Great Britain Journals Press

London Journal of Humanities and Social Science
General Section

RESEARCH FINGERPRINT

IDENTIFIER
LJRHSS-226267

PEER REVIEW
Double Blind

SIMILARITY CHECK
Perplexity AI and iThenticate

ACCESS
Open Access

LANGUAGE
English

PRINT ISSN
2515-5784

ONLINE ISSN
2515-5792

EDITION

ABBREVIATION
LJRHSS

VOLUME
26

ISSUE
3

YEAR
2026

KEY DATES

RECEIVED
2026-03-10

ACCEPTED
2026-03-16

ONLINE PUBLISHED
2026-04-20

PUBLISHED
2026-06-17

CATALOGING

CROSSMARK DOI
10.34257/LJRHSS226267UK

LCC CLASS
BF371, BF318

Article Record

Reflections on Learning and Memory in Light of the Executive Function of Memory

CORRESPONDENCE

AUTHORS & AFFILIATIONS

José Manuel Salum Tomé PhD. ¶*

PhD, Doctor of Education

¶ Department of Education, Collaborative Research Group for School Development (GICDE), Autonomous University of Chile, Temuco, CI (OA)

ABSTRACT

Animals in the wild face numerous challenges to survive. One fundamental one is obtaining food, and to do so effectively, they must remember the places they have searched. Successfully completing this task requires a system of memory and attention. “Attention is understood as the mechanism that activates the processes involved in the processing of information, participates in and facilitates the work of all cognitive processes, regulating and exercising control over them.” (García, 1997; Rosello, 1998; Ruiz-Vargas, 1987). Attention is a selective process of receiving information that controls the threshold of our cognitive system and also fulfills alert functions, involved in educational and study learning processes, participates as an alert in high-risk professions, in the concentration and focus of research, memory and learning among others.

Index Terms: memory • natural environment • attention • thought

FUNDING
No external funding was declared for this work.

CONFLICTS
The authors declare no conflict of interest.

AI USAGE
No generative AI was used for analysis or results.

HOW TO CITE
Salum Tomé (2026). Reflections on Learning and Memory in Light of the Executive Function of Memory. London Journal of Humanities and Social Science, 26(3), 32-35. DOI: 10.34257/LJRHSS226267UK

ACCESS ONLINE

METADATA CONTINUATION

AUTHOR CONTACT QR LEDGER

José Manuel Salum Tomé
PhD.¶[1]*

ARCHIVAL RECORD

LJRHSS · Vol 26 · Issue 3 · 2026

Article ID LJRHSS-226267 · DOI 10.34257/LJRHSS226267UK

Print ISSN 2515-5784 · Online ISSN 2515-5792

CROSSREF DOI 10.34257/LJRHSS226267UK

RESEARCH ARTICLE

Reflections on Learning and Memory in Light of the Executive Function of Memory

José Manuel Salum Tomé PhD.[¶ΙΙ*]

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ΙΙ PhD, Doctor of Education

AFFILIATIONS

¶ Department of Education, Collaborative Research Group for School Development (GICDE), Autonomous University of Chile, Temuco, Cl (**OA**)

Abstract

Animals in the wild face numerous challenges to survive. One fundamental one is obtaining food, and to do so effectively, they must remember the places they have searched. Successfully completing this task requires a system of memory and attention. "Attention is understood as the mechanism that activates the processes involved in the processing of information, participates in and facilitates the work of all cognitive processes, regulating and exercising control over them." (García, 1997; Rosello, 1998; Ruiz-Vargas, 1987). Attention is a selective process of receiving information that controls the threshold of our cognitive system and also fulfills alert functions, involved in educational and study learning processes, participates as an alert in high-risk professions, in the concentration and focus of research, memory and learning among others.

Keywords: *memory, natural environment, attention, thought*

Correspondence: José Manuel Salum Tomé PhD.

1 STUDY METHOD

The work mainly corresponds to a theoretical-reflective study of a documentary nature.

- It is based on the review and analysis of scientific literature from cognitive psychology, neuroscience, and education.
- It integrates contributions from various authors who have researched memory, attention, learning, and executive functions.
- It uses a conceptual and analytical approach, whose purpose is to reinterpret the role of memory in learning processes from the advances of neuroscience.
- It does not present empirical work or collection of experimental data, but rather an academic reflection supported by specialized bibliography.

The method corresponds to a theoretical analysis based on an interdisciplinary literature review, aimed at conceptually reinterpreting the relationship between memory, attention and learning.

2 OBJECTIVE OF THE STUDY

The central objective of the text is to reflect on and rethink the role of memory in learning, especially considering the executive function of working memory, from the contributions of cognitive neuroscience. More specifically, the study seeks to:

- Analyze the relationship between memory, attention, and learning.
- Examine how working memory and its executive function are involved in the organization of thought and behavior.
- Move beyond the traditional view of memory as a simple storage of information, proposing an active and dynamic role in cognitive processes.

3 LINE OF RESEARCH

The work falls mainly within the following line:
Educational Neuroscience / Cognition and Learning
More specifically, it addresses:

- Cognitive processes in education
- Memory and learning
- Executive functions
- Relationship between neuroscience and educational practices

This line of research seeks to understand how the neural and cognitive processes that support learning work, in order to improve pedagogical strategies and educational processes.

Synthesis Element	Description
Method	Theoretical-reflective study based on a literature review of cognitive psychology and neuroscience
Aim	Analyze the active role of memory—especially working memory—in learning processes
Line of research	Educational neuroscience, cognitive processes, memory and learning

Table 1. Paper Synthesis

4 INTRODUCTION

The three most important functions are selecting information, controlling limited capacity, and keeping physiological, emotional, and neurological processes activated and alert.

Attention is divided into three mechanisms: selective, divided, and sustained attention.

The selectivity of attention can be easily shown in studies that indicate that we focus only on some details of interest to us, and add what is missing based on what we remember.

In general, the complex process of attention is a mechanism that integrates and involves feelings, emotions, and physiological structures that allow our mind to access all existing stimuli. It gives us the ability to select, distribute, and give our own meaning to each thing, object, or place, so that we can discriminate how pleasant and interesting a given event seems to us, in order to effectively guide our tastes, aspirations, and individual potential and to better integrate ourselves socially.

What kind of ability is attention? Psychologists have not yet agreed on this; some consider attention to be just one aspect of perception and other cognitive abilities.

We choose what we will see or hear by anticipating the structured information it will provide. Only those episodes to which we pay attention are anticipated, explored, and recorded; in other words, the act of perceiving requires selectivity.

The selective nature of attention can be easily demonstrated; one way to do this is by recording people's eye movements as they look at paintings or photographs. Studies of this kind indicate that we focus only on certain details; then, based on these cues, we fill in the missing information, perhaps drawing on memories.

Evidence supporting selective attention also comes from divided attention studies. People can learn to perform two complex tasks simultaneously, but there are well-defined limitations. In general, attentional capacity depends on the resources required for the tasks being attempted. If few resources and conscious control are needed, a person can perform other tasks concurrently. If the task is far from automatic, it will require a significant amount of the person performing it. If one wants to perform two difficult tasks simultaneously, it is necessary to practice one of them first until it becomes relatively automatic and requires little attention.

The environment in which we live is complex because it includes a large amount of information that we must attend to and sometimes requires us to respond to more than one piece of information simultaneously.

When attentional and memory processes are activated, we are more receptive to events in the environment and perform an activity or task more effectively, even if it requires more effort.

Through care we become aware of the physiological and pathological changes in our internal environment, whether physical or mental.

Attention does not function in isolation, but is directly related to other psychological processes such as memory.

5 THE BIOLOGICAL VIEW OF MEMORY

With the advances neuroscience has made in understanding how memory works, the view of memory as simply a storage or retrieval of data is changing, giving a more active and dynamic role to the process of memorizing. The use of neuroimaging technologies such as fMRI (functional magnetic resonance imaging), PET (positron emission tomography), EEG (electroencephalography), and MEG (magnetoencephalography) is allowing us to understand how the brain works, moving away from the black box of decades past, filled with unused data and information, and opening up a different perspective on the concept of memorization and, consequently, on learning.

Currently, neuroscientists have identified the existence of different types of memory, either through research or by observing them in people affected by injuries or illnesses (Gluck, Mercado, & Myers, 2009). In his book, *The Brain and Learning*, Jossey-Bass states that memory is not a unitary construct; rather, the characteristics of learning are related to the ability to remember, which is not a passive event but a series of events that organize memories into a meaningful sequence. He considers memory a phenomenon that encompasses the entire brain. Furthermore, he maintains that the brain structures linked to learning mathematics differ from those linked to learning to read or to learning to play the piano. The same is true for the memory systems linked to these activities, which develop at different times. Similarly, remembering who you are or where you are from activates different memories in separate brain regions.

Understanding how memory works reveals the role that experience and practice play in the learning and memorization process by modifying neural structures. On the one hand, there is a direct relationship between the number of experiences involved and the complexity of the environment with the number of structures that change in the brain; and on the other hand, practice increases the capacity to learn and memorize. It is also known that learning and memory not only affect the number of synapses, but also change the structural dynamics of the brain by modifying the supporting cells, the astrocytes, and the blood capillaries that provide nourishment to neurons.

Memory is considered a "storehouse" of information from which data is retrieved when needed. Eric Kandel, Nobel laureate in Medicine in 2000, defines it as "the ability to acquire and store extremely diverse information, from trivialities of daily life to complex abstractions of geography and algebra. Thanks to this ability, we can solve problems by recalling different experiences" (Kandel, 2007). Kandel mentions that with the birth of cognitive neuroscience, about 40 years ago, it became possible to link the strategies used in psychology with biological methods for studying the brain. This allows us to biologically examine the mental processes that take place in the brain, suggesting that creative activities such as language, music, and art are functions involving specialized neural circuits in different brain regions, which are made up of nerve cells, neurons (Kandel, 2007). Taking this biological perspective on the processes involved in learning and memorization, we can say that learning gathers stimuli from the environment through different neural circuits, which then pass them on to be stored in various neural networks—memories. Memory carries out a process of neuronal "manipulation" to store information in these different neural networks, so that finally, through a process of recall, different circuits and neural networks are connected to produce a behavior or solve a problem. This biological view allows us to see a more active role for memory in this entire stage of information processing and retrieval, rather than simply

as a "storage" system. It involves a series of spatiotemporal neuronal interactions between different memories to generate a response to the environment.

6 MEMORY IN AN EXECUTIVE ROLE

One of the memories that led me to start this reflection and rethink that they have a more active role in cognitive processes and therefore in learning, is undoubtedly the executive function of working memory, which has been defined "as the center of the cognitive construct that supports general intelligence and creative thinking" (Geake, 2009).

The executive function of working memory reflects, in a way, the educational field's interest in identifying the brain's center responsible for mentalizing or performing metacognitive functions, controlling processes related to products, planning goals, and maintaining attention on important tasks (Geake, 2009). Working memory manages information by manipulating and maintaining it to accomplish a task, and it plans and organizes goals as the situation demands. This memory undergoes continuous updating and reorganization to fulfill the proposed tasks and is also involved in unconscious processing mechanisms that allow us to find solutions to problems after a good night's sleep. In addition to storing information in long-term memory, working memory manipulates information to guide behavior. Researchers have found evidence of executive control of working memory in many cognitive functions, including: updating memory by receiving and evaluating sensory information to transfer it to long-term memory and retrieve it from there, and deciding which memories are needed for which tasks; The establishment of goals and plans, recording goals, planning how to achieve them in advance, and setting priorities; task switching, monitoring external cues for information indicating the need to switch from one task to another; and stimulus selection and response inhibition, allowing the evaluation of a stimulus selection and the inhibition of a habitual response, shifting attention to a new alternative that responds to a specific context (Gluck, Mercado, & Myers, 2009; Geake, 2009). According to M.C. Etchepareborda, working memory is responsible for channeling the flow of information in the neural system, performing attentional functions, encoding and retaining verbal information, language acquisition, and the processing of visuospatial information. It governs memory systems, distributing attention to each task according to the demands placed on the neural system, the individual's level of experience, and the demands of the environment. Furthermore, as a task is mastered, less attention will be needed, allowing the execution of other compatible tasks, giving working memory a more dynamic and executive role than a simple data file.

Another interesting aspect is the location of the executive center for working memory. Neuroimaging studies show that the neural functions of the frontal cortex are linked to working memory performance. This strengthens the idea of an active role for memory, since the frontal cortex, on the one hand, is the region that would be best connected to perform all these tasks and, on the other hand, has all the necessary inputs and outputs to develop an executive function regarding cognitive and operational control over selective attention (Geake, 2009).

Given what we've just seen about the executive role of memory, the question arises: can we still think that memory is limited to simply storing information? Clearly not; we would have to look at the concept of learning and memory in a different way.

7 LEARNING VS. MEMORIZING

Let's now look at one of the most widely used definitions of learning, that of John Anderson: "Learning is the process by which lasting changes occur in behavioral potential as a result of experience" (Andersen, 2001) (Londoño, 2008). The incorporation of experience is an aspect we can assign to learning, while in recall and behavioral change, one hardly finds a clear distinction between the role of memory and learning. L. Londoño uses the term "lasting" to differentiate between learning and memory. He argues that lasting changes over time endure in learning, while recall does not (Londoño, 2008). If we consider memory as a file storage system, this might be true, but as we have seen, the way memories interact through an executive center gives it a more active role in managing cognitive processes.

According to S. Machado (Machado, et al., 2008), there is a boundary between learning and memory. Both originate in neuronal plasticity, with learning being the process by which we acquire knowledge about our surrounding environment, and memory being the individual's ability to retain and use information in different ways and over different periods.

If we also consider that the executive function of working memory is located in the frontal cortex, we can see that memory plays an active role in complex thinking skills and that we can differentiate it from the role of learning. Memory is defined as that which encodes, stores, retrieves, and manages the information necessary to solve problems or generate behaviors, while learning encompasses all the processes and strategies related to acquiring information about the environment for memory.

8 CONCLUSIONS

For education, differentiating the roles of learning and memory would allow for the optimization of pedagogical strategies aimed at promoting better learning and memorization. These two processes are intimately related and could be situated at two different yet complementary moments in the series of neural processes through which organisms manage and process information provided by the senses to adapt to the demands of their environment. Learning plays a role related to the acquisition of stimuli and the incorporation of new experiences into memory, while memory takes on a more executive role, managing all that information to provide the best response to the environment or the best solution to a problem. As we discover how the dynamics of neural networks operate in the brain during the learning and memorization process, and how this adaptive neuroplasticity occurs to change cognitive capacity, we will be able to better define the domains of learning and memory.

REFERENCES

[1] Anderson, J.R. (2001). *Cognitive psychology and its implications* (5th ed.). Worth Publishers.

[2] Etchepareborda, M. C. (n.d.). *Working memory and executive functions*. Reference academic publication in child neuropsychology.

[3] Geake, J. G. (2009). *The brain at school: Educational neuroscience in the classroom*. McGraw-Hill/Open University Press.

[4] García, E. (1997). *Psychology of attention*. Editorial Síntesis.

[5] *The Brain and Learning*. (2009). Jossey-Bass.

[6] Gluck, M. A., Mercado, E., & Myers, C. E. (2009). *Learning and memory: From brain to behavior*. Worth Publishers.

[7] Kandel, E. R. (2007). *In search of memory: The emergence of a new science of mind*. W. W. Norton & Company.

[8] Londoño, L. (2008). *Learning and memory: a conceptual distinction*. Journal of Educational Psychology.

[9] Machado, S., et al. (2008). *Neuronal plasticity, learning and memory*. Journal of Neuroscience.

[10] Rosello, J. (1998). *Attention and cognitive processes*. Editorial Pirámide.

[11] Ruiz-Vargas, J. M. (1987). *Attention processes and cognitive control*. Alianza Psicología.