can then temporarily prevent a student from understanding (or retaining) the rules of addition (Piaget, 1953-54/2014, pp. 37-8).

THE NEUROSCIENCE PERSPECTIVE ABOUT AFFECTION AND COGNITION

In line with Piaget's theory, the field of neuroscience has brought many contributions to the learning process, as recent research into the way the brain learns corroborates "Piaget's assumption that neurological maturation is an important factor in cognitive development" (Papalia & Olds, 2013, p. 191) to the extent that peaks of brain development coincide with changes occurring in the cognitive sphere according to the Piagetian description (Papalia & Olds, 2013). In this sense, according to Ansari (2005), Cubelli (2009) and Mason (2009), knowledge of brain functioning can enable the educator to develop well-suited pedagogical strategies, which can bring more meaning, motivation and efficiency to the learning process. Therefore, arguments of many aspects of cognition controlled by the prefrontal cortex take place. In general, the prefrontal area responsible for executive functions confers the ability to select objectives, plan behavior to achieve such goals and cognitive flexibility, through inhibitory control (Guerra, 2011).

Immordino-Yang and Damasio (2007) discuss the significant area in common among areas of processes related to cognition and emotion, indicating that the individual learns what excites him, what is significant and necessary to live well. Regarding this point, currently, the inseparability, the superposition of the processes of cognition and emotion in the brain is undeniable as the neural circuits that process cognition also process emotion, configuring areas that share functions (Guerra, 2011). Something that helps us a lot to understand this overlap is the role of the limbic system both with regard to regulating emotions and memory formation (Machado & Haertel, 2013), a cognitive aspect considered basic for learning using this approach (Carvalho, Campos Junior,

& De Souza, 2019; Cosenza, 2012; Guerra, 2011). This is because “the acquisition of new information that can be retained in memory is called learning” (Carvalho, Campos Junior, & De Souza, 2019, p. 6)

Regarding the emotional component, according to Fonseca (2016), it provides the basic and necessary affective support for the cognitive and executive functions of learning responsible for the more human modalities of information processing, and its triggering also contributes to the formation of memory. This means that as long as a given experience contains enough emotion, the individual will be able to record that experience in their memory and activate it later (Abrantes, 2014).

According to Portes (2015), memory is a process related to the maintenance of learning that can be later recalled, with this comprising some subdivisions. While working memory deals with transient records, lasting from seconds to a few minutes, short-term memory lasts from 3 to 6 hours until the information is stored in a more lasting way in the areas responsible for long-term memory.

The memories themselves are stored in engrams spread throughout the brain. The memory corresponding to each function is stored in the region that performs it. Visual memories, for example, are in the occipital lobe, motor memories are in the cerebellum, auditory memories are in the superior temporal gyrus, olfactory memories are in the uncus, and so on. However, even though the limbic system is not used to store memories, it is very important for their consolidation. In this memory process of consolidation by the limbic system, the Papez circuit stands out, until recently considered as the basic circuit in the processing of emotions, but currently recognized as a circuit related to memory (Machado & Haertel, 2013).

In this mnemonic context, the decision criteria regarding the maintenance and disposal of memories are the reciprocal connections between the prefrontal area and the limbic system, communicating so that together they can decide which of the memories temporarily retained in working memory should be stored permanently (Machado & Haertel, 2013). Various factors participate in this process: rational data, brought by the prefrontal area, which will cause what is “relevant” to the individual to be memorized, emotional data brought by the emotion-generating elements of the limbic system, causing the emotions to be recorded memories that “affected” the individual, in the sense of having generated in him an intense emotional response and many other complex and abstract data, many of which are not yet known (Guerra, 2011; Machado & Haertel, 2013).

Referenced in Machado & Haertel (2013), we can state that the prefrontal area retains almost everything that seems momentarily relevant in working memory.

Subsequently, the prefrontal area transfers to the limbic system the memories that must be consolidated, after communicating with this system. Some areas of the limbic system, mainly the hippocampus, will then, through the Papez circuit, record these memories in various areas of the brain, from where they can be evoked again in the future. In this circuit, it is the fornix that connects the hippocampus to the mammillary bodies of the hypothalamus. The mammillary bodies of the hypothalamus, in turn, connect to the anterior nuclei of the thalamus (NAT) through the mammillothalamic fasciculus. The internal capsule connects fibers that depart from the NAT to the cingulate gyrus. From the cingulate gyrus, the contents pass to the parahippocampal gyrus and adjacent regions and then return to the hippocampus, forming a closed circuit. The amygdala and the septal area also connect to various points in the circuit, configuring the role of emotions in this process as it allows the influence of subjective issues in the consolidation of long-term memories. This is precisely why we have an easier time memorizing what impacted us most emotionally.

In addition to emotion and memory, the learning process requires several mental functions, such as perception, attention, executive function, motivation “and, therefore, depends on the brain” (Guerra, 2011, p. 1). In this sense, it requires attention (which is frontal) on the cognitive stimuli processed after the student receives and perceives them through sensory pathways and gives them meaning through evaluation based on previous learning, desires, needs and values, generating motivation for learning the new content, and, consequently, the learner’s action on the new cognitive experience (Guerra, 2011). The subject needs attentional focus to receive and process information, this attention is essential for working memory. Human attention requires three systems located in the brain stem (responsible for the state of wakefulness), the parietal lobe (responsible for orienting the focus of attention to information) and the prefrontal lobe (responsible for maintaining the attentional focus on information) (Guerra, 2011).

However, it is an intertwined process, as we can identify in the aforementioned motivational basis the influence of emotion and motivation, in turn, will influence the executive functions responsible for developing learning strategies on the part of the student (Guerra, 2011). In order to bridge the inseparability between affection and cognition, some aspects related to motivation are still important. As the student receives and processes new information, if the nucleus accumbens (it’s known as the “reward center”) activates, this area will activate the frontal areas that will make a decision based on the value of the experience. The frontal areas, in turn, will activate other prefrontal areas that will lead to the planning of behavioral strategies to achieve the learning objective, leading the individual

to repeat that cognitive experience that led to the activation of the reward center, processing motivation. (Guerra, 2011). Furthermore, we have the amygdala that processes fear, anger, anxiety, being very important for evaluating the extent of a threat in a cognitive stimulus, which is a brain area for processing emotions, also involved in reward mechanisms, with implications for motivation (Cosenza, 2012). These two regions that process motivation and emotion are connected to the aforementioned hippocampus, a very important brain region for memory consolidation (Guerra, 2011).

According to Guerra (2011), motivation is related to executive function and those areas of emotion that evaluate the value of the experience. Something worth noting is that motivation can be extrinsic or intrinsic. While extrinsic is related to external factors, such as obtaining a degree, intrinsic, which is the one that interests us most and which we should even seek to promote in the learning process, is related to beliefs of high self-efficacy and capacity for self-regulation, tending to be more lasting. According to socio-cognitive theory (Bandura, 1977, 1982), self-efficacy beliefs consist of the subject believing that they can master a cognitive challenge, producing positive results. The capacity for self-regulation of learning is related to the capacity for cognitive flexibility, leading to a change in strategy if insufficiency is identified in the strategy used to achieve the established objective. Furthermore, it is related to the monitoring of cognitive activities and emotions, directing behavior. In order to achieve this, the self-regulated student uses inhibitory control (Guerra, 2011).

Consequently, in the light of neuroscience, it is possible to claim that learning is guided by emotion (Guerra, 2011), with an inseparability and therefore, a cooperative relation between the cognition system represented by the cortex and the limbic system that comprises the regulatory structures of emotions, providing the learning process that has a motivational basis.

AFFECTION AND COGNITION IN VYGOTSKY

In Vygotsky, the best-known and explored theoretical elements of his theory are the aspects relating to cognitive functioning, using the terms “mental functions” and “consciousness” “to designate processes that we call cognitive” (Oliveira, 1992, p.76). Therefore, the question arises about the place of affection in such processes. To begin with, despite the sparse information about the affective dimension in human psychological functioning, in the author’s available texts, we can say that Vygotsky (as cited by Pasqualini, 2009), attributes fundamental importance to affection, considering it “as an essential factor in the development psychic in all its stages and conceived in unity with – and not in opposition to – the intellect” (p. 36).

In addition to the more general assumptions of his

theory mentioned, there are several ‘entry points’ in his work that allow an approach to the affective dimension of psychological functioning. Firstly, he wrote several texts about issues directly linked to this dimension (emotion, will, imagination, creativity), most of them not translated from Russian and many not published even in the Soviet Union (...). A long manuscript on emotions, written in 1933, was only published in 1984 in the sixth volume of the Soviet edition of his works (Oliveira, 1992, p. 77).

In this direction, according to Gleizer (as cited by Silva, 2008, p. 136), influenced by the philosopher Spinoza “who proposed the monist solution to problems related to the body and soul, feeling and reason”, Vygotsky opposes “to dualist theories that, consistent with the assumptions of Cartesian philosophy, separated body and mind, feeling and reason” (Silva, 2008, p. 136). He questions the separation between the affective and cognitive planes of psychological functioning, arguing that one of the main problems of traditional psychology was precisely that division. “Affect and intellect are not two reciprocally exclusive poles, but two psychic functions closely linked to each other and inseparable” (Vygotsky, 1996, p. 314).

Vygotsky (1960/2003) argues that there is a predominance of the purely naturalistic plane in the chapter on emotions, which highlights their instinctive character, ranging from the Darwinian conception of emotions that claims to be human feelings of biological-animal origin, to the behaviorism of his time. Rather, for Vygotsky, emotions are superior psychological functions, therefore “cultural and subject to development, transformation or new appearances. Furthermore, the Vygotskian conception of emotion places this psychological process in close relationship with others in the human psyche” (Machado, Facci, & Barroco, 2011, p. 651).

Vygotsky considered that in the course of development, emotions are transformed, that is, they move away from their biological origin and become a historical-cultural phenomenon. These qualitative changes that occur with emotions throughout development relate to man’s increased control over himself. Reason, intellect (developed thanks to the growing mastery of cultural instruments), has the ability to control the most primitive impulses and emotions (self-regulation of behavior). However, this is not an oppressive reason, but rather a reason at the service of emotional life, constituting an instrument for the elaboration and refinement of feelings (Oliveira & Rego, 2003, pp.136-37).

It is proposed, then, to start from “the construction of a new approach based on the principles of dialectical

materialism" (Gouvêa & Gerken, 2005, p. 128), conceiving "emotions as formed from historical-social conditions, therefore, learned in a given context" (Machado, Facci, & Barroco, 2011, p. 651).

It is worth reiterating that for Vygotsky the historical-cultural character is also one of the qualities of the higher functions of emotion and feeling, to the extent that the ways of thinking and feeling are saturated with culturally learned concepts. As Oliveira and Rego (2003) argue, for the Russian author, the meanings constructed in the cultural context in which the subject is inserted mediate the genesis of social affective life. In this way, the subject learns to think, speak, feel and act according to their culture. For example, a Westerner thinks and feels differently than an Easterner or a Muslim, but the same social determinations and influences are elaborated and managed by the subject singularly.

Furthermore, according to Machado, Facci and Barroco (2011), emotional development is presupposed by historicity to the extent that history progresses with the development of humanity and, as a result, the meanings of feelings and emotions undergo modifications. In this sense, as Smirnov points out (cited by Machado et al., 2011, p. 652), "what in one historical period provoked special feelings in the members of a given social class, can provoke opposite feelings in the members of another social class and in another historical era." Emotions and feelings also depend on society's way of living, the social class to which the individual belongs and their education, in addition to their historical character.

In this way, in the wake of his questioning about the separation between the affective and cognitive planes of psychological functioning, made by traditional psychology, Vygotsky argues that thought originates from the plane of motivation that comprises affection, emotion, impulses, interests, needs and inclinations. Therefore, the presentation of the thought process as an autonomous flow of thoughts that think themselves, by this psychology, ends up not considering the dimension of the cause and origin of the thought concerning the aforementioned plane of motivation and constituting a thought dissociated from the affections, impulses, interests and personal needs of the thinker.

In this case, thought inevitably turns into an autonomous stream of thoughts that think themselves, dissociates itself from the entire plenitude of dynamic life, from the living motivations, from the interests, from the involvements of the thinking man, and thus becomes or a completely useless epiphenomenon, which nothing can change in man's life or behavior, or an original and autonomous ancient force that, by interfering in the life of consciousness and the life of the individual, ends up influencing them in an incomprehensible way (Vygotsky, 1934 /2001, p. 16).

Furthermore, for Vygotsky, such psychology does not give rise to any significant investigation into the influence of thought on affect.

In *Thought and Language* (Vygotsky, 1934/2013), in Vygotsky's approach to the meaning of the word, the author argues that "a word without meaning is an empty sound" (p.150), with meaning, therefore, "a criterion of 'word', its indispensable component" (pp.150-51), arguing, therefore, that the meaning of a word represents a tight amalgam of thought and language to the point that it is difficult to say when it comes to and a phenomenon of speech or a phenomenon of thought. From such an approach, we can find, according to Oliveira (1992), a significant link between affect and cognition. Firstly, because although the meaning, "an essential component of the word being, at the same time, an act of thought" (p. 80) as it is already "in itself, a generalization" (p. 80) or a concept, seems to concern exclusively to the cognitive dimension, Vygotsky draws the distinction between the two elements of the meaning of the word, namely, the meaning itself and the sense. According to Oliveira (1992), meaning itself concerns the system of objective relation formed in the process of word development, "consisting of a relatively stable core of understanding of the word, shared by all people who use it" (p. 81). Meaning concerns the meaning of the word for each individual, "composed of relation that concern the context of use of the word and the individual's affective experiences" (Vygotsky, 1934/2013, p. 81); to the emotional and personal motives of that individual.

The word car, for example, has the objective meaning of 'four-wheeled vehicle, powered by fuel, used to transport people'. The meaning of the word car, however, will vary depending on the person who uses it and the context in which it is applied. For the taxi driver it means a work instrument; for teenagers who like driving, it can be a form of leisure; for a pedestrian who has already been run over, the car has a threatening sense, reminiscent of an unpleasant situation, and so on. The meaning of the word links its objective meaning to the context of language use and the affective and personal motives of its users. It is related to the fact that individual experience is always more complex than the generalization contained in signs (Oliveira, 1992, p. 81).

Consequently, for Vygotsky (1934/2013), precisely this sense of the words meaning and, consequently, the plane of meaning that relates words to affective and contextual experiences are what predominate in inner speech. What the author calls inner speech is the internalized form of language that is addressed not to an external interlocutor, but to the individual himself; speech that is fragmented, abbreviated and understandable only by the person themselves; speech

focused on thought, aiming to assist the subject in their psychological operations. Thus, in inner speech, the plane of meaning that relates words to affective and contextual experiences predominates in such a way that, according to the Russian author, the meanings of different words flow into each other, with each word being so loaded with meaning to the point of many words are needed to explain it in external speech.

In this context of the relations between thought and language outlined by Vygotsky (1934/2013), more especially, when claiming that the meaning of the word is “a phenomenon of verbal thought, or of meaningful speech – a union of word and thought” (p. 151), Vygotsky states that “to understand someone else’s speech, it is not enough to understand their words – we have to understand their thoughts. But even that is not enough – we also need to know his motivation” (p. 130). In this way, “in the very meaning of the word, therefore, so central to Vygotsky, there is a concretization of his integrative perspective on the cognitive and affective aspects of human psychological functioning” (Oliveira, 1992, p. 82). As a corollary, it is possible to say that for Vygotsky, to the extent that he has assumed the intimate and dialectical relation between affection and cognition, from an early age, it is the consideration of its affective-volitional basis that makes it possible to understand human thought.

When we talk about the relation of thought and language with other aspects of the life of consciousness, the first question to arise is the relationship between intellect and affection. As we know, the separation between the intellectual part of our consciousness and its affective and volitional part is one of the radical defects of all traditional psychology [...] Whoever separated thought from affection from the beginning definitively closed the path for himself for the explanation of the causes of thought itself, because the deterministic analysis of thought necessarily presupposes the revelation of the motives and driving tendencies of thought, which guide its movement in this or that aspect (Vygotsky, 1934/2001, pp. 15-16).

FINAL CONSIDERATIONS

As we said in the introduction, the relation between affect and cognition constitutes a matter of significant relevance in the field of the interface between Psychology and Education, configuring a great contribution that Psychology can make to the educational field, highlighting the Jean Piaget’s and Lev Vygotsky’s classic theoretical perspectives. These two theoretical perspectives highlight the intimate interaction between affect and cognition. However, it is important to point out that the theoretical perspectives present significant differences, placing their emphasis on peculiar points to each one.

In this sense, we can identify the significant social

and cultural dimensions given to affect by Vygotsky, insofar as his historical-cultural Psychology understands both cognition and emotion as superior psychological functions and, therefore, culturally learned. Piaget’s theoretical perspective, on the other hand, emphasizes the concepts of interest and assimilation which, although they do not dispense with the social and cultural dimensions, such plans are structured based on the individual dimension. Vygotsky’s vision, unlike Piaget’s perspective, understands the human being as social from early childhood and, as such, the social plane gains an exuberance not present in Piaget’s theory, preceding the individual dimension. From Vygotsky’s theoretical perspective, in the analysis made about the relationship between affect and cognition, the emphasis is placed on the concepts of meaning and sense.

Furthermore, in this conceptual context about the relationship between affect and cognition, the focus of an emerging theory, neuroscience, guided by a biological perspective was also legitimized, from which other contributions regarding the topic discussed are extracted. The object of study of neurosciences are neurons and their constituent molecules, the structures of the nervous system and their functions, and also behavior and cognitive functions. In this way, this perspective understands human behavior and cognitive functions as “resulting from the activity of these structures” (Carvalho, Campos Junior, & De Souza, 2019, p. 2). Consequently, this perspective has researched the mechanisms of memory, attention, learning, communication, language and emotion (Ventura, 2010); and most importantly for what interests us in the present work: the research about the ways in which human emotions can contribute to the learning process.

In this way, we consider that research on the multidisciplinary nature of neurosciences and other sciences such as the humanities is legitimized, with a view to enriching the understanding of cognition processes. In this sense, we identified that despite some new developments regarding a greater approach to the biological bases of learning, the orientation of neuroscience regarding the way the brain learns and the relationship between affect and cognition, aligns with the Piagetian theory.

However, Vygotsky’s approach to the relation between affect and cognition differs greatly from those concerning neuroscience and Piaget’s. Therefore, it is important to reinforce the specificities of each of these theories about the constitution of the human psyche, which ends up driving the differences in understanding this relation.

Therefore, based on the selection made, within the limits of this article, we present some possible contributions of such readings with regard to the theme discussed regarding the relation between affect and cognition. Therefore, within the scope of what has

been presented, we further argue that although they contain differences, the three perspectives explain the importance of affect for cognition. As a corollary, we conclude that the contributions made by the readings of Piaget, Vygotsky and neuroscience are relevant, but we highlight the need for other studies on the topic, given its relevance.

REFERENCES

- Abrantes, P. (2014). De como escrevemos a vida e a vida se inscreve em nós: um estudo da socialização através da análise de autobiografias. *Educ. Soc.*, 35 (126), 111-127. <https://doi.org/10.1590/S0101-73302014000100007>
- Ansari, D. (2005). Paving the way towards meaningful interactions between neuroscience and education. *Developmental Science*, 8 (6), 467-467.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
- Becker, F. (2013). Sujeito do conhecimento e ensino de matemática. *Schème Revista Eletrônica de Psicologia e Epistemologia Genéticas*, 5(Edição Especial), 65-86.
- Becker, F. (2014). Abstração pseudo-empírica e reflexionante. *Schème Revista Eletrônica de Psicologia e Epistemologia Genéticas*, 6 (Número Especial), 104-128.
- Carvalho, C. G., Campos Junior, J., & De Souza, G. A. D. B. (2019). Neurociência: Uma Abordagem Sobre as Emoções E O Processo de Aprendizagem. *Revista da Universidade Vale do Rio Verde*, 17 (1), 1-10. Recovered from <https://institutoconectomus.com.br/neurociencia-uma-abordagembrsobre-as-emocoes-e-o-processobrde-aprendizagem/>
- Corrêa, C. R. G. L. (2015a) Dificuldade na noção lógica de conservação de quantidade no estágio pré-peratório de Piaget. *Revista Psicologia em Estudo*, 20 (3), 341-352. <https://doi.org/10.4025/psicoestud.v20i3.24369>
- Corrêa, C. R. G. L. (2015b). Os por quês da criança na psicologia genética de Piaget e na psicanálise e a dificuldade de aprendizagem. *Revista Ágora: Estudos em Teoria Psicanalítica*, 18 (2), 289-303. <https://doi.org/10.1590/S1516-14982015000200009>
- Corrêa, C. R. G. L. (2017). A Relação entre Desenvolvimento Humano e Aprendizagem: Perspectivas Teóricas. *Psicologia Escolar e Educacional*, 21 (3), 379-386. <https://doi.org/10.1590/2175-3539201702131117>
- Cosenza, R. M. (2012). *Fundamentos de Neuroanatomia*. 4.ed. Rio de Janeiro: Guanabara Koogan.
- Cubelli, R. (2009). Theories on mind, not on brain, are relevant for education. *Cortex*, 45 (4), 562-564.
- Fonseca, V. (2016). Importância das emoções na aprendizagem: uma abordagem neuropsicopedagógica. *Revista Psicopedagogia*, 33 (102), 365-384. Recovered from http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S0103-84862016000300014
- Franco, M. A. M., Carvalho, A. M., & Guerra, L. B. (2011). Discurso Médico e Discurso Pedagógico: Interfaces e suas Implicações para a Prática Pedagógica. *Revista Brasileira de Educação Especial*, v.16, 463-478.
- Gouvêa, M. C. S., & Gerken, C. H. (2005). Vygotsky e a teoria sócio-histórica. In Faria Filho, L. M. (Ed.), *Pensadores Sociais e História da Educação* (pp. 125-144). Belo Horizonte: Autêntica.
- Guerra, L. B. (2011). O Diálogo entre a Neurociência e a Educação: Da Euforia aos Desafios e Possibilidades. *Revista Interlocução*, v.4, pp. 3-12.
- Immordino-Yang, M. H., & Damasio, A. (2007). We Feel, Therefore We Learn: The Relevance of Affective and Social Neuroscience to Education. *Mind Brain and Education*, 1 (1), 3-10. <https://doi.org/10.1111/j.1751-228X.2007.00004.x>
- Machado, L. V., Facci, M. G. D., & Barroco, S. M. S. (2011). Teoria das Emoções em Vigotski. *Psicologia em Estudo*, 16 (4), 647-657.
- Machado, A., & Haertel, L. M. (2013). *Neuroanatomia Funcional*. Rio de Janeiro: Atheneu.
- Mason, L. (2009). Bridging neuroscience and education: A two-way path is possible. *Cortex*, 45 (4), 548-9
- Oliveira, M. K. de. (1992). O problema da afetividade e Vygotsky. In La Taille, Y. de; Oliveira, M. K. de & Dantas, H. (Eds.), *Piaget, Vygotsky e Wallon: Teorias Psicogenéticas em Discussão* (pp. 75-84). São Paulo: Summus.
- Oliveira, M. K. de., & Rego, T. C. (2003). Vygotsky e as complexas relações entre cognição e afeto. In Arantes, V. A (Ed.), *Afetividade na escola* (pp. 75-84). São Paulo: Summus.
- Papalia, D. E., & Olds, S. W. (2013). *Desenvolvimento humano*. Porto Alegre: Artmed.
- Pasqualini, J. C. (2009). A perspectiva histórico-dialética da periodização do desenvolvimento infantil. *Revista Psicologia em Estudo*, 14 (1), 31-40.
- Piaget, Jean. (2014). *Relações entre a afetividade e a inteligência no desenvolvimento mental da criança* (C. J. P. Saltini, & D. B. Cavenaghi, Trad.). Rio de Janeiro: Walk Editora (Course given at the Sorbonne in 1953-54).
- Portes, D. S. (2015). A importância das neurociências na formação do professor de inglês. *Revista Psicopedagogia*, 32 (98), 168-181. Recovered from http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S0103-84862015000200007
- Silva, E. R. da. (2008). As relações entre cognição e afetividade em LA: a influência de Vygotsky nessa abordagem temática. *Soletas (UERJ)*, VIII (15), 133-140.
- Souza, M. T. C. C. (2011). As Relações entre Afetividade e Inteligência no Desenvolvimento Psicológico. *Psicologia: Teoria e Pesquisa*, 27 (2), 249-254.
- Ventura, D. F. (2010). Um retrato da área de Neurociência e comportamento no Brasil. *Psicologia: Teoria e Pesquisa*, 26, n.spe, 123-129.
- Vygotsky, L. S. (1996). *Obras escogidas* (Vol. 4). Madrid: Visor.
- Vygotsky, L. S. (2001). *A construção do pensamento e da linguagem* (P. Bezerra, Trad.). São Paulo: Martins Fontes

(Original work published in 1934).

Vygotsky, L. S. (2003). As emoções e seu desenvolvimento na infância. In: Vygotsky, L. *O Desenvolvimento Psicológico na Infância* (C. Berliner, Trad.). (pp. 79-106). Conferência 4. São Paulo: Martins Fontes (Original work published in 1960).

Vygotsky, L. S. (2013). *Pensamento e Linguagem* (J. L. Camargo,

Trad.). São Paulo: Martins Fontes (Original work published in 1934).

Received: October 15, 2021.

Approved on: April 11, 2023.

This paper was translated from Portuguese by Ana Maria Pereira Dionísio.