

Perspectives of Human Memory Models: A Critical Review

Ph.D. candidate

Suhair S. Al-Faris

● ABSTRACT

- These models have been adopted by many researchers especially with regard to language learning. However, few authors have reviewed them critically. The main **purpose** of this research is to provide a **critical review of the basic memory models by demonstrating their description, showing their evidences, examining their applications and their limitations if any.** In addition, **integrating** them to serve the language teaching/learning process. The main **question** of the research states: **Can memory models be merged in a way to result an eclectic model that provides a typical model which can be implemented in an educational setting?** A critical review is put forward by manifesting the strength and short comings of these models. The research reveals; each memory model has a specific perspective of memory function in terms of processing the data that a human brain receives in daily-base life and how it holds this data otherwise it will be lost. Moreover, **an eclectic model can be formulated to comprise the subdivisions** that suites the teaching strategies adopted. So, in the light of this result, a **researcher can design the model that fits his/her educational setting** making use of them.
- The research is supposed to pave the way for future studies in utilizing more than one memory model and apply them to language teaching/learning process. **This will be followed by a diagram demonstrating all memory taxonomies.**

Introduction

- Memory is the ability of the brain to encode, store, and recall data or information.
- ~~It is the process of retaining information over time in order to influence future actions.~~
- Without the ability to recall prior events, language, relationships, and personal identity development would be impossible. (Tulving, E.1984).
- Memory is frequently conceptualized as an information processing system with explicit and implicit functions composed of a sensory processor, a short-term (or working) memory, and a long-term memory (Cowan, N. 2017). Memory underpins any learning process (Cowan, N.2014). Scholars and researchers through centuries conducted researches and presented models.

Memory; Importance in Cognition and Education

A “cognitive revolution” started during 1950s and 1960s leading to a number of theories represented by George Miller’s (1956) “the magical number seven, plus or minus two”, Richard Atkinson and Richard Shiffrin’s (1968) “the multi-store model”, Fergus Craik and Robert Lockhart’s (1972) “the levels-of-processing model”, Alan Baddeley and Graham Hitch (1974) “Working Memory Model”. These models will be discussed below.

Memory Theories and Models

- That Memory can be divided into subcomponents is not something new; it was adopted in 1890 by William James the prominent American psychologist, then by Donald Hebb in 1949.
- **Miller's (1956) "Magic Number Theory"**
 - Magic Number Theory was proposed by the American cognitive psychologist George A. Miller as "The magic number 7" theory in which he maintained that Short-Term memory (STM) could keep 7 plus minus 2 items.
- **Peterson and Peterson (1959) "Duration of Short-Term Memory Model"**
- Information will be lost quickly from STM if not rehearsed

- **Atkinson and Shiffrin's (1968) "Multi-Store Model"**

- Atkinson and Shiffrin (1968) suggested a Multi-Store Model which is also known as the cognitive model. It postulates that information received from environment goes through three stages: Sensory register then to Short-Term Memory which is able to process information and send it to LTM. Sensory register /Memory (SM) is a kind of memory store where information is received by receptors then being processed by a complicated nervous system with unlimited capacity in filtering sensory information in a short duration for fraction of second

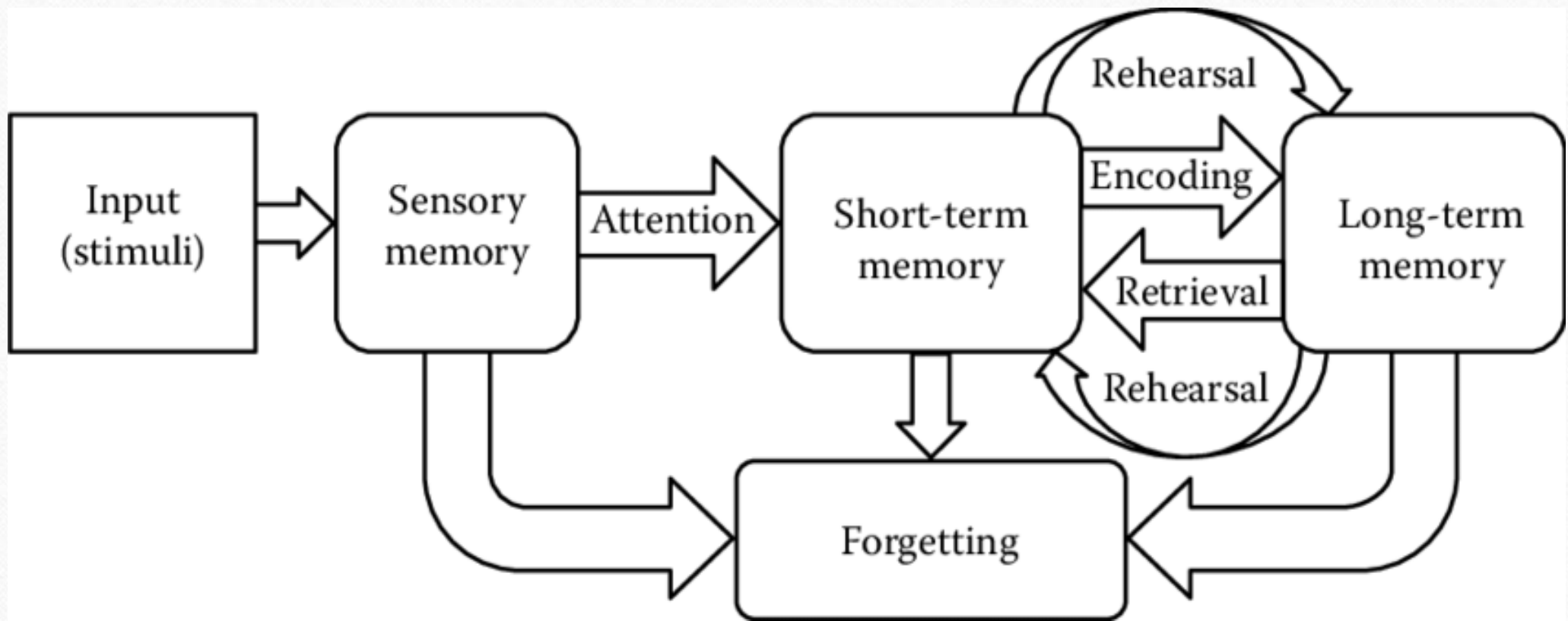


Figure (1) **The Multi-Store Model** of Memory by (Atkinson and Shiffrin ,1968)

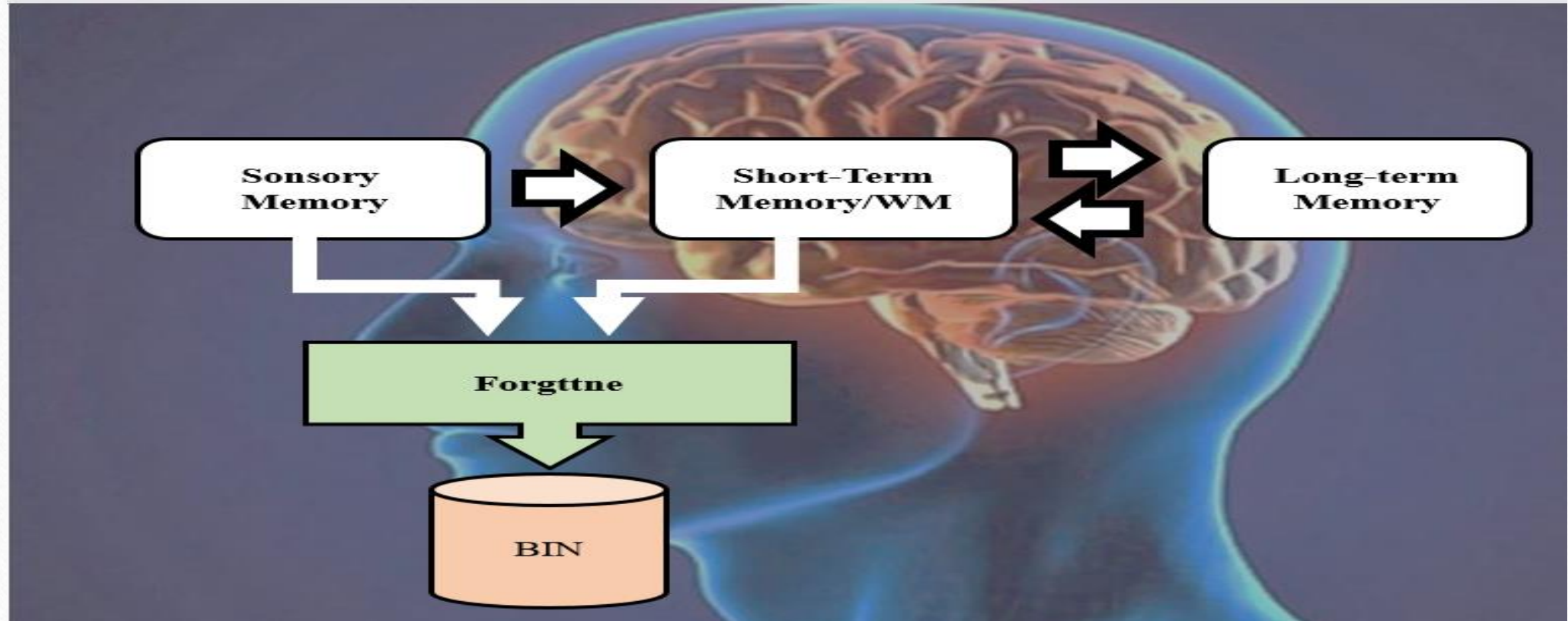


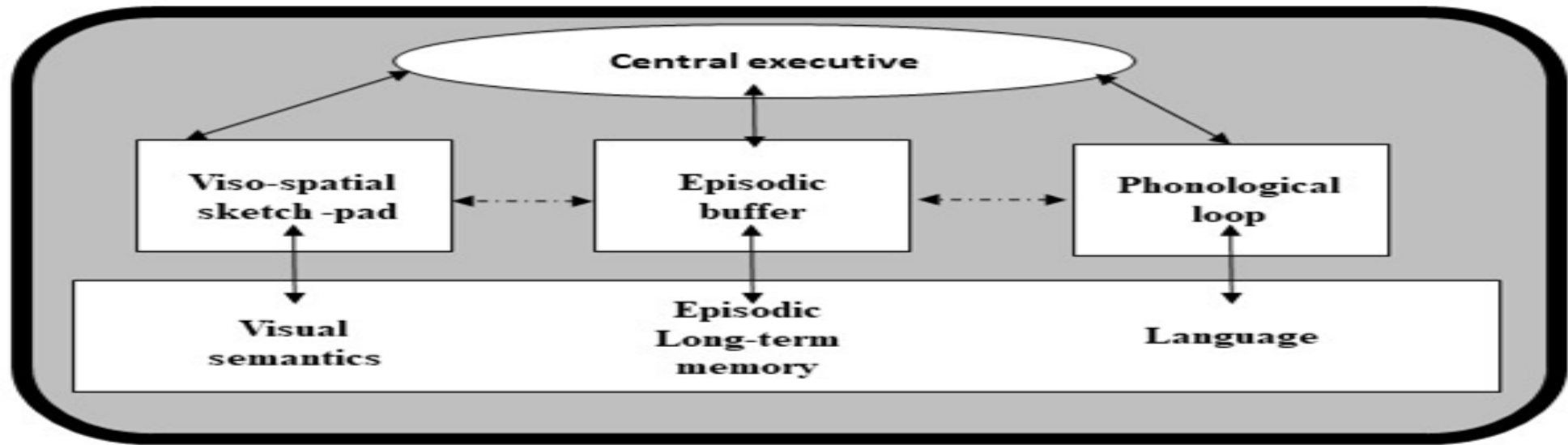
Figure (2) Forgetting information in Sensory and STM/WM by Atkinson and Shiffrin's model(1968)

Craik and Lockhart (1972) “Levels of Processing Model” (LOP)

- Their basic idea was that the way of remembering information depended largely on the way of *encoding* or deeply processing information. They differentiated between two forms of processing; shallow and deep processing that occurs when an observation is made.

Baddeley and Hitch's (1974,1999) "Working Memory Model"

- This model has been proposed to be as a more accurate alternative to Short-Term store (Primary Memory) considering it



Michael T. Ullman's (2001) "Declarative/Procedural Model of Lexicon and Grammar"

- In 2001, the American neuroscientist Michael T. Ullman put forward his Declarative Procedural (DP) model of language which highlights two "Memory" systems; the *declarative* and the *procedural* system which are part of LTM

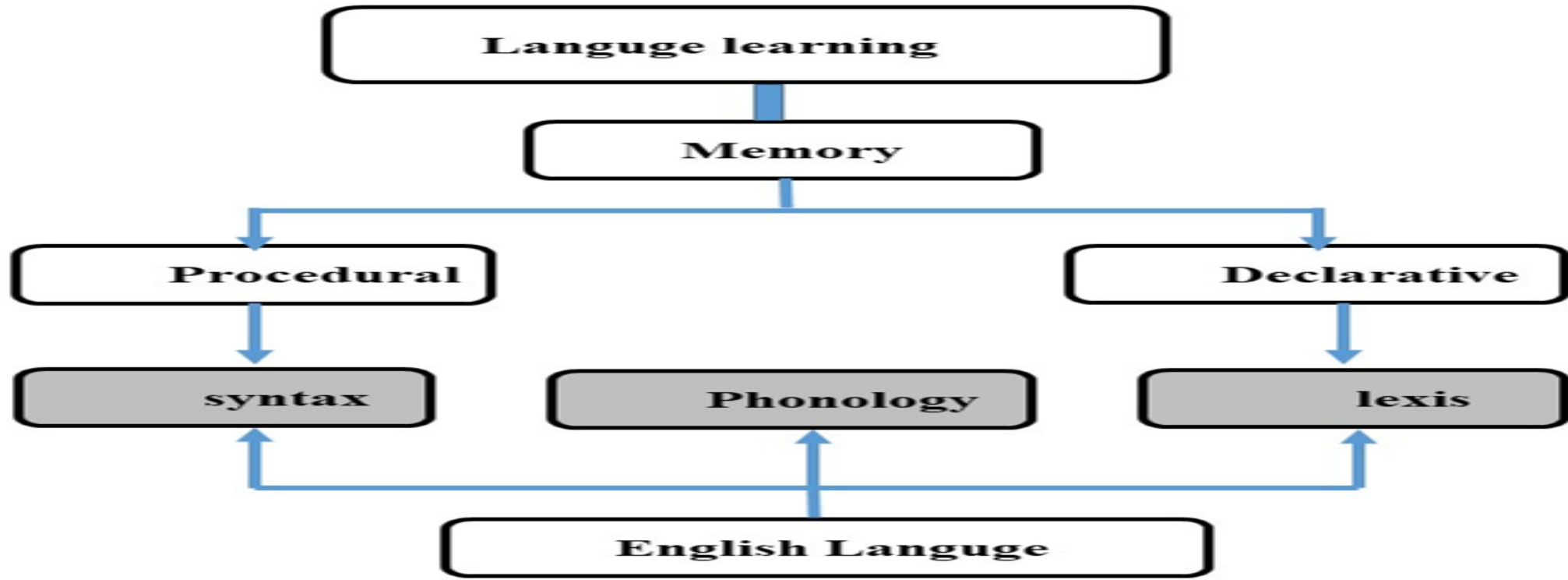


Figure 5: Ullmans' DP Model (2001)

- **Critical Review , Discussion**

- **Conclusion**

- In the light of has been reviewed, the main concern in this study is dealing with two different memory systems as far as learning is concerned; the **STM and the LTM** .It provides the reader with the **perspectives of the psychological bases of how a human receives and processes information** through main stages SM, STM and LTM of the magnificent structure “memory” from different perspectives. Language Learning is one of the most important activities accomplished by memory through implementing relevant learning strategies. Yet, it seems that human **memory is highly intricate and complex**. It needs more time and efforts to understand and learn how it works as well as it is essential to recognize its role in learning and how it can be utilized in language classrooms.

- Therefore, **the academic implication** of this study is **opening access to future researches in integrating more than one memory model for various academic purposes**. Consequently, a generated model can be employed to serve the educational process, in specific, in terms of the need analysis of the targeted community or sample.

-

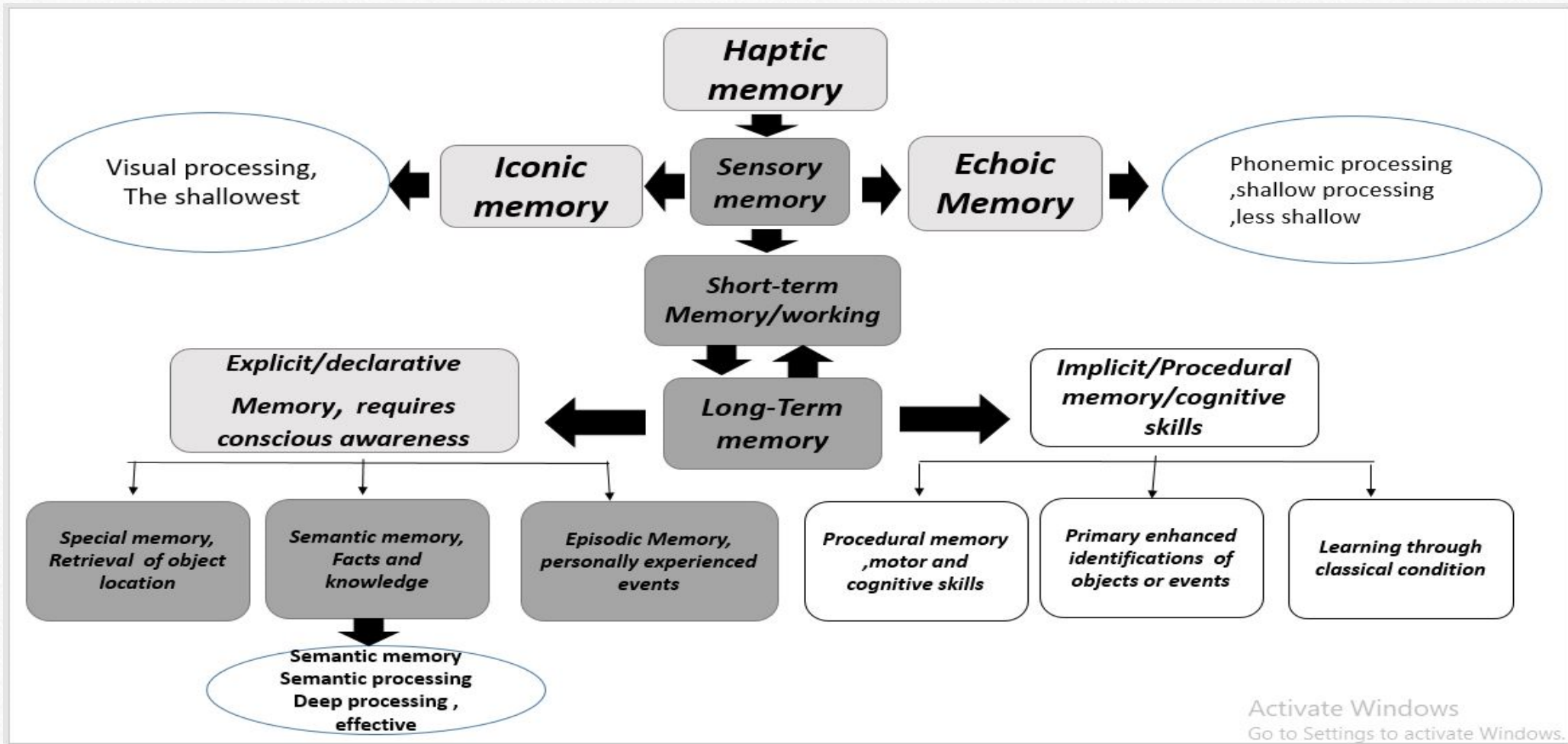


Figure (6) Memory types, stages and processes. An eclectic paradigm by the researcher

Thank you
