

Between body and consciousness: proprioception as a Higher Psychological Function in the cultural-historical perspective – a literature review

Entre o corpo e a consciência:
propriocepção como Função Psíquica Superior na perspectiva
histórico-cultural – uma revisão da literatura

Entre el cuerpo y la conciencia:
la propiocepción como Función Psíquica Superior en la perspectiva
histórico-cultural – una revisión de la literatura

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ABSTRACT

This article presents a literature review on the concept of proprioception from the perspective of Cultural-Historical Psychology (CHP), seeking to understand how this function—widely studied in the physiological and neuroscientific fields—can be conceived as a voluntary and mediated psychological process. Grounded in the assumptions of Vygotsky and Luria, the study begins with the understanding that the body is not merely a biological substrate, but a locus for the constitution of consciousness and the origin of Higher Psychological Functions (HPFs). Thus, investigating proprioception through the lens of CHP implies repositioning the body at the center of human constitution, articulating sensation, perception, and consciousness. The literature review followed the PRISMA protocol, with searches conducted in the SciELO and Redalyc databases between 2000 and 2024. After the selection process and

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the reading of titles, abstracts, and full texts, only three articles demonstrated an effective—though partial—connection between proprioception and CHP assumptions. A predominance of studies addressing proprioception from physiological or neurophenomenological perspectives was identified, even when Luria is cited, without integrating social mediation, cultural genesis, or the interfunctional nature of HPFs. The absence of works that directly articulate proprioception and CHP reveals a significant theoretical–methodological gap. The analysis of the selected studies allowed us to understand that proprioception, although grounded in sensory processes, can be conceived within CHP as a psychological function that develops through internalization, cultural mediation, and voluntary activity. From this perspective, sensation, perception, and consciousness form an integrated system that enables individuals to act intentionally in the world. It is concluded that the literature lacks formulations that consider the body as an epistemological principle and as the historical matrix of consciousness, indicating the need to deepen investigations that articulate body, culture, and human constitution within the cultural-historical approach.

Keywords: Proprioception; Cultural-Historical Psychology; Human constitution; Higher Psychological Functions; Body and consciousness.

RESUMO

Este artigo apresenta uma revisão da literatura sobre o conceito de propriocepção na perspectiva da Psicologia Histórico-Cultural (PHC), buscando compreender de que modo essa função, amplamente estudada nos campos fisiológico e neurocientífico, pode ser concebida como processo psíquico voluntário e mediado. Sustentado nos pressupostos de Vigotski e de Luria, o estudo parte do entendimento de que o corpo não constitui apenas substrato biológico, mas lócus de constituição da consciência e origem das Funções Psíquicas Superiores (FPS). Assim, investigar a propriocepção sob o enfoque da PHC implica recolocar o corpo no centro da constituição humana, articulando sensação, percepção e consciência. A revisão de literatura foi conduzida segundo o protocolo PRISMA, com buscas nas bases SciELO e Redalyc entre 2000 e 2024. Após o processo de seleção, leitura dos títulos, resumos e textos completos, apenas três artigos apresentaram aproximação efetiva entre propriocepção e pressupostos da PHC, ainda que de forma parcial. Identificou-se predominância de estudos que tratam a propriocepção sob enfoques fisiológicos ou neurofenomenológicos, mesmo quando citam Luria, sem integrar a mediação social, a gênese cultural ou a interfuncionalidade das FPS. A ausência de trabalhos que articulem diretamente propriocepção e PHC evidencia uma lacuna teórico-metodológica relevante. A análise dos estudos selecionados permitiu compreender que a propriocepção, embora fundada em processos sensoriais, pode ser concebida, na PHC, como função psíquica que se desenvolve por internalização, mediação cultural e atividade voluntária. Nessa perspectiva, sensação, percepção e consciência constituem um sistema integrado que possibilita, ao sujeito, agir intencionalmente no mundo. Conclui-se que a literatura carece de formulações que considerem o corpo como princípio epistemológico e como matriz histórica da consciência, indicando a necessidade de aprofundar investigações que articulem corpo, cultura e constituição humana na abordagem histórico-cultural.

Palavras-chave: Propriocepção; Psicologia Histórico-Cultural; Constituição humana; Funções Psíquicas Superiores; Corpo e consciência.

RESUMEN

Este artículo presenta una revisión de la literatura sobre el concepto de propiocepción en la perspectiva de la Psicología Histórico-Cultural (PHC), buscando comprender de qué modo esta función, ampliamente estudiada en los campos fisiológico y neurocientífico, puede concebirse como un proceso psíquico voluntario y mediado. Sostenido en los presupuestos de Vigotski y Luria, el estudio parte del entendimiento de que el cuerpo no constituye únicamente un sustrato biológico, sino un locus de constitución de la conciencia y origen de las Funciones Psíquicas Superiores (FPS). Así, investigar la propiocepción desde el enfoque de la PHC implica recolocar el cuerpo en el centro de la constitución humana, articulando sensación, percepción y conciencia. La revisión de la literatura fue realizada según el protocolo PRISMA, con búsquedas en las bases SciELO y Redalyc entre 2000 y 2024. Después del proceso de selección y de la lectura de los títulos, resúmenes y textos completos, solo tres artículos presentaron una aproximación efectiva entre propiocepción y presupuestos de la PHC, aunque de forma parcial. Se identificó un predominio de estudios que abordan la propiocepción desde enfoques fisiológicos o neurofenomenológicos, incluso cuando citan a Luria, sin integrar la mediación social, la génesis cultural o la interfuncionalidad de las FPS. La ausencia de trabajos que articulen directamente propiocepción y PHC evidencia una laguna teórico-metodológica relevante. El análisis de los estudios seleccionados permitió comprender que la propiocepción, aunque basada en procesos sensoriales, puede concebirse, en la PHC, como una función psíquica que se desarrolla mediante la internalización, la mediación cultural y la actividad voluntaria. Desde esta perspectiva, sensación, percepción y conciencia constituyen un sistema integrado que permite al sujeto actuar intencionalmente en el mundo. Se concluye que la literatura carece de formulaciones que consideren el cuerpo como principio epistemológico y como matriz histórica de la conciencia, lo que señala la necesidad de profundizar en investigaciones que articulen cuerpo, cultura y constitución humana en el enfoque histórico-cultural.

Palabras clave: Propiocepción; Psicología Histórico-Cultural; Constitución humana; Funciones Psíquicas Superiores; Cuerpo y conciencia.

1. Introduction

The body, commonly understood as a biological given, constitutes the starting point and foundation of human existence, insofar as it represents the fundamental condition of experience and perception (MERLEAU-PONTY, 1994). It is within the body, forged as a product of intricate social relations, that consciousness emerges and recognizes itself; it is through the body that the subject acts, feels, and relates to the world. Investigating the body—and, more specifically, proprioception, that is, the perception of oneself as a body situated in space and time—means revisiting the original locus of consciousness and subjectivity within the human sciences. It involves understanding the subject as both a “body that feels” and a “body that signifies,” from a

perspective that articulates sensation, perception, and consciousness in the epistemological understanding of human constitution.

Cultural-Historical Psychology (CHP)¹ offers a privileged theoretical-methodological foundation for this investigation. By conceiving Higher Psychological Functions (HPFs) as historically constituted and culturally mediated (VYGOTSKY, 1995; LURIA, 1981; LEONTIEV, 2004), it proposes that all conscious activity results from the appropriation of social relations. In this context, proprioception may be understood not merely as a physiological function, but as a voluntary psychological function capable of development through social relations, symbolic practices, and cultural mediations. Thus, investigating proprioception from the perspective of CHP means recognizing that the body actively participates in the constitution of consciousness and thought, thereby overcoming the dualism between body and mind.

From a historical-epistemological standpoint, the absence of studies integrating the body and human constitution reveals a theoretical gap within CHP (SILVA, 2025). Most of the literature focuses exclusively on physiological aspects related to modes of perception. Considering this fact, the present study proposes to conduct a literature review based on the PRISMA² guidelines in order to highlight precisely this insufficiency: proprioception from the perspective of Cultural-Historical Psychology.

The relevance of this investigation lies in evidencing a gap in the scientific literature. Although proprioception has been extensively studied in physiological contexts, studies approaching it from the perspective of CHP remain scarce. Conducting a literature review according to the PRISMA model makes it possible to map what has been published and, above all, what has not yet been produced on the subject—thereby revealing the lack of approaches capable of integrating body and mind within the same epistemological framework, namely that of CHP. This absence points to the emergence and necessity of the present study because proprioception, understood as the perception of the body—both internally and externally—situated in the world, in space, and in time, represents a privileged pathway for rethinking the body-mind unity. In doing so, it repositions the body, conceived as a product of social relations, as the origin of consciousness and human constitution within the CHP perspective. To think of the body as the locus of perception, self-consciousness, and relationship with others means revisiting the very “place” where everything began.

The present article therefore seeks to reposition the concept of the body itself at the center of psychological and epistemological reflection, understanding it as a principle of meaning-making and human constitution. This approach aims to contribute to the development of a psychology that recognizes, within its very genesis, the inseparable character of body and mind.

2. Propriocepção: sensação e percepção voluntárias – corpo que age, sente e se relaciona

A propriocepção é um dos principais canais para compreendermos as informações do mundo exterior e do próprio corpo (Luria, 1979); é uma sensação articular e muscular (DAMÁSIO, 1996), de caráter ativo e seletivo (LURIA, 1979). Reconhecer a localização espacial do corpo, em sua posição e orientação, sem a necessidade de usar a visão, é a propriocepção. O primeiro a identificá-la como sensação proprioceptiva foi Sherrington, em 1890, enfatizando que propriocepção é o reconhecimento do senso de “nós mesmos”, em um *feedback* dos membros ao sistema nervoso central (SHERRINGTON, 1906).

Os sentidos que constituem o mundo (visão, audição, paladar, olfato e tato) compõem a sensibilidade e são facilmente reconhecidos. Todavia, a propriocepção acaba por ser um sentido “não enaltecido” e muito simplista no argumento trivial, pois faz parte do nosso desenvolvimento enquanto ontogênese e, por vezes, passa como despercebida, por ser regulada de forma inconsciente e automática (SACKS, 1997).

Não pensamos, por exemplo, para ficar em pé e andar, e fazemos isso até mesmo de olhos fechados; mas parte do nosso corpo (músculos, tendões e articulações) é monitorado e ajustado pela posição e pelo tono, de modo automático e inconsciente (SACKS, 1997; LURIA, 1979). “É tão automático, tão familiar, que nunca pensamos nele [movimento corporal]” (SACKS, 1997, p. 41).

O controle do movimento, a coordenação, o senso do corpo e a habilidade de governar as sensações dos músculos, tendões e articulações, são elementos que fundamentam a propriocepção, de modo a ser “como os olhos do corpo” (SACKS, 1997, p. 44), mas é tão automático e de caráter filogenético – a princípio – do sujeito, que passa a ser não reconhecido. Por ser automático, nós não pensamos mais para fazer – o que pode dar a ideia de ser banal.

3. Proprioception: Voluntary Sensation and Perception – The Body That Acts, Feels, and Relates

Proprioception is one of the primary channels through which we understand information from both the external world and our own bodies (Luria, 1979); it is a joint and muscular sensation (Damasio, 1996) characterized by its active and selective nature (Luria, 1979). The ability to recognize the spatial location of the body, including its position and orientation, without the need to rely on vision, is known as proprioception. The first scholar to identify it as a proprioceptive sensation was Sherrington, in 1890, emphasizing that proprioception is the recognition of the sense of “ourselves,” through feedback transmitted from the limbs to the central nervous system (Sherrington, 1906).

The senses that constitute our experience of the world (vision, hearing, taste, smell, and touch) compose sensibility and are easily recognized. However, proprioception tends to be a “non-celebrated” sense and is often regarded in a simplistic manner, as it forms part of our ontogenetic development and frequently goes unnoticed because it is regulated unconsciously and automatically (Sacks, 1997).

For example, we do not consciously think about standing up or walking, and we are able to perform these actions even with our eyes closed; nevertheless, parts of our body (muscles, tendons, and joints) are continuously monitored and adjusted in terms of position and tone in an automatic and unconscious manner (Sacks, 1997; Luria, 1979). “It is so automatic, so familiar, that we never think about it [bodily movement]” (Sacks, 1997, p. 41).

Movement control, coordination, bodily awareness, and the ability to regulate sensations originating from muscles, tendons, and joints are elements that underlie proprioception, making it “like the eyes of the body” (Sacks, 1997, p. 44). Yet, because it is so automatic and initially rooted in the subject’s phylogenetic development, it often remains unrecognized. Precisely because it is automatic, we no longer need to think in order to act, which may create the impression that it is trivial.

[...] beginning with sensation, which represents the primary mechanism through which the relationship with the environment is established, it is not the natural substrate itself that determines its development. Although its starting point is natural and organic, the degree to which sensation depends upon this substrate is only relative, since the very functioning of the analyzers depends, above all, on the environmental stimuli to which they respond (Martins, 2013, p. 294, translated by the author).

However, the absence of proprioception may affect the fluidity of spontaneous movement, which is experienced as something that is “one’s own,” characteristically “self-generated.”

David Hume, an eighteenth-century philosopher, was one of the first thinkers—within the fields of philosophy and psychology—to reject the notion that knowledge derives from innate reason and to establish that sensory impressions are the basis of all human ideas (1739). His opposition to Cartesian rationalism is evident in his assertion that the mind possesses no prior knowledge of the world but is instead constituted through experience. In this sense, following Hume (1739), it may be inferred that there is no “absolute certainty” regarding the regularity of the ideas we form about the world, since these ideas derive from sensations that are unique to each individual.

To illustrate this point more clearly, we turn to a text by Oliver Sacks (1997), in which he discusses several cases related to psychic functioning. The book, entitled *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*, presents, in the chapter “The Disembodied Lady,” a particularly relevant reflection that brings us back to Hume’s thinking on experience, sensation, body, and mind in human constitution. This connection becomes evident when we consider the discussions found in Hume’s *A Treatise of Human Nature* (1739), particularly in the sections “Of Impressions and Ideas” and “Of Personal Identity.”

(...) Standing was impossible—unless she looked at her feet. She could not hold anything in her hands, which would ‘wander,’ unless she kept her eyes fixed on them. When she tried to reach out her hands to grasp something or to feed herself, her hands would miss the target grotesquely, as if some essential control or coordination had disappeared. (...) There seemed to be a very large, almost total, proprioceptive deficit extending from her toes to her head—the parietal lobes were functioning, but they had nothing to work with. (...) We put out an emergency call (...) for the physiatrist, the specialist in physical medicine. (...) He arrived quickly (...). His eyes widened when he saw Christina; he examined her promptly and thoroughly, and then performed electrical tests of nerve and muscle function. ‘It is extraordinary,’ he said. ‘I have never seen anything like this before, either personally or in the literature. She has completely lost proprioception—you are right—from head to toe. She has no sensation in her muscles, tendons, or joints. There is a slight loss of other sensory modalities—for light touch, temperature, and pain—and a minor involvement of the motor fibers as well. But it is predominantly the sense of position—proprioception—that underlies this impairment’ (Sacks, 1997, pp. 42–43).

Hume's idea can be related to proprioception, especially in the case described by Sacks (1997), in which Christina completely lost her proprioceptive sense. Just as Hume suggests that knowledge is constructed through sensory impressions, proprioception functions as a fundamental experience for the construction of the "self" and for the subject's relationship with the environment. The absence of proprioception/sensations affects the fluidity of spontaneous movement, which is experienced as being of "one's own property," characteristically "one's own." This is the situation described in Sacks's account, in which the character completely lost her proprioceptive sense and, in its place (as becomes evident throughout the narrative), relied on hearing and vision in order to compensate for natural posture through an adopted or theatrical pose. Having lost the naturalness and sensation of her own body, she came to characterize herself as "disembodied": "(...) I feel my body is blind and deaf to itself ... it has no sense of itself" (p. 47) (...) "I feel peculiar—disembodied" (p. 42), declared the character (Sacks, 1997, pp. 47/42).

From this perspective, proprioception—characterized as both sensation and perception—is fundamental for the recognition of one's own body (spatial location, position, and orientation) and necessary for conscious activity. It is initially considered part of the ontogenetic plane, that is, as an integral component of the developmental sequence of the human species. Nevertheless, it is the senses that constitute the "self." Even though the starting point is natural and organic, it is the "sensory content" (sensation, perception, and representation) that constitutes consciousness (Leontiev, 2004). For this reason, we begin from the assumption that proprioception may also be understood as a voluntary function.

Sensory impression is responsible for bodily control, enabling the body to remain aligned and balanced in space, as well as for muscular senses, defined as the "perception of the relative position of the trunk and limbs, derived from receptors in the joints and tendons" (Sacks, 1997, p. 62). Likewise, Hume argues that one cannot speak of the "self" without sensation—experience is always linked to this sensory relationship, which serves as the principle of knowledge. For him, there is no mind without a body; the mind is action and sensation. Thus, the subject acts, behaves, and feels through sensory experiences—within a cultural environment—which shape the "self."

Through this analysis, we can identify that the functioning of proprioception exemplifies Hume's view of experience and human constitution. Sensations and the subject's interaction with the environment/society through sensory organs not only constitute the understanding of the world but also form the very perception of the "self." Sacks (1997) reinforces this connection by highlighting how the loss of proprioception affects the notion of a "sense of self," emphasizing that knowledge of one's own body is as idiosyncratic as the sensory impressions that constitute our ideas.

Within this context, there emerges an idea that may be understood as an effort to organize sensory experiences and derive from them a broader understanding of both the world and ourselves, in which the concept of proprioception, as a psychological and sensory function, exemplifies how experience constitutes knowledge and self-perception through sensory impression.

Thus, it may be argued that proprioception presents both an elementary and a higher dimension. In its elementary form, it operates involuntarily as a biological mechanism of bodily orientation; in its higher form, it involves conscious awareness and the voluntary regulation of movements in relation to the external environment, thereby configuring itself as a Higher Psychological Function. For Vygotsky (1978), proprioception constitutes a form of voluntary regulation that enables the subject to plan and execute movements while considering the context in which they occur. This process, in turn, is mediated by attention, perception, and memory.

As a psychological function originating in sensation, its character is active and selective. "(...) In physiological terms, sensation is by no means a passive process but always incorporates motor components into its structure" (Luria, 1979, p. 7). As a proprioceptive sensation, it provides "(...) information about the body in space and the position of the support and movement apparatus, ensuring the regulation of our movements" (Luria, 1979, p. 9).

Sensations were divided into three types by Luria (1979): (1) interoceptive sensations, (2) proprioceptive sensations, and (3) exteroceptive sensations.

The first, interoceptive sensation, encompasses the signals that originate within the internal environment of the organism and ensure the regulation of elementary drives. It constitutes an intermediate point between genuine sensations and emotions. Its importance lies in regulating the balance of the organism's internal metabolic processes.

The second, proprioceptive sensation, provides information about the body in space and about the position of the support and movement apparatus, ensuring the regulation of our movements.

The third type, exteroceptive sensation, ensures the reception of signals from the external world, thereby creating the basis for conscious behavior. This group includes smell, taste, touch, vision, and hearing, and is divided into contact sensations (taste and touch) and distance sensations (smell, vision, and hearing).

From this perspective, together with the active and selective processing of information about the body and its movement, proprioception in our study is associated not only with sensation but also with perception, that is, with the “receptive activity of the subject” (Luria, 1979, p. 40). According to Luria (1979), “perceptual activity is almost never limited to a single modality, but comprises the result of the joint work of various sensory organs”; furthermore, “the process of perceiving an object is never carried out at an elementary level, and its composition always includes the higher level of psychological activity” (Luria, 1979, p. 41).

Perception does not depend solely on the sensory organs; it also incorporates the subject’s prior experience and the singularity of his or her conceptions. It further involves the active, coherent, and critical manner in which the subject analyzes an object, as well as the maintenance of the movements that integrate this receptive activity (Luria, 1979).

In this sense, considering the literature of Cultural-Historical Psychology, our study understands proprioception as encompassing both the recognition of the body schema—its location, position, and orientation—in an active and selective manner (which corresponds to sensation), and the receptive activity together with its implications (which corresponds to perception).

Proprioception, defined as the “mapping of information from touch, pressure, and skeletal movements” (Damasio, 2011, p. 267), and related to the ability to produce images and maps that make it possible to perceive and recognize the position of the body in space (Damasio, 2011), constitutes a fundamental function for establishing contact, body image, coordination, and the organization of movement. Moreover, it is essential for the formation of self-awareness and for the regulation of actions (Kignel, 2005).

However, more than a physiological function, proprioception may be understood, from a cultural-historical perspective, as the meeting point between sensation, perception, and consciousness—that is, between immediate feeling and reflective understanding. Through sensation, the body apprehends the environment; through perception, it organizes these impressions into meanings; and through consciousness, the subject recognizes oneself in relation to others and to the environment (Luria, 1979). This relationship reveals that the body is the primary instance through which human beings both feel and signify. Thus, studying proprioception is not limited to understanding a merely sensory mechanism; rather, it involves investigating the very process of human constitution, in order to understand how the body gives rise to consciousness and to the possibility of thinking and acting in the world.

4. Human Constitution Through Proprioception: The Body as an Epistemological Principle

Thinking about human constitution requires recognizing the body as the point of origin and the condition of possibility for knowledge and consciousness. The body is the very place where the world becomes experience. It is through the body that the subject perceives, acts, and recognizes oneself; and it is from the body that thought is organized toward others and reality. From this perspective, the body constitutes the epistemological principle for the study of the human being: it is within the body that perception, consciousness, and subjectivity are rooted.

Proprioception occupies a central position in this process. It represents the sensory link between the organism and the environment, between the “self” and the world. Hume (1789) already intuited this interdependence when he argued that ideas derive from sensory impressions and that the “self” does not exist as an autonomous substance, but rather as a bundle of perceptions succeeding one another in continuity. Thus, sensory experience grounds the mind, and consciousness emerges as an effect of the body's relations with the environment. From this perspective, proprioception may be understood as one of the pathways through which the subject is constituted.

Within the framework of Cultural-Historical Psychology, proprioception ceases to be regarded as a merely physiological phenomenon and comes to be understood as a Higher Psychological Function. It integrates the unity between biology and culture. For Vygotsky (1995), every Higher Psychological Function originates in social relations,

mediated by signs, before becoming an internal function. In this way, although proprioception is grounded in organic processes, it develops through the appropriation of social practices and culturally shaped ways of moving, perceiving, and feeling. The body, therefore, is historical: it carries within its gestures and perceptions the marks of the culture and social relations that constitute it.

Human constitution, in this sense, is also a process of constituting the body. Proprioception not only informs the subject about their position in space but also inserts them into the symbolic world, where sensations acquire social meaning (Silva, 2025). When a child learns to support their body, coordinate movements, or regulate their own actions, they are not merely developing motor skills; they are appropriating cultural ways of being and acting in the world. This transition from sensory experience to mediated consciousness expresses the dialectical movement that Cultural-Historical Psychology identifies between the biological and the social.

Authors such as Luria (1979; 1981), Vygotsky (1995), and Leontiev (2004) deepened this understanding by arguing that psychological functions are organized into complex systems, integrating sensation, perception, attention, and memory into a functional whole. From this perspective, proprioception constitutes one of the foundations of intentionality, as it enables the subject to act voluntarily, consciously, and in a socially oriented manner. It mediates the relationship between the body and the world.

From an epistemological point of view, recognizing proprioception as a category within Cultural-Historical Psychology implies identifying a body-in-relation, constituted through and emerging from the relationships among the sensing body, the other, and the environment. As Bachelard (1996) and Canguilhem (2009) emphasize, every science originates from a body that feels and experiences. In this sense, proprioception represents the inaugural link between sensation and thought—the point at which experience may become a clue to consciousness.

Thus, investigating proprioception from the perspective of Cultural-Historical Psychology means restoring the body to the center of scientific thought concerning human constitution. However, the concept of the body is reformulated here, since it is not the body of medicine, biology, or clinical practice. Rather, it is a body understood as the material substrate of complex social, historical, and cultural processes. It is a body in constant potentiality for becoming; an aware, conscious, and capable body, rather than a passive or objectified one. It is

emphasized that knowing, feeling, and existing are expressions of the same historical process of humanization, within a dynamic that begins and ends in a body-in-relation.

5. Literature Review

The systematic review presented in this study was conducted based on the guidelines of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA), as established by Moher et al. (2009).¹

The systematic search for articles (excluding theses and dissertations) was carried out using two databases: the *Scientific Electronic Library Online* (SciELO) and the *Sistema de Información Científica Redalyc* (Redalyc). These platforms were selected because of their relevance to the objectives of the research, allowing for a comprehensive and detailed analysis of studies related to the topic under investigation. SciELO is indexed in the Web of Science and includes articles selected through a rigorous evaluation process conducted by specialized committees, which assess each journal in relation to others indexed within the same thematic area and according to its relevance within the collection. Redalyc, in turn, is an open-access database that gathers high-quality scientific articles, focusing primarily on academic production “from” and “in” Latin America, and is particularly suitable for research in the humanities. The combination of these databases provided a diverse and relevant overview, ensuring the inclusion of Brazilian articles in the systematic review.

Initially, the descriptors “Proprioception” AND “Cultural-Historical Psychology” were used in the search process. However, due to the limited (and sometimes nonexistent) results obtained, it became necessary to adjust the search strategy. Therefore, broader descriptors were adopted, such as: “Cultural-Historical Psychology” OR “Vigotski” OR “Luria” AND “proprioception” OR “perception” OR “sensation.” This reformulation took into account the central authors of Cultural-Historical Psychology, such as Vigotski and Luria, as well as concepts closely related to proprioception, including sensation and perception. This broader approach enabled the identification of studies that were more relevant to the topic under investigation. We chose to use the spelling *Vigotski*, rather than *Vygotski*, *Vygotsky*, or *Vigotsky*, following the more recent translations discussed by Prestes (2010). In her publications, Prestes argues that translation choices reflect ideological and cultural matrices, as well as

particular “Western ways of thinking.” Therefore, referring to the Russian author as *Vigotski* is consistent with a tradition of careful translation that seeks fidelity to the original and avoids the Anglo-Saxon transliteration *Vygotsky*, which became more widespread outside the Lusophone context. Since this review focused on Brazilian research, this translational choice was considered the most coherent.

The refinement of the search results followed specific criteria: inclusion of the Brazilian collection, articles published between 2000 and 2024, studies belonging to the broad areas of Human Sciences, Social Sciences, Health Sciences, and Linguistics, Languages, and Arts, and the exclusion of duplicate records.

For the selection of studies, the following sequence was established: analysis of titles, reading of keywords, reading of abstracts, preliminary reading of the full articles, and verification of the reference lists. An additional criterion was that proprioception should either constitute the primary focus of the study or be addressed tangentially, while the theoretical-methodological framework of the selected studies needed to be aligned with the principles of Cultural-Historical Psychology.

Table 1. Search descriptors and number of studies identified, screened, and selected at each stage of the systematic review

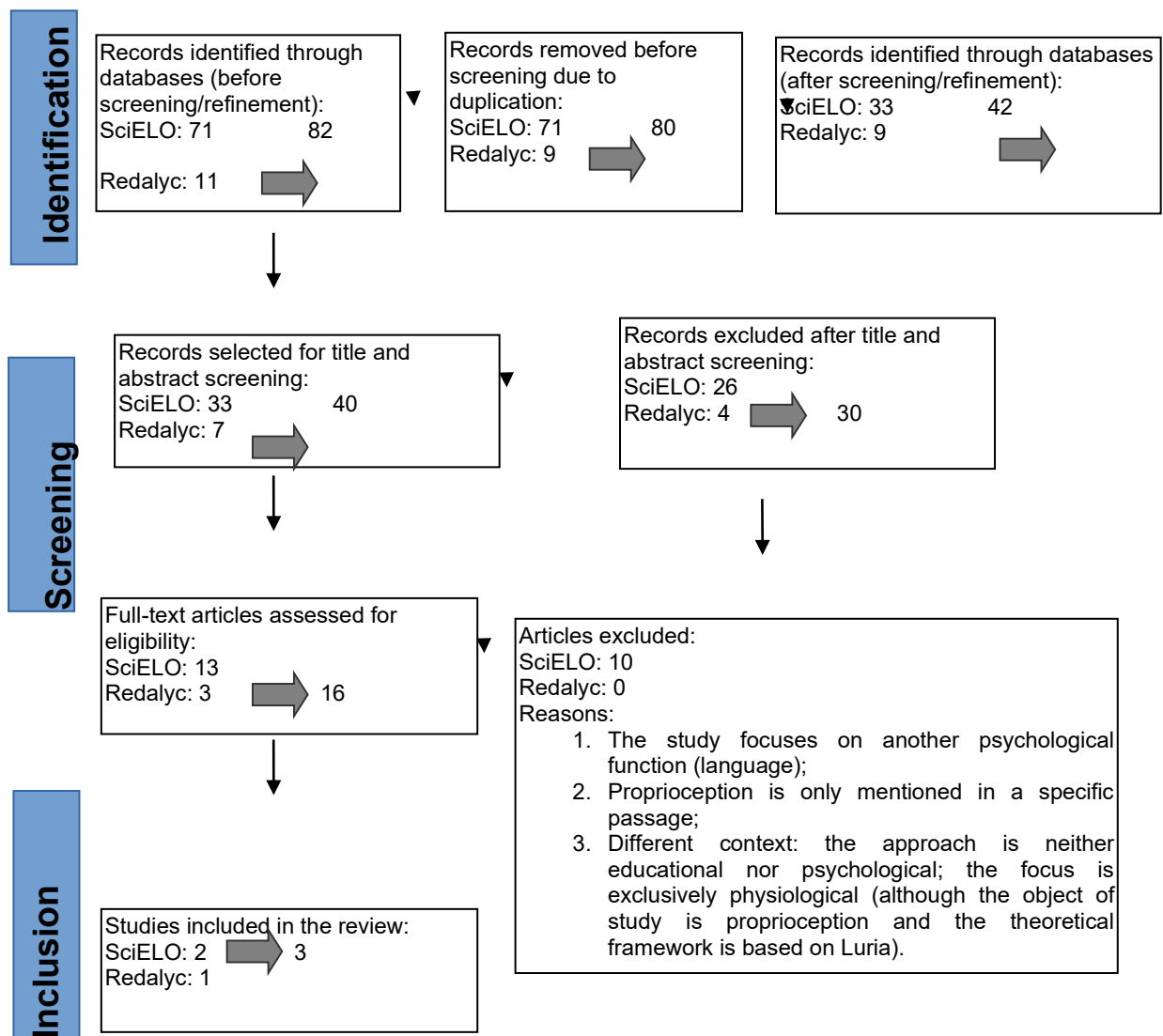
Search descriptor	Total number of records identified	Number of records after screening/refinement	Number of studies selected
Cultural-Historical Psychology AND Proprioception	0 in SciELO 4 in Redalyc	0 in SciELO 4 in Redalyc	
Cultural-Historical Psychology OR Vigotski OR Luria AND Proprioception OR Perception OR Sensation	71 in SciELO 7 in Redalyc	33 in SciELO 7 in Redalyc	3 in SciELO 3 in Redalyc
Total	71 SciELO 11 Redalyc	(after duplicate records were removed): 33 in SciELO 9 na Redalyc	3 in SciELO 3 in Redalyc

Source: author's own elaboration.

To ensure transparency and traceability in the literature review process, the procedures for identifying, selecting, and including studies were organized in accordance with the PRISMA 2020 guidelines. While Table 1 quantitatively presents the results obtained from each search strategy, Table 2 illustrates, through a flow diagram, the stages followed from the identification of records in the databases to the definition of the articles that composed the final corpus of the study.

Table 2. PRISMA 2020 flow diagram illustrating the study selection process for a new systematic review.

Identification of studies via databases and registers



Source: Flow diagram adapted from the PRISMA 2020 flow diagram. Author's own elaboration.

Based on the articles retrieved, the initial analysis focused on identifying the number of studies that addressed proprioception as a central topic of investigation, in contrast to those that employed the term as a complementary or tangential concept—always within the framework of Cultural-Historical Psychology (CHP). Although the authors Vigotski and Luria were initially included in the search strategy because they are key representatives of CHP, and it was expected that studies drawing on these authors would follow the principles of CHP, this assumption was not consistently confirmed.

Thus, four articles were identified as addressing proprioception as their central theme. In the SciELO database, one prominent study was identified: (1) Campos-García, Solovieva, and Machinskaya (2024). In the Redalyc database, three relevant articles were found: (2) Gomes da Silva (2011), (3) Nanni (2005), and (4) Gomes da Silva (2013).

The articles that addressed proprioception tangentially were all identified in the SciELO database: (1) Tonietto, Wagner, Trentini, Sperb, and Parente (2011); (2) Kohl Oliveira and Rego (2010); (3) Martins, Carvalho, and Meire (2018); (4) Lopes, Leite, Neme, and Valle (2016); (5) Tuleski, Chaves, and Barroco (2012); (6) Pena and Andrade-Filho (2006); and (7) Carvalho (2000).

5.1 Articles with Proprioception as the Central Theme

(1) “Neuropsychological Rehabilitation in the Case of an Adolescent with a Cerebrovascular Event in Early Childhood”, by David Campos-García, Yulia Solovieva, and Regina Machinskaya (2024): this article addresses the neuropsychological rehabilitation of an adolescent who suffered a stroke during early childhood, resulting in brain damage to the right hemisphere and cerebellum, with motor, cognitive, and social sequelae. Using a rehabilitation program based on the approaches of Luria and Vigotski, the interventions focused on the functional reorganization of impaired systems. The treatment included playful and practical activities aimed at improving proprioception, muscle tone, and balance, promoting greater independence and motivation. The results demonstrated advances in fine motor skills, coordination, action planning, verbal communication, and social interaction. The study shows that individualized intervention programs can produce positive outcomes, highlighting the importance of integrating psychophysiological and psychological aspects in rehabilitation.

(2) “Oliver Sacks and the ‘Neurophenomenology of the Self’”, by Sergio Gomes da Silva (2011): this article explores the contributions of the neurologist Oliver Sacks. Although Sacks employed many concepts associated with Cultural-Historical Psychology—after all, he maintained an academic dialogue with Luria—the article presents the cases discussed by Sacks and combines their findings with phenomenological concepts in order to understand themes such as subjectivity, identity, and body image. The study is noteworthy for considering not only physiological aspects but also the subjective narratives of individuals, thereby advancing a more humanized perspective on neurology. The article emphasizes the integration of mind and body in the construction of personal identity.

(3) “The Teaching of Dance in the Structuring/Expansion of Students’ Body Awareness and Self-Esteem”, by Dionísia Nanni (2005): Nanni investigates how dance can contribute to the development of self-image, self-concept, and self-esteem among the participants in her study. The research highlights that dance, as a bodily and cultural-historical practice, promotes bodily awareness, emotional expression, and social interaction, thereby fostering both physical and psychological well-being. With regard to proprioception, the text defines it as the organism’s ability to perceive the position and movements of the limbs without visual control, through receptors located in muscles, joints, and tendons. The author emphasizes that proprioception is essential for the development of body schema, spatial awareness, and motor coordination, all of which are fundamental elements in dance education. Furthermore, proprioception contributes to the formation of self-image and self-esteem by enabling individuals to perceive and adjust their movements accurately, promoting a harmonious integration of body and mind. The study also concludes that dance plays an important role in the development of these aspects, especially when practiced from childhood, facilitating the construction of psychomotor and emotional skills. However, this work differs from the focus of the present investigation because it is not grounded in Cultural-Historical Psychology, despite including some references to Luria. Although it explores relevant themes such as body awareness, proprioception, and the relationship between dance and human development, its approach is primarily based on phenomenological, neurophysiological, and psychoanalytic analyses. The study draws upon authors such as Schilder, Ajuriaguerra, and Merleau-Ponty and adopts a perspective more oriented toward the integration of anatomical, sensory, and emotional elements.

(4) “The Cerebral Genesis of Body Image: Some Considerations on the Phenomenon of Phantom Limbs in Ramachandran”, by Sergio Gomes da Silva (2013): this article analyzes the phenomenon of phantom limbs through the work of the neurologist Ramachandran, highlighting neural plasticity as the foundation for the construction and updating of body image by the brain. Phantom limbs illustrate the brain’s capacity to reorganize its sensory maps following amputation while maintaining representations of absent limbs. Drawing on Ramachandran’s work, the author proposes that body image results from interactions among genetic factors, proprioceptive sensations, and visual inputs, emphasizing cortical plasticity as a key element for understanding changes in bodily perception. Regarding proprioception, the article explores how it integrates sensory information to form a body schema. The study presents experiments demonstrating that the brain can incorporate external objects into body image, exemplifying the flexibility of proprioception in adapting to new sensory configurations, even in the face of significant bodily alterations. Although this work offers important contributions to understanding neural plasticity and the construction of body image, it diverges from the focus of the present study because it is not grounded in Cultural-Historical Psychology, despite once again drawing extensively on Luria, a major representative of this theoretical tradition. Silva’s (2013) work adopts an approach predominantly based on cerebral materiality and neural reorganization. In Cultural-Historical Psychology, body image and Higher Psychological Functions are understood through mediation by tools, signs, and cultural processes. In contrast, the author focuses on neural reorganization as the basis for explaining phenomena such as phantom limbs, emphasizing primarily aspects of biological development.

Articles that address proprioception tangentially are highlighted below.

(1) “Interfaces Between Executive Functions, Language, and Intentionality”, by Lauren Tonietto, Gabriela Peretti Wagner, Clarissa Marcelli Trentini, Tania Mara Sperb, and Maria Alice de Mattos Pimenta Parente (2011): this article examines the relationship between executive functions, language, and intentionality, emphasizing language as a regulatory function of intentional action, based on the theoretical contributions of Luria, Vigotski, Baddeley, and Fuster. The study highlights language as a mediator in the development of executive functions. These functions include planning, attention, and inhibitory control and are discussed from a cognitive perspective rather

than from the framework of Cultural-Historical Psychology (although the theoretical background also includes Luria and Vigotski). With regard to proprioception, the article addresses the perception of one's own body in relation to motor planning and action regulation, processes mediated by executive functions and by the relationship between language and intentionality. For example, the organization of goal-directed motor actions may involve self-regulation and inner communication, which depend on the connections between bodily perception and the cognitive processes described.

(2) "Contributions of Luria's Cultural-Historical Perspective to Contemporary Research", by Marta Kohl de Oliveira and Teresa Cristina Rego (2010): this article explores mental (psychological) processes in their relationship with culture. Although proprioception is not the central theme, the study presents a more specific discussion of proprioception when addressing the "units of cerebral functioning," particularly the second unit, which is responsible for the reception, analysis, and storage of information. Within this context, the authors provide an extensive reflection on the role of the sensory organs in receiving sensory data that underlie cerebral processes. The entire analysis is grounded in the assumptions of Cultural-Historical Psychology.

Based on the general considerations regarding the four studies that directly addressed proprioception, two were excluded due to their lack of affinity with the theoretical-methodological perspective adopted in this study, namely Cultural-Historical Psychology, despite citing Luria and taking proprioception as their object of investigation. This incompatibility resulted from the theoretical approaches adopted by these studies, which diverge from the framework guiding the present research.

Regarding the references to Luria and the predominantly physiological emphasis found in these studies, it may be inferred that this occurred because Luria's scholarly production can be understood as encompassing two distinct phases: a more physiological phase, which took place during the period in which Vigotski's work was censored in the former Union of Soviet Socialist Republics, from 1936 to 1956; and a later phase, in which Luria republished studies grounded in medical-clinical practice while incorporating ideas from the Vygotskian theoretical framework (Yasnitsky & Van der Veer, 2016).

The study by Kohl and Rego (2010), due to its theoretical framework, offers valuable considerations regarding proprioception and is fully aligned with the

principles of Cultural-Historical Psychology, thereby contributing significantly to the foundation of the present investigation, even though proprioception is not the article's primary focus. The excluded studies follow the same rationale as those addressing proprioception directly: they are grounded in different theoretical-methodological perspectives and merely cite Luria without situating their analyses within the context of Cultural-Historical Psychology.

The studies that address proprioception tangentially associate language with a central role in the development of other Higher Psychological Functions, including perception, and also provide interesting discussions of the concept of perception (Lopes, Leite, Neme, & Valle, 2016; Tuleski, Chaves, & Barroco, 2012; Tonietto, Wagner, Trentini, Sperb, & Parente, 2011; Martins, Carvalho, & Meire, 2018; Pena & Andrade-Filho, 2006; Carvalho, 2000). For this reason, they were not highlighted in the general considerations. In these studies, language is viewed as a function that organizes and enhances the interfunctionality among psychological processes, including perception, without assigning it an exclusive focus or providing a more in-depth discussion of the concept itself. Other studies that were not included consider only the physiological dimension of proprioception (Pena & Andrade-Filho, 2006; Nanni, 2005; Gomes da Silva, 2013).

Thus, based on this literature review, the articles included in our discussion were those by Kohl and Rego (2010), Campos-García, Solovieva, and Machinskaya (2024), and Gomes da Silva (2011), considering the theme of proprioception from the perspective of Cultural-Historical Psychology.

Furthermore, considering that proprioception involves both perception and sensation, we highlight a study that, although it does not address proprioception as a central theme or directly relate to the topic under discussion, presents relevant reflections throughout the text. This article was not selected for analysis because it does not address the topic extensively, making only a brief reference to it. Nevertheless, even this brief discussion offers an interesting contribution that can be incorporated into the present study. This is the case of the article by Andrade and Smolka (2012), which frequently employs the term "perception" in the sense of "making something one's own" (p. 708), emphasizing its relationship with the body/brain, culture, and processes of appropriation.

(...) perceptions ("located" in the occipito-temporo-parietal areas) are not merely a set of accumulated sensations, nor are they simply stored; rather, they are created in the very process of the individual's development. If perception depends on environmental conditions for its constitution, we may say that it is stored, processed, and constructed through the appropriation of sociocultural practices (Andrade & Smolka, 2012, p. 704).

Finally, although we identified studies that addressed the topic of proprioception, none of them specifically focused on the perspective of Cultural-Historical Psychology (CHP), or, as in the case of Kohl and Rego (2010), were grounded in CHP but did not specifically address the topic of proprioception.

What was most frequently observed in the existing literature was an emphasis on the physiological dimension of proprioception, often based on Luria's studies, but without discussions grounded in a Cultural-Historical Psychology approach or relating proprioception to Higher Psychological Functions, volitional action, or processes of appropriation.

This gap highlights that proprioception from the perspective of Cultural-Historical Psychology remains a new and underexplored topic. In this sense, the review presented here contributes to expanding—and encouraging—research on proprioception within the framework of CHP, thereby deepening the understanding of human constitution through the body, understood not merely as a biological substrate but as an epistemological principle of knowing, feeling, and existing. Investigating proprioception from the perspective of Cultural-Historical Psychology implies recognizing that the body–mind unity is not a natural given but rather a historical and mediated construction, realized through social and symbolic relations. It is through the body that the subject perceives the world, organizes sensory experience, and gradually becomes conscious of oneself—a process in which sensation, perception, and thought are dialectically intertwined. Thus, restoring the body to the center of psychological reflection means returning to the point of origin of consciousness, to the place where the human being is constituted as a perceptive, relational, and historical being.

The process of human constitution, in any field, skill, or practice, requires time and unfolds in an idiosyncratic manner, involving processes of perceiving the world, selecting signs, developing, and acting. To become constituted, therefore, is to develop through time, space, and social context.

Thus, the analysis of the selected articles reinforces the relevance of proprioception as a mediating element in human development and in practices involving the body in action. By providing this overview, the literature review not only offered theoretical and methodological support for the development of the present study but also encouraged the search for new sources and interpretations within Cultural-Historical Psychology, thereby expanding the field of investigation of proprioception from a CHP perspective. In particular, proprioception was investigated as a voluntary activity—and not merely a reflexive one—of a body that acts, feels, and relates to the world.

6. Final considerations

This study stems from the recognition of the insufficiency of investigations on proprioception from the perspective of Cultural-Historical Psychology (CHP) and reveals not only a theoretical and methodological gap in the scientific literature but also an opportunity to reorient the way we conceive the body, sensation, and one's location in space and time. Based on Cultural-Historical Psychology, particularly in the developments of the works of Vigotski, Luria, and Leontiev, Higher Psychological Functions (HPFs) are understood as historically developed and culturally mediated. In this sense, proprioception cannot be conceived merely as a physiological phenomenon. On the contrary, it is a function capable of reorganization and development through social practices, symbolic relations, and cultural contexts of learning. Cultural-Historical Psychology therefore provides a framework for overcoming naturalizing interpretations of proprioception, which are often associated with biomedical or neuroscientific fields, repositioning it instead as a dimension of human experience.

By understanding proprioception as a voluntary psychological function, this study affirms an approach that values intentionality, consciousness, and sensitivity as essential dimensions of human formation. It is not merely a matter of “feeling the body,” but of learning to feel it through experiences mediated by symbolic tools and shared cultural practices (Silva, 2025). The development of proprioception can therefore be understood as a process of human formation in which the body ceases to be merely a biological support and becomes a field of expression and action.

Reconsidering proprioception as a relevant category within Cultural-Historical Psychology challenges the very way in which we think about the development of Higher Psychological Functions. It means recognizing that the body, historically subordinated in theories of knowledge, must be brought back to the beginning of the discussion, acknowledging it as a locus of cultural mediation, conscious formation, and subjective constitution.

Finally, the scarcity of studies on this topic from a cultural-historical perspective indicates the urgency of further investigations capable of articulating the foundations of Cultural-Historical Psychology with discussions centered on sensory and bodily experience. The present study not only maps this epistemological absence but also proposes an approach committed to the complexity of human phenomena—always historical, situated, and dialectical—thereby expanding the possibilities for understanding human nature and human constitution.

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