# A PSYCHOLINGUISTIC STUDY OF THE COGNITIVE PROCESSES FOR THE UNDERGRADUATE STUDENTS

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## ABSTRACT

This study aims to find out the undergraduate students' awareness of the cognitive processes in recognizing words and sentences, and to what extent they can use these processes? The current approach used for this study is a quantitative research kind that is used to analyze the data obtained. The sample consists of (100) fourth-year students from the English department, College of Education for Human Sciences, University of Wasit. This study concludes that students have some ability to recognize most of the cognitive awareness components in recognizing words and sentences. Based on the findings, several suggestions and recommendations have been made for the University instructors and students to consider increasing their cognitive processes awareness and reading skills.

**Key Words**: Cognitive processes, Cognition, Cognitive awareness, Production, Recognition.

## 1. INTRODUCTION

Language is a system of systems that are composed of many basic components namely: meaning, form, phoneme, etc. while many manipulating different processes, which are described as the cognitive processes such as visual sequential processing, attention, visual discrimination, working memory, immediate memory, etc., are all used for language understanding sake. To create a minimally flexible cognitive system with a range of minimally flexible behavioural output, cognitive processes are processes of information transfer that typically take place to connect multiple (or complex) informational inputs. Cognitive processes are studied in different contexts and analyzed from many different perspectives too. Those processes can be noticed clearly in the fields of linguistics, musicology, anaesthesia, neuroscience, psychiatry, psychology, education, philosophy, anthropology, biology, systemic, logic, and computer science (Von Eckardt, 1996).

Comprehension, decoding, and fluency must become automatic so that they do not need to be consciously thought about to understand and recognize words and sentences. Readers who have to consciously decode words and sentences are easily sidetracked by numerous processes and unable to focus on the meaning of what they are reading.

For successful reading and thorough comprehension of the words and sentences in a written text, the cognitive processes that support decodings, such as attention, visual discrimination, visual sequential processing, immediate memory, and working memory, must be automatic. These abilities are lacking in many readers who struggle. Despite the importance of these skills, many

experts and university instructors disregard them and do not accord them the respect they deserve. Closing the gap between what the research indicates is required for struggling readers and what is offered in our universities is the main challenge in improving word and sentence recognition.

It does not follow cognitive skills that cannot be taught simply because they are not explicitly and academically taught. Techniques to improve fundamental cognitive abilities have been known for more than 50 years and used in a variety of clinical therapies, but they have not been feasible to use in the classroom. These cognitive functions are now observable and quantifiable, and the use of digital games for learning is enabling classroom delivery of cognitive training programs. Therefore, the present study deals with an important area of psycholinguistics and linguistics since it is concerned with uncovering the words and the sentences recognized by undergraduate students. It is necessary to have cognitive processes. Psycholinguists, all over the world, have found that learners operate different cognitive processes to comprehend and read a text in which these processes are in need to be identified.

### 1.1 The Cognitive Processes

To comprehend human behaviour, one must first comprehend the mental processes through which humans collect knowledge and attempt to comprehend it. Not only one process is responsible for imparting meaning to this world; instead, cognitive processes are a collection of processes. Thus, cognitive processes are the mental processes through which humans acquire and comprehend information from the outside environments. Those cognitive processes are basic ones that allow the brain to take in and process information underpin the tasks, which are necessary for reading. Paying attention, memory, following instructions, and organizing information are all essential skills that individuals who struggle with reading disabilities. It is vital to highlight that these cognitive abilities are not just important for reading, they are fundamental for learning any skill (Swanson et al, 2013).

How these processes are classified differs from one author to the next.

As a result, two common classifications will be considered. The first classification divides cognitive processes into three key categories: decoding, fluency, and understanding, which are then further separated into subcategories, these processes focus on operations that address the issue of

invention and production. The second classification divides these cognitive processes into six categories, which deal with the practical or mental components of students or recognition (Siegel, 2005).

Working memory, phonological processing, and syntactic awareness are three cognitive processes that have been demonstrated to be important in the development of reading skills in the English language and to be distributed in individuals with reading disabilities. These three processes have such a strong influence that many psychological educational tests for individuals at risk of learning difficulties include some or all of them (Siegel, 2005).

## 2.RESEARCH INSTRUMENTATIONS

The act of presenting questions, and collecting and evaluating data to find answers is known as research. Numbers, texts, and images can all be converted from data. Researchers are performing a study with quantitative data when data is numbers. The research method is defined by (Leedy& Ormord, 2001; Williams, 2011) as the comprehensive measures done by a researcher before beginning a research project.

Because the current study is dealing with a broad variety of data and statistics, the researcher employs a quantitative approach to data analysis and collection. Aliga and Gunderson (2002) define quantitative analysis as the process of collecting numerical data and analyzing it with mathematical tools, particularly statistics, to better understand a problem or phenomenon.

According to Williams (2011), a quantitative technique indicates the entire process through which researchers initiate research projects. So, quantitative research is concerned with measuring and analyzing variables to achieve certain objectives. This approach entails using and analyzing numerical data using certain statistical processes to arrive at specific solutions to the supplied issues.

In qualitative research, variables are measured and analyzed to achieve specific outcomes. "A variable is a quality or quantity-varying trait or characteristic of things or persons" (Fraser Health Authority, 2011). A variable is something you can manipulate and control in addition to something you can measure. This research approach is concerned with measuring and evaluating various factors to investigate certain results. This current kind is used to investigate huge and chosen selected groups, and it collects data in the form of statistics and numbers to examine certain factors.

The test is made up of ten questions, each of which deals with a distinct cognitive process that undergraduate students employ. All of them have something to do with the production and recognition of words and sentences. The first five questions are about procedures that are closely related to the word "production," while the latter five are about "recognition." In reality, both undergraduate students and lecturers in their instructional operations currently utilize such cognitive processes. It is worth mentioning that while all of the students' processes deal with different data, they all measure the college students' ability to produce and recognize words and sentences.

To end, such instruments are used for practical reasons. Second, they are simple to score and manage. This type of material is ideal for studying huge groups of students or people. Finally, because of the great content validity of these assessments, more items can be covered.

## 3.RESEARCH PRODUCERS

It is worth noting that all 10 questions are meant to examine the cognitive processes employed by undergraduate students for the production and recognition of words and sentences. Sustained attention, sequential processing, visual span, visual discrimination, comprehension, phonological processing, syntactic awareness, semantic processing, morphological awareness, and orthographic processing are all examples of processes that deal with the reading skills abilities.

The material had chosen randomly from different internet platforms, websites and some books. The researcher in her preparation for this test may deliberately choose such random material to be able to discover the undergraduate students' ability to perceive and absorb, as well as their ability to use their mental processes to recover or recall the information stored in their brains and to solve and find out the answers for all the questions included innovatively more than be just a matter of memorization and indoctrination process.

For each of the 10 questions and each cognitive process connected to invention and awareness of words and sentences by students, the researcher developed it based on random and nonspecific information from internet websites and some books. Every question assesses and evaluates a certain cognitive process while also taking into consideration the students' mental abilities to tackle the problem. Because the students were in the fourth grade, the assessments were on a more advanced level to better assess their ability to apply their mental capacities. The researcher classified cognitive processes into two categories. For undergraduate students, the first section of cognitive processes is focused on processes that address the issue of invention or production; attention; awareness; understanding; receipt; and export of information are all steps that a learner must go through to recover information and utilize it later. Decoding, fluency, understanding, and other processes are examples. The second half of these operations deal with the practical or mental components of students. These activities are critical for students' studying English to improve their reading and comprehension abilities. These processes include syntax, phonology, semantics, working memory, and orthography, which are all instances of these processes, and everything in this study centres on them.

The first classification of the cognitive processes, which deals with the production of words and sentences, starts with an item that measured the sustained attention of the student. A little long passage contains different variables and 10 questions that the testee should answer correctly and briefly. The second item deals with sequential processing that has a close connection with comprehending and sequentially integrating stimuli. The arrangement technique is used to measure the ability of the student to use this process. In the third Test, which concerns the visual discrimination process, which in turn has a close relationship with the ability to distinguish between the different items and forms, two pictures containing a group of differentiations are presented the students should verify them correctly. The fourth item is called a visual span process. This means the number of different visual aspects in a multi-element arrangement that may be processed simultaneously at a glance; a retelling short three paragraphs are used to measure the ability of the students to retell something by using their information. The fifth item deals with the comprehension process, a group of ten-point each of which has different information or technique is used to masseur the students' ability to comprehend and interpret what they have read.

The students' capacity to distinguish words and sentences is the second categorization of cognitive processes utilized by undergraduate students. The sixth test is about phonological processing, or the students' capacity to convert sounds into letters and use them to construct a whole sentence. The test item consists of 10 distinct word groupings, each of which has three identical words with the same rhyme and pronunciation and one unique word. Following that, the seventh test item is

about syntactic awareness. The researcher picked 10 points for this test question as well; each point is a phrase with an incorrect verb, and the students were asked to fill in the blanks.

Each point represented a phrase that lacked a valid verb, and the students were instructed to finish the sentences with the right form of the verb. The eighth test item is a ten-point multiple-choice question in which the researcher asks the students to choose the correct and appropriate definition for a certain term. The ninth test item assesses the students' morphological awareness. It is also an MCQ; it is a type of question with 10 points and a variety of inquiries on word forms and meanings, with the students being asked to pick the most relevant answer. The last test item differs somewhat from the others. The last test differs from the others in that it assesses students' abilities in certain areas, such as spelling. The students were instructed to remove and repair orthographic errors and misspelt words from a small paragraph.

## 4.THE DISCUSSION

The results demonstrate that the students have such a mid-way level of cognitive awareness and cognitive differences in recognizing words and sentences although their arithmetic means exceed the hypothetical ones. This outcome can be attributable to a variety of factors and reasons. Firstly, the researcher notice that there are individual differences in the use of the cognitive processes among the students, and that leads to the fact that there are cognitive processes that have been used more than the rest and thus excel over them.

The results show that the students, with all their responses to the concerned questions, used all the cognitive processes, which are: sustained attention, sequential processing, visual discrimination, visual span, comprehension, phonological processing, syntactic awareness, semantic processing, morphological awareness, and orthographic processing that included in this study, but there is a slight change in the percentage of their use. Perhaps this is because students may face many difficulties and struggles in using those processes or do not have enough awareness of the correct way in using them.

Despite the importance of these capabilities, they have been neglected by the supervisors and instructors in universities and not given sufficient importance. The only solution is to make the students well aware of the right way to use their cognitive abilities and cognitive processes and help them develop them through successive research on these processes and how to develop and how to encourage the instructors to use them and applied them properly during teaching.

Furthermore, the findings show that the students engage a variety of cognitive processes that are dominant and less dominant in identifying words and sentences. Throughout the results, the researcher can discover the superiority of some cognitive processes that were used by the students over other processes. The researcher finds out the following:

1-Concerning the sustained attention process, the students show a high cognitive ability using this process. Its result was the highest when compared with the other processes. This process is concerned with what happens when our minds wander halfway through a word or between words, causing us to have to restart the decoding process. Therefore, in applying this process, the student needs to be focused on the given material and try to keep his/her mind ignoring any other

distractions and inhabit attention shifts to irrelevant activities. When the students answer the test that relates to this cognitive process, they show a high degree of concentration and understanding. This means that students have a good awareness of recognizing words and sentences at this level of processing.

2-Concerning sequential processing, the students show a low cognitive ability using this process. Its result was the lowest when compared to the other cognitive processes. This process is mainly concerned with how the decoding process will be affected if the learner cannot keep the letters or words in the appropriate order when they enter their brains. The students show a poor cognitive ability in using and recognizing words and sentences and putting them in the correct order. This means that the students may have reading disabilities and this may lead us to conclude that some students may suffer from dyslexia, which is a common learning difficulty.

3-The visual discrimination process result shows that the students have a mid-way cognitive ability using this process. This process is mainly concerned with the ability of the learner's brain to discern some sounds or words from others in a fraction of a second for decoding to be successful. Therefore, the researcher concludes the students have a poor cognitive awareness in recognizing and discerning words and sentences.

4- Concerned with the visual span process, the students also show a midway cognitive ability in recognizing words and sentences using this process.

Visual span refers to the amount of information that the learner may absorb in a single glance. This means that the students show a little cognitive awareness and attention to the information given to him/her.

5- Concerned about the comprehension process, the students show a good cognitive ability in recognizing words and sentences. Comprehension is the ability to comprehend and interpret what the learner has read and why he/ she read in the first place. Regarding this process, the result was good and acceptable among the others. However, year after year, teachers and students grapple with this issue. Therefore, more attention should be given to this process because it is essential in the process of learning.

6- The phonological processing result shows a high and good cognitive awareness that the students have. The students show a high ability to associate words with sounds and are capable of recognizing words and sentences regarding this process. The students seem to practice well and develop this ability by using Roach's book (2009).

7- In terms of the syntactic awareness process, students' responses are also located med-way. That is, they have some ability to formulate the syntactic structures of their words and sentences to prevent any potential grammatical mistakes. One reason for their lack of skill is that they do not notice the internal grammatical structure of phrases. Word-order correction tasks need not just linguistic skills but also active memory: word clusters must be precisely stored and reassembled to generate structurally right sentences.

8- In terms of semantic processing, learners achieve acceptable results in determining the appropriate responses of the semantic units. It is worth noting that such awareness is built on the recognition of words and sentences. Furthermore, most students keep a large number of words in their mental lexicon in terms of sense relationships, i.e. synonyms. They have a decent methodology for separating these difficulties. As a result, they allow them to pass the test, but they must improve such skills to achieve the greatest results.

9- Learners receive high marks for morphological awareness since this cognitive process is seen as straightforward and uncomplicated, as well as pupils who are well acquainted with morphemes that are deemed tangible and observable.

10- In terms of orthographic processing, students receive high marks because this cognitive process is regarded as simple and easy, as well as students who are highly acknowledged for recognizing misspelt words and sentences and correcting them, both of which are regarded as concrete and observable.

## 5. CONCLUSIONS
According to the results obtained from the research, the following conclusions have been drawn:

1-According to the students' responses, the analytical results show that the students have a good level of awareness of their cognitive processes, but still they need to improve this knowledge by developing their reading and comprehending skills.

2-The test results show the presence of the individuals' differences in using their cognitive processes to recognize words and sentences. The emergence of these differences in the use of the cognitive processes is due to the disparity of mental ability possessed by each student.

3-The results show that some cognitive processes appeared or were used more than the other processes, such as the process of sustained attention, comprehension, phonological processing, and orthographic processing.

Although these cognitive processes can be developed by letting the students familiar with them or giving them more quizzes or tests to develop their ability in using such processes.

4-The test results showed that the students manifested a med-way and weakness in using other cognitive processes such as sequential processing, comprehension, visual span, visual discrimination, syntactic awareness, semantic processing, and morphological awareness. This may be since the students have a weak level of attention and comprehension in recognizing words and sentences regarding these processes.

5-Psycholinguistics plays an important role in the process of developing students' mental awareness through the different psychological studies on the students' mental health, scientific ability, intelligence factors, the surrounding environment, individual differences, and even their feelings and imagination. Psychologists should pay attention to the obstacles the students face in this path by working on periodic research to provide the educational system with professional

solutions. These periodic research studies will help to understand these cognitive processes more. Furthermore, let the psychologists provide the instructors with practical and scientific methods to develop their abilities to communicate probably with the students.

6-During the process of analyzing the results, there were clear differences between the students' ability at the recognition and production level in recognizing words and sentences. The results show a high cognitive awareness of the last five cognitive processes, which require a high cognitive ability, as well as the students need not think for a long time and use a great mental effort. While solving the questions that need a kind of production ability, students need all those factors and imagination to add some information by using their thinking and cognitive abilities.

**Table 1: The Arithmetic Mean, Hypothetical Mean, Standard Deviation, t-test value, and p-value of the first classification for the cognitive processes.**

| Levels | The overall grade of the level | number of paragraph | Arithmetic mean | hypothetical mean | standard deviation | t-test value | P-Value | indication |
|---|---|---|---|---|---|---|---|---|
| Test 1 | 10 | 10 | 7.2100 | 5.5 | 1.79390 | 40.192 | 0.000 | significant |
| Test 2 | 10 | 10 | 4.07 | 4 | 2.49806 | 24.459 | 0.000 | significant |
| Test 3 | 10 | 10 | 6.1100 | 5 | 1.76438 | 33.496 | 0.000 | significant |
| Test 4 | 10 | 3 | 5.9100 | 6.5 | 2.10519 | 24.463 | 0.000 | Not significant |
| Test 5 | 10 | 10 | 5.1500 | 5 | 1.74596 | 37.859 | 0.000 | significant |

**Table (2) The Arithmetic Mean and the Hypothetical Mean to the second classification of the cognitive processes.**

| Levels | The overall grade of the level | number of paragraph | Arithmetic mean | hypothetical mean | standard deviation | t- test value | p-value | Indication |
|---|---|---|---|---|---|---|---|---|
| Test 6 | 10 | 10 | 6.61 | 5.5 | 1.75 | 37.859 | 0.000 | Significant |
| Test 7 | 10 | 10 | 5.51 | 5.5 | 1.91 | 28.855 | 0.000 | Significant |
| Test 8 | 10 | 10 | 5.96 | 6 | 1.90 | 31.349 | 0.000 | not significant |
| Test 9 | 10 | 10 | 5.86 | 5.5 | 2.59 | 22.593 | 0.000 | Significant |
| Test 10 | 10 | 10 | 9.12 | 6 | 1.48 | 61.663 | 0.000 | Significant |

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