

ATTENTIONAL PROCESSES IN EARLY INFANCY: EVIDENCE FROM NEUROSCIENCE AND IMPLICATIONS FOR PEDAGOGICAL PRACTICE

PROCESSOS ATENCIONAIS NA PRIMEIRA INFÂNCIA: EVIDÊNCIAS DA NEUROCIÊNCIA E IMPLICAÇÕES PARA A PRÁTICA PEDAGÓGICA

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ABSTRACT: This study examines the contributions of attentional processes during early infancy from a neuroscientific perspective. Through a systematic review of recent scientific literature, complemented by seminal and foundational works in the field, it explores the pedagogical potential of intentional Neuroeducation-based practices aimed at fostering and strengthening attentional capacities during the earliest years of childhood. The study is characterized as a bibliographic investigation grounded in the analysis of scientific research addressing the relationships among attentional processes, early infancy, pedagogical practices, and neuroscience. The findings indicate that attention is a fundamental process for learning, as the attentional filter is responsible for selecting, organizing, and subsequently consolidating information into memory. The review also demonstrates that attentional processes are closely associated with other cognitive mechanisms, including motivation, emotion, and executive functions, requiring the integrated functioning of these systems, since attention plays a crucial role in memory consolidation and effective learning. Furthermore, the study discusses the relevance of neuroscientific knowledge as an important resource for enhancing pedagogical practice, particularly through the incorporation of playful and musical elements into educational planning for infants and toddlers. It concludes that a deeper understanding of attentional processes can support teachers in designing more intentional and effective pedagogical practices, thereby promoting child development not only in terms of learning outcomes but also in relation to children's holistic development and overall well-being.

Keywords: Neuroeducation; Child development; Pedagogical practices; Early childhood education.

RESUMO: Este estudo examina as contribuições dos processos atencionais na primeiríssima infância sob a perspectiva da neurociência. Por meio de uma revisão sistemática da literatura científica recente, complementada por obras clássicas e fundamentais da área, investiga o potencial pedagógico de práticas intencionais fundamentadas na Neuroeducação para promover e fortalecer as capacidades atencionais nos primeiros anos da infância. O estudo caracteriza-se como uma pesquisa bibliográfica baseada na análise de investigações científicas que abordam as relações entre os processos atencionais, a primeiríssima infância, as práticas pedagógicas e a neurociência. Os resultados indicam que a atenção constitui um processo fundamental para a aprendizagem, uma vez que o filtro atencional é responsável por selecionar, organizar e, posteriormente, consolidar as informações na memória. A revisão também demonstra que os processos atencionais estão estreitamente associados a outros mecanismos cognitivos, como a motivação, a emoção e as funções executivas, exigindo o funcionamento integrado desses

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sistemas, visto que a atenção desempenha papel essencial na consolidação da memória e na efetivação da aprendizagem. Além disso, o estudo discute a relevância dos conhecimentos neurocientíficos como um importante recurso para o aprimoramento da prática pedagógica, especialmente por meio da incorporação de elementos lúdicos e musicais ao planejamento educacional voltado a bebês e crianças pequenas. Conclui-se que uma compreensão mais aprofundada dos processos atencionais pode auxiliar os professores na elaboração de práticas pedagógicas mais intencionais e eficazes, promovendo o desenvolvimento infantil não apenas em termos de aprendizagem, mas também em relação ao desenvolvimento integral e ao bem-estar das crianças.

Palavras-chave: Neuroeducação; desenvolvimento infantil; práticas pedagógicas; educação infantil.

INTRODUCTION

Human development is one of the most complex, plastic, and environmentally responsive biological processes. Within this context, brain development stands out because of its multifaceted nature, as it is intrinsically associated with the multiple dimensions of human experience (Costa, 2018). This process occurs at a particularly rapid pace during the first 1,000 days after conception, encompassing both the prenatal period and the first years of life, a developmental window widely recognized as critical for the establishment of brain structures and functions (Cusick & Georgieff, 2016).

In this regard, attentional processes play a central role in human development, constituting essential mechanisms for memory activation and the construction of learning (Costa, 2023). Within the field of Neuroeducation, attention is not regarded as a single, homogeneous ability but rather as a set of neurocognitive processes that operate in different ways according to situational characteristics and task demands (Strauss, Sherman, & Spreen, 2006). Consequently, understanding the functioning of attentional processes is fundamental to improving pedagogical practices, since school environments are characterized by multiple competing stimuli that continuously vie for children's attention.

Accordingly, the implementation of dynamic, engaging, interactive, and meaningful learning activities, tailored to the developmental characteristics of each age group, may promote sustained attention, stimulate children's interest, and enhance learning processes. Incorporating music, sensory experiences, play-based activities, and periods of rest into the daily school routine encourages children's engagement while respecting their developmental characteristics and cognitive needs (Oliveira, Silva, & Nunes, 2024). Furthermore, alternating among different pedagogical activities enables attentional demands to be distributed across shorter intervals that are more consistent with children's natural attention span, as emphasized by Cosenza and Guerra (2011).

From this perspective, the development of attention and other neurocognitive functions during early childhood is of particular relevance to Early Childhood Education, as these abilities provide the foundation for learning and children's holistic development (Oliveira et al., 2024). Accordingly, knowledge of attentional processes may assist teachers in designing more intentional and effective pedagogical practices capable of

strengthening these abilities from the earliest years of life (Oliveira et al., 2024). Moreover, by promoting educational experiences that take into account the neurocognitive aspects of child development, schools contribute not only to learning outcomes but also to children's overall development and well-being.

Therefore, the primary objective of this study was to explore the pedagogical potential of intentional Neuroeducation-based practices designed to stimulate and develop attentional capacities during early infancy by addressing the following research question: How can neuroscientific knowledge regarding attentional processes during early infancy contribute to the planning of intentional pedagogical practices in Early Childhood Education? To achieve this objective, the paper is organized into two main sections. First, it presents a theoretical framework on the concept of attention from a neuroscientific perspective. Second, it examines the importance of attentional processes for child development during early infancy in relation to pedagogical intentionality, drawing on a systematic review of the literature. Finally, the main findings are synthesized in the concluding remarks.

METHODOLOGY

This study is an exploratory bibliographic investigation based on the analysis of scientific literature in the fields of neuroscience and Neuroeducation. Its primary focus is to examine the contributions of attentional processes to child development, with particular emphasis on their relationship with learning and memory during early infancy, especially within educational settings. Accordingly, the study analyzes theoretical advances concerning attention as a fundamental neurocognitive mechanism underlying human development and discusses their implications for planning pedagogical practices aimed at infants and toddlers.

The theoretical framework is grounded on the assumption that attentional processes exert a substantial influence on the development of memory and learning and are intrinsically associated with motivation, emotions, and executive functions. From this perspective, attention is understood not as an isolated function but as an integrated neurocognitive mechanism interacting with multiple systems that support learning. Within educational contexts, play-based pedagogical experiences—particularly those involving music and games—are regarded as important strategies for stimulating attention during the first years of life and fostering infants' cognitive development (Machado & Casarin, 2024; Oliveira et al., 2024).

According to Severino (2010), bibliographic research is based on previously published records, including books, scientific articles, dissertations, theses, and official documents. In addition, the exploratory approach allows researchers to identify and delineate relevant information regarding the phenomenon under investigation, facilitating a deeper understanding of the research object and the conditions under which it manifests itself in educational contexts.

The relevance of this study stems from the fact that this topic remains relatively underexplored within educational practice. In many educational settings, reductionist conceptions regarding the attentional capacities of infants and young children persist,

often based on the assumption that they are unable to sustain attention during pedagogical interactions. Such perspectives frequently encourage an excessive emphasis on pedagogical practices centered on mechanical repetition and standardized behaviors rather than on educational approaches that intentionally stimulate attentional processes. Although repetition plays an important role in consolidating certain types of learning, its use in a decontextualized manner, disconnected from children's developmental needs, may limit opportunities for exploration, inquiry, and active knowledge construction.

The documentary corpus was composed primarily of recent scientific publications while also incorporating classical and foundational works in the field. The review included peer-reviewed scientific articles, academic publications, and reference books in neuroscience and Neuroeducation. Official policy documents guiding pedagogical practice in Early Childhood Education were also examined, including the Brazilian National Common Core Curriculum (BNCC) (Brasil, 2017), as well as national curricular guidelines and other official educational frameworks.

To further deepen the understanding of attentional processes and their relationship with pedagogical practice, additional literature was identified through searches of books and scientific databases, including the Scientific Electronic Library Online (SciELO) and Google Scholar. Literature selection was guided by the descriptors neuroscience, attentional processes, and early childhood, chosen because of their direct relevance to the objectives of the study. Studies focusing on health conditions such as Autism Spectrum Disorder (ASD), publications outside the targeted age range, and studies that did not conceptualize attention from a neuroscientific perspective were excluded. Studies emphasizing the importance of attentional processes for learning during early infancy and highlighting the interaction of attention with memory, learning, motivation, emotions, and executive functions in improving pedagogical practices were included.

The analysis sought to identify theoretical and empirical evidence supporting the understanding of attention as a fundamental process underlying child development and to examine its potential contributions to improving pedagogical practices in Early Childhood Education, particularly with regard to the intentional organization of educational experiences designed to foster children's holistic development.

THE CONCEPT OF ATTENTION FROM A NEUROSCIENTIFIC PERSPECTIVE

According to Carreiro et al. (2012), attention can be understood as the capacity to allocate mental resources to specific stimuli, enabling them to be processed more efficiently. This process is of fundamental importance because it directly influences perception, memory, learning, and behavior. In addition to external stimuli, such as sounds and movements, attention is also influenced by internal stimuli, including thoughts, concerns, and memories.

Attention is involved in virtually every activity performed in daily life, ranging from simple tasks, such as following a conversation, to more complex processes related to learning. It enables individuals to select, organize, and direct their focus toward information considered most relevant at a given moment. Throughout daily activities,

people are exposed to an enormous amount of simultaneous stimuli, including sounds, images, thoughts, emotions, and environmental information. Since the brain cannot process all these stimuli in depth at the same time, attention functions as a selection mechanism, prioritizing the information that is most relevant (Lima, 2014; Strauss, Sherman, & Spreen, 2006).

Scientific investigations into attention date back to the late nineteenth century. William James, widely regarded as one of the pioneers of psychology, defined attention as the mind's capacity to focus on a specific stimulus among several occurring simultaneously. According to James, attending to one stimulus necessarily implies relegating other information to the background (James, 1890, as cited in Carreiro et al., 2012). This conceptualization continues to underpin contemporary research in neuroscience and cognitive neuropsychology.

From a neuropsychological perspective, attention is not viewed as a unitary ability but rather as a collection of processes that operate differently depending on situational demands and task requirements. The principal forms of attention described in the literature include selective, sustained, alternating, and divided attention (Strauss et al., 2006).

Selective attention refers to the ability to concentrate on a specific stimulus while suppressing competing information. This ability is evident in everyday situations, such as maintaining a conversation despite surrounding background noise. Sustained attention refers to the capacity to maintain focus on a task over an extended period, such as listening to a story or completing a classroom activity. Alternating attention involves the ability to shift efficiently between different tasks, as when a child interrupts an activity to respond to a teacher's instruction and subsequently returns to the original task. Divided attention, in turn, enables individuals to process multiple activities simultaneously and therefore requires greater cognitive control (Strauss et al., 2006).

In addition to these classifications, research indicates that attention may operate either voluntarily or automatically, depending on the circumstances. Voluntary attention occurs when individuals consciously direct their focus toward a specific objective, such as during classroom instruction or task completion. Automatic attention, by contrast, is triggered involuntarily by unexpected stimuli, such as a sudden noise or an abrupt movement in the environment (Carreiro et al., 2012).

According to Cosenza and Guerra (2011), attentional processes involve the coordinated activity of multiple brain regions rather than the functioning of a single neural structure. These regions operate in an integrated manner to enable individuals to maintain focus, select relevant information, suppress distractions, and respond appropriately to environmental stimuli. This coordinated neural activity supports concentration, behavioral regulation, and the successful execution of everyday activities. Among the brain regions involved, the prefrontal cortex plays a particularly important role because of its association with executive functions, decision-making, and attentional control. Furthermore, structures responsible for maintaining alertness and regulating wakefulness also contribute directly to attentional functioning (Cosenza & Guerra, 2011; Lima, 2014).

Attention is also fundamentally associated with memory and learning, as it serves as the gateway through which new information enters the memory system. According to

Cosenza and Guerra (2011), information can only be effectively learned and encoded if it first receives attentional focus.

These authors further argue that when individuals are genuinely engaged and attentive, information is processed more effectively and is therefore more likely to be consolidated into long-term memory. Consequently, merely being exposed to information or passively listening to a lecture does not guarantee learning, highlighting the importance of children's active participation in the learning process.

Another important consideration is that both emotional and environmental factors directly influence attention. Stress, anxiety, fatigue, and excessive stimulation may impair an individual's ability to concentrate. Conversely, content that arouses interest, curiosity, and motivation tends to sustain attention and promote cognitive engagement (Cosenza & Guerra, 2011).

Cosenza and Guerra (2011) further emphasize that emotion and attention are intrinsically linked to learning. When educational content is meaningful, interesting, or emotionally engaging, the brain tends to maintain attention for longer periods, facilitating comprehension and memory consolidation. Conversely, stress, fear, and lack of motivation may impair attentional processes and hinder learning. Emotional factors therefore exert a substantial influence on how the brain selects and processes information within educational environments.

Understanding attentional functioning is particularly important in school settings, where numerous stimuli continuously compete for children's focus. Classroom conversations, external noise, electronic devices, and even emotional concerns may interfere with concentration and academic performance. This issue is especially relevant during childhood and adolescence, when the brain regions responsible for attentional control and executive functioning are still undergoing maturation.

Accordingly, understanding the mechanisms underlying attention may enable teachers to develop instructional strategies that enhance students' engagement during classroom activities. Dynamic, age-appropriate, interactive, and meaningful learning experiences can promote sustained attention, stimulate children's interest, and ultimately contribute to more effective learning.

ATTENTIONAL PROCESSES IN EARLY INFANCY AND PEDAGOGICAL PRACTICES

Early infancy encompasses the period from birth to three years of age. According to the Brazilian National Common Core Curriculum (BNCC), this age range corresponds to the nursery stage of Early Childhood Education and is divided into two groups: infants (0 to 18 months) and toddlers (19 months to 3 years and 11 months) (Brasil, 2017).

Attention can be defined as the neurocognitive capacity to select, direct, and sustain focus on relevant stimuli. When examining attentional processes during early infancy, it is essential to consider other fundamental factors that both influence and are influenced by attention. From this perspective, attention is recognized as an essential prerequisite for learning (Corrêa & Silva, 2024). Moreover, it is through the attentional filter that information is selected, organized, and ultimately consolidated into memory

(Costa, 2023).

Studies indicate that motivation, emotions, and executive functions interact continuously with attentional processes (Costa, 2023). Consequently, attention is closely associated with other cognitive mechanisms required for its development, requiring the integrated functioning of these systems because attention is fundamental to both memory consolidation and effective learning.

Attention constitutes a core neurocognitive resource - or, as Amaral and Guerra (2020) describe it, one of the essential mental functions underlying learning and child development. These authors conceptualize attention as the initial stage of information processing across different memory systems. Accordingly, attention enables environmental stimuli to enter the brain for subsequent processing, organization, and storage.

Amaral and Guerra (2020) further emphasize that when children fail to attend to presented information, the brain is unable to process it efficiently, preventing its effective encoding. Consequently, insufficient attention directly compromises learning because the brain cannot adequately process or store the information required for knowledge construction.

Within educational settings, attentional functioning is directly associated with children's engagement in proposed learning experiences. Therefore, activities requiring focused attention should minimize distracting environmental stimuli whenever possible. Cosenza and Guerra (2011) recommend that teachers communicate with children using a calm tone of voice, position themselves at the child's eye level during interactions, and incorporate playful and musical elements into pedagogical activities.

During early childhood, attentional development can be fostered through diverse play-based experiences (Oliveira et al., 2024). Activities requiring concentration, such as puzzles, memory games, and other structured forms of play, represent valuable resources for strengthening attentional skills. Likewise, structured environments with predictable daily routines help children direct their attention toward specific tasks while reducing interference from distracting stimuli (Oliveira et al., 2024).

Within this context, Early Childhood Education has a distinctive advantage by adopting play as a fundamental pedagogical principle. Incorporating music, sensory activities, games, and scheduled periods of rest into the school routine promotes children's engagement while respecting their developmental characteristics (Oliveira et al., 2024). Furthermore, alternating among different educational activities allows attentional demands to occur within shorter intervals that better match children's developmental capacity for sustained focus (Cosenza & Guerra, 2011).

One of the most widely recognized strategies for enhancing attentional processes is the use of music, given its contributions to emotional regulation, motor synchronization, and attentional engagement, as documented in studies on neuroplasticity and child development. Regarding the earliest years of life, the National Curriculum Framework for Early Childhood Education (RCNEI) emphasizes that musical interactions should occur through playful experiences, particularly games and playful activities, as these provide opportunities for teachers and caregivers to foster infants' attentional development through vocal imitation, sounds, and other forms of musical

interaction (Brasil, 1998).

Machado and Casarin (2024), in their investigation of the contributions of music to language development during the first five years of life, demonstrated that musical experiences significantly promote attention and concentration, both of which are essential for children's learning. According to these authors, music activates multiple cognitive processes, contributing not only to language development but also to children's holistic development by stimulating motor abilities, imagination, thinking, and creativity.

Beyond cognitive development, sensory and emotional experiences also exert a substantial influence on children's learning. Castro et al. (2024) argue that musical experiences promote the integrated activation of emotional, attentional, and memory-related processes, reinforcing the importance of pedagogically enriched environments for fostering children's overall development.

Attentional development may also be enhanced through educational games. Activities requiring concentration, such as puzzles and memory games, constitute valuable resources for strengthening children's attentional capacities (Oliveira et al., 2024). Likewise, structured learning environments with clearly established routines help children maintain focus on specific activities while minimizing the influence of distracting stimuli (Oliveira et al., 2024).

Understanding the development of attention and other neurocognitive functions during early childhood - that is, from birth to five years of age - has important implications for Early Childhood Education, as attention constitutes a fundamental element of both learning processes and children's holistic development (Oliveira et al., 2024). These authors emphasize that teachers who understand attentional functioning are better equipped to implement pedagogical practices that strengthen this ability, thereby promoting more meaningful educational experiences capable of fostering both learning and healthy child development.

Accordingly, knowledge of attentional processes can assist teachers in designing more intentional and effective pedagogical practices capable of strengthening these competencies from the earliest years of life. The National Curriculum Guidelines for Early Childhood Education (DCNEI) further emphasize that play is not merely a complementary activity but rather a foundational principle of Early Childhood Education through which children construct knowledge, develop skills, and express emotions (Brasil, 2009).

The diversification of instructional strategies advocated by both the BNCC and the DCNEI supports the presentation of the same learning content through multiple forms of expression - oral, visual, bodily, and playful languages - thereby expanding learning opportunities and promoting sustained attention (Costa & Omizzolo, 2026).

From a pedagogical perspective, everyday school life presents teachers with challenges arising from children's diverse learning rhythms, learning styles, and educational needs. Within this context, neuroscientific knowledge provides valuable support for improving pedagogical practice, particularly in educational planning, monitoring children's development, and assessment processes. Systematic observation grounded in neuroscientific knowledge enables teachers to identify children's progress, difficulties, and potential, thereby supporting the continuous and reflective refinement of

pedagogical interventions (Costa & Omizzolo, 2026).

Collectively, these findings reinforce the understanding that Neuroeducation should be conceived as an interdisciplinary field integrating Neuroscience, Psychology, and Education, providing valuable contributions to pedagogical planning without reducing educational phenomena to exclusively biological explanations (Pacífico et al., 2024).

One important implication emerging from the literature concerns the role of pedagogical intentionality in shaping attentional development during early childhood. Although attention is influenced by biological maturation, neuroscientific evidence consistently demonstrates that environmental experiences exert a substantial influence on the strengthening of neural networks associated with attentional control. Consequently, educational contexts should not merely accommodate children's current attentional capacities but actively contribute to their progressive development through carefully planned pedagogical experiences. This perspective reinforces the understanding that attention is neither an immutable characteristic nor a fixed individual trait; rather, it constitutes a dynamic neurocognitive process that can be continuously strengthened through meaningful interactions with the environment.

This understanding has important implications for Early Childhood Education. In many educational contexts, children's apparent distractibility is frequently interpreted as evidence of an inability to sustain attention. However, neuroscientific studies suggest that fluctuations in attentional engagement often reflect characteristics of the learning environment itself rather than limitations inherent to the child. Activities that lack meaning, emotional relevance, or opportunities for active participation are less likely to maintain attentional engagement than experiences involving exploration, play, movement, social interaction, and problem solving. Therefore, rather than focusing exclusively on children's capacity to remain seated or silent, pedagogical planning should prioritize the creation of learning environments capable of naturally eliciting curiosity and sustained cognitive engagement.

This perspective is closely aligned with contemporary conceptions of active learning. Rather than considering children as passive recipients of information, Neuroeducation recognizes learning as an active process in which children continuously construct knowledge through interaction with people, objects, language, and their surrounding environment. Within this framework, attention becomes a mediator between experience and learning, allowing relevant environmental information to be selected, processed, and integrated into existing cognitive structures. Consequently, educational practices that promote active exploration and meaningful participation tend to stimulate attentional processes more effectively than approaches centered exclusively on repetition or teacher-directed instruction.

FINAL CONSIDERATIONS

The studies reviewed demonstrate that attention plays a fundamental role in child development, as it enables children to observe, explore, and actively engage with the experiences that shape their everyday lives. Consequently, attention is intrinsically linked

to learning, facilitating the comprehension, encoding, and transformation of information into new knowledge. The literature further indicates that, from the earliest years of life, attentional processes support the selection of environmental information, the construction of knowledge, and the development of a wide range of cognitive abilities.

The findings also reveal that attention is influenced by factors extending beyond children's capacity to concentrate. Interest in learning activities, emotional states, motivation, previous experiences, and environmental conditions all directly affect how children allocate and sustain their attentional focus. These findings underscore the importance of considering such factors when designing pedagogical interventions. By providing meaningful educational experiences that stimulate curiosity, engagement, and active participation, teachers can foster children's role as active agents in their own learning process.

The discussions presented throughout this study highlight the considerable potential of Early Childhood Education to promote the development of attentional processes through play, music, social interaction, and other playful learning experiences. Such educational practices respect the developmental characteristics of early childhood while encouraging children's active participation in learning experiences, thereby supporting their overall development.

The reviewed literature also emphasizes the important contributions of neuroscience to pedagogical practice. Understanding the mechanisms underlying child development enables teachers to design learning experiences that are better aligned with children's developmental needs while preserving the central importance of social interaction, play, and sensitive, responsive listening within Early Childhood Education.

Based on the evidence presented, it can be concluded that a deeper understanding of attentional processes can support the development of more intentional, evidence-informed, and pedagogically effective educational practices, ultimately fostering the holistic development of infants and toddlers.

It is hoped that the reflections presented in this study will contribute to the work of Early Childhood Education professionals by encouraging pedagogical practices that are increasingly meaningful, intentional, and responsive to the needs and developmental potential of children during the earliest years of life.

REFERENCES

- AMARAL, A. L. N.; GUERRA, L. B. **Neurociência e educação: olhando para o futuro da aprendizagem**. Brasília: SESI/DN, 2020. Disponível em: <https://www.portaldaindustria.com.br/publicacoes/2022/10/neurociencia-e-educacao-olhando-para-o-futuro-da-aprendizagem/>
- BRASIL. Ministério da Educação e Cultura. **Referencial Curricular Nacional para a Educação Infantil**. Brasília, 1998. vol 03, p. 45 - 77. Disponível em: <http://portal.mec.gov.br/seb/arquivos/pdf/volume3.pdf>. Acesso em 29/09/2023.

BRASIL. Ministério da Educação. Secretaria de Educação Básica. **Diretrizes curriculares nacionais para a educação infantil**. Brasília: MEC/SEB, 2009. Disponível em: http://portal.mec.gov.br/dmdocuments/diretrizescurriculares_2012.pdf.

BRASIL. Ministério da Educação. Secretaria de Educação Básica. **Base Nacional Comum Curricular (BNCC)**. Educação é a Base. Brasília: MEC/Consed/Undime, 2017. Disponível em: <http://basenacionalcomum.mec.gov.br/abase/#infantil>.

CARREIRO, M. E. F. *et al.* (org.). **Avaliação e intervenção neuropsicológica nos transtornos do desenvolvimento**. São Paulo: Memnon, 2012.

CASTRO, G. S.; PACÍFICO, M.; FERREIRA, E. C.; ZAGO, F. C. S.; GAVIOLI, L. F. P. Musicalização e saúde emocional: uma interface necessária para a educação. In: BIANCHESSI, C. (org.). **Interfaces entre saúde e educação: saberes, práticas e olhares interdisciplinares**. v. 5. Curitiba: Editora Bagai, 2024. p. 9-18. DOI: <https://doi.org/10.37008/978-65-5368-535-2.28.12.24>

COSENZA, R. M.; GUERRA, L. B. **Neurociência e educação: como o cérebro aprende**. Porto Alegre: Artmed, 2011.

CORRÊA, C. B. R.; SILVA, D. da S. C.. **Neurociências e primeira infância**. Trabalho de conclusão de curso. Universidade Presbiteriana Mackenzie, p. 19, São Paulo, 2024. Disponível em: <https://dspace.mackenzie.br/handle/10899/41711>.

COSTA, J. C. da. Neurodesenvolvimento e os primeiros anos de vida: genética vs. ambiente. RELAdEI, **Revista Latinoamericana de Educación Infantil**, 7(1), 2018. Disponível em: <https://repositorio.pucrs.br/dspace/handle/10923/15633>.

COSTA, R. L. S. Neurociência e aprendizagem. **Revista Brasileira de Educação** v. 28, 2023. <https://doi.org/10.1590/S1413-24782023280010>.

COSTA, T. S.; OMIZZOLO, S. R.. **Concepções docentes sobre a aprendizagem na primeira infância em uma escola municipal de educação infantil de Imperatriz- MA**. Monografia (Graduação) - Universidade Federal do Maranhão, Imperatriz, 2026. Disponível em: <https://monografias.ufma.br/jspui/handle/123456789/10393>.

CUSICK, S. E.; GEORGIEFF, M. K. O papel da nutrição no desenvolvimento cerebral: a oportunidade de ouro dos 'primeiros 1000 dias'. **J Pediatr**. 2016. Doi: <https://doi.org/10.3389/fnut.2025.1673003>.

LIMA, R. F. de. **Atenção**. In: SEABRA, A. G.; DIAS, N. M. (org.). Avaliação neuropsicológica cognitiva: atenção e funções executivas. v. 1. São Paulo: Memnon, 2014. p. 15-23.

MACHADO, M. V.; CASARIN, M. M.. **A música e a infância: contribuições para o desenvolvimento da linguagem na criança**. Cadernos da pedagogia v. 18 n. 42 (2024): Dossiê - Educação Infantil em questão: especificidades para a docência e a formação. Disponível em: <http://cadernosdapedagogia.ufscar.br/index.php/cp/article/view/2141>.



OLIVEIRA, N. L. B. C.; SILVA, A. L. G. da; NUNES, J. B. A.. **Desenvolvimento das aprendizagens na educação infantil:** contribuições da neurociência / Dissertação apresentada ao Programa de Pós-Graduação Stricto Sensu Mestrado Profissional em Educação e Diversidade da Universidade do Estado da Bahia, 2024. Jacobina – BA. Disponível em: <https://saberaberto.uneb.br/handle/20.500.11896/6239>.

PACÍFICO, M.; VERGUTZ, S. A. B.; MATTOS, J. C. S. de; AGUERO, L. de O. Neuroeducação: entre avanços e expectativas. In: PACÍFICO, M.arsiel (org.). **Pesquisas em educação: formação de professores, culturas e diversidade.** Campo Grande: Secretaria de Estado de Educação de Mato Grosso do Sul, 2024. p. 106-122.

STRAUSS, E.; SHERMAN, E. M. S.; SPREEN, O.. **A Compendium of Neuropsychological Tests:** Administration, Norms, and Commentary. 3. ed. Oxford: Oxford University Press, 2006.

SEVERINO, A. J. **Metodologia do trabalho científico.** 23. ed. São Paulo-SP: Cortez Editora, 2007. v. 1. 304p.