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NEUROPSYCHOLOGY IN THE LITERACY ACTION PROPOSED BY THE PAULO FREIRE METHOD

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Andressa Lis Fernandes[1], Alcimar de Paula[2], Cleudia Fernandes da Silva Paula[3], Israel Lucas Fernandes de Paula e Silva[4], Ricardo José Viana Sales[5]

ABSTRACT

The article proposes an analysis of the effectiveness of the Paulo Freire method in the literacy of young people and adults, articulating its foundations with neuropsychological constructs related to memory, attention and learning. The initial concern stems from the dropout rate among students enrolled in schooling programs, despite the transformative power of the Freirean method. The research consists of a literature review with authors such as Abramovay (2015), Catânia (1999), Eysenck (2017), Mendonça (2007) and Paulo Freire (1967), articulated with the practical experience of the authors, in order to understand the cognitive processes that sustain the success of the method in Youth and Adult Education (EJA). The sociolinguistic approach, the valorization of the previous experience of the learner and the stimulus to the active construction of knowledge are highlighted. The text deepens the role of the mnemonic system in the effectiveness of the method, evidencing the use of generating words (PGs) and visual and sound resources that favor language decoding, expand working memory and release the attentional system. The search for PGs in everyday materials (newspapers, music, labels, etc.) activates structures such as Inner Scribe and Visual Cache, in addition to expanding the capacity of the episodic buffer, increasing retention from 4 to up to 16 informative units. It is concluded that the integration between significant teaching strategies and neuropsychological foundations enhances literacy in EJA, by making the process more functional, participatory and cognitively stimulating. The study contributes directly to the continuing education of literacy teachers, favoring practices more aligned with the needs of adult learners.

Keywords: Method, Paulo Freire, Neuropsychology, Memory, Learning.

[1]Specialist in Neuropsychology (ALGA METTIG)
Email: andressalf1@gmail.com
[2]Specialist in Neuropsychology (ALGA METTIG)
Email: bispo.depaula@hotmail.com
[3]Specialist in Neuropsychology (UFBA)
E-mail: cleudia.psico@gmail.com
[4] Public Health Physician (FPS)
E-mail: israellucas@hotmail.com
[5] Master in Law, Governance and Public Policy (UNIFACS/BA)
Email: ricardojvsales@gmail.com

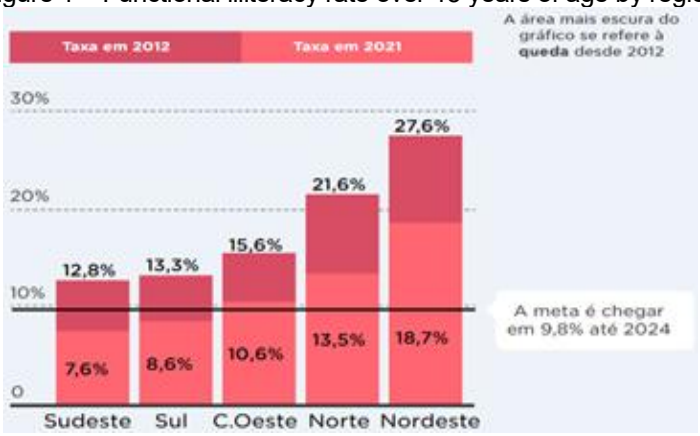
1 INTRODUCTION

Brazil is facing, in contemporary times, an educational crisis marked by high rates of illiteracy. According to data from the Brazilian Institute of Geography and Statistics (IBGE), the illiteracy rate in 2022 was 5.6%, which corresponds to approximately 9.6 million people who cannot read and write.

In addition to absolute illiteracy, the country also lives with alarming rates of functional illiteracy. According to information from the Nexo Políticas Públicas portal (2023), this phenomenon affects individuals who, although formally literate, have significant difficulties in understanding and interpreting texts. The website presents a comparative table by states, which contributes to the regionalized understanding of the indicator.

Among the Brazilian regions, the Northeast concentrates the highest percentage of functional illiteracy, reaching 27.6% of the population over 15 years of age. This data shows that more than a quarter of the inhabitants of this age group did not develop reading skills compatible with the expected schooling, which compromises their full access to citizenship and the world of work.

Figure 1 – Functional illiteracy rate over 15 years of age by region



Source: Taken from the NEXO website https://pp.nexojornal.com.br/Dados/2023/05/19/A-alfabetiza%C3%A7%C3%A3o-e-o-illiteracy-functional-in-Brazil.

In view of the educational scenario mentioned, it is necessary, on an emergency basis, to develop a strategic plan with the purpose of changing this reality. In order to monitor and measure the progress of education in the country, the **Basic Education Development Index (Ideb) was created in 2007** by the National Institute of Educational Studies and Research Anísio Teixeira (INEP). This index is intended to measure the quality of national learning and to establish improvement goals for education, especially from 2012 onwards.

As a complementary action, **QEdu emerged**, a digital platform that provides educational data related to Brazilian Basic Education, allowing the monitoring and analysis of educational

indicators. The tool establishes goals for different federative levels, covering schools, municipalities, states and the country as a whole.

In 2021, Ideb set a national target of 4.9, with only 3.9 being achieved, a result that indicates the inefficiency of current educational projects in promoting significant advances in the school development of students.

In addition, the QEdu presents a comparison between the performance of Brazilian students and international assessments carried out through sampling with students aged 15 and over. These assessments are coordinated by the Organization for Economic Co-operation and Development (OECD) and, in its 2018 edition, measured learning in subjects such as science, mathematics, and Portuguese, as illustrated in Figure 2:

Figure 2 - International Evaluations

Source: taken from the QEdu website

In view of the high dropout rate among students enrolled in educational programs aimed at literacy, there is concern about the effectiveness of the strategies adopted. Considering that the method developed by Paulo Freire is available to intervene and reduce illiteracy rates, it is relevant to question its current application.

Although Paulo Freire's work is widely disseminated, it is still questioned whether the educators of the Youth and Adult Education (EJA) modality have, in fact, mastered the fundamentals and methodologies proposed by him. Investigating whether this method has been effectively used to mitigate the number of illiterate people and understanding how neuropsychology analyzes its effectiveness are pertinent questions that deserve academic attention.

This work aims to understand, in the light of neuropsychological constructs, the cognitive processes and strategies that favor the success of the Freirean method in adult literacy. To this end, a literature review was carried out based on authors such as Abramovay (2015), Catânia (1999), Eysenck (2017), Mendonça (2007) and Paulo Freire (1967), in addition to the analysis of the practices of the authors of this study. Thus, it seeks to contribute to the elaboration of training materials for literacy teachers of EJA.

The study describes Paulo Freire's sociolinguistic method, as well as its neuropsychological foundation, highlighting its relevance for the continuing education of education professionals. Next, a practical recapitulation of the method will be carried out, identifying its main elements and the contributions offered by neuropsychology to the improvement of literacy action.

1.1 PAULO FREIRE'S SOCIOLINGUISTIC METHOD

Beck (2016) analyzes the work of Paulo Freire and describes his method of literacy in a clear and accessible way. The Patron of Brazilian Education developed a pedagogical proposal aimed at adults in the process of literacy, based on the life experiences of the learners themselves. Its objective was to break with traditional methodologies, such as the use of standardized booklets, and build a more **active, participatory and contextualized** educational practice.

Conventional booklets taught expressions such as "the ox drools" and "grandma saw the grape", without any relation to the sociocultural reality of the student. Freire proposed the use of the so-called **generative words (PGs),** taken directly from the daily lives of literacy students, thus promoting a teaching process based on **co-participation**, **critical thinking** and **the autonomy** of the subjects, characteristics scarce at the time for the illiterate population.

The method was developed while Freire was acting as director of the Department of Cultural Extensions at the University of Recife. It was tested in the city of Angicos, in the state of Rio Grande do Norte, where, in just **40 hours**, it allowed **300 people** to learn to read and write. This expressive result evidences the **effectiveness** of the proposal, enabling a rereading in the light of **neuropsychology**, especially with regard to the activation of cognitive structures related to language and memory.

The main practical aspects of the method will be described below, highlighting its specificities and contributions to the education of young people and adults.

1.2 PAULO FREIRE'S SOCIOLINGUISTIC METHOD: STAGES AND DEFINITIONS

Paulo Freire's sociolinguistic method is divided into three main phases: **investigation, thematization and problematization**, as described by the author himself (FREIRE, 1967, p. 111). In addition, Mendonça (2007, p. 105) proposes a methodological approach composed of five stages: **coding, decoding, analysis, synthesis and fixation of reading and writing,** aligned with the levels of development of written language — pre-syllabic, syllabic and alphabetic.

1.2.1 Investigation Phase

In this phase, teacher and student share knowledge in a horizontal relationship, without subjection. The objective is **to map the vocabulary universe** of the student and the community in which he is inserted, identifying the central themes of his biography. The proposal is to value the non-formal knowledge already acquired by the practice of the mother tongue and by social experience.

The investigation includes the survey of approximately **500 words** from the student's daily life, with the selection of the so-called **generating words (PG),** which must meet the following criteria:

- **Phonetic richness**
- **Degree of phonetic difficulty**, in progressive order
- **Pragmatic content**, i.e. contextual and social relevance (e.g., "packaging", "brick", "cement", "ladder")

1.2.2 Thematization and Problematization Phase

The chosen PG is analyzed with the group, seeking to understand its importance in the **social, family and economic context** of the students. This reflection promotes the development of critical awareness and connection with reality.

1.2.3 Encoding and Decoding Steps

Codification consists of the visual or symbolic representation of PG, through resources such as orality, drawing, music, mime or dramatization — always respecting geographical, historical and cultural variations.

Decoding, on the other hand , corresponds to the rereading of the reality associated with PG. Initially, the students explore the **sociopolitical meaning** of the word, arousing interest in emerging themes of everyday life. This stage aims to develop critical thinking and reflective positioning in the face of the circumstances experienced.

1.2.4 Didactic Activities and Language Levels

During the process, activities related to the **pre-syllabic**, **syllabic** and **alphabetic** levels are applied. The PG "escada", for example, can be identified in terms of sound and spelling. Students perform exercises to recognize the word and the initial letter, based on various texts such as **song lyrics, poetry, labels, pamphlets, newspapers and books**.

1.2.5 Analysis and Synthesis Stages

In this phase, the **syllabic family of PG** is presented, using new word discovery cards. Students are invited to **recognize syllables** in different typographic formats (uppercase and cursive) and, subsequently, to identify **new words** from the syllabic combinations constructed (Figure 3 and Figure 4).

Figure 3 – Analysis of the Generating Word (PG)

ES-CA-DA

SA – LO – OS – VA – **ES**	*es - is - os - us - as*
CA – EM – **CA** – CO – QUE	*ca - ce - cu - co - ci*
DA – LA – DO – VE – CA	*de - do - da - di - du*
A I O U E	*a o u i e*

Source: extracted from the book Literacy: sociolinguistic method

1.2.6 Stage of Synthesis and Composition of Words

After the analysis phase, in which the student identifies the letters and syllables of the generating word (PG) through the discovery form, the synthesis stage begins. At this stage, the learner is encouraged to **compose new words** using the syllables that make up the PG, as in the example of the word "ESCADA": the **initial (ES), medial (CA)** and **final (DA)** syllables are explored with the aim of constructing different words.

A playful strategy recommended for this activity is the use of **syllabic dominoes** (Figure 5), which stimulates the recognition and recombination of syllables in meaningful contexts. This tool favors the development of phonological awareness and lexical organization.

The student can compose the new words orally and record them on the board or on the blackboard, and is later invited to read these words aloud. Then, they are asked to copy the words identified in their notebook, reinforcing the link between reading, writing and meaning.

The compositions generated from the discovery form will be illustrated in **Figure 4**, showing how vocabulary expansion and deepening of learning through the sociolinguistic method are developed in practice.

Figure 4: New word discovery card
HORSE CALLUS COW MOON HOUSE DICE
CABBAGE HURTS GO SCHOOL FALLS
Source: extracted from the book Literacy: sociolinguistic and adapted method

In the analysis and synthesis phase, during the discovery stage, the learner continues to explore the initial, medial and final syllables of the generating word (PG), with the objective of constructing new words. One of the strategies used is the **syllabic domino** (Figure 5), which consists of a playful activity that favors the phonological association and recomposition of syllables.

After mastering this stage, the student is led to the process of **composing words**, through the joining of the identified syllables. This activity can be carried out collectively on the blackboard, followed by the reading of the words created. Subsequently, it is suggested that each word be **copied in the notebook**, reinforcing the relationship between listening, speaking, reading and writing.

The development of autonomy in the construction of words indicates that the student is prepared to participate in **didactic activities at the syllabic level**, which deepen his contact with the structure of the written language and favor progression to the alphabetic level.

Figure 5: Syllabic dominoes

1.2.7 Stage of Fixation of Reading and Writing

The phase of **fixing reading and writing consists of** consolidating the skills acquired by the student throughout the synthesis process. At this stage, the student is asked to perform activities such as **reading and writing compound words**, dictation of terms and phrases, **word search** exercises, crossword puzzles, as well as oral **and written transcription tasks** from the regional dialect to the standard norm of the Portuguese language. It is complemented by activities of **interpretation and textual production**, which aim to give meaning to linguistic structures and lived experiences.

1.2.8 Problematization Stage

The **problematization** phase closes the Freirean methodological cycle and is characterized by the critical questioning between educator and student. From the dialogue about the "why" of each situation addressed, the development of an **investigative and reflective posture is promoted**. This practice replaces the magical vision with a **critical understanding of reality**, encouraging the subject to seek **transformative answers**, overcome obstacles and strengthen their **citizen autonomy**.

In summary, the **Paulo Freire method** favors literacy through **dialogical mediation**, anchored in the life experiences of the subjects and in the words that emerge from their sociocultural realities. From the identification of the generating word (PG), the decoding begins, which allows the appropriation of the letters, syllables and the structure of the words. The process culminates in the understanding of the symbolic and contextual content of linguistic expressions, promoting the **development of critical thinking** and the construction of the **learner's autonomy** as an active citizen.

1.3 REREADING OF THE PAULO FREIRE METHOD BY NEUROPSYCHOLOGY

1.3.1 Learning and memory

Learning consists of the integration of cognitive, metacognitive, affective, motivational, and behavioral factors that interact during the process of knowledge construction. From the perspective of **self-regulated learning**, the student is seen as the protagonist of his own learning process, being able to develop strategies to control his psychological processes throughout the school trajectory. This perspective should be fostered in schools as part of the integral education of students (BORUCHOVITCH; GOMES, 2019).

Concomitantly, memory plays an essential role in the learning process, being present in multiple daily human activities. Without it, it would be unfeasible to maintain the communicative flow, remember relevant information, write academic texts, recognize people or understand readings.

According to Eysenck (2017, p. 209), the learning and memory process occurs in different stages, including: **encoding**, **storage,** and **retrieval**. Coding consists of the perception of sensory stimuli, which are transformed into cognitive information. Storage refers to the recording of this information in the mnemonic system. Retrieval, on the other hand, is the ability to access and retrieve previously stored data, allowing the practical application of the acquired knowledge.

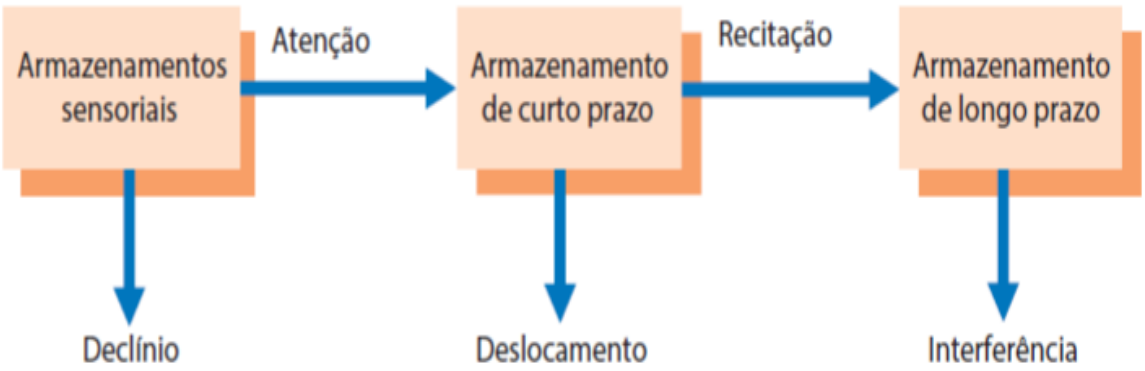
1.3.2 Subtypes of memory

Eysenck (2017, p. 210) classifies memory into three systems according to their capacity and duration:

- **Sensory memory**: immediate and brief recording of the sensory stimuli captured (visual, auditory, etc.).
- **Short-term memory**: Limited storage, used for momentary retention of information.
- **Long-term memory**: responsible for the stable retention of relevant information, associated with meaningful experiences.

To explain the structure of these systems, the author presents the **multistorage model of Atkinson and Shiffrin (1968),** which describes the basic architecture of human memory. This model proposes that sensory stimuli are initially processed by sensory memory, and, through attention and encoding mechanisms, are transferred to short-term memory. When consolidated, this data is stored in long-term memory, from where it can be retrieved as needed.

Figure 6- Memory multi-storage model proposed by Atkinson and Shiffrin



Source: Memory multi-storage model, as proposed by Atkinson and Shiffrin (1968).

1.3.3 Multistorage Model: Learning, Memory and Applications in Literacy

According to the multi-storage model, proposed by Atkinson and Shiffrin (1968), environmental stimulation is primarily processed by **specific sensory** storage systems, such as visual and auditory ones. This information remains for a short period in these systems, and is later forwarded to **short-term storage** through selective attention. Those that are revisited or recited repeatedly can then be consolidated into **long-term storage**. According to Eysenck (2017, p. 210), there is a direct relationship between the **frequency of recitation** in short-term storage and the **intensity of the memory trace** maintained in the long term.

1.3.4 Sensory storages

Sensory systems constitute short-term memory reserves, with the most studied being **iconic (** visual) memory and **echoic** (auditory) memory. Iconic memory retains visual information for about 500 milliseconds, operating from mechanisms responsible for visual perception. Such a structure allows the visual stimulus to remain accessible for longer, being essential in the reading process.

Studies conducted by Persuh et al. (2012) indicate that iconic memory is significantly affected when the subject performs tasks that require **divided attention**. This finding contributes to understanding the positive results obtained during the literacy process promoted by Paulo Freire in Angicos, which spared divided attention by using words previously known by the students, both in terms of sound and meaning. This procedure preserved the iconic memory, facilitating cognitive processing and learning.

Echoic memory, on the other hand, according to Eysenck (2017), retains auditory information for about two seconds. During verbal exposition, attention is essential so that information is temporarily maintained and can be integrated into the understanding of the discourse. This same mechanism is activated during reading aloud, because when listening to their own speech, the learner activates previously stored content, favoring **meaningful assimilation**.

1.3.5 Short-term memory

Short-term memory (PCM) has **limited capacity**, being able to retain approximately **seven units** (MILLER, 1956). However, this capacity can be expanded through "***chunks***", which are groupings of smaller information integrated into meaningful units. A classic example is the memorization of the CPF number in groups of three digits.

According to Corrêa (2010, p. 217), memory capacity varies according to the type and familiarity of the items. For digits, the limit is about seven units; for letters, six; and for words, five. Longer words tend to reduce this ability, while familiar words are more likely to be retained. This performance also depends on the time required to **verbally articulate** each unit and the presence of lexical meaning.

An illustrative example is the encoding of binary numbers in decimal or hexadecimal format. The binary sequence 0010 1000 1001 1100 1101 1010, for example, can be more easily memorized as 2, 8, 9, C, D, A by subjects with knowledge of numerical conversion — demonstrating that chunks are most effective when **they carry meaning**.

Other factors can influence MCP, making it difficult to define the exact number of units retained. According to Cowan (2001), the capacity of MCP would be approximately **four**

chunks in young adults, being lower in children and older adults – an estimate known as the "**golden number**".

1.4 WORKING MEMORY

In the current literature, short-term memory has been largely replaced by the concept of **working memory** or **working memory**, which is highlighted in this study. This structure involves not only retention, but also **active manipulation** of information in complex tasks, being fundamental for school performance and linguistic processing during literacy.

Short-term memory (PCM) plays an important role in everyday life, being responsible for enabling immediate mnemonic actions, such as remembering a phone number shortly before performing it. In this context, Eysenck (2017, p. 215) highlights:

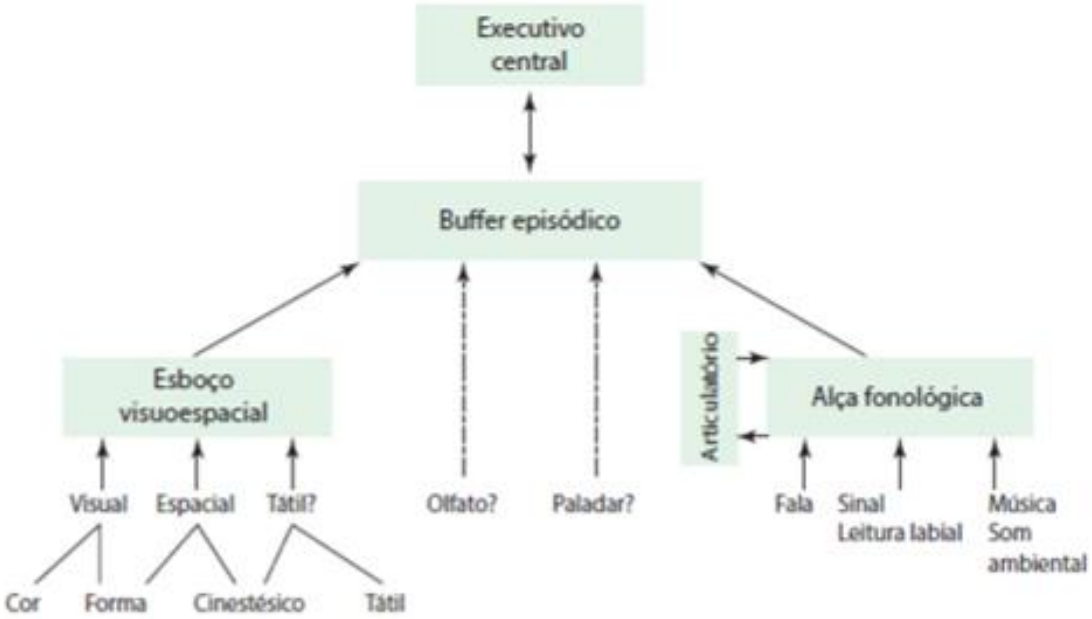
"Alan Baddeley and Graham Hitch (1974) (...) They argued that, in general, we use short-term memory when performing complex tasks. With such tasks, we perform several processes. However, you also have to briefly store information about the outcome of early processes in short-term memory as you move on to later processes. For example, this happens very often in mental arithmetic. One of Baddeley and Hitch's central insights was that short-term memory is essential in the performance of numerous tasks that are not explicitly memory tasks. ”

In this way, MCP is recognized as an integral part of a more comprehensive system called **working memory** (or working memory). This conception replaces the traditional idea of short-term storage, by presenting memory as a dynamic and functional structure composed of **specialized subsystems** (BADDELEY, 1992, p. 5).

According to Baddeley (2012, p. 22), working memory is composed of four interdependent subsystems. The first is the **central executive**, responsible for the overall coordination of cognitive functions and the allocation of attention between tasks. The **phonological loop**, in turn, is in charge of temporarily processing and storing auditory information in phonological form, such as sounds and words. **Visuospatial sketching** acts in the processing and maintenance of visual and spatial data, allowing the manipulation of mental images during tasks such as reading, writing, or navigating environments. The **episodic buffer**, on the other hand , works as an integrative system that temporarily gathers the information from the phonological loop and the visuospatial sketch, organizing it in a contextualized way. These components operate in a dynamic and articulated manner, sustaining performance in complex tasks that require attention, memory, and reasoning simultaneously.

This model reinforces the idea that memory is composed of multiple interactive layers, being fundamental in the performance of **complex, cognitive and school tasks**, such as reading, writing and solving mathematical problems.

Figure 7 - Baddeley's working memory model showing the flow of information from perception to working memory



Source: Baddeley (2012). ©Annual Reviews 2012. With permission from Annual Reviews.

Eysenck (2017, p. 220) highlights that the central executive is a fundamental component for the proper functioning of working memory. This structure has limited capacity and performs functions similar to those of attention, being responsible for dealing with tasks that involve varied cognitive demands. To perform its functions, the central executive uses subordinate systems for specific purposes, such as the phonological loop and the visuospatial sketch. The phonological loop maintains the temporal sequence of the words presented, contributing to auditory and linguistic processing, while the visuospatial sketch is responsible for storing and manipulating information of a visual and spatial nature.

These three components—central executive, phonological loop, and visuospatial sketch—have limited capacity and function relatively independently. In this context, two assumptions are considered essential: the first indicates that when two tasks use the same subsystem, it is not possible to perform them simultaneously effectively; On the other hand, if the tasks depend on different components, it is possible to perform them both simultaneously and separately.

Regarding the structure of the phonological loop, Eysenck (2017, p. 216) explains that it is composed of two integrated systems. The first is passive phonological storage, which is directly related to speech perception and acts as a temporary retention system for heard sounds. The second is the articulatory process, linked to the production of speech (as in recitation), which allows access to and activation of phonologically stored contents. This articulation between perception and phonological production is essential for the proper

functioning of short-term verbal memory, and is especially relevant in literacy and reading tasks.

Figure 8 - Phonological loop system as imagined by Baddeley (1990).

Source: Baddeley (2012). ©Annual Reviews 2012. With permission from Annual Reviews.

Recent research reveals that there are complex underlying processes related to the phonological loop that still require clarification for a better understanding of its interactions with memory mechanisms. Acheson et al. (2010) identified that the effects observed in mnemonic activities do not exclusively involve the phonological loop, as semantic processes also play a relevant role. Schweppe et al. (2011) pointed out that the working memory model is specified, highlighting that studies have emphasized similarity at the phonemic level. However, it is still unclear whether the effect of phonological similarity depends more on acoustic similarity (similar sounds) or articulatory similarity (similar articulatory movements), as discussed by Eysenck (2017, p. 215).

In this context, Baddeley (2012) observes that word recall in sequential tasks has a higher performance with short words, not because of the size, but because of the orthographic neighborhood effect. Jalbert et al. (2011) explain that this neighborhood consists of words of the same length that differ by only one letter, which generates an increase in memorization capacity through familiarity between items. This phenomenon contributes to the explanation of mnemonic facilitation in Paulo Freire's method, which values words common to the student's daily life, avoiding attentional overload. The decoding process carried out by the method favors the orthographic neighborhood, promoting natural memorization and facilitating the literacy process.

Eysenck (2017) reinforces the importance of the phonological loop in everyday life, showing that the act of remembering words is essential for language learning. The structure is composed of passive phonological storage, related to speech perception, and the articulatory process, which allows access to information through recitation. In the case of the tasks with Generating Words (PG), used by Freire, these are previously known by the

students, favoring the graphic memory of the dictated word without requiring divided attention, which frees up cognitive resources for new learning.

Regarding the visuospatial sketch, it is a structure responsible for the temporary storage and manipulation of visual patterns and spatial movements. Visual processing involves identifying the "what," while spatial processing deals with the "where." According to Eysenck (2017, p. 219), based on Logie (1995), the visuospatial sketch is subdivided into Visual Cache (which stores shape and color) and Inner Scribe (which processes spatial and movement information). Both structures act in the transfer of information to the central executive. The Freire method uses this system by encouraging students to identify PGs in everyday materials, such as labels, songs, magazines, and poems, activating both the Visual Cache and the Inner Scribe and promoting an interaction between the components of working memory.

The central executive is another essential component in complex cognitive activities, such as problem-solving, decision-making, and the simultaneous execution of tasks. Its function is related to the manipulation of information, and not to storage, articulating four fundamental processes: the concentration of attention, the division of attention between different stimuli, the alternation between tasks and communication with long-term memory. According to Eysenck (2017, p. 220), this structure is located in the prefrontal cortex, although it depends on other brain areas for its full functioning.

The episodic buffer, as proposed by Baddeley (2012), is responsible for the integration of episodes and events from visual, auditory and other codes. This subsystem connects the components of working memory to perception and long-term memory, with an estimated capacity of four *chunks* or units of integrated information. When words are presented in isolation, the immediate retention capacity is around five words. However, when presented as contextualized sentences, this capacity increases to up to 16 words (Baddeley et al., 1987), exceeding the limits of the phonological loop and revealing the potential of the episodic buffer. This characteristic of the system explains, in part, the success of the Freire method in using words inserted in sentences with meaning, enabling greater retention and mastery of written language.

The ability to produce immediate memories with up to 16 words derives from the integration promoted by the episodic buffer, operating with the help of the central executive, who organizes the information into *chunks* (BADDELEY; WILSON, 2002). Such understanding reinforces the importance of including this neuropsychological knowledge in continuing education of teachers, especially in Youth and Adult Education, allowing educators

to develop strategies that stimulate the nervous system in an efficient, motivating and meaningful way.

Neuropsychology offers important contributions to the educational field by explaining both typical brain functioning and disorders that affect the learning process. By identifying neuropsychological predictors during schooling, it is possible to develop alternative pathways through sensory strategies that favor memory, attention, and literacy — as demonstrated in the Freirean approach.

2 RESULTS AND DISCUSSION

Paulo Freire's method has as its essence to transform the learner into an active and participative subject in the construction of his own knowledge. By integrating "learning how to do something" with what you "already know how to do", you promote continuous and meaningful knowledge. In this way, the learner ceases to be just a passive receiver to become a protagonist in the elaboration of contextualized knowledge. Many learners have practical knowledge, but they need to develop awareness of such knowledge — thus promoting reflective learning that is integrated with everyday experience.

The use of generating words (PG), previously known in terms of sonority and meaning, avoids attentional overload by releasing the sensory systems from competing stimuli, especially iconic and echoic memories. This factor contributes significantly to the decoding process, favoring the **phonological and orthographic neighborhood**, elements that facilitate memorization. As a result, there is greater fluidity in reading and graphic mastery of the writing of the mother tongue, expanding the student's learning capacity.

The search for PG in diverse materials — such as newspapers, labels, music and poems — constitutes an exploratory process that directly activates the **visuospatial sketch**, specifically the ***Visual Cache*** and ***Inner Scribe components***. This movement stimulates visual and spatial memory, favoring the construction of meanings through the manipulation of mental images, which expands the mnemonic capacity in interaction with the **central executive**, responsible for the coordination and integration of the working memory subsystems.

In addition, the method benefits from ***episodic* buffering**, especially when the PG is presented in sentence form, within a meaningful context. This procedure increases the recall capacity from 4 to up to 16 units, overcoming the limits of the phonological loop, as demonstrated in the research of Eysenck (2017). Such mnemonic expansion occurs through the integration of linguistic *chunks*, promoted by the central executive, favoring the understanding of the content and the mastery of writing.

The integrative analysis between the foundations of Paulo Freire's sociolinguistic method and the principles of neuropsychology highlights the transformative potential of literacy based on dialogue, contextualization and activation of cognitive structures essential to learning. By privileging generative words extracted from the sociocultural universe of the learner, Freire promotes not only the mastery of written language, but also the critical awareness and autonomy of the subject.

The articulation between the subsystems of working memory — central executive, phonological loop, visuospatial sketch and episodic buffer — reveals how the method functionally stimulates the processes of encoding, storage and retrieval of information, facilitating the acquisition of reading and writing. In addition, the proposed methodological structure respects the pace of each learner and reduces attentional overload, favoring meaningful learning.

These results indicate that Paulo Freire's method, by relying on the subject's cognitive and affective principles, is articulated with subsystems of human memory in a functional, efficient and humanizing way. Such an approach expands the potential of literacy, promotes pedagogical inclusion and strengthens the critical role of the learner in the world.

3 FINAL CONSIDERATIONS

From the reflections developed and the contributions of neuropsychology, it was possible to understand in greater depth Paulo Freire's method and its impact on the promotion of significant literacy. It was evidenced that the use of generative words and respect for the sociocultural universe of the student activate relevant mnemonic structures, favoring learning with greater fluidity, efficiency and retention.

It is essential that teachers participate in training processes that contemplate not only the principles of the Freirean method, but also the neuropsychological bases that support it. This training should cover from Youth and Adult Education to other segments of basic education, contributing to the reduction of the rates of illiterate students.

From this, a fundamental question arises: does the teacher, when creating and applying teaching methodologies, really understand "how the learner's brain learns" in its multiple dimensions? It is therefore necessary to build more appropriate paths for students who face difficulties in school monitoring.

In this sense, the urgency of greater approximation between neuroscience and educational practice is pointed out. Neuropsychological findings on attention, memory, information processing, and executive functions can be incorporated into teacher training curricula, contributing to the construction of more effective, inclusive, and neurologically

sensitive school environments for human development. With this, the bridge between theory and practice, between science and teaching, and between the educator and his commitment to emancipatory learning is strengthened.

REFERENCES

Baddeley, A. (2010). Memória de curta duração. In A. Baddeley, M. C. Anderson, & M. W. Eysenck (Eds.), Memória (pp. 1–XX). Artmed.

Beck, C. (2016). Método Paulo Freire de alfabetização. Andragogia Brasil. https://andragogiabrasil.com.br/metodo-paulo-freire-de-alfabetizacao/

Boruchovitch, E., & Gomes, M. A. M. (2019). Aprendizagem autorregulada: Como promovê-la no contexto educativo? Vozes.

Catania, C. A. (1999). Aprendizagem: Comportamento, linguagem (2nd ed.). Artmed.

Corrêa, A. C. O. (2010). Memória, aprendizagem e esquecimento: A memória através das neurociências cognitivas. Atheneu.

Eysenck, M. W., & Keane, M. T. (2017). Manual de psicologia cognitiva (L. F. M. Dorvillé & S. M. M. da Rosa, Trans.; A. Jaeger, Rev. técnica) (7th ed.). Artmed.

Freire, P. (1967). Educação como prática da liberdade. Paz e Terra. http://dx.doi.org/10.1590/S0101-73301997000200009

Freire, P. (1996). Pedagogia da autonomia: Saberes necessários à prática educativa. Paz e Terra.

Germano, J. W. (1997). Como quarenta horas de Angicos. Educação & Sociedade, 18(59), 391–395. http://dx.doi.org/10.1590/S0101-73301997000200009

Instituto Brasileiro de Geografia e Estatística. (n.d.). Pesquisa Nacional por Amostra de Domicílios Contínua - PNAD. https://biblioteca.ibge.gov.br/visualizacao/livros/liv101576_informativo.pdf

Mendonça, O. S., & Mendonça, O. C. (2007). Alfabetização: Método sociolinguístico: Consciência social, silábica e alfabética em Paulo Freire. Cortez.

Ministério da Educação. (2017). Brasil Alfabetizado será ampliado em 2017 e atenderá 250 mil jovens e adultos. http://portal.mec.gov.br/ultimas-noticias/204-10899842/39281-brasil-alfabetizado-sera-ampliado-em-2017-e-atendera-250-mil-jovens-e-adultos

Ministério da Educação. (n.d.). Programa Mais Alfabetização. http://portal.mec.gov.br/component/content/article?id=62871

Ministério da Educação. (2018). Programa Mais Alfabetização - Manual Operacional do Sistema de Orientação Pedagógica e Monitoramento. http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=86471-manual-operacional-2-pmalfa-20-04-2018&category_slug=abril-2018pdf&Itemid=30192

Qedu. (n.d.). São Francisco do Conde - IDEB. https://www.qedu.org.br/cidade/4338-sao-francisco-doconde/ideb

Todos Pela Educação. (n.d.). Perguntas e respostas: O que é e o que faz o FNDE? https://www.todospelaeducacao.org.br/conteudo/perguntas-e-respostas-o-quee-e-o-que-faz-o-fnde