ENG891

ADVANCED PSYCHOLINGUISTICS

Course Guide

Introduction

Welcome to ENG891: Psycholinguistics. It is a 3-credit unit course for the Master of Arts in English students. It builds on what you have learnt at the undergraduate level in ENG491. It brings the reality of how your mind processes and uses language in communicating intentions and meanings. We sincerely hope you learn a lot as you study this course. It will open your eyes to many more things you didn't know!

Course Competencies

- ✓ It is expected that you should be able to research into the processes involved in speech production, speech comprehension and speech interpretation.
- ✓ The course will also enable you to master the underlying activities to how language and the mind interrelate and work.
- ✓ From this course, you will also learn to identify language disorders and how they can be managed or treated.

Course Objectives

At the end of this course, you should be able to:

- Identify the link between language and the mind
- Examine the processes involved in language production, comprehension and interpretation
- See how the language we use every day is related to the workings of our mind
- Interconnect our language use to our everyday experience
- Find out how the processes of language learning is birthed in children as well as adults
- Critically relate our everyday language usage to our real-life experiences
- Identify types of language disorders and how they can be treated

Working through this Course

To complete the course, you are required to read the study units, get the recommended reading materials and read them. You will also need to undertake practical exercises for which you need a pen, a notebook and other materials that will be listed in this guide. It is advised that you do not jump units; study all of them because they have been arranged in such a way that the content of one unit is built on the content of a preceding one. There are exercises at the end of each unit. The exercises are to aid your mastery of the concepts being discussed. At the end of each unit, you will be required to submit written assignments for assessment purposes. At the end of the course, you will write a final examination.

Study Units

Module 1: Psycholinguistics: Issues and Concerns

Unit 1: Psycholinguistic Concepts
Unit 2: Development of Psycholinguistics
Unit 3: How does Psycholinguistics Relate to our Lives?
Unit 4: Current Issues and Controversies in Psycholinguistics
Unit 5: What about Linguistic Universals?
Unit 6: Different Forms of Psycholinguistic Inquiry

Module 2: Language Acquisition

Unit 1: Biological Foundations
Unit 2: The Role of Cognition
Unit 3: Caregiver Language
Unit 4: Vocabulary Acquisition
Unit 5: Phonological Acquisition
Unit 6: Syntactic Acquisition
Unit 7: Semantic Acquisition

Module 3: Speech Comprehension

Unit 1: What does Speech Comprehension Entail?

Unit 2: Neural Processes for Speech Comprehension/Production

Unit 3: Phenomenon of Speech Recognition

Unit 4: Parsing

Unit 5: The Concept of Interpretation

Module 4: Speech Production

Unit 1: What does Speech Production Entail?

Unit 2: Lexical Selection and its Assemblage

Unit 3: The “Slip of Tongue” Phenomenon

Module 5: Psycholinguistics and Neurolinguistics

Unit 1: Language and the Brain

Unit 2: Identifying Language Disorders

Unit 3: The Role of the Brain in Language Disorders

Unit 4: Language Disorders: Causes, Types and Remedies

Unit 5: Language Attrition in Individuals

References and Further Readings

The references used in the course material are listed at end of each Course Unit. However, in addition, related materials that you can read to enrich your learning is added too so that you can expand your horizon on the course. You should do well to ensure that you find such materials to read. As a research student, it is also expected that you would use the opportunity given you by the University to study as much as possible on the topic by going into the e-library of the University. It subscribes to at least two data bases, which will give you more than enough resources to do good research work.

Presentation Schedule

The date for the submission of your Tutor Marked Assignments (TMAs) now really Computer Marked Assignments are also captured in the University calendar. Do well to familiarize yourself with them and ensure that you study hard and take all of them.

In sincerity, these TMAs are expected to help you assess yourself and review how well you have learned the content of your course material on the course.

Assessment

This course is assessed in two ways: tutor marked assignments and a final examination.

Tutor Marked Assignments (TMA)

You will need to do a specified number of the Tutor-Marked Assignments (TMAs). Every unit in this course has a Self-Assessment Exercise. The total marks for the three (3) assignments will be 30% of your total work. It is also important for you to note that TMAs are usually given as CBAs in NOUN. Thus, the tutor marked assignments will be done online and they will be graded immediately. Therefore, you need to be on the lookout for the academic calendar to know when each of your TMAs are due to go live. It is also important for you to be ready in case any of your TMAs comes in the form of seminar presentation. In addition, it is obvious that you need to master your computer skills and become very techno-friendly.

Final Examination and Grading

You are also expected to take an end-of-semester examination, which is 70% of your total mark. The final examination of ENG891 will be of three (3) hours' duration. All areas of the course will be assessed. The examination will consist of questions which reflect the type of self-testing, practice exercises and tutor-marked assignments you have previously come across. You are advised to revise the entire course after studying the last unit before you sit for the examination.

Course Marking Scheme

The following table lays out how the actual course mark allocation is broken down.

Assessment	***Marks %***
Assignments (three)	*30*
Final Examination	*70*
Total	***100***

How to Get the Most from the Course

In distance learning, the study units replace the university lecturer. This is one of the advantages of distance learning; you can read and work through specially designed study materials at your own pace, and at a time and place that suit you best. Think of it as reading the lecture instead of listening to a lecturer. In the same way that a lecturer might give you some reading to do, the study units tell you when to read your set books or other materials. Just as a lecturer might give you an in-class exercise, your study units provide exercises for you to do at appropriate points. Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit and how a particular unit is integrated with the other units and the course as a whole. Next is a set of intended learning outcomes. These ILOs let you know what you should be able to do by the time you have completed the unit. You should use these ILOs to guide your study. When you have finished the units, you must go back and check whether you have arrived at the intended outcomes for your learning. If you make a habit of doing this, you will significantly improve your chances of passing the course. The main body of the unit guides you through the required reading from other sources. This will usually be either from your set books or from your course guides. The following is a practical strategy for working through the course. If you run into trouble, email your facilitator. Remember that your facilitator's job is to help you. When you need assistance, do not hesitate to call and ask your facilitator to provide it. Follow the following advice carefully:

1. Read this Course Guide thoroughly; it is your first assignment.

2. Organise a study schedule. Plan the time you are expected to spend on each unit based on the projected study hours and how the self-assessment

assignments relate to the units. Whatever method you choose to use, you should decide on and write down dates for working on each unit.

3. Once you have created your own study schedule, do everything you can to stick to it. The major reason that students fail is that they get behind with their course work. If you get into difficulties with your schedule, please let your facilitator know before it is too late for help.

4. Turn to Unit 1 and read the Introduction and the Intended Learning Outcomes for the Unit.

5. Assemble the study materials. Information about what you need for a unit is given in the 'Introduction' at the beginning of each unit. You will almost always need both the study unit you are working on and one of your set books on your desk at the same time.

6. Work through the unit. The content of the unit itself has been arranged to provide a sequence for you to follow. As you work through the unit, you will be instructed to read sections from your set books or other articles. Use the unit to guide your reading.

7. Review the ILOs for each unit to ensure that you have achieved them. If you feel unsure about any of the ILOs, review the study material or consult your facilitator.

8. When you are confident that you have achieved a unit's ILOs, you can then start on the next unit. Proceed unit by unit through the course and try to pace your study so that you keep yourself on schedule.

9. When you have submitted an assignment to your facilitator for marking, do not wait for its return before starting on the next unit. Keep to your schedule. Consult your tutor as soon as possible if you have any questions or problems.

10. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit ILOs (listed at the beginning of each unit) and the Course Objectives (listed in the Course Guide).

11. Keep in touch with your Study Centre. Up-to-date course information will be continuously available there. Also, ensure to check your emails, SMS and the University website for constant updates and information on your programme in general. If your programme or Faculty has a social media platform to pass information to students, make sure you also make maximum use of this to your benefit.

Online Facilitation

There are eight (8) online facilitation hours available for you to interact with your lecturer and clarify issues you need to ask questions about in the course. If your course has a facilitator, ensure that you attend all sessions. There is usually a university wide time table for this purpose. However, in case you have a special arrange in your class with your supervisor, ensure the schedule and timetable is followed so that you can get the best out of the course. It is to your benefit. However, in case your course does not yet have facilitation facility, make best use of the videos the University is producing for each course to make your life easier.

Course Information

Course Code: ENG891

Course Title: Psycholinguistics

Credit Unit: 3

Course Status: E

Course Blub:

Semester: 1

Course Duration: 1 semester

Required Hours for Study: 24

Course Team

Course Developer: NOUN/Prof Iyabode O. A. Nwabueze

Course Writers: Prof Iyabode O. A. Nwabueze, Dr Afolabi Tajudeen Alebiosu, Ms Philomena Elom

Content Editor:

Instructional Designer:

Learning Technologists:

Copy Editor:

Ice Breaker

Sincerely, studying the mind can be so creepy. However, when you add language to it, it becomes very exciting. The field of psycholinguistics is such an exciting field. However, many think it is boring. That is because they have not realized that their child calling ‘ta ta’ instead of ‘daddy’ is a psycholinguistic phenomenon. Even when they say ‘see shed’ instead of ‘she said’, they are living out a psycholinguistic experience! Have had any of these experiences? Then, let us commence this awesome journey together!

Module 1: Psycholinguistics: Issues and Concerns

Unit 1: Psycholinguistic Concepts

Unit 2: Development of Psycholinguistics

Unit 3: How does Psycholinguistics Relate to our Lives?

Unit 4: Current Issues and Controversies in Psycholinguistics

Unit 5: What about Linguistic Universals?

Unit 6: Different Forms of Psycholinguistic Inquiry

UNIT 1: Psycholinguistic Concepts

1.1 Introduction

1.2 Learning Outcomes

1.3 The Scope of Psycholinguistics

1. 3.1 What is Psycholinguistics?

1.3.2 Some Definitions of Psycholinguistics

1.4 Descriptive Approach to Psycholinguistics

1.5 Psycholinguistics and the Human Mind

1.6 Summary

1.7 References / Further Reading/ Web Resources

1.8 Possible Answers to Self-Assessment Exercise(s) within the Content

1.1 Introduction

This module is a general introduction to the field of psycholinguistics. It attempts to define psycholinguistics by giving you an overview of the field. It looks at different definitions that had been propounded over time in the field as well as traces its history. The link that psycholinguistics has to the human life is discussed. In particular, this unit introduces you to the concept of psycholinguistics. It attempts to give a definitive form to the field. It thus brings to our understanding the reality of the way psychology and linguistics come together to create a new field – psycholinguistics.

1.2 Learning Outcomes

At the end of this unit, you should be able to:

1. Define psycholinguistics
2. State some definitions given by different scholars of psycholinguistics

3. Draw the psycholinguistics operational circle and discuss its working procedure.

1.3. Psycholinguistic Concepts

1.3.1 What is Psycholinguistics?

This is the question that has bothered the mind of scholars in the past sixty or so years since Transformational Generative Grammar movement has forced the subject of the link between language and its relationship to the human psychology to the fore front of linguistic studies. Essentially, psycholinguistics is the study of language as it relates to the human mind. Some scholars see psycholinguistics as the study of how language influences and is influenced by the human mind. Other scholars, especially those with psychological leaning, tend to see psycholinguistics in terms of the experimental form of the study of human mind within the laboratory and its ability to comprehend language. This has led to the division of the area of study into the psycholinguistics and the psychology of language broad categorisations.

Self-Assessment Exercise 1

Give a clear and concise definition of psycholinguistics.

1.3.2 Some Definitions of Psycholinguistics

Aitchison (1990:333) defines psycholinguistics as the study of language and mind, which “aims to model the way the mind” works in “relation to language”. Looking at this definition, it is obvious that her view of psycholinguistics is that which maps out the strategizing of language usage as well as language comprehension. To her then, anything that the mind does in relation to language is psycholinguistics. She further distinguishes between psycholinguistics and neurolinguistics. Her point of contention is that while neurolinguistics seeks to link language to brain functioning and its influence on language, psycholinguistics measures the unobservable operations of the mind as it relates to the human language experience. It is obvious then that the human

brain relates to language in a physically observable manner as is seen in the language of aphasics, while psycholinguistics has many nuances in linguistic employment of humans that may not be possible to measure in a realistic manner. One could agree with this observation as the manner in which medical science could measure language related task of humans is not realistically possible in psycholinguistics. This has thus resulted in so many controversies concerning the subject as it relates to its source in the work of psychologists and linguists.

Aitchison (1990) also claims that psychologists' attempts to study the language of humans in the laboratory environment have proven unrealistic. This she notes has made it obvious that language is a social phenomenon, which needs to be observed beyond the walls of the laboratory. For, according to her, it is effectively frustrating to psychologists who found that a realistic state of affairs in terms of finding how the human mind works in relation to their language production and comprehension could not give the correct data in a laboratory environment.

1.4 Descriptive Approach to Psycholinguistics

Another important issue we need to consider here is that, while psychologists maintain that laboratory study of the human language is the best way to elicit data for psycholinguistic study, linguists continue to favour a descriptive study of the human language as they see the more naturalistic study of language as providing best evidence for trustworthy data in psycholinguistic study. Even though psychologists have always looked at laboratory experiments as the most acceptable, the reality is that linguistics that best fits and likely to show a realistic state of affairs in terms of human language usage may be best elicited from human beings in real situations. Descriptive linguistics thus provides the most sensible manner of collecting psycholinguistic data. Having said this, one needs to also state that the linguist as a source of data is still tenable. When one considers the way language death is spreading to the languages of the world, a time may come, and as Crystal (2000) has even already reported, the time may already be with us, when there may be only one speaker of a language of the world. And clearly, it is from the assumed internal processing of the linguistic usages of the informant of that particular language that is on the verge of extinction that the psycholinguistic operations would have to be

deduced. As Lang (1994) asserts, language operates in a social form even while presenting its psychological foundation. It is however this psychological foundation that psycholinguistics seeks to unravel.

To Hawkins (1994), the internal processing is an important means of unravelling the meaning content in a linguistic context. Human psychology thus retains its important position in human communication process. Vygotsky (1962) actually avers that communication with language only makes meaning in relation to deciphering the communicative intentions of the speaker. This essentially refers to the psychological basis of language use by both speaker and hearer.

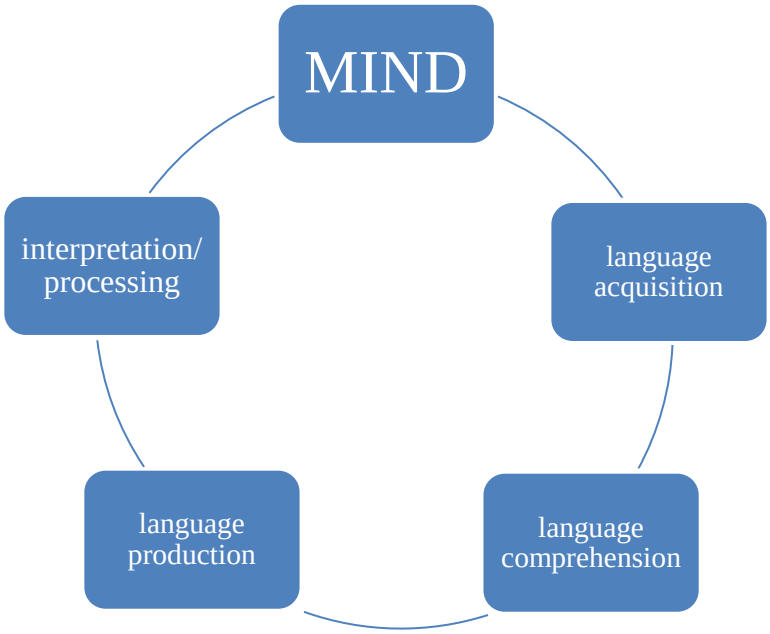
1.5 Psycholinguistics and the Human Mind

Even though many scholars have found Chomsky's (1965) cognitive base for language use objectionable on many fronts, especially his claims of exclusive dominance of competence over performance in language usage, the fact is that his recognition of the important role of the human mind in the psychological base for human language performatives is very insightful. Halliday's (1971) ideational concept appears to lean towards this view too even though he views the sociological foundation of language as a stronger base of human language operations.

As Daniel (2009) firmly notes, the two bases are important in true linguistic inquiries. The link between the two foundations of language obviously affects the way we communicate. As such, linguistic acquisition, processing, comprehension and production are all intertwined. We may thus be able to aver that psycholinguistics is essentially about language usage of human beings and how it is affected by their psychological dispositions to its acquisition, comprehension and production. The next section gives a graphical representation of how the mind relates with language in functional terms.

Below is a graphical representation of how language and the mind relate.

Figure 1: A Psycholinguistic Operational Circle



The graph above presents a non-directional circle of language link with the mind. In this sense, the mind is involved in the acquisition of language, in comprehending what has been said, in producing what is to be said, in processing what is heard or to be said.

Self-Assessment Exercise 2

State clearly three definitions of psycholinguistics discussed by the authors in this Unit.

1.6 Summary

This Unit discusses the definition of psycholinguistics. It should be obvious that psycholinguistics is not an easy concept to define. Nonetheless, it is also clear that an

important link between psychological studies and the linguistic studies was successfully forged to create this new field called psycholinguistics. The attempt by authors to relate the field to individuality is also apparent. However, the collective mind is also a possibility as shown by some of the authors. You may therefore ask further questions on how to resolve the issues raised in this work. This will show that you are not a passive learner in this course.

1.7 References/Further Reading/Web Resources

Aitchison, J. (1990). "Language and Mind: Psycholinguistics." *Encyclopaedia of language*. N. E. Collinge. Ed. Routledge. 333-370.

Chomsky, N. (1965). *Aspects of the theory of syntax*. MIT Press.

Crystal, D. (2000). *Language Death*. : Cambridge University Press.

Daniel, I. O. (2009). *Portrayal of Nigerian women's assertiveness in Nigerian newspapers*. Publishing House Ltd.

Halliday, M. A. K. (1971). "Linguistic Function and Literary Style – an Inquiry into the Language of William Golding's *The Inheritors*." *Literary style: A symposium*. S. Chatman. Ed. Oxford University Press. 330-68.

Hawkins, J. A. (1994). *A performance theory of order and constituents*. Cambridge University Press.

Vygotsky, L. S. (1962). *Thought and language*. E. Haafmann & G. Vakar. Ed & Trans. Cambridge, The MIT Press.

Science Daily. (2010). Psycholinguistics. Retrieved, 17 August, 2010. http://www.sciencedaily.com/articles/p/psycholinguistics.htm.

Unit 2: Development of Psycholinguistics

2.1 Introduction

2.2 Learning Outcomes

2.3 The Beginning

2.3.1 Experimental Studies by Scholars

2.3.2 Factors Responsible for the Emergence of Psycholinguistics

2.4 Modularity of Language

2.5 Scholars Credited with the Development of Psycholinguistics

2.6 Summary

2.7 References/Further Reading/Web Resources

2.8 Possible Answers to Self-Assessment Exercise(s) within the Content

2.1 Introduction

In Unit 1 of this Module, you were introduced to the field of psycholinguistics. The Unit gave you some definitions of psycholinguistics. It discussed different views of different scholars on the subject matter. It also encouraged you to raise questions on these definitions as well as to give your own working definition. This Unit gives a summary of the when and how of the development of the field of psycholinguistics. It traces its history to the start as well as the point of convergence of psychology and linguistics. Read up the references at the end of the unit as they will help you to understand better what this course is all about.

2.2 Learning Outcomes

At the end of the Unit, you should be able to:

1. Discuss the start point of psycholinguistics

2. Outline the factors that led to the emergence of the psycholinguistic field

3. Identify the scholars at the forefront of the emergence of the field of psycholinguistics.

2.3. The Beginning

2.3.1 Experimental Studies by Scholars

Psycholinguistics as a scientific endeavour started as far back as the 18th century. Aitchison (1990) asserts that the first known experiment in psycholinguistics was conducted by the German philosopher, Dietrich Tiedemann. He used his son as the experiment. In his study, he carefully recorded the linguistic development of his son along with other developmental characteristics that he exhibited. The first experimental record in psycholinguistics is nonetheless credited to the British psychologist Francis Galton (1822-1911). However, it was only recently, precisely the middle of the 20th century, when the field got serious some attention from scholars. It was believed that Noam Chomsky is the father of psycholinguistics. The general feeling and belief is that the field grew out of the research efforts of Noam Chomsky in linguistics and philosophy of language (Aitchison, 1990).

In agreement with Aitchison, Reber (1987) asserts that psycholinguistics has its beginning pre-20th century but nevertheless re-invented itself in the middle of the century. By the 1950s and 1960s, the field has grown in leaps and bounds due to the assiduous work of such scholars like Noam Chomsky, Zelig Harris, George Miller, Karl Lashley, Charles Osgood, John Carroll, Thomas Sebeok, and Herbert Simon among a host of others. Though, in his view, which appears to be Roger Brown's as noted by Reber, psycholinguistics seems an aberration as a name to call the emerging field that linked psychology to linguistics. It is better to have used such a term like psycho-linguistics, with a hyphen separating and indicating the hybrid nature of the discipline in order for it not to seem like a 'deranged polyglot' as claimed by Roger Brown (1958) (in Reber, 1987: 326). In Reber's view, psycholinguistics started to decline by the

1970s as many questions seemingly trail it. He nonetheless acknowledged that scholarship of Chomsky did not decline. And considering Chomsky is always in 'bold relief' when discussing the scholarship of psycholinguistics, one finds it difficult to agree with his claim that the field is in decline.

As a scholar of language, you are therefore encouraged to explore the relevance of psycholinguistics to the present linguistic studies. As much as many would like to discountenance the psychological aspect of linguistic studies and subsume it to the sociological performance, Daniel (2008) proves that the relevance of psychology to linguistic studies is without doubt paramount to the full understanding of linguistic inquiries. You may, therefore, need to ask yourself some very pertinent questions as you go through this course. What actually is the relevance of psychology to linguistic studies? How much of psychology is relevant to the social study of language? What basis is there to look at psycholinguistics as a distinct course on its own? Is the course really useful to your life as a person? I am sure that by the time you have gone through this course, you should find answers that you seek.

Self-Assessment Exercise 1

Describe the beginning point of psycholinguistics.

2. 3.2 Factors Responsible for the Emergence of Psycholinguistics

A critical look at the emergence of psycholinguistics will indicate that some important factors are responsible for its emergence. We looked at the beginning of the field. In this section, we intend to look at the factors that led to the emergence of the field. Like any academic field of study, there are always problems that require solutions. When it is said that necessity is the mother of invention, it appears the inventor of the saying

did not have psycholinguistics in mind. However, it is obvious that all fields of human endeavour are always created out of a need to be met. The question then is, what factors could be said to be responsible for the emergence of the psycholinguistics field. One major factor is the work of Noam Chomsky. Aitchison (1990) asserts that a direct factor that affected the development of psycholinguistics is the impactful work of Noam Chomsky in linguistics. His cognitive linguistics greatly affected the way the field of psycholinguistics developed. Reber (1987) acknowledged the influence of Chomsky in the development of psycholinguistics. It is thus obvious that the growth of Transformational Generative Grammar, with its focus on the cognitive ability of the native speaker to properly use their language brought the psychological basis of the linguistic performance into great focus. Aitchison actually used the term 'inspired' (1990: 334) to describe the impact of Chomsky's influence in directing research efforts of various scholars in this direction. In this wise, research into child language usage became popular in that period. Nonetheless, in line with the assertions of Reber (1987), the field began to suffer splintering and disillusionment from different scholars and thus led to a loss of focus. Aitchison notes that many of the Chomsky-inspired work could not be really given conclusive evidence to his theories and proposals (cf. Aitchison, 1989). In addition, psychologists became disillusioned with the fact that psycholinguistics focus was to test hypotheses advanced by theoretical linguistics. Naturally, the field of psycholinguistics began to suffer from such negative attitude. As such, recent years saw different people actually working with their mind on psycholinguistic study but with diverse philosophical traditions as their base of approach.

2.4 Modularity of Language

Despite the varying approaches to psycholinguistic study, it is generally agreed among scholars that language is modular in nature. What this means is that the human language system is made up of a number of separate but interacting components. When one looks at Chomsky's (1981) work, a full description of the nature and manner in which these modules interact is explained in details. It is thus a firm base for psycholinguistic inquiry as it exposes the manner in which these linguistic components

operate among one another. It could thus be seen that Chomsky remains an important factor in the way the field continues to develop over the years.

Aitchison (1990) however notes that despite this apparent agreement among scholars on the modular nature of the human speech, the integration of the modules has become a point of contest among scholars of language. While some scholars believe that these components are separate with links between them, others are of the view that encapsulation is the watchword in which each module works automatically and independently, with its content sealed off from that of other modules.

The issue nevertheless is that scholarship does not have an end. You may therefore look at the two arguments above and research into that which you think is the most likely in your own language. Remember that the human language is universal in nature; this is an important point that scholars cannot dispute over. You can thus apply these principles to your own language and ascertain the veracity of these claims.

Self-Assessment Exercise 2

Outline two important factors responsible for the emergence of psycholinguistics as a field of study.

2.5 Scholars Credited with the Development of Psycholinguistics

In this section, we will be talking about the scholars that have been given the credit of developing psycholinguistics as a field. It is important to do this because, as a scholar, it is necessary that you always acknowledge the contribution of others, no matter how minute you may consider it. It is, after all, their intellectual property. Doing otherwise will be considered stealing. And stealing people's ideas without acknowledging it as

theirs is as bad as stealing a bowl of *gari* from a market. As you would have noticed, some irreprehensible names have continued to crop up in our discussions above. We will, however, bring to the fore the names of many of these linguists and psychologists that have enabled the psycholinguistic field of study to find its feet (a manner of speaking) in the comity of other disciplines.

Noam Chomsky naturally takes the lead. His series of works on Transformational Generative Grammar easily form a basis for the development of the psycholinguistic field. The work had been criticised greatly for being mentalistic (cf. Olaoye, 2007 among others). That notwithstanding, the fact that this mentalistic grammar and the propounding of theories related to it gave psycholinguistics its firm base cannot be wished away. It is thus obvious that the credit for the popularisation of the psycholinguistic discipline will not be misplaced if given to Noam Chomsky. Aitchison (1990) and Reber (1987) views on the matter lend credence to this position. It is still necessary to also state that this very mentalistic nature of Chomsky's propositions have been the major quarrel linguists and some other scholars have with his theories on grammar. As much as the discussion here is not about Chomsky's syntactic theory, it cannot be ignored that the very nature of his propositions is fundamental to the growth of the field under consideration. One may however be cautious in making assertions in the light of Reber's (1987) view that psycholinguistics as a discipline has fallen into disfavour since the early sixties when Chomsky raised the stakes of the field so high.

We will nevertheless consider other linguists that have contributed their quota to the growth of the field. Vygotsky is another scholar that may be considered as a major contributor to the field. His study on the mind and its relation to communication easily gives us such an impression to add him to the list. Aitchison is another great contributor to the development of the field because much of her work has been in this area. Reber (1987) gives credit to a number of other scholars like Zelig Harris, George Miller, Karl Lashley, Herbert Simon, Charles Osgood, John Carroll, and Thomas Sebeok

. Self-Assessment Exercise 3

Discuss the contributions of any two scholars to the development of the psycholinguistics as a field.

2.6 Summary

This Unit discussed the history of psycholinguistics. It traced its history from the earliest stage of its development from the 18th century. It discussed the factors that led to its emergence. Obviously, a need to link the human mind to language development and use gave rise to the field. The way Noam Chomsky's work in theoretical linguistics helped to fast track the development of the field through inspiring the spate of work in the area was also focused on. It is thus obvious that psycholinguistics as a field has a strong link with Transformational Generative Grammar developed by Chomsky.This unit presented the historical profile of psycholinguistics. It discussed its root in the work of such linguists like Dietrich Tiedemann and Francis Galton. It extensively presented the larger than life influence of Noam Chomsky's work in theoretical linguistics on the developmental process of psycholinguistics. It outlined the scholars whose works greatly helped the field to develop.

2.7 References/Further Reading/Web Resources

Aitchison, J. (1989). *The articulate mammal: An introduction to psycholinguistics* (3rd edn.). London: Unwin Hyman Ltd.

Aitchison, J. (1990). "Language and Mind: Psycholinguistics." *Encyclopaedia of language*. N. E. Collinge. Ed. Routledge. 333-370.

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Halliday, M. A. K. (1971). "Linguistic Function and Literary Style – an Inquiry into the Language of William Golding's *The Inheritors*." *Literary style: A symposium*. S. Chatman. Ed. Oxford University Press. 330-68.

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Unit 3: How Does Psycholinguistics Relate to Our Lives?

3.1 Introduction

3.2 Learning Outcomes

3.3 The Psycholinguistic Experience

3.3.1 Practical Ways that Psycholinguistics Relate to the Human Ways of Life

3.3.2 The Thought Process

3.4 Relate Psycholinguistics to Your Personal Linguistic Experiences

3.5 Some other Features

3.6 Summary

3.7 References/Further Reading/Web Resources

3.8 Possible Answers to Self-Assessment Exercise(s) within the Content

3.1 Introduction

In the previous Unit, you learnt about the nature of language. The different characteristics as well as the definitions of language were outlined. The processes of the human minds were discussed as well as how they combine environmental factors to the human cognition and language. The relationship between language and the human mind were also highlighted. This unit discusses the practical way that psycholinguistics can be related with human ways of life. You should thus be able to see that psycholinguistics is not merely an abstract issue but that which has practical application to the human life, your own life

3.2 Learning Outcomes

At the end of this unit, you should be able to:

1. Identify the specific ways in which psycholinguistics has practical application to our lives.
2. Relate psycholinguistics to your personal linguistic experiences.

3.3 The Psycholinguistic Experience

3.3.1 Practical Ways that Psycholinguistics Relate to the Human Ways of Life

You may be wondering right now that in what ways can psycholinguistics affect your life practically. In the first place, it studies the way the human mind works as it relates to language. This shows that the human thinking process is closely connected to language. Language is not independent of the things that go on in our minds. It is quite obvious that language essentially express what is going on in our minds. This can be seen quite clearly expressed by scholars in the past. Chomsky's view is that language is rooted in the ability of the user. It is also obvious that when we look at Halliday's argument of ideational function of language, psycholinguistics becomes more relevant to our practical life experiences.

In the famous Chomsky argument, grammaticality is highly rooted in the ability of the speaker to control language usage. It is also obvious that the things we talk about are rooted in the things that we think about. This makes real the issue of the linguistic reality of the experiences of language users. Halliday's discussion, using the lost tribe in Golding's *The Inheritor* and how their linguistic choices mainly reflect their personal experiences, shows clearly that the issue of practical usages of psycholinguistics to the human life is very practical.

In addition, psycholinguistics undoubtedly makes obvious, through such practical occurrences like slips of the tongue and the anticipation of the next phoneme in the course of discussing, easily reveals that psycholinguistics has a practical application in our lives. For example, I am sure that you have had occasion to say 'ma' instead of 'sir', then self-correcting, you end up with 'sir' and laugh at your own seeming incompetence. The question then is: is the speaker here actually unable to know the correct response to have given to the interlocutor or are there other factors responsible for this sort of response? It appears that the other will be the most appropriate answer. Why did I say so? This is because the speaker was able to self-correct immediately. It shows that, unlike Chomsky's idea of linguistic incompetence as propounded in his Transformational Generative Grammar theory, this particular scene is not due to that

but mainly a psychological situation that could have been rooted in a mind probably occupied with something else. This comes to reason as the interlocutor is able to self-correct. Psycholinguistics also helps us to study how human beings comprehend language. Steinberg, Nagata and Aline (2001) assert that meanings which underlie speech comprehension are concepts that are in a person's mind. This shows that, within the mind of a person, there must be underlying ideas that give meaning to the language of communication. This could be seen as the basis of Halliday's linguistic theory as noted above.

The slip of tongue phenomenon also easily reveals another way that psycholinguistics can easily be linked to our lives. It shows how human beings anticipate the next item of production in their speeches. When someone thus says 'se shaid', we can easily relate that the person has only interchanged the initial sounds in the two words. Aitchison (1989) argues that this is one of the structural patterns in the production process and that it is not haphazard in nature. The parsing process in structural production thus shows that there is a pattern of production in human speech and the English language makes use of its pattern even in the mistakes made. Scovel (1998) fully agrees with this postulation.

3.3.2 The Thought Process

The fact that thought processes are important to interpreting what is being said also reveals how the psycholinguistic studies affect our lives. In addition, as Arokoyo (2012) found out in her study, even children that are in the language acquisition process tend to make a whole lot of assumptions in their communication process, especially, with close family members. In another sense, our environment as input to the thought processes of human beings can also be seen as another thing that underlies the psycholinguistic study. Concepts do not grow on trees; they are gotten from the experiences of the interlocutor. Psycholinguistics also helps us to uncover the nuances of the relationship of these experiences to our linguistic choices. Daniel (2008) has argued that deep seated in the linguistic choices of the way women are described in Nigerian newspapers have a lot to do with the perception of the power level of women in the Nigerian society. It is thus not surprising that women are more

often regarded as appendages of men. The experience of women to become fulfilled in being seen as the wife or mother of someone (Oriaku, 1996) appears to be rooted in a psychological disposition that exalts wifehood and motherhood above the personhood of the woman within the Nigerian society. This thus clearly shows that even within the social set up, social psychology has a lot of influence on our linguistic life (cf. Lang, 1994).

It should be obvious by now that psycholinguistics has a lot of practical influence upon our lives, whether privately or socially.

Self-Assessment Exercise 1

Give two examples of slips of the tongue and their possible causes

3.4 Relate Psycholinguistics to your Personal Linguistic Experiences

In this section, as the saying goes, you are the boss. You are expected to be able to relate the instances from your own life in which psycholinguistics appears to be manifesting in practical terms. We are going to help you to be able to deal with this section practically. How? You may ask. You are going to be given some leading questions that will guide you into giving practical realisation of how psycholinguistics has had practical effects in your life.

Scenario A

Have you ever had to remember some things happening around you in order to interpret the meaning of a language event? Let us look at a scenario like this:

Policeman: This man, stop wasting my time

Driver: Oga, I beg now! [Prostrating] Just manage am like that [hand stretched to the policeman]

Policeman: [angrily] let's go to the station. Can't you hear me?

Passenger: *Settle the man* now and let us go.

The italicised portion of this exchange will require some contextual or environmental factors to interpret. Have you ever thought of the fact that an American that is new in Nigeria may find it difficult to easily interpret this statement? But can you find it difficult to interpret this statement or the whole scene itself? Explain why you think you can interpret this scene or statement without much difficulty? Try to write down your explanation to clarify your thoughts.

Self-Assessment Exercise 2

1. Identify some important ways that psycholinguistics can be practically applied to the individual's life.

3.5 Some other Features

Scenario B

Malapropism, tip of the tongue phenomenon and the slip of the tongue are features common with the speech production process. How do these relate to your life in practical terms? Slips of the tongue are a common feature of the sometimes unsuccessful attempts by human beings to communicate. However, they are called slips of tongues because they are produced through unwitting release by the speaker. For you, can you find instances of such occurrences? If yes, describe them.

What do you say of the tip of the tongue phenomenon? I agree with you that it can be very frustrating. You know you have the word right there at the edge of your mind but your tongue can't seem to be able to actualise it. Then, sometime late in the night or when you have gone far away from the scene of the discussion, bingo! With a snap of the finger, probably in the most unrelated environment, the word comes crashing into your world. How about that for an examination setting? You can understand why I said it can be most frustrating. This is part of the things the psycholinguist is expected to provide explanation for. Why did the word decide to elude you? And why must it be at that particular time when you are in desperate need of it? Why did it come back and descend into your consciousness and subsequently your tongue when the crucial moment is probably forever lost (your final year examination? It happened to me when I was writing my essay examination in my final year in the secondary school. Imagine that the spelling of *already* eluded me until after I had submitted my script to the examiner. What a shame!) Describe your experience. I know you will have one.

Self-Assessment Exercise 3

Discuss two practical ways that you have experienced a situation in which you think psycholinguistics could really help to explain the phenomenon of what happened to you.

3.6 Summary

This Unit outlines some practical ways that psycholinguistics affect the individual and social life of people. It reveals some important ways that it has practical application in the life of each individual and the social cognition. It leads the learner to see the practical application of the psycholinguistics study to the life of the individual and their society. It describes the very way the psycholinguistics brings to the fore the individual and social cognition to the way their linguistic choices are made. It also exposes the individual to the very personal unravelling of their own encounter with the psycholinguistic operations in their everyday life experiences.

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Unit 4: Current Issues and Controversies in Psycholinguistics

4.1 Introduction

4.2 Learning Outcomes

4.3 Controversial Issues

4.3.1 Nativism

4.3.2 Modularity

4.4 Structure

4.5 Process

4.6 Summary

4.7 References/Further Reading/ Web Resources

4.8 Possible Answers to Self-Assessment Exercise(s) within the Content

4.1 Introduction

In the previous unit, you learnt about the difference between psycholinguistics and psychology of language. It shows that the focus of psycholinguistics is language while that of psychology of language is focused on the mapping of the mind. This Unit will bring to the fore the current issues in psycholinguistic inquiry. It discusses such topics like nativism, modularity, structure and process as issues of concern to psycholinguists. Carefully look through the discussion below and look at the controversial issues and determine your own stand.

4.2. Learning Outcomes

At the end of this Unit, you should be able to:

1. Identify the current issues in psycholinguistics.
2. Discuss these controversies.

4.3 Controversial Issues

4.3.1 Nativism

Nativism is a concept that Reber (1987) describes as *anti-learning*. He sees Chomsky as the precursor of this kind of psycholinguistics which sees the essential "knowledge base for acquiring a language as is assumed to be inborn and the observed language be merely the result a fixing of parameter in a universal system" (p. 330). To him, the actual worry is the idea that language is innate and thus not really influenced by pragmatic factors. Aitchison (1989) has argued against this Chomskyan position of the human language being basically already made rather than being dependent on the system that enables the person acquiring the language to interact with the environment and have their meaning interpretable within these experiences. The question then is: what is this Chomskyan position that is raising so much dust.

Chomsky (1965) presents the argument that the language is based on the innate competence of native speakers who can self-correct and give faultless performance in that language. Transformational Generative Grammar, developed by Noam Chomsky, is based on the native speaker's 'competence' to recognise incorrect sentence structures in 'performance' (1965). He claims that such grammatically irrelevant interference like memory limitations, distractions, attention and interest shift, and errors do not affect the knowledge a speaker-hearer has about their language.

As noted above, many scholars have raised objection to this Chomsky's perfect native speaker theory. The fact that pragmatic probabilities as possible interpretation elements in meaning assignment to utterances have been left out of the discussion by the generativist idealists has been mentioned above (cf. Dik, 1986; Olaoye, 2007). Nonetheless, going by Arokoyo (2012) claims, it appears the generative theory has become more malleable to meaning inclusion in its syntactic descriptions. Daniel (2008) nonetheless has argued that meaning inclusion is what makes communication real in linguistic performance.

Self-Assessment Exercise 1

Discuss your understanding of the nativist theory.

4.3.2 Modularity

Modularity of language has also proved to be a controversial issue among scholars (Aitchison, 1990). The confusion concerns the integration of modules, whether they remain separate or with links between them or have an overall central organiser which contains more abstract representations. Modularity is an important feature of the linguistic description as presented by the principles and parameters theory of Chomsky (1981). The question has thus been whether one can assume that the language could be seen as being in distinct forms or modules that combine to form a phonetic representation from the logical form.

Chomsky (1981) clearly presented this modular form in the principles and parameters theory as expounded by Lamidi (2000) and Daniel (2008). The delineation of the UG in the theory is subsequently expounded as follows. The lexicon specifies all the features peculiar to certain lexical items in terms of its morphological, categorial, contextual, and syntactic characteristics. The categorial component gets projected as a particular X-bar category of noun, verb, adjective, preposition, and so on, as specified for it by the X-bar theory. The categorial and the transformational components constitute the base element in the grammar. The base rules then generate D-structures, otherwise regarded as deep structures, through the insertion of projectile nodes. These are then mapped to S-structure by the rule Move-α. The moved items usually leave traces at the extraction sites and these are co-indexed with the moved elements. This is the rule that constitutes the transformational component. It may get realised at the PF- and LF-representations, which happen to be the respective phonetic and meaning levels of the language.

The subsystems presented of the theory are explainable in the following manner. The bounding theory specifies the restrictions placed on how far an element can move at

a time. The government theory indicates the relation between an element and the categories dependent on it. The θ-theory assigns thematic roles to arguments within its purview. Binding theory has to do with relations between an element and its antecedent. X'-theory gives the projectile node representation of categories. Case theory, on its part, is concerned with the assignment of abstract Case to overt NPs. Finally, Control theory deals with the issue of the referential potential of the abstract pronoun, PRO.

It is thus easy to identify the fact that the modular structure of language actually interact to give definite grammatical structures. All these interact at certain levels with one another to dictate the grammaticality or otherwise of a structure. Case and θ-theories are said to be related while government and binding theories have implications for each other when they interact in a structure. Criticisms have been levelled against TGG. From its earliest history of existence, it is claimed that Generative Grammar has always been controversial. According to Yule (1996: 103) “Unfortunately, almost everything involved in the analysis of generative grammar remains controversial.”

Nonetheless, the main issue that scholars have had with Chomsky’s delineation of the theory remains that of the fantastic native speaker as well as the prescriptism that has remained its hall mark in terms of linguistic description. But the theory has shown the fact that the natural language has a modular structure and form. The more recent linguistic description within this tradition is the Minimalist Program. It attempts to work on how to economise the operations of the linguistic systems to achieve minimal movement for linguistic elements. It has not, however, discountenanced the modular nature of the natural language. This is the view that Aitchison (1990) also notes appears to be agreed upon by scholars.

Self-Assessment Exercise 2

Describe clearly the interactive modules that operate in the principles and parameters theory.

4.4 Structure

Structure is essentially about the putting together of lexical units to form a whole. This whole is usually about making meaning. Linguists have over the years tried to describe this structure in order to communicate. Nonetheless, as shown above, structures are usually deeply seated in psychological processes. This is one of the strong points made by Chomsky (1965) and in his subsequent development of the theory. Even Halliday (1971) reveals this important fact in his discussion of the ideational function of language. He proves that the way a language is used has to do with what is going on in the user's mind. Daniel (2008) confirms this position in her analysis of the newspapers linguistic expressions of women, either pictorial or linguistic. She found that women's psychological disposition determines their linguistic choices. When you look at yourself too, ask yourself why did you say what you said. If you choose to wear clothe that bares your body, are you not trying to make a statement? If you choose to speak down at someone, is it not a sign that you feel superior to the person? Your answer to these questions or teasers should help you to see that the way the mind and language interact is very close. In addition, Aitchison (1990) suggests that the confusion have always been whether structure and process are closely related or not. The fact that there is a close link has been established above. Nonetheless, our focus in this section is the structure and this is what we will discuss.

The fact that structure could be called the phonetic output of the linguistic process that becomes physically available to us has been mentioned above. It is therefore clear that structure is what can be regarded as the Spell Out stage in the Minimalist Program. It is the actual production. It is the actual output. How does the structure play out as the representation of the production of a linguistic piece? It is obvious that a situation of "em…em…" in a speech event may mean a lot more than mere fillers as they most probably will be described as by linguists. They could suggest indecision or lack of communicative competence by the speaker. In essence, these fillers could be negative. However, they could also be positive. You may ask how. If a politician is trying to show that they have 'arrived', they would likely be using these fillers to impress, to show that they are now what is usually referred to as 'big man'; no gender

prejudice intended. This goes to show that structure is a revealer of the mindset of the speaker or their communicative competence, beyond linguistic competence, that is.

In addition, when a structural element is elided, it could be with the intention of making a point to the receiver of the message. It may also be to show ones social position or even to indicate the communicative competence of the speaker. But more often than not, it may be a sign of linguistic competence in the user. In this way, Chomsky's argument of the ability of a speaker being able to self-correct becomes relevant here. As such, proper or grammatical structural forms are a psycholinguistic result of not only properly processing the language but also making the correct linguistic choices to produce the grammatical structure that is obtained in the process.

Self-Assessment Exercise 3

State the connection between linguistic processing and the linguistic structure that results.

4.5 Process

Hawkins (1994) reveals to us a lot about the issues surrounding linguistic processing. Nonetheless, as other scholars such as Vygotsky (1962), Lang (1994) and others have shown previously, linguistic processing is very deeply rooted in the mind and manifests in linguistic behaviours that get realised as linguistic productions. Aitchison tries to argue for this link as noted above and it is obvious that this link exists as we have also tried to show above. The reality is that linguistic processes – whether towards comprehension or for the purposes of production – necessarily undergo the same processing but in different orders. This is why it is seen in the communicative process that it is when the language of the speaker (writer) is correctly decoded and interpreted that we can say that communication has taken place. As such, such example of hesitant speech as noted above could be communicatively meaningful. Nonetheless, except there are such structural forms that can clearly convey them, it may be difficult to decipher the intention of the speaker. This is why the example of the nonsensical

sentence given by Chomsky (1965) as an example of a correct structure that does not make sense makes a whole lot of sense here; the fact is that the sentence is actually nonsense and does not have any communicative content that could be interpreted. This is why one still thinks that meaning content eventually becomes the reason for the communicative act in the first place, no matter what contrary view may be held by some generativists (cf. Gray, 1978).

Aitchison (1990) asserts that the link between process and structure is an issue of contention among linguists. Our view is that this need not be so. The reality before us is that without a psychological base, language will have no form. Processing of the language determines its production content just as the processing of the linguistic raw material given by a producer provides the basis of interpretation by a receiver of the message. As Kress (1990) duly notes, none of these processes is idle; they are all very active and very involving for all the parties involved.

Self-Assessment Exercise 4

Discuss the role of linguistic processing in showing a user's linguistic competence.

4.6 Summary

This Unit outlines current issues in psycholinguistics. These are identified as nativism, modularity, structure and process. In discussing each of these issues, a deep link between them is identified within the literature. The fact that comes out clearly is that they are interrelated. It is thus obvious that the source of the human language is related to its universal form as a modular structure. The physical structure and processing of the human language are linked.

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Unit 3: Controversies in Psycholinguistics

3.1 Introduction

3.2 Learning Outcomes

3.3 The Human Language Phenomenon

3. 3.1 Multidisciplinary Nature of Psycholinguistics

3.3.2 Issues in Psycholinguistics (1)

3.4 Issues in Psycholinguistics (II)

3.5 Child Grammar

3.6 Summary

3.7 References / Further Reading/ Web Resources

3.8 Possible Answers to Self-Assessment Exercise(s) within the Content

3.1. Introduction

In the previous Unit, such current issues in psycholinguistics like *nativism, modularity, processing* and *structure* were examined. In this Unit, we shall look at the controversial issues in psycholinguistics. The field is full of many topics that have been debated for ages. These areas have influenced language studies and development; and more data are still being assembled to learn more about human language behaviour. This thus discusses the stand of the cognitivist/mentalist and the behaviourist schools of thought. While the former holds that language is innate, the latter believes that it is environmental. We will try to draw a middle line between them. We shall also assess the species–specific trait of man in possessing language. Some have argued whether animal communication like the 'dance language' of the bees actually constitutes language in the same sense like that of the human language. The unit will also give an insight into the controversy regarding the relationship between language and

thought and we shall see whether children actually imitate adult in their speech or they possess creative instinct to generate what has been labelled as ‘child grammar’.

3.2 Learning Outcomes

At the end of this Unit, you should be able to:

1. Examine the cognitivist/mentalist and behaviourist theories of language acquisition
2. Describe the role of imitation in language learning
3. Explain the Critical Age Hypothesis (C. A. H.)
4. Discuss how thought interrelate with language
5. Distinguish between human language and animal communication

3.3 The Human Language Phenomenon

3.3.1 Multidisciplinary Nature of Psycholinguistics

The field of psycholinguistics is varied and complex. The issues being discussed range from the most profound to the most trivial. Topics being debated include: How do we acquire language? Is language related to thought? Do children imitate adults when learning to speak? Do animals possess language in the same sense as we talk of human language? All these and many more have generated a lot of controversies that researchers have come to the conclusion that more still needs to be done to determine what really happens when psychology, sociology and philosophy come in contact with human language. Kayami (2001) expresses deep concern when he says that “the topic of human language acquisition implicates the most profound questions about our understanding of the human mind and its subject matter, the speech of children, is endlessly fascinating. But the attempt to understand it scientifically is guaranteed to bring on a certain degree of frustration.”

Controversies abound in psycholinguistics because it deals, not only with language study, but also the psychological aspects involved. These include language acquisition and behaviour as well as the psychological mechanisms responsible for them. Implicit in the explanations are questions to be determined. Since psycholinguistics has to do with human mind, a lot of assumptions must be scrutinized to avoid arriving at the wrong conclusions. Psycholinguists want to know how language structures are acquired by children and how they are used in the process of speaking, understanding and remembering.

Arguments also arise whether animal communication differs from that of man. Though they appear the same because they both have fixed systems of signals, this similarity is vague and generalized since it cannot explain adequately human linguistic complexities. For example, the popular “bees dance” often touted as a form of communication is used to communicate the location of food by means of a dance done in the hive. However, this message is limited just like the message of higher primates like gibbons and chimpanzees, which are credited with communication signals similar to human whereas a closer look reveals serious limitations. A cry may indicate ‘impending danger’ and a grunt may mean desire for food or request for care towards the infants. All these do not constitute language because there is restriction and any message beyond the immediate cannot be conveyed.

Moreover, the relationship between language and thought is still steeped in controversy. The subject has been of considerable interest over the years. Since the Whorfian hypothesis, which claimed total dependence of thought on language generated so much debate, new insights are now given that such a position is extremist and that, as far as cognition is concerned, children can think before they talk. A better perspective is that language is vital to interaction and therefore affects the way we think and which in turn affects the way we speak. Language and thought are therefore integrative and cannot be perceived differently.

Catania (2012) aptly submits that, sometimes, when participants in a controversy have something to say, they merely say the same things in different ways. This underlies the cognitivist/mentalist and the behaviourist debate on language acquisition. While

the cognitivists are concerned with the structure of language, the behaviourists emphasize the function. However, the two can overlap. The controversy between the two schools of thought is in part simply a matter of speaking of the same things in different ways. Sometimes, when we fail to identify the problems appropriately, controversies arise because we mistakenly speak of different things as if they were the same (Catania, 2012).

Self-Assessment Exercise 1

‘Psycholinguistics is an interdisciplinary field of study steeped in controversy.’ Discuss.

3.3.2 Issues in Psycholinguistics (1)

Perhaps there is hardly any field of language study that entertains so much controversy like psycholinguistics. This is not unexpected because it is an area that examines in full detail the relationship between language and the mind. Many areas combine together to furnish it with a corpus of data that still require much scrutiny. These include but not limited to psychology, sociology, philosophy and biology. Carroll (1994) explains that controversial issues abound in psycholinguistics because it has a rich heritage that includes contributions from diverse intellectual tradition of how best to describe language study and language process. Some pertinent questions we ask are:

1. What knowledge of language is needed by human beings to use language?
2. What cognitive processes come to play in language behaviour?

Attempts to answer questions like the above, among other complex questions, require an interdisciplinary approach, which psycholinguistics offers. Psycholinguistics is primarily a sub-discipline of psychology and linguistics but it is also related to developmental psychology, cognitive psychology, neurolinguistics and speech

science (Carroll, 1999). We can now understand why there is a debate on what happens when a child acquires a language. The two schools of thought involved in this debate have been labeled as the cognitivist/mentalist and the behaviourist theorists. The mentalists argue that children are born with a mental biological structure that is genetically wired to process language.

Chomsky (1965) asserts that a child possesses the capacity to generate an infinite set of utterances because of a device termed Language Acquisition Device (LAD), which is a property of the child's brain that endows it to aggregate linguistic information. During language acquisition, children pick a number of words spontaneously and combine them into a structured sequence by assigning each word its natural role. There is thus no need for any explicit instruction as propounded by the behaviourist school of thought. Mentalists propose that what the child needs is a tacit knowledge of a language as they begin to formulate endless sentences of their own. They argue that a child's mind is not a blank slate (tabula rasa) and that language acquisition is dependent on an innate species – specific module different from general intelligence.

On the other hand, we have the behaviourists who hold that language learning depends wholly on the environment and that imitation is central to language learning. However, the controversy here should not be seen from an extremist position. The assertion by the cognitivists does not really rule out environmental input. They only argue that environment is a catalyst and not the nucleus of language acquisition and learning. They do not actually say that we acquire language without experience. Their assertion is that language acquisition requires environmental input to trigger and stimulate language development. An example is given that deaf children cannot acquire language because when they cannot experience speech, they cannot possess spoken language. It is not possible for children language acquisition to take place in a vacuum. During language acquisition, exposure and stimulation by their caregivers are important factors in language enrichment. Mentalists also support their position by citing the creativity of human language. How come children produce utterances they never heard before? Even the preceding ten lines of this write-up have probably never been written by these authors. Almost every sentence that you hear or speak everyday is a brand new event not previously experienced. Yet, you create them

effortlessly from your mental faculty without imitating or depending on anybody. The environment merely serves to stimulate and not to create those bits of language for you. Everyone who knows a language knows a relatively small number of principles, a small number of sounds put together to create words and a large but finite vocabulary. This finite knowledge provides the person who knows a language with infinite creativity (Fernandez &Cains, 2011).

The relationship between language and thought also constitutes a veritable source of controversy in psycholinguistics. We have one school of thought that says thought depends on language and another school says that thought is independent of language. Whorf (1956) claims that we dissect the world through our particular language and that speakers of different languages perceive the world differently in what is usually referred to as linguistic relativity theory. With the increasing complexity of the modern world, we have realized that the Whorfian hypothesis is seriously flawed. Pinker (1995) argued that Whorf's assertion is extremist because, as far as cognition is concerned, children can think before they talk. It has been shown that people think, not only in words but also in images. Studies in semantics and pragmatics have shown words having more than two meanings but still perfectly understood in various contexts. For example, the word 'spring' can be understood to mean (weather, sudden jump, pool and a metal object).There are also individuals who can think but cannot communicate through language. These are people suffering from neurological disorder and language impairment like 'aphasia'. This occurs where there is damage to the left hemisphere of the brain responsible for language processing.

Fodor (1975) also argues that general intelligence is the system responsible for generating the language of thought, which in turn is translated into speech by our linguistic system. This implies that any thought can be conveyed in any human language, thus contradicting the Whorfian position. Current studies, like Leva (2011), however, suggest that language and thought are integrated and as such cannot be processed separately. Studies reveal that how people talk changes how they think and learning new colour words enhances a person's ability to discriminate colour. Learning new ways of talking about time imparts a new way of thinking about it (Leva 2011). Jones (2010) counters that speakers of a certain language do understand a

concept even if it is not in their language. For example, the German word "schandenfrende" which has no equivalent in English is still understood by English speaker, to mean "rejoicing from the bad luck of others." He however concedes that language influences and enforces our thought process.

Ogbulogo (2005) explains that as the environment changes, culture and language typically respond by creating new terminologies to describe it. The terminologies used by a culture primarily reflect that culture's interests and concern. While Indians in Canada's Northwest Territories have 13 terms for different types and conditions of snow, the non-skiing native Southern Californians make do with only 2 terms. These are 'ice' and 'snow'. Nevertheless, they also have other terms in English for different stages of frozen water. These include: blizzard, frost, sleet, slush, etc. In Nigeria, we only talk of dry and wet seasons, which in Yoruba means 'ògbelè' and 'ògìnnìntìn' respectively. But do you know that the Yoruba language has other weather terminologies like 'kùrukùru' (fog), 'oyé' (harmattan), etc? Cassava variants in Nigerian ethnic terminologies include 'akpu', 'èbà', 'gàrí', 'oka', 'abacha', 'kpakpo', etc. Encarta (2012) says the evidently close connection between language and thought does not imply that there is no thought without language. Pre-linguistic infants and higher primates can solve quite complex problems involving spatial memory, which indicates thinking. Artistic and musical thoughts do not require specific linguistic expressions, which may be purely visual or auditory. We can deduce from the foregoing arguments that all thoughts require representation of one kind or another but are not solely dependent on it. However, there is enough evidence that any representation, linguistic or otherwise, is immensely increased by the use of language.

Self-Assessment Exercise 2

1. Examine the controversy of the Mentalist and the Behaviourist schools of thought.

2. Discuss the relationship between language and thought.

3.4 Issues in Psycholinguistics (II)

Perhaps, no other controversy has generated more interest than that which holds that animals could communicate in the same sense as we have it in the human language. Can we actually speak of animal language? The answer is no. This is because language is species-specific to man and a large number of evidence suggests that only man has the capacity for language. This is so because of the mechanism in the human brain and the physiological make-up of the vocal track. This genetic make-up endows humans with special adaptability to language behaviour.

Encyclopedia (2012) reveals that "other members of the animal kingdom have the ability to communicate through vocal noises but the distinguishing characteristics of human language are its infinite productivity and creativity." Some have argued that the bees dance constitutes language but such an assertion does not consider that nectar sources are the only known theme of this communication system. Erroneously described as 'dance language', bees are only able to carry out conventionalized movement to indicate the locations of nectar and no other message. Even the way parrots mimic human sounds could only be possible because they are kept in the company of human beings. Such behaviour could not be taken to be a spoken language because it is wholly derivative and serves no independent communicative function.

We can deduce from the above that animal communication differs considerably from that of man. Though they may appear the same when seen as a fixed system of signals, this similarity is vague and generalized because it is inadequate to explain human linguistic complexities. Higher primates such as gibbons and chimpanzees are credited with communication signals similar to humans but a closer look will reveal serious limitations. A cry which may indicate an impending danger is hardly distinguishable from that which is used for anger. While a low sounded grunt may be for care and attention, a similar sound may be taken to be a murmur of delight. While the human language can convey an unlimited set of discrete signals, animal communication revolves around a limited set of signals. No language study has come up to show how any animal can say to another animal "I have found your missing infant

being carried away by the hunter who is sleeping under the tree." Animal vocalism remains where it was before civilization whereas the human language is dynamic.

3.5 Child Grammar

The role of imitation in language behaviour still constitutes an area of controversy in psycholinguistics. Some linguists believe that imitation plays a critical role in language behaviour while others claim otherwise. The major issue is, to what extent does imitation affect language learning and development?

Studies have shown that what is called imitation is just exposure to the adult model which will guide the child to formulate their own sentences and create novel utterances. Psycholinguists based their idea of Universal Grammar (UG) on the assumption that children do not imitate blindly the adult language forms. All children everywhere no matter the race, colour or location are born with a brain ready to equip them with language. As the child grammar develops, it has all the universal properties similar to all other languages elsewhere. The linguistic components of the child grammar at the phonological, syntactic and lexical levels are complete and conform to the rules of the speakers. When you observe a child acquiring language, there is a systematic unfolding of linguistic complexity from one-word stage to multi-word level. When sufficient exposure is given to the child, they will be attuned genetically to produce their own speech independently.

You may be surprised that language is not taught to children. Researchers have revealed that it is only the encouragement from the caregiver interaction and the peer group relationship from the environment that trigger the child's language production. This interaction will engender their linguistic creativity. When you attempt to correct the child's error, it will be of little or no effect since they will learn the correct pattern on their own without imitation. McNeil (1966) reports of a child who was corrected to say 'ate' when he was saying 'eated' due to generalization of the 'ed' past tense form. The effort proved futile as the child made no attempt to imitate the adult model. Therefore children's errors often go unnoticed and even when noticed are not corrected because the correction does absolutely no good.

Fernandez and Cairns (2011) argue that the word ‘imitation’ cannot really be used to describe what goes on in child/caregiver interaction. He contends that “imitation occurs where a child repeats what an adult has said or at least produces a child’s version of it immediately an adult has said it.” Where a caregiver says: “Thisis a big blue ball” and the child responds “Blue ball”, we cannot actually term such as imitation because there seems to be a great deal of individual variation in the production of such an utterance. A good illustration that imitation plays little or no role in a child’s language acquisition is reported in Fernandez and Cairns (2011) where an adult and a child engaged in this conversation:

Child:	Want other one spoon, Daddy.
Adult:	You mean, you want the other spoon.
Child:	Yes, I want other one spoon, please, Daddy.
Adult:	Can you say “the other spoon”?
Child:	Other … one … spoon
Adult:	Say “other”.
Child:	Other.
Adult:	Say “spoon”.
Child:	Spoon
Adult:	Other … spoon
Child:	Other … spoon. Now can I have other one spoon?

It is obvious that the ‘teacher’ has only succeeded in wasting his time as the child still repeats what he said from the beginning.

Another area of controversy is the one that says that at certain age language learning and language acquisition will begin to decline. Some psycholinguists hold that a learner reaches their linguistic plateau whereby attempt to learn a language becomes more difficult. Studies still continue whether such an assertion is true or not. Slobin (1972) posits that by the time a child is five years old, all the basic structures of the language are in place while fine-tuning will continue till late childhood. This corroborates Lenneberg’s (1967) assertion of a critical stage when language acquisition is crucial. Known as the Critical Age Hypothesis (CAH), it presents the

optimal period for first language acquisition as at “the early teen years after which a fully complex linguistic system will not develop.” This appears plausible because placidity of the brain is being put to test after a certain age. At a certain critical period, the brain cannot properly process cognitive demands of the language in the same way that it did during infancy. Researches also confirm that some wild children who acquire language very late after childhood found it difficult to learn well. A case was reported of Genie, a Californian girl locked in a closet for the first thirteen years of her life by an abusive father. She acquired words and the ability to communicate verbally but she never acquired the full morphological and syntactic system of English despite the efforts of her rescuers who were from the University of California in Los Angeles. Samples of her speech include:

Genie, full stomach
Want Curtiss play piano

(Curtiss, 1988)

In addition, whereas a child experiences little difficulty in acquiring more than one language, older learners do not find it easy or they possess little proficiency in such language when diligently learnt. This is easy to explain because children do not have a language to lean on whereas a second language (L2) learner can interact in one language and merely use the second one as a back-up. Furthermore, the language learning circuitry of the brain is more elastic in childhood than that of an adult learner who speaks with a foreign accent when they pick up a second language.

Self-Assessment Exercise 3

1. Distinguish between animal communication and human language.

2. Explain the Critical Age Hypothesis (CAH).

3.6 Summary

In the Unit, we discussed some controversial issues in the field of psycholinguistics. These range from very serious issues to those of simple assumptions. We now know that psycholinguistics is an interdisciplinary field consisting of linguistics, psychology, philosophy and speech science among others. A lot of questions need to be answered in such a plethora of studies. Controversial issues that have arisen include whether language is acquired or learnt. What is the role of environment in language learning? Do human beings possess a mental mechanism that predisposes them to acquire language seamlessly? We have examined to what extent the mentalists and the behaviourists can hold their grounds and that the two schools of thought should find a middle point. The study also explained the debate regarding the relationship between language and thought. We have seen the extremist position of the Whorfian hypothesis and that animal communication cannot be on the same platform as human language. We also mentioned the role of imitation in language behaviour and conclude that children are not blind imitators. Finally, we talked on the Critical Age Hypothesis (CAH) debate and explained that at a certain age, learning a language becomes a challenge because the plasticity of the brain functions better during childhood for easier language acquisition and learning.

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Unit 5: What about Linguistic Universals?

5.1 Introduction

5.2 Learning Outcomes

5.3 Functional Perspectives of Psycholinguistics

5. 3.1 Integrating the Issues in Psycholinguistics

5.3.2 Communicative Competence versus Linguistic Competence

5.4 The Inner Processes of the Human Mind

5.5 Linguistic Universals as the Point of Compromise

5.6 Summary

5.7 References/Further Reading/Web Resources

5.8 Possible Answers to Self-Assessment Exercise(s) within the Content

5.1. Introduction

In the previous Unit, the controversies that dominate psycholinguistic inquiry were brought to your awareness. The Unit also tried to bring to the fore how these controversies can be brought into positive use for the advancement of the discipline. This unit will thus attempt to integrate these controversial issues and try to find a middle point for all of them. You should, consequently, be ready to make your practical contribution to the advancement of psycholinguistics by providing your own suggestions to the issues raised and how these issues can help advance the field of psycholinguistics. One expects that, as you were previously told in the preceding Unit, you should take these suggestions from the practical experiences you have had with psycholinguistics. You may be surprised at how much the suggestion you make may impact the field. So, do not be shy in expressing yourself.

5.2 Learning Outcomes

At the end of this Unit, you should be able to:

1. Relate the issues in psycholinguistics to one another
2. Identify linguistic universals as the meeting point of psycholinguistic inquiry.

5.3 Functional Perspectives of Psycholinguistics

5.3.1 Integrating the Issues in Psycholinguistics

It cannot be denied that there are many issues that are involved in the development of psycholinguistics. There is therefore need to integrate these issues; the controversies surrounding the development of the field as well as the issues that continue to dog its academic steps. Some of these issues that have been raised in the previous units include the nativistic source of language as well as the confusion about the processing and structural form of the natural language. It is obvious that modularity appears to be a commonly held view about language. Nonetheless, the functional approach appears to inflame passions just like the nativistic postures do too (cf. Reber, 1987). As argued by recent scholars (Aitchison, 1989, 1990; Daniel, 2008; Steinberg, Nagata & Aline, 2001; Yule, 1996), the fact of the matter is that language is meant to be used to function by bringing to light the human thought. This function is based on the psychological state or posture of the individual at a particular time and under a particular circumstance. In addition, it has also come to reality that some of these functions get impaired due, sometimes, to biological accidents. This is where the issue of aphasia comes from.

Another important issue that has remained controversial is that of language acquisition and language learning. What really is the difference? The general consensus had usually been that the language learnt is that which is a person's second language or subsequent language whereas the first language is usually acquired. This means that as you are growing up, you just find yourself speaking the language of those around

you. Wikipedia (2013) describes this as an unconscious process. This language is also technically referred to as Mother Tongue or L1. The question of whether a language is learnt or acquired does not seem to us like an issue that should carry as much controversy as it does. The important thing is that, whether learnt or acquired, linguistic competence of the speaker should be a target of the teacher or instructor, as the case may be.

5.3.2 Communicative Competence versus Linguistic Competence

In the same vein, communicative competence and linguistic competence have remained at logger heads (cf. Adejare, 1995; Daniel, 2008 & Ogunsiji, 2004). The fact is that psychological disposition has a lot to do with the kind of competence a speaker demonstrates most times. The truth also is that there is need for the speaker to have linguistic competence in order to make sensible constructions that are meaningful. On the other hand, the speaker must speak within correct context for the meaningfulness of the structure to manifest. You can check out your words as you speak them to determine this. When you are speaking to your lecturer, do you address them as if you are speaking to your mates in the class? I'm sure your answer is no. Why do you think it is so? This is because in your mind, you know that you have to respect your lecturer. Therefore, your choice of expression as it concerns your lecturer has to be respectful. This is not about the correctness of your grammatical expressions but the relationship between the participants in this context: you and your lecturer. So, communicative competence influenced by your psychological disposition determined your choice of expressions. Another issue is the critical age hypothesis. Is it really such that when a child passes an age into puberty it can no longer learn a language? There has been argument for and against this position. However, one wonders about the adults that are still able to master a foreign language at a later date in their lives if it is impossible for a person to learn language at a particular time of life. Moreover, the experiments of scholars such as that of Genie in the US where the child was denied linguistic contact until about the age of her teens and she was still able to marginally master the language that was later introduced to her, one begins to wonder if such a notion is actually scientific in outlook. One could therefore state that physical disposition to speech is more likely to determine if one can speak or not. The fact also remains that when through an accident, a person loses the ability to speak properly; this is when

the issue of the ability to speak may begin to rear its ugly head. Nevertheless, one must not deny the fact that, among psycholinguists, the issue of psychological base of language is non-negotiable. Most communication engaged in is informed by the psychological disposition of the speaker.

In addition, it is true that cognition of the language user has a lot to do with the ability of the speaker to make coherent linguistic expressions that are found meaningful. A person suffering from a medical condition that makes it impossible to make sensible communication possible will likely be unable to communicate effectively. This has been found to be the case with aphasia patients. Even those that suffer a condition of paralysis tend to also lose their power of speech. Crystal (1982) insists that there is such a large disparity in the speech of this set of people that more data will be required to ascertain the ability of these ones to speak at their level of communication. He asserts that more data will likely expose this disparity than the assumption that the aphasic patients tend to speak in the same manner. Let us ask you a personal question: Have you ever seen a mad person speak in a sensible manner? If yes, then be sure that that fellow is no longer insane but has the mind restored. You can experiment with this on your own. I'm sure that many people you even assume are sane may surprise you. This is to show you that cognition is a practical part of what psycholinguistics exposes in the user of language.

Self-Assessment Exercise 1

Discuss how four salient issues in psycholinguistics relate to one another.

5.4 The Inner Processes of the Human Mind

The human mind is very deep. However, it is the base of thoughts that give life to language. The human mind is where the thoughts are conceived and then realised as linguistic elements. Aitchison (1990) argues that the human mind is only reflected in terms of thought made tangible by language. The processing of language is seen as

a major work that thoughts perform. As such, language reflects thoughts. The processing of thoughts is what language reflects (Aitchison, 1989, 1990; Steinberg, Nagata & Aline, 2001; Yule, 1996). It is apparently normal for children learning or acquiring a language to process it within their cognitive and environmental experiences. It is within the limit of the things they have experienced that they use language to express themselves. It is, therefore, necessary to note that linguistic processing is determined by the environmental experience of the user of the language. The person that is yet to make use of a computer may not be able to describe that experience with language. It is clearly not far-fetched to imagine that this person may not be able to process the thoughts concerning this phenomenon in the mind. The ability to comprehend and produce language can be related to environmental factors.

Steinberg, Nagata and Aline (2001) argue that the basic mental entities used by the child acquiring the language are derived from the physical world. As such, the child may be able to account for the words such as ‘drink milk’ essentially from the experience of having been given milk to drink by the caregiver. Aitchison (1989) notes that the idea of Chomsky that children come already loaded with language in their minds is unacceptable. The more acceptable idea seems to be that of children being able to process language to express what their environment have enabled them to experience. This second option appears more reasonable and acceptable. She uses many examples of children processing language to prove her point. As such, when children assert statements like ‘Daddy car’ or ‘Mummy comb’, it is because they can relate to these experiences in their physical environment. Children that do not have a daddy or their daddies do not have a car may not be able to make such assertions. In addition, these children are able to transfer such experiences into similar new experiences to produce new structures that can relate those new experiences. This is an important element of language, its dynamism, which Yule (1996) identified. The next section discusses how the issues can find a middle point.

Self-Assessment Exercise 2

> Discuss the important element required by the human mind in order for it to express itself in language.

5.5 Linguistic Universals as the Point of Compromise

We have tried to discuss some points of disagreement and points of agreement among scholars of psycholinguistics. You may probably be asking the question: What is all the noise about? The issue is that psycholinguistics is really a practical part of our lives as noted above. We have talked about the reality of slips of the tongue or even edge of the tongue phenomenon. Now, I'm sure that you have experienced these at one time or the other. The word either slips out of your mouth before you are ready to say it or you just practically rack your brain, trying to get a hold of that particular word you desire to say or that you think is the most appropriate to communicate your intention. Is this really your experience? If this is true, then you must see that psycholinguistics is not just a field that was dreamed up. It has reality in our lives. If this is so, then what do we think focusing on the differences in the field will likely achieve? Most probably, it will help scholars to produce a lot of academic papers (cf. Crystal, 1982) – and saying nothing. This does not seem a sensible thing to us.

Linguistic universal is a reality that Noam Chomsky has been advocating with his grammar. Universal Grammar (UG) has delineated the reality of linguistic universals among the languages of the world. It appears sensible to agree that many languages of the world have a lot of things in common. In the first place, all languages are produced with the air stream mechanism as their sound source (Daniel, 2011); whether this is egressive or ingressive is usually dependent, most often than not, on the particular sound being produced and, sometimes, the particular language as most languages of the world make use of the expulsion of air (egressive air stream mechanism) to produce their sounds. This being as it may, the fact remains that most languages of the world make use of the air stream mechanism to produce sounds.

Sometimes, even this air stream may come from the pharynx or trapped in the larynx. The common point also is that this air stream is usually that which originated from the lungs. But the question then is: is the ingressive production from the lungs? If it is not from there, at least it goes there. So, even here, the lungs are connected to what is happening. Why are we talking about all these here? This is to show that language has a connection with the universal.

In addition, we also know that all languages have four basic skills. These are: listening, speaking, reading and writing. An important point to be made here is that, whether we like it or not, all languages share the same basic skills of listening and speaking. These tie all languages together. There is no language called natural language which does not involve the skill of speaking and listening. One sure thing that is different is that it is when a language attains a greater level of complexity that it gets reduced to writing. Not all languages share these skills of a truth but all of them have the potential of attaining these skills. It thus shows that there are many things that languages share in common.

It is also obvious that all languages are used to communicate. It is clear that for there to be meaning conveyance, there must be a psychological base for the linguistic employment. In this wise, one can see that the issue of deep structure or ideational content of language usage is universal (see Chomsky, 1965; Halliday, 1971; Lang, 1994; Vygotsky, 1962). Thus, we can see that all languages have meaning content; if not, there would be no communication. This is another important link that all languages of the world share.

All languages of the world have modular structure. We mentioned this fact in a previous unit (Unit 2 of this module). This fact is also another fact that has been proven scientifically. It is thus clear that languages have modularity and systems that they share. It is another universal nature of the human language.

Why then are we saying all these things? It is important to see the linking force between the languages of the world. The attempt to make them look so distinct and different may not really be true. It is imperative to determine what a real controversy is and what is pseudo-controversy (apology to Crystal, 1982) in linguistic studies. You need to understand that linguistic universal is the reality of psycholinguistics as a thrust and focus.

Self-Assessment Exercise 3

Discuss in detail any two of the many ways that psycholinguistics express the points of compromise as a linguistic field.

6.6 Summary

This Unit outlines the different issues in psycholinguistics that mark the points of agreement and controversies. It tries to bring together the points at which the field of psycholinguistics present the points of compromise in the field. It concludes that linguistic universal is the best point of compromise. It highlights the specific controversies and agreements in psycholinguistics. It identifies controversial issues and the issues on which linguists agree. The last part suggests that the middle point for the issues here is the realisation that linguistic universal is not just a concept of Chomsky's but a reality as it shows in the different points raised in the unit.

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Unit 6: Different Forms of Psycholinguistic Inquiry

6.1 Introduction

6.2 Learning Outcomes

6.3 Psycholinguistic Inquiry

6.3.1 The Psycholinguistic Processes

6.3.2 Speech Comprehension

6.3.3 Speech Production

6. 3.4 Lexical Selection

6.4 Assemblage

6.5 Language Acquisition

6.6 Summary

6.7 References/Further Reading/Web Resources

6.7 Possible Answers to Self-Assessment Exercise(s) within the Content

6.1 Introduction

In Unit 2 of this Module, you learnt about the history of psycholinguistics. The Unit introduced you to some key players in the course of the development of psycholinguistics as a field of study. It discussed different views of different scholars on the subject matter. The great influence of Noam Chomsky's grammatical postulations on the development of the field is also brought to the fore. This unit gives the diverse attempts made to develop the field of psycholinguistics. It introduces you to the procedures with which the study of psycholinguistics was done by different people in the past. You are expected to read up the references at the end of the unit as they will help you to understand better what this unit specifically focuses on.

6.2 Learning Outcomes

At the end of the Unit, you should be able to:

1. State the three processes involved in psycholinguistic inquiry

2. Discuss the comprehension process

3. Determine the processes involved in the production of speech

4. Explain the language acquisition process.

6.3 Psycholinguistic Inquiry

6.3.1 The Psycholinguistics Processes

Actually, scholars have been able to determine some processes involved in the psycholinguistic endeavour. It has been found that processes involved in psycholinguistics include the speech comprehension, speech production and the language acquisition. It is actually necessary to state that the process of language comprehension usually precedes that of speech production. It is a natural order really as even in the communication process, it is obvious that listening precedes speaking (though we have also wondered if the sounds that the child makes at birth to announce its arrival could be called speech preceding listening). Nonetheless, Steinberg, Nagata and Aline (2001) have questioned the possibility as they believe that speech cannot be attributed to those initial sounds nor comprehension attributed to those initial seeming understanding by the neonate. Nonetheless, it seems natural to assume that speech comprehension precedes speech production in the whole process of language acquisition. Steinberg, Nagata and Aline (2001) actually assert that it is unimaginable any other way. This unit is thus designed and patterned after this form. The next section presents to you the speech comprehension process which is followed by the section on speech production, after the language acquisition process is fully discussed.

Self-Assessment Exercise 1

State at least three processes of psycholinguistics you have come across.

6.3.2 Speech Comprehension Process

Speech comprehension is actually about understanding speech. Steinberg, Nagata and Aline (2001) traced the beginning of speech comprehension from the womb. It was however impossible to finalise the very beginning of speech comprehension in children. Whether it begins from the womb is impossible to determine. Even though scholars tried to establish the very time the child starts to comprehend speech, it has not actually been easy for this to be fully established. The attempt to investigate the less than 12 hours after the child was born could not show any significant ability of the **neonate** (new born baby) to understand the mother's voice and react to it while played under an experimental condition after four days. Yet, the same extent of comprehension and reaction to the mother's voice could not be established after just 12 hours (Steinberg, Nagata & Aline, 2001). All these show the impossibility of establishing the actual time that comprehension begins for humans.

Nonetheless, it is important to state that the essential thing about speech comprehension is the fact that it can occur in individuals once they can establish communication occurrence in terms of meaning making. This thus shows meaning as being basic to comprehension. Scovel (1998) regards comprehension as the ability of the listener or reader to be able to decipher the information being passed across. Steinberg, Nagata and Aline (2001) on their part state that except the word in the language is linked to real or existent element, it cannot be regarded as able to be meaningful. In their view, speech can only be comprehended if the person receiving the information can link the words in the language to concrete things, making communicative meaning within that language otherwise communication event may be difficult.

In addition, Steinberg, Nagata and Aline (2001) also aver that thought is the foundation of language. To them, meaning is rooted in the thought of the user of the language. The idea is that without thought, language cannot form meaning. It is this meaning contained in a thought element or the idea contained in the language that contains the

meaning. As such, concepts are contained in the language and they can only be comprehended if they are explicitly passed across. The question here is that, as noted by Steinberg, Nagata and Aline (2001), those mute people that can comprehend language can essentially do so because they have thought processes. They were thus able to establish the importance of thought to making meaning in language.

It is also important to determine that their argument is not an extension of linguistic relativism. Nonetheless, one could only say that the connection of thought to language is an important aspect of what psycholinguistics is expected to study after all. Thought is naturally a part of the linguistic process; only that it is never expressed.

In the same vein, it is imperative to state that the being able to produce speech is not the only way of measuring language acquisition. This is because, as mentioned above, it is possible to have the comprehension of language without the ability to produce it. This is seen in the examples provided by Steinberg, Nagata and Aline (2001) in the experiments done with Christopher Nolan, Anne McDonald and Rie (Japanese) who despite being mute went ahead to make use of written language to make impact, even publishing best seller books. It is thus obvious that muteness does not equal lack of language. You may see this being re-enacted in President Hugo Chavez of Venezuela having to be communicating with his aides essentially through writing, due to his partial loss of speech as a result of cancer.

Self-Assessment Exercise 2

1. Discuss the speech comprehension process.
2. Would you consider a mute person as ‘languageless’? State two reason(s) for your view.

3.3 The Speech Production Processes

Aitchinson (1990) avers that speech comprehension and speech production cannot be regarded as two sides of a coin. She opines that they have some dynamics operating in each of them. She also notes that there is the tendency to concentrate on the discussion of speech comprehension at the expense of speech production. However, this position seems at variance with Steinberg, Nagata and Aline (2001) who posit that comprehension is the underdog in the study of speech production and comprehension processes. Nonetheless, this debate is not the focus of this unit.

Aitchison (1990) suggests that there are two broad processes involved in speech production. These are **lexical selection** and **assemblage**.

6.3.4 Lexical Selection

The idea is that lexical selection process has been viewed as possibly an important means of determining speech production processes in that the tip of the tongue phenomenon suggest that there is an attempt to choose particular words that fit into the intended meaning but the wrong or related in terms of meaning or sound may be chosen instead. This is why someone may say *knife* instead of *wife* or as is often the case with many of us, in answering an older caller, we may say *sir* to a woman instead of *ma* or vice versa. It thus shows that there is some relationship in the choices made by speakers in their production of speech.

Aitchison (1990) also reports that some scholars have suggested that all possible sounds related to what the speaker has in mind to say are activated at the same time. She nonetheless wonders at the possibility of such occurrence as it could lead to the cumbersomeness of choice on the part of the speaker. Her view is that the actual thing that happens is that the speakers of the language appear to have the ability to suppress the word not required immediately in order to select that which best fits the communication intentions of the speaker.

Nevertheless, an important point made by Aitchison is her observation that verbs seem to form a fulcrum in that they get selected first and thus less liable to error in production. In addition, she notes that the speakers of the English language tend to have the ability to provide a word in the case where an existing word may not be readily available. This should clearly explain the creativity often observed in the users of the language. It affirms the reality of the dynamism of language. As such, saying that "Children use *deduceful* rules" (Aitchison, 1990:352), where one means to say the word *deductive* is a situation saving device to allow the communication process to move on without interruption. Pragmatics thus becomes a useful tool in psycholinguistic analysis as it is obvious that there will be no communication breakdown in such a situation as the cooperative principle will easily enable the co-interlocutor(s) to supply the required correct word in their minds to interpret the meaning content of the statement.

6.4 Assemblage

The slip of tongue phenomenon gives the easiest clue to the assemblage process. It involves words, morphemes, syllables and phonemes. There are about three possible manners in which the process occurs. These include **anticipation**, **perseverations** and **transpositions** (Aitchison, 1990).

Anticipation has to do with when an item comes earlier than expected while perseverations is the wrong repetition of a linguistic item. Transpositions tend to involve a situation where items substitute one another.

Examples of these occurrences include:

He took *sail* out of his *winds*. (transposition)

Aitchison (1990) outlines some tendencies that characterise the occurrence of errors in speech production. She asserts that:

1. Anticipation generally outnumbers perseverations, noting that some anticipations may actually be unfinished transpositions
2. Errors normally occur within tone-groups
3. Units of errors tend to be of approximate equal size, with equal metrical pattern
4. Sound slips are usually obedient to the rules of syllable positioning
5. They also obey the laws of English syllable structure
6. The words formed by slips of tongue are usually more patterned than chance occurrences.

All these suggest that the human speech production process is orderly, making anticipation prominent and giving verbs a fulcrum position that allows for other syntactic and phonemic elements to be filled in as the production process unfolds. In addition, there is a suggestion of a rhythmic patterning, following a hierarchical ordering.

The suggestion then is that the human processing of the language production tends to be that of ‘scan-copying mechanism’ (Aitchison, 1990). The ability to self-correct also shows that there is a monitoring mechanism in the process of speech production.

The question we need to ask ourselves at this point is: what is the difference between an error and a mistake? Aitchison (1990) appears to see them as the same. But we hold differently that errors being fundamental and thus suggestive of perseveration are due to linguistic incompetence, mistakes are those that are possible to correct in the production process as some of the factors that predispose to slips of tongue are at the root of such slips and not incompetence on the part of the speaker. Clearly, then, it will

seem that this dichotomy in the nomenclature of apparent performance fault lines need to be clearly defined.

Self-Assessment Exercise

Outline clearly some of the important processes involved in speech production.

6.5 Language Acquisition

Language acquisition is considered a normal process in development. When it is delayed or never started in children, it is usually seen as a source of concern by the adult (Scovel, 1998). Developmental psycholinguistics is considered the field that appropriately studies this phenomenon. The assumption here is that there are stages of human speech development. Even though in their study Steinberg et al (2001) have tried to show that the stage of language learning or acquisition by children involves the neonate stage, Scovel argues for a later stage. He notes that the literature has put the stage at which children begin to manifest their acquisition of their mother tongue as eighteen months. The question is: what was happening before this time?

As argued by Steinberg et al (2001), it appears that the children are soaking up all the linguistic input from their environment. It thus makes it such a landmark when the child utters its first complete word. However, as noted by Scovel, the period before this time is essentially foreshadowed by some kinds of communication. These authors call the initial sounds made by the child iconic as it merely expresses signs of discomfort or sudden outbursts that may seem inexplicable. The following stage from about two months is that stage at which the child can now express some communication pattern in terms of the child being able to link randomly its expressions to its needs. This crying stage is considered the precursor to the actual human speech. It therefore prepares

the child for the time it can effectively make use of its vocal organs among the human species.

The question is: did the child pick up this ability to speak from its environment or is it naturally predisposed to this skill? Chomsky (1965) has proposed that all human beings have the congenital ability to acquire language due to a naturally inbuilt mechanism called the Language Acquisition Device (LAD). Chomsky (1981) later modified this to Universal Grammar (UG) which Scovel (1998) describes as a more appropriate term. Indeed, as argued by Scovel (1998), human beings indeed possess this device as no human being in reality lacks the ability to speak eventually if the linguistic inputs are provided except in a situation where a congenital malformation occurred, which could result in the inability of the person to ever master the neuromuscular skills required for speech production. Nonetheless, when the required environment is made available, the human element tends to develop speech and move from the iconic stage to the symbolic communicative stage. This turning point is usually achieved with the first words of the child (Scovel, 1998). Nonetheless, children tend to be egocentric in doing their language initiation: their focus tend to be on their world. Anything outside that world never seems to get a labelling.

Evidence that language acquisition may really be innate to all humans, as argued by Chomsky and his co-travellers, could be seen in the example of swimming and playing of piano or drum, as noted by Scovel (1998), is very pertinent. He points out that not everybody eventually learns to swim or to play any of the musical instruments mentioned above; but it is rare for anyone not to be able to acquire language except where the environmental linguistic input is unavailable or there is a congenital hindrance. In addition, the fact that every attempt to teach the chimpanzee nicknamed Nim Chimsky (after Noam Chomsky) language proved abortive whereas the human child appeared already predisposed to complex linguistic structures through a regular patterning of its structures even at age two. Scovel insightfully observes that

> in comparing these two sets of data, we are led to the inescapable conclusion that even at a very young age, before they have any conscious awareness of the difference between parts of speech such as nouns and verbs, young humans very rapidly acquire the notion that words do not combine randomly but follow a systematic pattern of permissible sequences (1998: 16).

This proves two things: that the language ability in the human species starts early as well as determinedly so advance that animals of the lower class are never able to attain such linguistic skill because nature did not provide for such ability in them. It also goes to show that children tend to follow the pattern of their target language in terms of its phonology and syntax. In addition, as noted by Scovel, creativity is also a mark of the child's acquisition of language. He notes examples such as the one from Reich (1986:142):

Daughter: Somebody is at the door

Mother: There's nobody at the door.

Daughter: There's *yesbody* at the door.

(Scovel, 1998: 19)

There is no evidence that the child learnt this particular word from anyone. It will appear that what the child tried to do is to insist or emphasise by bringing the syntactic initial *yes* in a tag into play and combining same to create the new word *yesbody* in contrast to the mother's *nobody* as its own emphatic stress. Scovel also gives another example of such advanced creativity that took the father of the child a bit of time to puzzle out its ungrammaticality while seeing its acceptability. *There Carlos is!* said by a child is actually a replacement of the usual pronominal with a nominal in the sentence as explained by Scovel. And following his analysis of the pattern as shown below, it shows the child's ability to create not just new words but also adapt sentence structures for its utilitarian communication purposes. The patterns are:

Pattern A: There's Carlos! [There's/Here's + Noun]

Pattern B: There he is! [There/Here Pronoun + is]

Pattern C: *There Carlos is! [There/Here + Noun + is]

(Scovel, 1998:20)

*The asterisk is used to mark ungrammaticality in structures.

Looking at the examples above, it is easy to see that the child has combined the structures of Patterns A and B to form a new one in Pattern C. As argued in Daniel (2012), communicative contingency at times determines linguistic choices more than grammatical correctness. It appears that children's ability to do this efficiently in their linguistic production may supersede that of adults greatly. And why not, if it serves their purposes. Another important issue that needs to be dealt with here is the issue of stages in acquisition. Following Klima and Bellugi (1966), Scovel observes that there are about three stages in language acquisition. He notes that for both the child linguistic acquirer and the adult language learner, the stages appear fixed and cannot be jumped, even if individual ability seems to determine the rate of acquisition for each person.

The three stages are:

Stage 1: use of NO at the start of sentence

No the sun shining

No Mary do it.

Stage 2: use of NO inside the sentence but no auxiliary

Where will she go?

Why Doggy can't see?

Why you don’t know?

Stage 3: use of WH word and auxiliary verb before subject

Where will she go?

Why can’t Doggy see?

Why don’t you know?

(Scovel, 1998:23)

One important point made by scholars here is that none of these stages are ever skipped. The length of time an individual uses in each stage is determined by the individual cognitive level. Scovel also avers that an adult learning a new language undergoes each of these stages. It is consequently obvious that it is not age that determines the language acquisition process, but the progression ability of individuals. Eventually, keeping at it is the important thing as every faithful learner of a new language can eventually gain proficiency in it.

This brings to the fore the debate on the critical period. However, when we look at the universal stages outlined above and the fact that an adult learner of a new language can go through these stages and possibly attain proficiency, the question of the critical period for language learning seems suspect. Critical period is supposed to be that period after adolescence when a person can no longer master the learning of a new language. The evidence of people at very mature stages of their lives getting into new communities and linguistically integrating abound. In our view, the only thing, beyond the congenital factor, that can hinder an individual from attaining proficiency in a new language learning situation is more psychological than biological. To this end, when a language’s relevance to the social advancement of the learning appears invisible, the learner may lack the motivation to learn such a language. If the social prestige of such a language is suspect, the learner may have no desire to master the language. A myriad of reasons could be adduced for why a learner may have low motivation for

learning a new language; these reasons are however likely to be sociolinguistic rather than biological. The point being made here is that, to us the critical stage period appears fallacious and should be discarded as a factor in psycholinguistic inquiry. You may, of course, test the points made by looking within your environment to find out if there is stage or age in life when the members of your community lack the wherewithal to master a new language introduced into the community.

Self-Assessment Exercise

1. State the role played by the Language Acquisition Device and the way it works in the modern linguistic theories.

2. Identify and exemplify with about three structures the proficiency stage in the language learning stages, contrasting the structural examples with the likely initial stage in the language acquisition process.

6.6 Summary

This Unit discussed the three main linguistic processes involved in human language usages. These are the comprehension, the production and the language acquisition processes. It was found that the comprehension processes is the most widely discussed in the literature because it can easily be seen in terms of the reaction of the interlocutor to stimuli. However, the discussion of the production processes indicate that the seeming errors made by speakers tend to inform on them about the actual processes that the human mind engage in in producing speech. The language acquisition process is seen to enable the human being to acquire language. It reveals the innate ability of man to move to the symbolic stage of communicative ability of man. In addition, the human ability to be dynamic in linguistic usages is revealed as starting early through the young human's ability to create new words to meet particular communicative needs per time. The conclusion is thus that the whole linguistic processes end up being essentially to the end of human beings exchanging information through communication.

6.7 References/Further Reading/Web Resources

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Module 2: Language Acquisition

Unit 1: Biological Foundations

Unit 2: The Role of Cognition

Unit 3: Caregiver Language

Unit 4: Vocabulary Acquisition

Unit 5: Phonological Acquisition

Unit 6: Syntactic Acquisition

Unit 7: Semantic Acquisition

UNIT 1: Biological Foundations

1.1 Introduction

1.2 Learning Outcomes

1.3 The Human Language Experience

1. 3.1 Language and the Human Mind

1.3.2 Language Processing

1.4 Biological Basis of Language Acquisition

1.5 Language Acquisition Theories

1.6 Summary

1.7 References / Further Reading/ Web Resources

1.8 Possible Answers to Self-Assessment Exercise(s) within the Content

1.1 Introduction

This Unit will look at language acquisition as a biological phenomenon. The underpinning biological foundations that bring language to life will be scrutinized so that you can appreciate that even though language acquisition is spontaneous, it is an organized an orderly progression. Psycholinguists agree that only human beings have the innate capacity to possess language having been born with the Language Acquisition Device (LAD). The process of this acquisition from a child's first crying at birth to the word and sentence level deserves our close attention.

1.2 Intended Learning Outcomes (ILO's)

At the end of this unit, you should be able to:

- Explain the specie-specific trait of human language
- Discuss how language is acquired spontaneously
- Distinguish language acquisition from language learning

- State the features for the biological foundations of human language
- Mention the human child's capacity for language creativity

1.3 The Human Language Experience

1.3.1 Language and the Human Mind

Language acquisition remains one of the greatest human biological accomplishments. Therefore, some of the major concerns of psycholinguistics include how we can establish the kind of process involved in producing and understanding language and the need to study the relationship between language and the human mind. Researchers are interested in explaining what characteristics of the human mind make it possible to acquire language; how far acquisition is biologically programmed and how far it is influenced by our environment; what makes second language learning (in adulthood) different from first language acquisition. When you realize what the cognitive process includes the use of language and that there is interplay between psychology and linguistics then the biological foundation of human language is established. Do you realize that you cannot talk of psychology without the human mind which is centred in the brain? The brain is a biological organism responsible for cognition, memory, thinking and reasoning. The acquisition of language by children consists of the brain becoming organized in a genetically determined manner. Fernandez and Cairns (2011) argued that just as the biological based system of human vision is already well developed at birth but required visual stimuli for depth perception of the left versus right eye, so also will children's acquisition of language require environmental input to trigger or stimulate language development.

Linguists believe that the first language acquisition is the process of language learning that children pick up at birth or even before when they acquire their mother tongue. According to Wrobe (2013), children learn their mother tongue at a fast pace and very efficiently with "a rapid and effortless transition from the "initial state" to the "final state" and "there is a growing consensus that by the age of three, children have acquired the basic phonological, morpho-syntactic, and semantic regularities of the target language

irrespective of the language or languages to be learned" In the same vein, Gazzaniga (2004) submits that a child language acquisition experience is rooted in biology. This is because all humans have mechanisms that respond specifically to speech signals. Imaging studies of the brain show that the perisylvian area of the left hemisphere are wired to acquire language long before the infant gains much experience about his or her environment. The acquisition of the grammatical system underlying is a smooth and effortless process if neurological disorders do not upset the order of the language development.

Self-Assessment Exercise 1

1. Explain the psychological basis of language acquisition
2. Examine the conditions for second language acquisition.

1.3.2 Language Processing

Researchers have observed that during the active years of language acquisition, children exposed to more than one language will develop the lexicon and grammar of the two languages simultaneously. Human language is genetically based in the brain and it is processed biologically. It develops as the human infant interacts with the environment. The biologically based system in the human child will be triggered for language acquisition and development. This has been termed the nativist model of language acquisition. The nativist conception of language acquisition asserts that language is a natural developmental process. All children progress through similar milestones on a similar schedule. This could not be so were it not for the fact that language is rooted in human biology (Fernandez & Cairns, 2011:98). It is this biological nature of language acquisition that accounts for the properties of Universal Grammar (UG). You will notice that children in all places and climes follow similar acquisition pattern and word order. The phonological, morphological and syntactical components follow the universal principles of language. Crain (1991) submits that a child's grammar never violates universal principles of language. For instance, they never contain rules that are not structure-dependent. Even children acquiring languages that

do not follow the general word order of Subject-Verb-Object (SVO) for English and many world languages, still conform to the order of the languages to which they are exposed. Languages like Japanese and Turkish have Subject-Object-Verb (SOV) while some other languages operate (VSO) and (VOS) patterns.

1.4 Biological Basis of Language Acquisition

According to Aitchinson (2008) human beings are biologically wired to acquire language and so have been described as the 'articulate mammal'. In a seminal study of the same title, she maintains that young children must learn the set of linguistic conventions used by those around them for any given language. The human species is biologically prepared for this prodigious task, but this preparation cannot be too specific, as human children must be flexible enough to learn not only all of the different words and conventional expressions of any language but also all the different types of abstract constructional patterns. If you observe carefully the natural arrangement of the speech organs, you will notice that they are programmed for articulation of sound. Your tongue is wonderfully flexible to take all forms of shapes during speech. Your teeth, lips, oesophagus, larynx, pharynx and the roof of the mouth, work altogether to make the sound of your voice into vowels and consonants. When you stress any word, the puff of air, the glottal stop and the bilabial plosives are conditioned in a manner and place for appropriate articulation.

Chomsky (2000) examines the language acquisition process and maintains that language is most of all a biological capacity because man has mental structural capacities including an innate concept of human language. This concept appears to be genetically determined and present in every human individual. Any normal child is thus predisposed to learning language easily combining a set of innate rules wish language input they hear.

Lennesberg's (1967) study on the biological foundations of language remains pertinent in any discussion of nature language acquisition. He anchored his position on the premise that language is specific. The genetic makeup of the human being makes language acquisition comprehensive and performance unique to man. The

main arguments of Lenneberg's study could be substantiated through a critical consideration of the following:

1. The coming of language occurs at about the same age in every healthy child throughout the world, strongly supporting the concept that genetically determined processes of maturation, rather than environmental influences, underlie capacity for speech and verbal understanding. Dr. Lenneberg points out the implications of this concept for the therapeutic and educational approach to children with hearing or speech deficits.

2. Children are fluent speakers of complex grammatical sentences by the age of three, without the benefit of formal instruction. They are capable of inventing languages that are more systematic than those they hear, showing resemblances to languages that they have never heard, and they obey subtle grammatical principles for which there is no evidence in their environments. Disease or injury can make people linguistic savants while severely retarded, or linguistically impaired when language exposure is restricted. Some language disorders are genetically transmitted. Aspects of language skill can be linked to characteristic regions of the human brain. The human vocal tract is tailored to the demands of speech, compromising other functions such as breathing and swallowing. Human auditory perception shows complementary specializations toward the demands of decoding speech sounds into linguistic segments.

3. Language can be seen as a universal biological capacity common to every individual.

4. There are some clear genetic factors essential to the understanding of the origins of language. Although a little simplistic, a first element to consider would be a human morphological predisposition to language. Indeed, the sounds of language seem closely related to the morphology of the vocal tract: certain characteristics of a human face seem to have a decisive influence upon speech sounds. Simple elements such as the shape of the mouth and lips can be related to the development of language in man, or at least seem to be prerequisite for speech articulation, and oral motivity in man.

5 Finally, the most important argument in favor of a biological foundation of language is probably the universality of its structures, i.e. it definitely seems to be common to every individual. The linguist Chomsky for example insisted on the fact that there are similar linguistic traits all over the world. In order to understand this, it is interesting to consider the idea of a Language Acquisition Device, which explains the transformation of a corpus of speech, i.e. a set of utterances (some grammatical, some not) into a complex grammatical system. This is generally studied in relation to the acquisition of language in a child. For example, the corpus of speech will be utterances overheard by a child in a given environment. Upon receipt of this corpus, the Language Acquisition Device creates a grammatical system. The device therefore represents some kind of internal structure that must be able to acquire any natural language. It is therefore universally applicable to the fundamental human capacity for language

Self-Assessment Exercise 2

1. 'Language acquisition is rooted in biology.' Discuss.
2. Describe Child Grammar as a feature of language acquisition.

1.5 Language Acquisition Theories

Language acquisition theories could be approached from the studies of two leading schools of thought; though the controversy rages on whether or not there is a complete theory of language acquisition. However, we can talk of the empiricist and the nativists. The former argues that language is behaviour and that imitation is crucial during acquisition while the latter argues that we are born with some inmate language facility. While the empirical linguists focus on learning theories to understand how children acquire language skills the nativists emphasize that biological components are responsible for the universal rules underlying language development.

According to Reilly (1998) the nativist theory suggests that children are born with something in their genes that allows them to acquire language. It proposes that there is a theoretical *Language Acquisition Device (LAD)* somewhere in our brains that is

responsible for learning a language the same way the hypothalamus is responsible for maintaining your body temperature. If language was partly biological, it could explain why humans seem to have far more complicated communication patterns than any other species. Nativists further argue that there is a *Universal Grammar (UG)* that is shared across differing languages, because this grammar is part of our genetic make-up. The majority of world languages have verbs and nouns, although this is not true in every instance, as well as similar ways to structure thoughts. Language is thought of as having a finite amount of rules from which we can build an infinite amount of phrases, and the core of these rules is somehow programmed into our brains. This is an ideal theory for explaining how young children can learn such complicated ideas so quickly or why there are so many similarities in language around the world. This theory is comparable to how we think of numbers; regardless of cultural background, math always works the same way.

On the other hand, the empirical theorists emphasize learning a language as you learn a new skill. This is possible through imitation and reinforcement. When a baby begins to babble, parents and caregivers cuddle them by smiling and patting them at the back to give them encouragement to repeat such therefore reinforcing such language behaviour. Children who learn to speak well are praised and they are corrected where they make mistakes. The weakness of this theory is that it fails to explain children unique expressions and the phenomenon of recursive mechanism where novel utterances are generated spontaneously by children once they learn short expressions. Researches have shown that adult stimulus and resources alone could not adequately account for the existence of child grammar. Reilly (1998) however cautions psycholinguists that theories on language acquisition are situation-based depending on the observations of researchers. It is still debatable how accurate they are to the real world. Language acquisition should therefore be regarded as a complicated process influenced by the genetics of an individual as well as the environment they live in.

Self-Assessment Exercise 3

1. Explain the nature – nature controversy in language acquisition.

1.6 Summary

In this Unit, you were able to study that human beings are genetically wired to acquire language and that language is specie-specific. The biological properties for language acquisition were also highlighted including an investigation into the major theories of language acquisition and development. The discussion explains that there are biological foundations for the acquisition of human language. Only human beings can be appropriately described as *The Articulate Mammals* who have the capacity for language. Our speech organs and mental make-up through the neurons in the human brain are wired for language acquisition, processing, comprehension, interpretation and production. The specie-specific trait in human language capacity also cuts across children of all races, colour and location thereby engendering what linguists have termed Universal Grammar (UG) which confirms that all normal children born without any injury to the acquisition mechanism can easily acquire language.

1.7 References / Further Reading/ Web Resources

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. There is interconnection between language and the human mind. The cognitive process has a bearing that relate psychology with linguistics
2. Environment plays a major role in second language acquisition. Reinforcement is a powerful tool in language development

Answers to SAEs 2

1. Lenneberg's study examines various factors such as genetics, age, morphological dispositions, physiological make-up, etc.
2. The creative instinct of children enables them to generate novel utterances. No wholesale imitation of the adult model.

Answers to SAEs 3

1. The controversy centres on the positions of the cognitivists and the environmentalists who have put forward differing positions but none could adequately explain the phenomenon of language acquisition.

UNIT 2: The Role of Cognition

2.1 Introduction

2.2 Learning Outcomes

2.3 The Concept of Cognition in Language acquisition

2.3.1 The Cognitive Process

2.3.2 Recursive Mechanism

2.4 Relationship between Cognition and Language Development

2.5 Language Processing and Cognition

2.6 Summary

2.8 References/Further Reading/Web Resources

2.8 Possible Answers to Self-Assessment Exercise(s) within the Content

2.1 Introduction

The previous Unit dealt with biological basis for the acquisition of the human language. We shall now explain the role of cognition in language. For you to appreciate the role cognition plays in language acquisition, it is important to describe how some scholars in the realm of cognitive linguistics explain the interplay of language, mind and socio-cultural experiences. They assert that cognition is a psychological perception of the stored knowledge about a certain field. What is within the experience and perception of an individual will be reflected in their language behaviour. According to Geeraerts and Cuyckens (2007) the role of language in cognition is interdependent because linguistic knowledge involves not just knowledge of the language but knowledge of our experience of the world as mediated by the language. The Unit will show you the interface between language and thought and how one complements the other. You

will then be able to appreciate what goes on in the human mind as children's language acquisition process suggests a system of remarkable complexity, which has generated a high degree of attention in psycholinguistics. This will give us an insight into what happens when a person begins to acquire language.

2:0 Intended Learning Outcomes (ILOs)

The objectives of this unit are for you:

- Describe the concept of 'cognition'
- Explain the cognitive process
- Examine the relationship between language and thought
- Describe the language behaviour in children
- Discuss the role of cognition in language acquisition

2.3 The Concept of Cognition in Language acquisition

2.3.1 The Cognitive Process

Panther and Radden (2011) see "cognition" as a cover term for the higher human faculties of reasoning such as drawing inferences, constructing and interpreting cognition model, linking concepts associatively and drawing analogies between distinct conceptual dominos. Researchers have revealed that cognition involves all processes of consciousness by which knowledge is accumulated such as perceiving, recognizing, conceiving and reasoning. It is the only word that refers to the brain as well as the mind (Encyclopaedia Britannica, 2010). This description of cognition underscores the complexity involved as we attempt to examine the role it plays in language acquisition. This definition underscores the complexity involved in the role of cognition in language acquisition and language learning. While we do not know everything about how the brain processes language, much is known and much more is being discovered about the mental faculty that affects language intuition and perception. Language is the centre of human existence and life without it would be

meaningless and inconceivable. In this regard, therefore, cognition in language acquisition is one of the most fascinating phases of human development. You can imagine how life without language would be. Language acquisition remains a central topic in cognitive science. Every theory tried to explain it but it is still steeped in controversy. Language is essentially specie-specific to man as all normal human beings speak. Language is the tool for thought and both language and thought are interlinked. Earlier theories look back at the total dependence of language on thought.

Whorf (1956) in the popular Whorfian hypothesis claims that we categorize the world around us through our particular language and that speakers of different languages perceive the world in different ways. Rigorous researches have clearly shown that such a view is an extreme position as far as cognition is concerned because children can think before they talk (Pinker, 1995). The role of cognition in language acquisition and language learning affirms that people think not only in words but also in images. Some branches of linguistics like semantics and pragmatics have also proved that human languages are varied and complex because one word can correspond to two thoughts; for example 'bow' when thinking about hunting is not usually confused with 'bow' in a salutation posture showing respect. You will see that from the foregoing it is tempting to confuse language and thought because we verbalize our thought using language. However, there are individuals who can think but cannot communicate through language. These are infants and people who suffer from neurological disorder like language impairment (aphasia). Any thought can be conveyed in any human language. Fodor (1975) submits that general intelligence is the system responsible for generating the language of thought and this in turn is translated into speech by our linguistic system.

Self-Assessment Exercise 1

1. Describe the relationship between language and cognition.
2. In what way is language related to thought?

2.3.2 Recursive Mechanism

Babies are born with a biological structure, including a brain that is genetically prepared to organize linguistic information. All human languages, close to 7000 spoken in the world today, though differ greatly on the surface, are profoundly similar in what psycholinguists term language universals. A person's ability to acquire and use a language is as natural as their ability to walk or a bird's ability to fly. All languages have phonology, morphology, syntax and a lexicon. A person acquiring language possesses recursive mechanism, which allows them to generate an infinite set of utterances as in "… the house that jack built." (Fernandez & Cairns, 2011:54). This is a multi-line poem beginning with: "This is the farmer sowing his corn… that kept the cock that crowed in the morning" …that (children add new thoughts and ideas until they get to the last line) "…that lay in the house that jack built." Chomsky (1965) also claims that the child's capacity to generate this endless set of sentences is because of Language Acquisition Device (LAD), a property of the child's brain that endows it with a predisposition for acquiring language. Please, note that this is a type of in-built mechanism whereby input from the environment activates internal processes that lead to acquisition of language. The child uses this facility for language acquisition – the outcome is grammar and lexicon. When the environment provides multiple linguistic stimuli, e.g. English and Yoruba, more than one grammar and lexicon will develop. Lukmon is a child whose mother interacts with in English while the grandmother speaks Yoruba to the boy. At age three, he greets his mum in English but says 'E karo' to the old woman. The child now knows intuitively that the language behaviour of the two parents differs. Secondly, child grammar never violates the universal principles of language. It follows a pattern that is structure-dependent. Even when an adult utters a sentence, the child cognitively produces a child's version of it e.g. a caregiver who says "this is a big blue ball" was reported to get a response "blue ball" (Fernandez & Cairns, 2011). This study queries the wholesale role of imitation in language behaviour. Many studies show a great deal of individual variation during language acquisition and learning.

2.4 Relationship between Cognition and Language Development

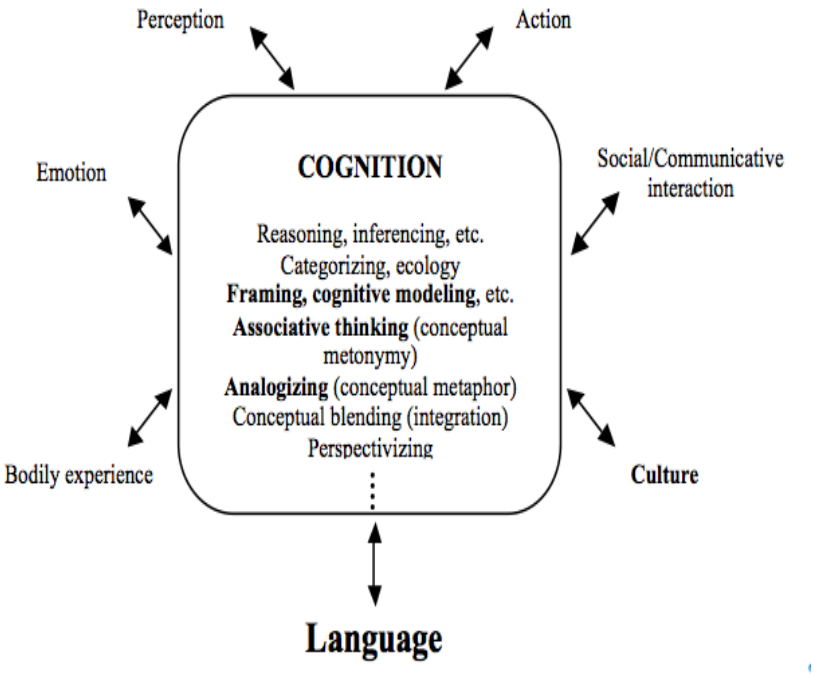
According to Panda (2019) many scholars believe that language should be structured and based on the words stored in the mental lexicon. It is from the storage that words are categorized to help people choose the most adequate variant during speech production. Thus, language processes are closely connected with the people's cognition and memory. To fully acquire language the child must perceive language from the environmental input during comprehension and interpretation which is an experience in cognitive psychology that will provide acquirer with the knowledge of the word so that he/she can fix this knowledge in words. Cognition is therefore central to language development because it is closely associated with the mental abilities of a man and it is characterized by certain features which are essential to language function and qualities. These are:

- Structure
- Regularity
- Flexibility
- Dynamism
- Arbitrariness
- Productivity

You will observe that cognition is the hub that controls the above features in language acquisition. It is noted that where a person acquiring any language suffers any cognitive dissonance, his language ability will suffer.

Willingham (2007) therefore argues that arbitrariness is necessary to promote productivity of language. This is anchored on the premise that despite the fact that human cognition operates the set of number of known words, the progress of language does not prevent its productivity when new words, structure and meanings appear with references to the other words. See fig 1:

Figure 1 Showing Cognition as the Hub of Language Development



Credit: Panther and Radden (2011)
https://www.researchgate.net/figure/Language-and-cognition-adapted-from-Panther-and-Radden-2011

Lust and Foley (2004) also argue that the relationship between language and cognition may be subtle and complex. In a classic experimentation, children were tested on reasoning involving “class inclusion,” i.e., hierarchical relations between sets and subsets. When given sets of objects (four cows and two horses), children (before six to eight years) report that they are “all animals” and may count “six animals.” Yet when asked, “Are there more animals or more cows,” children claim “there are more cows.” This behaviour fundamentally reflects limitations on cognitive computation over a hierarchical class inclusion structure. Children are not computing the simultaneous positive and negative relations involved in the hierarchy. (The cows are both more than the horses when comparing subsets, but less than the animals when comparing supersets in the hierarchical relation.) Children fail to hold the abstract “animals” superset constant while relating to the subsets.

Self-Assessment Exercise 2

1. Examine the complex nature of the cognitive process
2. Describe two features associated with language behaviour

2.5 Language Processing and Cognition

You will observe that our previous discussion dwelt on the features of language. It is therefore necessary to determine other levels involved in the aspects of language processing. Willingham (2007) submits that the process of perceiving the spoken language usually begins with the recognition of speech sounds. This is followed by the leaner's understanding of the meaning of certain words, which are preserved in the human mind in the form of separate words consisting definite phonemes. These are logically combined to form sentences which become the next level of language. According to Nordquist (2021), language processing level needs specific regulation with the help of syntax which preserves the basic structures to organize thoughts and ideas in complete and logical sentences to exchange them successfully. Several sentences are combined into texts (Willingham, 2007). Texts are perceived by people as complete stories telling or writing on a concrete theme and containing the definite idea. Words, sentences, and texts can be used effectively when the person who listens to or reads them can comprehend the meaning effectively. Cognitive psychology discusses the ways according to which people can identify, interpret, and comprehend the elements of language. From this point, the language processing is complex, and it is closely connected with the man's cognition.

Cognitive psychology studies the aspects of human cognition. Many processes of human cognition depend on language and its qualities. Thus, to realize the cognitive processes, people perceive, understand, learn, and remember a lot of information presented in the form of language. From this perspective, language is the stable structure which develops within the society, but it is perceived by persons individually. The individual perception and understanding of language as well as abilities to

formulate thoughts in the form of sentences to reflect the certain meaning should be discussed in the field of cognitive psychology (Parkin, 2000). However, in this case, the aspects of language cognition should be also examined with references to behavioral patterns used by individuals to represent their ideas and thoughts. Thus, language is the complex phenomenon which is closely associated with the human cognition because a lot of cognitive processes are realized with the help of language. To communicate, people exchange information in the form of words which have the certain sound pattern and which are combined in sentences. However, people understand the idea of the message only when they perceive and interpret the words and sentences appropriately. These processes are cognitive. Moreover, to perceive and recognize words, people should also have the definite knowledge of language and its words and structure. Thus, people should also remember words in the form of lexicon and know how to combine them in order to state the certain idea. As a result, language processing and human cognition with all its features and elements are closely connected.

Self-Assessment Exercise 3

1 Explain the role of culture in understanding language.

2. ‘Language and thought are inter-dependent’. Discuss.

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2.6. Summary

This Unit has attempted to examine the role of cognition in the processing of language as the individual draws from their necessary retrieval during verbal behaviour. You can now appreciate the complexities involved, in the production of human speech when language, mind and perception interrelate to govern a person’s language behaviour. The Unit explained that understanding the role of cognition in language will enable us to appreciate the interconnectedness among language, mind and socio-cultural experiences. Cognition also examines the psychological view of the stored knowledge about a certain field which is within the experience and perception of an individual as

reflected in their language behaviour. However, the role of language in cognition is interdependent because linguistic knowledge involves not only the knowledge of the experience of the world as mediated by the language.

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2.8 Possible Answers to SAEs

Answers to SAEs 1

1. Cognition involves processes of consciousness including perceiving, recognising and reasoning through which language is activated.
2. Language and thought are intertwined but not coterminous.

Answers to SAEs 2

1. The child perception of language involves the environmental input. The cognitive process is closely associated with mental abilities.
2. The features associated with language behaviour include structure, regularity, flexibility, dynamism, etc.

Answers to SAEs 3

1. The stable structure of any language is societal. The input from the culturally-exposed learner is reflected in language.
2. Language and thought are closely related. However, thought is not solely dependent on language and vice versa.

UNIT 3: Caregiver Language

3.1 Introduction

3.2 Learning Outcomes

3.3 The Caregiver

3. 3.1 Child-Directed Speech

3.3.2 The Role of the Caregiver in Language Development

3.4 Peculiarities of Child Directed Speech (CDS)

3.5 Baby Talk Register

3.7 Summary

3.7 References/Further Reading/Web Resources

3.8 Possible Answers to Self-Assessment Exercise(s) within the Content

3.1 Introduction

This Unit will be concerned with the role of the caregiver in language development. Attempt will be made to examine how the characteristics of caregiver's speech contribute to a child's early word learning. The Unit will deal with the relationship between a child's language development and the caregiver speech. From the time a child is born, they are highly motivated, curious and capable learners as they explore their surroundings cognitively and linguistically. It is the caregiver's duty to provide the required motivation that will encourage the infant to develop optimally its aptitude for speech. When the caregiver provides a threat-free relationship, the young learner will feel free to key in into all aspects of growth and development. When you realize that language competence is one of the most amazing developmental accomplishments of early childhood, then an examination of caregiver language will not be out of place.

3.2 Intended Learning Outcomes (ILOs)

At the end of this Unit, you should be able to

1. Explain the role of the caregiver in language learning
2. Describe the characteristics of caregiver's speech
3. Identify some specific caregiver language
4. Mention the unique features of child language
5. Discuss 'imitation' as a feature of caregiver language

3.3 The Caregiver

3.3.1 Child-Directed Speech

We all know that young children are dependent on the care they receive from others who are basically adults that give attention and guidance. There is no such thing as a child left on its own. They are always in the care of someone. These people are known as caregivers. The World Health Organization (2004) explains that "the word *caregiver* denotes people who look after infants or young children"p.6. This term is preferred because many young children are not looked after by their biological mothers. In the Nigerian communal setting, the care of young children is not limited to a person or a child's natural parents. There are many caregivers as relatives, siblings and friends who actively participate in taking care of the young ones. Children are born with neurophysiological and sensory filtering mechanisms which enable them to focus on human contact and communication. They react to gestures, facial messages and voice modulation.

Austin (1962) argues that long before the child is able to speak, the caregiver attributes meaning to the utterance, gesture and actions of the infant and responds accordingly.

When it is time for the child to acquire language, it is tied up closely with the child's experience in relation to the caregiver. The linguistic exposure emanating from the interaction between the child and the caregiver is termed *caregiver language.* Long before the child is able to speak, the caregiver attributes meanings to the utterances,

gestures and actions of the infants and responds accordingly. It is the caregiver's concern to extend and complement the child's linguistic capabilities.

Researchers also explain that the term "baby talk" could be used invariably to mean caretaker speech or caregiver language. Other definitions include Infant Directed Speech (IDS), Child–Directed Speech (CDS) and informally as 'motherese'. This is a language in a non-standard form used by adults in talking to toddlers and infants. In other words, caregiver language could be described as a universally understood kind of language which is fashioned for an efficient communication between adult and infant.

Have you watched a child less than two years being addressed by a caregiver? Perhaps you yourself have tried to cajole, pet or entice a child using baby talk in a way to get their attention. You will observe that you need to relax your pattern of speech and deliver it in a cooing manner, with raised intonation characterized by simple words and expressions. Through caregiver language, a child increases the pace of language acquisition because such language has been shown to be more effective in getting a child's attention. As children continue to grow, parents who are natural caregivers adapt their speech to suit the child's growing linguistic skills. You need to take note that when a caregiver gives responsive care and encouragement to the infant, they are ready to develop more confidence and joy in acquiring language. A linguistically deprived child will suffer in their ability to learn a language with reasonable proficiency. Here, you will recall the popular classic Oliver Twist, who was raised in an orphanage without much affection and care. When he dared to ask for more after exhausting his ration of food, he was seriously beaten. Such a hostile attitude of care giving will stifle whatever linguistic creativity a child acquiring language may possess. Basic communication and language development skills are very critical and they lay the foundation for verbal aptitude of toddlers.

Nicholas et al (2001) reports that the average child from a family of professionals learn 11 million words per year; a child from a working-class family hears 6 million words per year and a child from a family receiving welfare benefits hears 3 million words per year. The implication here is that the caregiver language of the last set has suffered a

deficit, which will take those children a long time to regain. Sometimes, the gap is so wide that it is less likely for these children to ever catch-up with their more advantageous peers. It is obvious from the illustration above that early language development is sequel to the quality of the social interaction a child has with the caregiver and other peers in his life. Talking to children could be seen as fundamental to language development because it opens the door for the child to build their linguistic proficiency so that they can independently create their own sentences.

Caregivers often engage in Infant Directed Speech (IDS) during gestures and mimicry. The speech is characterized by demonstration and repetitiousness so that the infant can recognize the necessary requirements for discovering systematic association between sounds and reference (Smith &Yu, 2008). Vocabulary and gestural social interaction between caregiver and the child are a way to establish better attention and eventual development of language. The moment a caregiver recognizes that a child is responding to their voices by kicking, jerking, cooing and gurgles, they begin taking turns with the child. The caregiver talks, pauses for the child to respond and then speaks again. Karmiloff and Karmiloff-Smith (2001:48) note that these 'conversations' that are initially one-sided linguistically may actually constitute an important preparation for taking part in later dialogue when the toddler will be capable of using language to replace the primitive kicks and gurgles.

Self-Assessment Exercise 1

1. Explain caregiver language.
2. What are the characteristics of Child Directed Speech (CDS)?

3.3.2 The Role of the Caregiver in Language Development

Right from the outset of infancy, the role of the caregiver cannot be overemphasized in the language development of the child. When a child cries, it is a form of communication, which the caregiver can interpret as that something is going wrong. While crying is universal in human infants, the degree to which it is manifested varies

according to the level of attention given by the caregiver. Small (1998) believes that in cultures where babies spend most of their hours in close contact with adult caregivers, infants engage in relatively little crying, whereas cultures like America which encourage infants to gain independence, leave them alone for much of the time. Furthermore, crying and caregiver's attention to it are adaptive trait because they "evolve to serve the infant's purpose: to ensure protection, adequate feeding and nurturing for an organism that cannot care for itself". By definition crying is designed to elicit a response, to activate emotions, to play on the empathy of another. The caretaker has also evolved the mechanism to recognize that infants' cries are a signal of unhappiness, and thus be motivated to do something about it (Small, 1998:156) Moreover, the caregiver engages in simplifying the linguistic code of the infant. Nordquist (2020) reveals that caregivers change their speech patterns in the same peculiar ways. They usually put their faces very close to the child, use shorter utterances and speak in an unusually melodious fashion. The caregiver speech could also be odd whereby approval is given to the truth spoken by the child rather than the grammatical accuracy. For example, when a child says ' Daddy hat on" might be termed correct if it truly reflected that the father is putting on a hat but "Daddy got a hat on" though well-formed will be met with disapproval if the truth condition is violated such as when daddy is not wearing a hat.

Besides, the caregiver's language ensures more attention on the part of the acquirer. When the caregiver interacts in a slower and more repetitive tone than the one he used in the regular conversation, the cognitive awareness of the child is better enhanced thus sharpening linguistic proficiency. Caregiver language also triggers off the onset of speech, while contributing to a regular and more stable pattern for language development. It equally serves as a powerful tool in providing a base for language acquisition. The caregiver-child interaction enables the infant to apply the principles involved to formulate larger words and sentences as they learn to process language. Studies also reveal that caregiver language increases a child's worth in social partnership. The social situations in which an infant and other peers share the same focus on an object will be rewarding enough to hone them for better interaction. Karoly et al (2005) argue that language and literacy acquisition happen best in the context of caring and attentive relationship, which invariably influence other critical

components of language development: expressive language, receptive language and social engagement. The mental development of infants can be aided through the use of caregiver language. This occurs when they process word forms and they remember those words when they need to recall them in future. When caregiver language is used as a priming tool by the children to recognize the faces of caregivers especially when speeches directed at them are accompanied with smiles and friendly gestural postures, their mental awareness increases. Child Directed Speech (CDS) teaches the child the basic structure and functions of language. As the caregiver responds to the infant's babble with meaningless murmurs, the child's cognitive sense develops. Though no logical meaning is attached, the verbal and emotional interactions show the bi-directional nature of speech and the importance of feedback (Fernand, 1991). Karoly et al (2005) emphasize that caregivers should model effective interactions and practise basic communication skills: notice, comment and invite. They should notice what the child is interested in, comment on the object or activity of interest and invite the child to think and talk about it. When the caregiver demonstrates such an engaging interest in what appeals to the child, the child finds learning to be fun. We, therefore, realize that caregivers language provides children with the clues needed to help them develop their own language skills. Through Child Directed Speech (CDS) children are given the linguistic tools to help them identify sounds, syllables and finally words and sentences.

3.4 Peculiarities of Child Directed Speech (CDS)

Psycholinguists have also mapped out caregiver language as Child Directed Speech (CDS) as having distinctive features of its own. Some of you will recall those infants years when basic sounds such as 'da' 'ba' 'fa' 'ma' are noticeable as the child utters its first speech. Celebration and approbation will greet the child's first utterance of 'Mama' and 'Baba'. Spenader (2006) gives an insight into the peculiarities of the caregiver's language as follows:

1. Lowered speech tempo. This is to create a friendly conversational tone that appeals more to the child for bonding and intimate attention.

2. Clearer articulation. The caregiver should enunciate his word to give a model for the child to imitate.
3. Higher pitch. This equally secures the child's attention as he can get easily distracted.
4. Nouns are used instead of pronouns. Karmiloff & Karmiloff-Smith (2001) exemplify in their studies of a caregiver who interacts with a child as follows:
   "Aren't you a nice baby?"
   "Good GIRL, drink all your Milk."
   "Look, look Doggie. Did you see the Doggie?"
   The caregiver makes sure that the child understands who and what is being referred to. They therefore use proper names instead of pronouns: They also make use of basic vocabulary to encourage the child to learn easily.
5. Concrete references to here and now. The caregiver does this by emphasizing new information through gestures and demonstrations. They call the children's attention in a way to give them special focus e.g. "Look at daddy. He is eating ba-Na-na." The syllabic pronunciation of banana is deliberate to give a child another vocabulary.
6. Use of simple sentence structure. This is a central feature of caregiver language as Child-Directed-Speech must be devoid of any complication. Instead of the caregiver to say "let's go home" we usually get expressions like "Go bye bye."
7. Few incomplete sentences. This is the caregiver style of following the child's pattern of behaviour. Since Child-Directed-Speech reflects developmental nature from one word to two and later to sentence level, it is desirable for the caregiver to encourage the natural flow of the child's language behaviour. Fernand (1991) reports that caregiver language may skip out small words by imitating young children who can make little sense of sentence composition, such as "to" "at" "my" 'so' and 'as' and articles (the, a ,an). A sentence like 'I want you to play your ball' may become 'Daddy wants Dayo to play ball'.
8. Many Repetitions. Children are gifted imitators. Their curiosity to learn is well-endowed such that when a caregiver does anything, the inquisitive child imitates them. This facility can best be used for language development when

caregivers frequently repeat words and sentences to sharpen the child's acquisition of language. For example, a sentence like: "that's a bag, Alaba" could be repeated by a follow up "yes, it is a bag" until the child's response is deemed positive by the caregiver.

Self-Assessment Exercise 2

1. Explain the role of the Caregiver
2. Mention two peculiarities of Caregiver language.

3.5 Baby Talk Register

Ferguson (1978) further exemplifies the phenomenon of the caregiver's language in a study described as *Essential Properties of Baby Talk Register.* These are categorized as follows:

PROSODY
1. High pitch
2. Exaggerated contours
3. Slow rate

SYNTAX
4. Short sentences
5. Parataxis
6. Telegraphic style
7. Repetition

LEXICON
8. Kin terms and body parts
9. Infant games
10. Qualities
11. Compound verbs
12. Hypocorism

PHONOLOGY

13. Cluster reduction
14. Liquid substitution
15. Reduplication
16. Special sounds

DISCOURSE

17. Questions
18. Pronoun shift

EXTENDED USES

19. Child speech
20. Animals
21. Adult intimacy

Self-Assessment Exercise 3

1. Supply any five ‘baby talk’ you know.

3.6 SUMMARY

In this Unit, you learnt about the role of the caregiver in the language development of infants. The type of reinforcement and the stimulating environment provided by caregivers were also shown to be of crucial importance to the child’s language behaviour. The discussion also explained the central role of the caregiver in a child’s acquisition of language and subsequent language behaviour. The Unit explained the unique features and peculiarities of Child Directed Speech (CDS) and itemizes the essential properties of ‘Baby talk Register’. It pointed out that caregivers must create a warm, friendly and linguistically stimulating environment to nurture the outset of language.

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3.8 Possible Answers to SAEs

Answers to SAEs 1

1. This could be described as the linguistic exposure and experience emanating from the interaction between the child and the caregiver.
2. There is the ample use of gestures and mimicry. Speech is characterised by demonstration and repetitiveness

Answers to SAEs 2

1. Caregivers simplify the linguistic code of the infant. They also serve as reinforcement agents of the child’s language development.
2. Peculiarities include: Lowered speech tempo and use of simple sentence structure.

Answers to SAEs 3

1. Baby Talk include: Telegraphic style, Short sentences, Kin terms and body parts, infant games and compound verbs.

UNIT 4: VOCABULARY ACQUISITION

4.1 Introduction

4.2 Learning Outcomes

4.3 Vocabulary Development

4. 3.1 Vocabulary Acquisition in Early Childhood

4.3.2 The Content of Early Vocabulary

4.4 Vocabulary Acquisition beyond the Early Years

4.5 Vocabulary Spurt

3.6 Summary

4.7 References/Further Reading/Web Resources

4.8 Possible Answers to Self-Assessment Exercise(s) within the Content

4.1. Introduction

It is said that nobody is formally taught how to speak their first language. Children take up their first language through interactions with their parents and the environment that surround them. Their need to communicate paves the way for language acquisition to take place. However, the ability to successfully use language requires children to acquire a range of tools including an extensive vocabulary. In this Unit, we shall discuss vocabulary development, starting from infancy to school age, highlighting the features of each phase. We shall also examine vocabulary spurt, what it entails and its characteristics.

4.2. Learning Outcomes

At the end of this Unit, you should be able to:

- Define vocabulary acquisition;
- Identify features of vocabulary acquisition in early childhood;
- Describe vocabulary development beyond the early years; and

- Explain vocabulary spurt.

4.3 Vocabulary Development

4.3.1 Vocabulary Acquisition in Early Childhood

Vocabulary acquisition is a process by which children develop the ability to understand and use words. It is the most noticeable feature of the early months of language acquisition. First word is uttered around the age of one. From that point, there is a steady lexical growth in both comprehension and production. Vocabulary development in childhood is made possible by caregivers, peers, family members, and reading during school age. It has been observed that at the initial stage of vocabulary growth, the pace is slow. By the age of 18 months, children can typically produce about 50 words and begin to make word combinations. This phase is followed by a rapid growth, and then a sudden drop. The period of rapid growth in vocabulary is called vocabulary spurt. UNESCO defines early childhood as the period from birth to eight years old. As a significant period of remarkable brain growth, these years constitute the critical foundation for cognitive, linguistic and general developmental milestones.

According to Tincoff and Jusczyk (2012), understanding of words starts when children are approximately six months. They start with few basic words like *Mommy*, *Daddy*, *bye bye*, and *no.* On the other hand, as mentioned before, true speech begins around their first birthday. First words in this period normally refer to things that are of importance to the children, such as objects, body parts, people, and relevant actions, and are mostly single-syllabic or repeated single syllables such as *sock* (for socks), *chair*, *baba*, *cat*, *eye*, *tata*, *ball, Mommy*, *bye bye*, and *hand*. Initially, the meanings of these words are extended. For instance, a toddler at the initial stage of vocabulary acquisition may call any female adult *Mommy* and any round object *ball*. At a later stage, with more linguistic maturity, the words are assigned accordingly. *Barner, Zapf and Lui (2012)* observe that *one* and *two* are the first number words that children learn between the ages of one and two. During the first few years of life, children are mastering concrete words such as *car*, *bottle*, *and dog*. By age 3, children are likely able to learn these concrete words without the need for a visual reference, so word acquisition tends to accelerate around this age. It is important to know that about 60% of the words used at infancy seem to have a naming function and will develop into

nouns. About 20% express actions. Many of these words will develop into verbs though not all. Other word classes are also found at this stage (such as adjectives and adverbs), along with several words that it becomes difficult to assign them to any word class.

4.3.2 The Content of Early Vocabulary

Young children talk about what is happening around them, not abstract things or events. Crystal (2010: 254) calls it the 'here and now'. Let us look at the content of their vocabulary.

People: mainly relatives and regular visitors e.g., *daddy*, *mama*, *man*, *baba*, *grandma*, *uncle*, etc.

Actions: the way things move like *jump*, *run*, *give*, *go*, and frequent activities around the child e.g., *eat*, *poopoo*, *bye-bye*,

Food: *apple*, *bobo*, *tea*, *juice*, *water*, *milk*, *drink*

Body parts: According to Crystal (ibid), children acquire facial words - such as *mouth* and *nose* – first. This is followed by other areas - *hand*, *leg* – and then body functions – such as *wee-wee*, *poo-poo*

Clothing of all kinds e.g. *shoes*, *socks*, *shirt*, *sweater*

Animals, which they may have seen in real life, picture or television, e.g. *cat*, *dog*, *goat*, *horse*, *cow*

Household objects: *cup*, s*poon* (usually pronounced *poon* at the early stage), *light*, *plate*, *phone*. All these have to do with their daily activities

Location: Several general words are used like *there*, *look*, *in*, *up*, *down*

Social words in response to questions: *yes*, *no*, *allgone*

Early descriptive words: *hot*, *big*, *small*

Pointing words (deictic): *there*, *that*, *mine*

Self-Assessment Exercise 1

Discuss the characteristics of early vocabulary development.

4.4 Vocabulary Acquisition beyond the Early Years

Most developmental psycholinguistics has focused on what happens in the first five years of life, perhaps because it is during this period that the greatest challenges are met. One consequence is that there has been little research on vocabulary acquisition in late childhood, adolescence and adulthood. It is however obvious that there are important changes after early childhood. Besides, Berman (2007) upholds that becoming a *proficient speaker* involves much more time than becoming a *native speaker.*

As children continue to grow physically, their vocabulary changes, both quantitatively and qualitatively. Quantitatively, as seen earlier, individuals learn a considerable number of words during late primary and secondary school years. Many different sources make it possible to acquire so many words either incidentally or through instruction. These sources include school activities, reading books, the Internet, cinema, television, radio and interaction with peers. Qualitatively, the child begins to use longer, more formal and less frequent words, which often have a highly specialised meaning. In addition, there is an increase in the use of derivational morphemes; the child forms more words with the help of affixes and compounding. There is an increase in lexical knowledge, with an understanding and use of synonyms and polysemy. Around the thirteenth birthday, children become more sensitive to linguistic registers and are able to appropriately interchange between casual conversation with all its slang and colloquialisms, and more formal and academic language. As vocabulary use changes, other aspects of language also develop considerably: morphosyntax and metacognition (e.g., critical thinking and use of analogies). This evolution continues well into adulthood, at least, with educated individuals.

Through formal learning in school, children build more vocabulary upon what they already know. Their previous knowledge is used to broaden their vocabulary. Once children have gained a level of vocabulary knowledge, new words are learned through explanations, using familiar, or old words. In particular, children begin to learn abstract words, for example, *love*, *happiness*, *choice*, and *freedom*. Word learning often involves physical context, builds on prior knowledge, takes place in social context, and includes semantic support. Also, in school-age, context and implicit learning are the

most common ways in which their vocabularies continue to develop. By this time, children learn new vocabulary, mostly through conversation and reading. Throughout schooling and adulthood, conversation and reading are the main methods in which vocabulary develops. This growth tends to slow once a person finishes schooling, as they have already acquired the vocabulary used in everyday conversation and reading material and generally are not engaging in activities that require additional vocabulary development.

Lorraine (2008) summarises the rate of vocabulary development in childhood, thus:

> By age 5, children tend to have an expressive vocabulary of 2,100-2,200 words. By age 6, they have approximately 2,600 words of expressive vocabulary and 20,000-24,000 words of receptive vocabulary. From age 6 to 8, the average child in school is learning 6-7 words per day, and from age 8 to 10, approximately 12 words per day.

As observed by Crystal (2010), children do not learn a word with its meaning 'ready-made'. They have to work out for themselves what it must mean, and in so doing, they commit errors. The errors include overextension, under-extension and mismatch. In overextension, the child applies a word to other objects that share a certain feature, such as shape, size or colour. Dog might be applied to other animals. In under-extension, the word is used with a narrower meaning than it has in the adult language. Dog might be applied to only the family dog. For mismatch, there is no apparent basis for the wrong use of a word by the child. The child may use c*ellphone* for *car*. (See the Unit on semantic acquisition for an extensive discussion on this subject.)

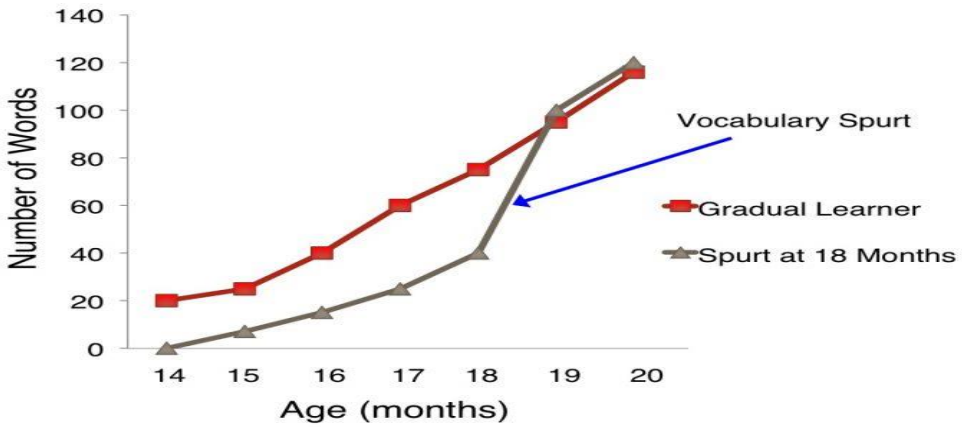
Self-Assessment Exercise 2

1. State at least three features of vocabulary development at school age.

2. 'Children do not learn a word with its meaning 'ready-made''. How true is this statement?

4.5 Vocabulary Spurt

As children get older, their rate of vocabulary growth increases. There are research postulations that children probably understand their first 50 words before they produce them. By the age of eighteen months, children typically attain a vocabulary of 50 words in production, and between two and three times greater in comprehension. A switch from an early stage of slow vocabulary growth to a later stage of faster growth is referred to as the *vocabulary spurt*. Young toddlers acquire one to three words per month. A vocabulary spurt often occurs over time as the number of acquired words accelerates. According to Ganger and Brent (2004), most children add about 10 to 20 new words a week. Between the ages of 18 to 24 months, children learn how to combine two words such as *no-no, bye-bye,* and *more please (*Hulit & Howard, 2002). Three-word and four-word combinations appear when most of the child's utterances are two-word productions. In addition, children are able to form conjoined sentences, using *and*. This suggests that there is a vocabulary spurt between the time that the child's first word appears, and when the child is able to form more than two words, and eventually, sentences. The graph below explicates vocabulary spurt:



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Self-Assessment Exercise 3

1. Describe the features of vocabulary spurt in language acquisition

2. Identify a child between 2-5 years. Interact with him/her for 1 week. Discuss the vocabulary features of the child's speech. Note that you can record the child's speech, using a diary or a tape recorder, of course with the permission of their parents

4.6 Summary

In this unit, you have learnt that vocabulary acquisition is a continuous process. It starts around the first birthday when children utter their first words. At a point, the pace of the process is slow, followed by a sudden acceleration (vocabulary spurt), and then a fall. The content of early vocabulary in children describes the happenings around them, with features of mismatch, overextension, and under extension. In later years/school-age, children learn new vocabulary mostly through conversation and reading. There is also access to various media such as television, the Internet, cinema, and radio, which enhance the quality of their vocabulary. School age is also when children's lexical knowledge becomes more sophisticated, with an understanding and use of contexts, synonyms and polysemy. What this means is that, as children continue to grow physically, their vocabulary changes both quantitatively and qualitatively. The Unit explains further that vocabulary acquisition in early childhood is the introduction to the most important component of language. It is an essential area of development because it provides the building blocks for the development of other linguistic skills, cognition, and academic achievement

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4.8 Possible Answers to SAEs

Answers to SAEs 1

1.

2.

Answers to SAEs 2

1.

2.

Answers to SAEs 3

1.

2

UNIT 5: PHONOLOGICAL ACQUISITION

5.1 Introduction

5.2 Learning Outcomes

5.3 The Phonological Process

5. 3.1 Perception of Speech

5.3.2 Speech Production Skills

5.4 The speaking Process

5.5 The Speech Organs

5.8 Summary

5.9 References/Further Reading/Web Resources

5.8 Possible Answers to Self-Assessment Exercise(s) within the Content

5.1 Introduction

Having looked at the role of the Caregiver in language acquisition we can now proceed to examine specifically the acquisition of phonology in language development. Here, we shall be discussing the process of children's acquisition of the target language phonology and its functional aspect such as its specific sound contrasts. In a study of phonological acquisition, you need to know how a child acquiring language connects with the phonetic knowledge of the language. The phonetic knowledge of a language is the awareness of the sound symbol relationship and patterns represented in a language. This is manifested when a child begins to talk by developing an awareness of speech sounds in language behaviour such as cooing, babbling and sound play.

5.2 Intended Learning Outcomes (ILOs)

At the end of this Unit, you should be able to:

1. Articulate phonological variations in sound production
2. Distinguish between phonology and phonetics
3. Describe the speech organs
4. Mention some phonological skills in language acquisition
5. Discuss variations of sounds

5.3 The Phonological Process

5.3.1 Perception of Speech

In the treatment of this topic, it is important to clarify some terms to put our discussion in proper perspectives. People sometimes confuse phonology and phonetics. A distinction should therefore be made. Phonetics deals with the physical aspects and characteristics of all human sounds while the realm of phonology is concerned with the functional aspects in a particular language. We can therefore deduce that acquisition of phonology will examine the process whereby children acquire the target's language phonology including its functional aspects like the language's specific sound contrasts. Phonological development refers to the gradual acquisition of an adult-like system of speech sounds that are used to convey meaning in a language. Phonological development can be considered in terms of both perception and production of speech sounds. The three main elements associated with the study of phonology and phonetics are phone, phoneme and allophone. According to Schmidth (2008) a phonic is any sound used in language, whereas a phoneme is the smallest distinctive sound unit of a particular language. An allophone is the realization of a phoneme in different contexts.

Bowen (2011) exemplifies the following as the phonological processes in a typical speech development.

Phonological Process	Example	Description
Pre-vocalic voicing	car = gar	A voiceless sound preceding a vowel is replaced by a voiced sound.
Word final devoicing	red = ret	A final voiced consonant is replaced by a voiceless consonant
Final consonant deletion	boat = bo	A final consonant is omitted (deleted) from a word.
Velar fronting	car = tar	A back sound is replaced by a front sound.
Palatal fronting	ship = sip	sh or zh are replaced b y s or z respectively
Consonant harmony	cup = pup	The pronunciation of a word is influenced by one of the sounds it 'should' contain.
Weak syllable deletion	telephone = teffone	Weak (unstressed) syllables are deleted from words of more than one syllable.
Cluster reduction	try = ty	One or more cluster elements are deleted (try = ty) or replaced (try = pwy).
Gliding of liquids	ladder = wadder	Liquids are replaced by glides.
Stopping	ship = tip	A stop consonant replaces a fricative or affricate.

5.3.2 Speech Production Skills

In the perception and production of speech sound children acquiring language will naturally develop their abilities without major cognitive or physical challenge. Study.com (2021) identifies some skills which children acquire naturally during their acquisition of phonology. These include phonological skills that all of us acquire as children naturally. These abilities can't be considered taught, as all children without major cognitive or physical challenges will acquire them. The particular skills in the following list are acquired in order as they go from easiest to most difficult.

- **Word awareness** is the ability to track specific words in a sentence. Most children acquire this ability between 1.5 and 2 years.
- **Understanding rhyme and alliteration**: by age 4, most children can understand and appreciate rhyming and alliteration. Many children's stories utilize these tactics (e.g., Sally sells seashells by the seashore).

- **Syllable awareness**: at 5 years old, most children are aware of syllables and are able to manipulate them in a basic manner.
- **Rhyme manipulation**: producing a rhyme is far more difficult than understanding one. This ability tends to be mastered by 5.5 years old.
- **Phoneme awareness**: this is the most difficult skill in phonological development and is gained between 6 and 9 years of age. Phoneme awareness is the ability for the child to manipulate **phonemes**, the smallest unit of spoken language. For example, a child who has mastered this skill should be able to mentally alter words by adding or deleting phonemes, such as changing the /n/ sound in the word *rain* to /l/, making *rail*. It sounds simple to you, but asking a 5-year-old to do this will be a lesson in frustration.

Studies have shown that children are aware of speech sounds long before they are able to produce them such that they can distinguish between phonemes like /b/ and /p/ from the speakers of the surrounding language and then start building related words of the local language. By about six to seven months a child develops language-like sounds called *babbling.* These are consonant sounds and vowel syllables e.g. *tata, dada, mama*. Though, babbling seems meaningless it is a significant milestone in phonological development of the child's language. Infants' ability to hear their own vocalization and those of the people around them become increasingly important for speech production. Phonology is the study of the sound system of language. Perhaps you already know the root word 'phone' from telephone meaning (carrying sound). Other words like microphone, gramophone and xylophone are all related to sound producing items. Phonology will, therefore, be looking at the anatomical and physiological aspects of sound production. Psycholinguists have described man as the only articulate mammal because he has the apparatus to make the sounds of speech. We learn to speak without knowing much about those organs. However, researchers have shown a detailed understanding of how human body produces the sounds of speech. In phonology, we can see how our lungs breathe out air, produce vibrations in the larynx and with the use of the tongue, teeth and lips we modify the sound that translate into speech.

Snyder and Anderson (2010) hold that speech is a learned system of communication requiring the coordinated use of voice, articulators and language skills. Although many

animals are physiologically able to use the voice for communication and convey a wide range of simple messages to other of their species, only humans are able to produce true speech. In a broad sense, speech is synonymous with language. Roach (1983) argues for the importance of phonology in language study. It gives us an insight into how the human mind works because a man's word is his bond. It also enables the learner to hear and correct mistakes in such a language while giving us the opportunities to teach the pronunciation of the language to others. In studying the phonology of any language, we must examine the structure of the segmental phonemes and how they are brought together as meaningful sound units through which the grammar of the language is projected (Jolayemi, 2006).

Let us examine these two sentences:

1. The cat is under the chair.
2. The hat is under the chair.

You notice that the phonemes /k/ and/h/ have altered the meaning ascribed to the sentences. These sounds having been realized differently, phonologically, have conveyed different meanings. Daniel (2011) submits that /t/ can be realized with aspiration, that is, puff of air, in the initial position of a stressed, syllable as in 'tape' but lateralized when followed by a lateral sound as in 'kettle'. However, it is nasalized when close to a nasal sound as in 'kitten'.

Self-assessment Exercise 1

1. Distinguish between phonetics and phonology.
2. How would you describe the acquisition of phonology?

5.4 The Speaking Process

Lust (2006) asserts that there are some prerequisites that children go through in the speaking process. First, they have to discover the units from the continuous speech

stream picked up from their parents and the environment which would be mapped along a digital knowledge of language. They also have to make fine distinctions in perception as well as production of speech sounds to enable them discover the contrastive differences of their particular language and what such difference are linguistically significant or not .

Alexander (2016) strongly believes that although infants perceive a wide range of phonemes and environmental sounds, their production of sounds is limited by their immature physiology. Early infant vocalizations are initially reflexive and later on non-reflexive vocalizations develop. Reflexive vocalizations come from the infant's physical state and include, crying, coughing, hiccupping, and burping. Between 6 and 8 weeks, many infants spontaneously produce cooing sounds. Cooing, and later on, babbling are non-reflexive vocalizations. The cooing stage is important because during this time, infants begin to manipulate their tongues and mouths in producing sounds. These actions are precursors to actions required for later speech production. At about 4 to 6 months, the babbling stage appears and it is characterized essentially by reduplicated sounds, such as 'ba-ba-ba-ba'. At about 11 to 12 months, infants may begin to produce word-like units that have relatively consistent sound patterns. A small number of conventional words may also be produced, such as "no." In literate cultures, awareness of phonological distinctions may develop as infants engage in picture book sharing activities with parents or caregivers. Parents may engage their infants in looking at the pictures by using wide variations in sounds and intonation. For example, animal sounds, rhyming text, songs, and environmental sounds. In this way, picture book sharing stimulates auditory perception and phonological awareness related to spoken and written language.

Self-assessment Exercise 2

1. Explain the pre-requisites involved in the speaking process.
2. Identify some stages of speech production.

5.5 The Speech Organs

When we speak, we make use of pulmonic eggressive air. This is the airstream moving out of our lungs. When such air is expelled; sounds are produced and translated to speech. Sometimes, when we pause to breathe in by using ingressive air, we can only produce quiet speech which is unclear to our listeners. A young child acquiring language may not produce exactly the same sound used by adults, not because they are not of the correct sound but because their speech organs have not developed fully. They cannot fully control the flow of eggressive air so that they will continue speaking rather than purse briefly while drawing more air. Moore (2001) exemplifies that children may not articulate a word in full or exactly, they can recognize it as an incomplete or mistaken form when an adult repeats it back to them.

Adult: What do you want to be when you grow up?

Child: A dowboy.

Adult: So, you want to be a dowboy.

Note here that 'cowboy', which contains a consonant sound /k/ is understood by the child to be the correct thing to say but the speech organs are not ripe enough to realize the sound. In phonology, we can see how our lungs breathe out air, produce vibrations in the larynx and with the use of the tongue, teeth and lips we modify the sound that translate into speech as shown below:

Fig. 1 Showing the Articulatory Organs of Speech

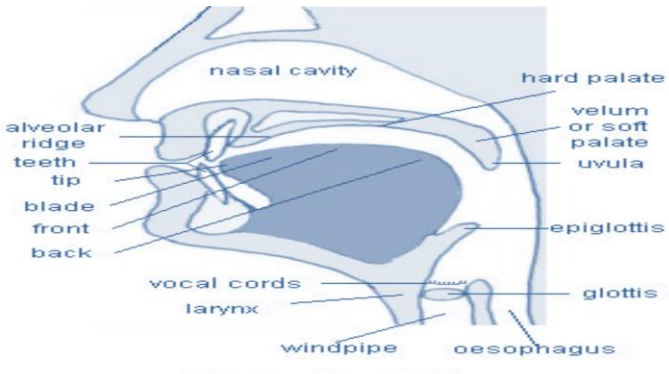


Image Credit: Moore, A. (2001)

A brief discussion of what goes on in the production of speech sounds will be made here. This involves the articulation of vowels and consonant sounds. English has 12 vowel sounds which are divided into seven short vowels and five long vowels. Vowels are described according to where the production takes places. This could be front, central or back of the mouth and whether the lips are rounded or spread.

The front vowels are: /i: / as in: seek /si:k/, need /ni:d/

/ i/ as in: sick /sik/, wit /wit/

/e/ as in: bet /bet/ net /bet/

/æ/ as in: cat /kæt/ man /mæn/

Central vowels are / ɜ: / as in: search /sɜ:tʃ/ girl /gɜ:l/

/ə/ as in: teacher /titʃə/, clever /klevə/

/ʌ / as in: but /bʌt/ gut /gʌt/

Back vowels air /u: / as in: cool /ku:l/ blue /blu:/

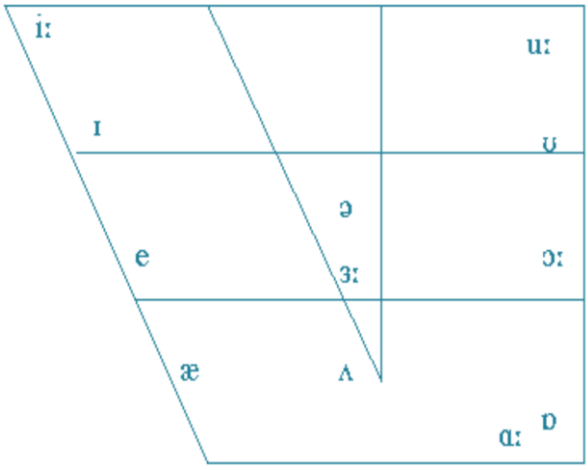
/u/ as in: full /ful/ pull /pul/

/ɔ:/ as in: fought /fɔ:t/ court /kɔ:t/

/ɒ/ as in: cot /kɒt/ dog /dɒg/

/a: / as in: car /ka:/ far /fa:/

This could be diagrammatized thus:



(Roach, 2004: 242)

In the production of consonant sounds, there is obstruction of the airstream, which could be partial or total as in /f/ and /p/ respectively. Here, you will need a mirror and see how you realize these two sounds. When /p/ is produced, the flow of air is obstructed by the lips but a different situation arises when /f/ is produced. This is due to the fact that the flow of air is partially obstructed by the contact of the lower lip and the upper teeth. In the phonological classification of consonant sounds, three factors are put into consideration:

1. The place of articulation: This refers to the point in the vocal tract where the air is interrupted for the articulation of a particular consonant sound.
2. Manner of Articulation: This is described according to the degree of obstruction of the air stream whether total or partial.
3. State of Glottis: It is used to show a voiced or voiceless sound. When there is vibration, the consonant sound is voiced and when there is no vibration it is voiceless.

The places of articulation in the production of consonants are:

	Term	**Description**
1.	Bilabial	Involving two lips as in /b/, /p/, /m/ (buy, pie, my)
2	Labio-dental	Lower lip and upper front teeth /f/, /v/ (fun, voodoo)
3.	Dental	Tip of tongue with incisors /θ/, /ð/ (think, though)
4	Alveolar	Tongue tip and alveolar ridge /t/, /d/ (tie, dye)
5.	Palato alveolar	Front part of tongue raised towards the hard palate /ʃ/, /dʒ/ (share and jump)
6.	Velar	Back of tongue against soft palate /k/, /g/ (cut, go)

7.	Glottal	Air passes through glottis /h/ (heave, hug)

The manner of articulation is described in this way.

	Term	**Description**
1.	Plosive	/b/, /p/ total obstruction of air
2.	Affricate	/tʃ/, /dʒ/ release of air is gradual in the air stream partially obstructed.
3.	Nasal	Air flow through nasal cavity /m/, /n/
4.	Fricative	Articulators obstruct flow of air partially with a frictional noise /h/, /r/

You can see from the above that phonology enables us to determine the phonetic realization of sounds of a language in the actual speech. With the use of the articulators speech sounds become the words of the language. The articulation mechanism comprises the lips, tongue, teeth, palate and jaw. Speech is produced by the interruption or shaping of the vocalized and unvocalised airstream through the movement of the organs of speech.

Self-assessment Exercise 3

1. Draw a diagrammatic representation of speech production to show clearly five organs of speech.

2. Produce a chart showing the ‘place and manner of articulation.

5.6 Summary

In the foregoing Unit, we explained that the acquisition of phonology entails a distinctive sound perception from infancy to adult speech. We distinguished phonetics from phonology and examined how children perceive speech and the phonological processes involved in a typical speech development. We also examined how children perceive speech by the ability to determine which sounds are linguistically significant. The Unit highlighted the processes involved in the production of sounds by describing how the human speech organs operate. Important sounds like the vowels and consonants were exemplified to demonstrate that the acquisition of phonology is an important stage in language development.

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5.8 Possible Answers to SAEs

Answers to SAEs 1

1. Phonetics deals with the physical aspects and characteristics of human sounds while phonology is concerned with the functional aspects of a particular language.
2. The acquisition of phonology involves the speech production skills of word awareness, syllable awareness, rhyme and phoneme manipulation ultimately to convey meaning.

Answers to SAEs 2

1. Children discover the units of speech patterns of speech patterns from parents and environments. They make fine distinctions and perceptions in the production of speech sounds
2. From 1-2 months cooing and babbling are visible.4-6 months will manifest reduplicated sounds while by 11-12 months, picture words are manifested

Answers to SAEs 3

1. Students are referred to the display page above to replicate same
2. Students are referred to the display page above to replicate same

UNIT 6: SYNTACTIC ACQUISITION

6.1 Introduction

6.2 Learning Outcomes

6.3 The Phonological Process

6. 3.1 Perception of Speech

6.3.2 Speech Production Skills

6.4 The Speaking Process

6.5 The Speech Organs

6.6 Summary

6.7 References/Further Reading/Web Resources

6.8 Possible Answers to Self-Assessment Exercise(s) within the Content

6.1 Introduction

In the previous Unit where we examined the phonological acquisition of language, you were acquainted with the complex nature of language development. In this Unit, you will be exposed to syntactic acquisition that looks at word order and its system. You will also know that one of the characteristics of language is that it is systematic and that any attempt to disorganize its orderly arrangement will affect its structure and by extension distract from its correct interpretation. Syntax is taken from a Greek word ‘arrange together’. It is the study of those rules that govern the ways in which words are arranged to form phrases clauses and sentences. Chomsky (1965)’s famous sentence “colourless green ideas sleep furiously” though grammatically correct but meaningless is used to demonstrate that the rules governing syntax are distinct from the words conveyed (Redfors, 2004). In the same vein, Lewis Carroll’s poem ‘Jabberwocky’ contains lines like:

The blithy toves did gyre and gimble.

The blithy toves karulized elastically.

The way words are strung together is English-like even though the words are nonsensical. We however know that the syntax of English will realize ‘toves’ as plural ‘gyre’ ‘gimble and ‘karulized’ as verb and ‘elastically’ as adverb. When the string is altered, the syntactic order will not be English. In linguistics, you are expected to be able to identify each of the constituents in the sentences and to say what category it belongs and the function it serves. These constituents are called word orders, which are combined together to make sentences. In English, the general word order is Subject Verb Object (SVO) though this varies from language to language. A sentence like:

The boy hit the girl
Subject Verb Object
If you reverse the word order to SOV

*“The girl boy hit the”, the sentence would contravene the syntactic pattern of English and therefore not be acceptable. A typical sentence in the English language consists of a subject and a predicate. While the subject is mostly realized by a noun phrase, the predicate is realized by a verb phrase, e.g.

1. The man (NP) became a doctor. (VP)
2. Her son (NP) speaks Hausa very well. (VP)

6.2 Intended Learning Outcomes (ILOs)

At the end of the Unit, you should be able to:
1. Explain Syntactic acquisition
2. Describe the process of the acquisition of syntax
3. Distinguish the one-word stage from other stages
4. Discuss Mean Length of Utterance (MLU)
5. Mention the features of Syntactic Development

6.3. Syntactic Development

6.3.1 Holophrases

According to Pinker (1995) babies begin to understand words shortly before their first birthday. At this stage words are usually produces in Isolation and this could last up to another year. Words produced are majority those describing objects such as food (juice and cookies), body parts (eye, nose) clothing (socks, pants, sweaters) animals (dog, cat) etc. There are other words in their memorized routine such as ‘Yes’, “No’ “bye’ hello’ etc. Studies also show that around 18 months of age there are observable changes in syntactic acquisition by children. The so called ‘primitive syntax’ begins to form. This includes two word strings like the following: ‘All dry’, ‘All messy’, ‘All well’, ‘Milk gone’, ‘no toy’, ‘see cat’, ‘more bread’, ‘see baby’, ‘bye bye car’. William (2005) also talks of syntactic development when syntactic structure takes place in an orderly manner to reveal the nature of the language acquisition process. The one-word stage features the child using the word ‘daddy’ to mean ‘I see daddy’ and ‘more’ to mean ‘give me more’. Such utterances are called ‘holophrases’ literally ‘whole sentences’. A child who wants candy will say ’candy’ instead of ‘want’ because the former is more informative to the desire being expressed. In the same vein a child who want ‘ball ‘ will be inclined to say ‘ball’ instead of saying “see ball” The following table exemplifies the one-word stage of the syntactic acquisition common among children.

Utterance	**Situation**
Dada	father enters room
Down	Child sits down
Door	father closes door
Here	points to a location
Mama	child gives mother something
Again	as child watches lighting a match

Lust (2006) argues that language is first and foremost symbolic. Sounds, words and sentences represent and capture infinity of possible meanings and intentions. It is therefore essential that syntax should be integrated with other parts of language use

for us to say what we mean and mean what we say. According to Ben and Lieven (2011), it is believed that with respect to the time course of syntactic development, cross-linguistic studies have demonstrated that children adapt to the core properties of their target language very early but may go through an extended stage in which target-like uses of grammatical morphology and omissions of the same morphemes can be found side by side. This has led acquisition researchers to abandon earlier 'all-or-nothing' models of syntactic development in favour of more complex models that involve interacting morpho-syntactic, phonological, discourse-pragmatic and processing factors.

Self-assessment Exercise 1

1. Explain syntactic acquisition in language development.

2. Describe Holophrasis in syntactic acquisition.

6.3.2 Features of Syntactic Development

The process of language acquisition is a complex and orderly progression. From the day a child is born till all the essential language properties are well possessed, its cognitive development is tied up with language. Therefore during the stages of acquiring the syntax of the language some features are typical of such language behavior. Alexander (2016) avers that syntactic development during infancy is not readily evident because infants do not begin to use expressive language until the later part of infancy and then only in the form of idiomorphs and single words. However, research with infants has documented their ability to "detect changes in the order of sounds". Children's receptive knowledge of syntax is developing during infancy as they observe and begin to participate in the communicative contexts around them. Children at the one-word stage appear to indicate that words presented in strings are not isolated units but are part of larger constituents. This early awareness facilitates syntactic knowledge development. Children develop receptive knowledge of syntax through speech directed to them and also by being listeners-observers in adult-to-

adult interactions. Syntactically, adult-to-child speech is shorter in length and less complex grammatically. It contains repetitions, uses few subordinate clauses, contains fewer modifiers and pronouns, and has more content words and fewer verbs. Older infants' receptive knowledge of syntax is evident in their nonverbal responses to questions or directions such as, "Where is your cup?" or "Go get the ball" or "Where is your nose?" When a child retrieves a cup or ball or points to his nose, comprehension of the question or request is evident. Infants who are involved in storybook interactions with adults are exposed to more complex syntactic structures than those present in daily conversational settings. As infants near their first birthday, they begin to participate verbally as well as nonverbally during storybook interactions. Adults intuitively appear to alter the exact text to fit the comprehension and linguistic competencies of children. They shorten the text, create their own version of the text, increase repetitions, ask questions, and add sound effects. These adaptations encourage more engagement from children.

6.4 Telegrahic Speech

Researches have shown that during infant years, children's speech is characterized by utterances with specific syntactic features. One of such features is the use of telegraphic speech whereby the child uses two or three content words in an utterance without function words. Such expressions lack articles, conjunctions, prepositions and inflections like 'the', 'and' 'on''s' respectively. You now have sentences like 'daddy come' instead of 'daddy has come' bring toy' instead of "bring the toy etc. The use of pronouns is problematic because it is more of a lexico-semantic concept rather than syntactic. This happens because even though children may be using multiple words like toddlers at the higher level of syntactic acquisition, the grammatical categories become more manifested. These are word classes or parts of speech such:

1. Nouns: which names a person, place, things or idea and usually preceded by articles. (Alaba, dog, Lagos, beauty, etc.)
2. Adjectives describe the attributes or qualities of nouns, e.g. great, poor, slow, powerful, etc.
3. Pronouns: The prefix in pronoun 'pro' means 'for'. We can therefore refer to pronoun as a word used instead of noun. When a noun is used repeatedly, it

becomes monotonous. Pronouns are used instead. These are, I, you, she, he, they, etc.

4. The verb: The verb is derived from a Latin word 'verbrum' (a word). No sentence can be complete without a finite verb. It is regarded as the most important of the word classes. It is an action word and other word revolve around it e.g. drew, jump, see, etc.
5. The Adverb: This is a modifier which gives more information or meaning about other parts of speech e.g. He talks slowly when provoked. (greatly, wonderfully, etc.)
6. Preposition: This is a word used to show the relationship between nouns or pronouns and other words that they precede in sentences, e.g. The book is on the table. (Under, beside etc.)
7. The conjunction: This is a word that links or joins two words, phrases, clauses or sentence e.g. food and drinks.
8. The interjection: it is an expression of strong feeling or fear, pity or sorrow. Sentences which contain interjections are called exclamatory sentences e.g. *What a pity! My goodness! Hurrah!*

Self-assessment Exercise 2

1 Discuss some features of syntactic development

2 Give five examples of telegraphic speech.

6.5 Mean Length of Utterance (MLU) in Syntactic Acquisition

When children begin to acquire syntax, psycholinguists are interested in the length of such utterance to be able to assess whether the developmental stage of language acquisition is stress-free or threatened. Aitchison (2008) relates the cases of three socially isolated children, Isabelle, Genie and Chelsea, that children acquisition of syntax can be endangered when they are cut off from the language environment. All three were cut off from language until long after the time they would have acquired it.

Genie's condition was particularly pathetic. When found, she was totally without language. She began acquiring speech well after the onset of adolescence – after the proposed 'critical period'. Although she learnt to speak in a rudimentary fashion, she progressed more slowly than normal children. For example, ordinary children go through a stage in which they utter two words at a time (WANT MILK, MUMMY PLAY), which normally lasts a matter of weeks. According to Lust (2006) Genie's language development, particularly its syntax appeared extremely 'deficited'. After five months she began to use single words and her vocabulary grew quickly. Her first words were often cognitively complex, e.g., colour and number words and superlatives. Two words were combined and then three to four words after about two years, attempted recursion appeared, e.g.,

1. Want milk
2. Genie love Curtiss
3. Big elephant long trunk
4. Ask [go shopping]
5. Tell [door lock]

Such cases of children who developed their language later in life have sparked off interest in language acquisition studies. This writer has seen some 3 - 4years old pre-schoolers talk of scenes from pictures, respond to questions and even describe limited events. An intriguing example is the writer's child's report of a friend who slapped him during a play session. Instead of using the word 'slap' still dormant in his linguistic domain, he said "Ibrahim do like this" by repeatedly tapping himself on the cheek. This shows the dexterity and spontaneity in the cognitive process. Children around 12 months attain one word stage when object naming develops (food, eye, nose, ball, toy, etc.).The child's first word remains controversial. Male chauvinists among the Yoruba claim that a child's first utterance is 'ba-ba' meaning (father). This is debatable as the mother-child interaction at this stage is so crucial that many children are inclined to saying 'Ma-ma' (mother). Action words like 'so' 'bia' 'wa' in the three major Nigerian languages, which mean 'come' engage the linguistic repertoire of the child. Even modifiers like 'all gone', 'more', 'finish', 'dirty', 'pupu', etc. are used. Here, they take umbrella or compass dimension as in 'all gone food', 'more more water', 'finish bread,' 'dirty dirty baby', 'pupu pupu sister', etc . You can now appreciate better how the

popular advertisement in television stations across Nigeria about “shaky shaky daddy” where the 3year- old child described the father’s condition who just suffered from a bout of fever comes to mind here. At this stage, one word covers many expressions. The child uses ‘milk’ to say ‘give me milk’, ‘milk has finished’, ‘I’ve spilled my milk’, etc.

Surakat (2009) gives an insight into a Nigerian preschooler’s cognitive process in her acquisition of English at age 47 - 62 months. In what he termed *pedolinguistics* (child language studies), audio and video data of a child named *Mana* were recorded and analyzed. Sample utterances of *Mana* include: ‘I say I go come back’ when asked for the whereabouts of the auntie. * “It is paiming me” (touching her mouth) when asked what is wrong with her. When Mana scribbled on a paper, she explained ‘I laite peibi like this’ to mean (I draw baby like this). Our concern here is that intelligibility is possible in the cognitive process of a child acquiring language. The data also shows that children engage in phonological sound redistribution e.g. *‘I want to hear my *noise*’ instead of ‘*voice’* when a tape recorder was demonstrated for her. ‘Paiming’ instead of ‘paining’ ‘peibi’ (baby) ‘lait’ (like) ‘anytin’ (anything) ‘stomas’ (stomach)

At the morphological, syntactic and semantic levels, a lot of creativity was noticed:

*Mummy has spoil my toy (absence of tense marker)

*Dupe has finish his food (absence of tense gender marker)

*He goed away (inadequate knowledge of irregular verbs)

*She have two bag (plural morpheme marker’s’ absent)

With age and cognitive maturity, children tend to master the correct forms. But at their level, communication still goes on all the same. It should be noted that even adult learners of a second language in the Nigerian setting make such mistakes like the ones described above because of the morpho-syntactic pattern of the target language e.g. *‘house big’ from a Yoruba/English bilingual because in Yoruba, the modifier is post posed ; that is, it comes after the noun ‘ile nla’ unlike English which is pre-posed (big house). At the semantic level, we also have cases like *‘sweet stories’ instead of ‘interesting stories’. It is therefore important to calculate the mean length of

utterance during syntactic acquisition. This is computed by adding bound and free morphemes in a language sample. There is a high degree of correlation of MLU and age because the child's sentences become longer with age. The child's working memory allows the child to plan and execute longer sentences. Several utterances are considered and calculated based on the number of individual morphemes in each utterance. Let us take a particular child who may say the following:

(i) I+ like+ toy = 3 morphemes

(ii) Mummy+ like +s+ to+ sing = 5

(iii) Give+ me+ food = 3 morphemes

These morphemes give a total of 11 which you can now divide by the total number of utterances. These are three. 11/3 = 3.2. MLU = 3.2

Normal children may differ by a year or more in their rate of language development but the stages they pass seem generally the same despite varied exposure. The role of cognition is natural and developmental in language acquisition as all children progress through similar milestones in a similar fashion. The general trend in the cognitive process of a child's acquisition of language could not explain fully how children succeed. The role of cognition is so complex that psycholinguists agree that more studies are required to fully comprehend the phenomenon of language acquisition and learning.

Self-Assessment Exercise 3

1. Describe Mean Length of Utterance (MLU) in the acquisition of syntax.

2. Examine the role of imitation in Child's grammar.

6.6 Summary

In this Unit, you were able to learn how the syntactic pattern of language is acquired. We explained that syntax is the study of how words are combined systematically to make sentences. In English the S.V.O pattern is the appropriate structure. Therefore, it should be noted that syntactic acquisition is not merely the stringing of words together but it must follow an ordered, systematic and rule governed pattern to be

appropriate and acceptable. Many of you will appreciate the importance of speaking appropriate grammatical sentences in your language. Any attempt to tamper with the pattern will lead to lack of intelligibility of such a language. The foregoing unit has explained that children from infancy attempt to acquire the syntax of their telegraphic stage to full length utterances. The Unit highlighted the peculiarities, features and characteristics that could be manifested and the challenges that usually confront acquirers are explained.

6.7 References/Further Reading/Web Resources

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. This occurs around 18 months when there are observable changes in the word pattern of the child. Syntactic structure attains an orderly manner to reveal the nature of language acquisition process.

2. It means a situation of using one word to mean a phrase such as when the word 'daddy' means more than father

Answers to SAEs 2

1. One word stage is indicative of large constituents. Verbal and non-verbal expressions begin to make sense as child grammar becomes evident.
2. Examples include ‘Eat food’, ‘take cup’, ‘dog milk’, ‘cat run’, ‘gone ball’.

Answers to SAEs 3

1. MLU is calculated by considering the bound and free morphemes in the child’s utterances. A number of sentences would now be divided by the total number of morphemes.
2. Imitation is central to the child’s syntactic but not wholesale because the creative instinct in children allows them to generate novel utterances different from the adult model.

UNIT 7: SEMANTIC ACQUISITION

7.1 Introduction
7.2 Learning Outcomes
7.3 From Words to Concepts
7. 3.1 Developmental Milestones in Infant Semantics
7.3.2 Semantic Development in Children
7.4 Levels of meaning
7.5 Features of Semantic Acquisition
7.6 Summary
7.7 References/Further Reading/Web Resources
7.8 Possible Answers to Self-Assessment Exercise(s) within the Content

7.1 Introduction

Our focus in this unit will be on semantic acquisition. We need to understand the term ‘semantics’ which according to Encyclopaedia Britannica (2022) is a derivative from a Greek word ‘Semaino” (the study of meaning). It focuses on the relationship between the sense and the reference. Linguistic semantics is the study of meaning that is used to understand human experience through language. There is interconnection between semantics and other component of language such as syntax phonology and morphology. According to Radford (1990) children must bring all their computational power for syntax and phonology to bear on the expression and comprehension of an infinite set of sounds, thoughts, beliefs, hopes and desires. Meanings are not usually provided by the environment; children must create them. This is a different situation when one considers the acquisition of syntax and phonology. Researchers have shown that the acquisition of semantic dimension of language knowledge will continue throughout life

7.2 Intended Learning Outcomes (ILOs)

At the end of the Unit, you should be able to:

1. Distinguish semantic acquisition from syntactic acquisition
2. Explain developmental milestones in infant semantics
3. Describe the levels of meaning
4. Appreciate children's creativity in language behaviour
5. Explain the features of semantic acquisition.

7. 3 From Words to Concepts

7. 3.1 Developmental Milestones in Infant Semantics

Children acquisition of semantics cannot be appreciated unless they can 'say what they mean and mean what they say'. At this stage of acquisition children should be able to link cognitive concepts and ideas, both their own and those of others to those meanings which are linguistically coded so that correct interpretations of concepts are understood. Radford (1990) postulated a maturational hypothesis on semantic acquisition where he identified the developmental milestones in infant semantics as follows:

Year 1

0–6 months

Beginnings of word recognition, e.g., "mommy" and "daddy" or infant's own name.

6–12 months

Remembers and detects words in fluent speech, words and stories heard two weeks

9 months Labelling facilitates categorization

10.5 months "Earliest evidence of recognitory comprehension"

11 months. Developing receptive lexicon and ability to actively seek a named object for frequent words

12 months Concepts like a "cup" or "ball" are acquired. Uses property or kind properties (e.g., "dog" versus "ball") to differentiate and quantify objects, linkages between words and categories are made

Year 2

12–24 months

12–13 months Distinguishes novel words categorically (count nouns versus adjectives; link nouns and object categories .Rapid increase in receptive lexicon

14 months “rapidly learns associations between words and objects” with only a few minutes of exposure. Understands as many as fifty words

Discriminates between two different words for a single action (e.g., “push” and “pull”), and between two different actions, but shows “a difficulty in processing language labels and actions simultaneously,” thus not linking specific words to specific actions

15–16 months “word spurt” in comprehension

18 months. One trial learning is sufficient for initiation of new words. Links words with speaker related referents

Able to form an association between a nonsense language label and a causal action within minutes (e.g., “push” and “pull”) Symbolic competencies are fully developed for: object permanence, deferred imitation, and symbolic play.

New words proliferate; estimated vocabulary 10–220.

2 Years+

May understand and produce 50–1,000 words

3 Years+

Estimated vocabulary of 5,000-10,000 words by 5 years. By 6 years, the child may control 14,000 word meanings; by adult, 50,000-300,000. Development of theory of mind and communicative intentions relevant to language. Higher order semantics (e.g., logical connectives and quantifiers) continue to develop. Integration of pragmatic, semantic and syntactic factors continues to develop.

Self-Assessment Exercise 1

1. Explain the relationship between syntax and semantics in language acquisition

2. Examine the development milestones in infant semantics

7.3.2 Semantic Development in Children

Alexander (2016) posits that semantic acquisition is concerned with the aspect of language knowledge that involves word meanings and vocabulary. It is observed that right from infancy parent child interactions are often in response to the infants' cries because the child is not comfortable with something bothering it. This occurs as an expression of its physiological and emotional status. A caregiver would recognize these types of cries by pitch, rhythm and intensity. Studies have shown that a meaning is attached to such cries to signal semantic development and the caregiver's response always involves a language and the assumption that the cries mean something. The interpretation given to this parent-child relationship promotes a form of communication which the infant interprets as a signal for seeking attention.

According to Alexander (2016), between 1 and 2 years of age, a child has 20 to 170 words in his productive vocabulary but understands many more. There is considerable variation among individual children because their vocabulary will reflect their individual family contexts and experiences. While idiomorphs will still be part of a young toddler's expressive vocabulary, there is gradual transition to conventional words. As objects and events in children's environments are repeatedly labelled, both the receptive and expressive vocabularies increase; however, the listening vocabulary is still larger than the productive vocabulary.

The productive vocabulary of older toddlers may range from 200 to 300 words, with a much more extensive listening vocabulary. A toddler usually maintains only one word pre referent in his or her productive vocabulary. A child may experiment with a specific word and switch to another if the first word is not successful in referring to the desired object, action or event. One aspect of semantic development involves children's acquisition of categories, which organize phenomena into groups of shared characteristics. These generalizations may be evident in toddlers' semantic over-extensions and under-extensions as they develop schemata with general and specific concepts. Semantic knowledge related to emergent literacy continues to expand during the toddler years, as children develop an awareness of environmental print and meanings, such as stop signs, McDonald's logos, and labels on food packaging.

Throughout infancy and toddlerhood, children are active learners in building their concept knowledge and vocabulary. Daily interactions with people, objects, and actions in their environment provide direct and vicarious experiences that enhance children's development of semantic knowledge. When children have opportunities to observe parents and teachers interacting with written language and to participate in those interactions, semantic knowledge related to written language is also enhanced.

7.4 Levels of Meaning

As children attain adulthood, semantic acquisition becomes more advanced and the several levels of meaning are more distinguishable. In other words there are different shades of meanings such as conceptual and connotative. The former looks at meaning at the primary or denotative meaning of a word. This is the lexical entry you will see in your dictionary. It is not affected by the context or emotional overtones reflected in the utterance. In conceptual meaning, there is a general acceptability of what the term stands for. ‘Man’ could be signified as Human + male + adult and ‘woman’ is signified as Human + female + adult.

The second level refers to how conceptual meaning is coloured to assume a higher meaning different from its ordinary sense. Alebiosu and Jimoh (2012) exemplify that “my brother is married to a pig” connotes ‘a dirty wife’, and “the company will fire any lazy workers” connotes ‘sack or dismissal’. The language of advertisement is full of connotations. An advertisement in a fuel station which says “put a tiger in your tank” got the attention of more customers than that which says “happy motoring and fast starting”.

Self-Assessment Exercise 2

1. Describe the semantic development in children
2. Distinguish between conceptual meaning and connotative meaning.

7.5 Features of Semantic Acquisition

Studies have revealed that in infancy, many children's experiences are essentially first hand or direct. It is however observable that direct experience has greater impact on concept development. Alexander (2016) therefore avers that direct experiences occur from birth as children experience object and events in their world as a direct participation. Activities such as touching, tasting, hearing, picking up items, seeing and hearing develop their concepts through visual representations. When infants attain their first birthday, they begin to use distinct words to refer to object being referred to William (2005) identified the semantic relations expressed by these utterances.

Intended Meaning	**Child's Utterance**
1. Jimmy is swimming.	Jimmy swim.
2. Ken's book	Ken book.
3. Daddy is at his office.	Daddy office.
4. You push the baby	Push baby.
5. Mommy is reading	Mommy read.

This level of semantic development is also characterized by over-extensions in the language development process. These include:

Word	**First Referent**	**Over-extensions**
1. bow-wow	dog	sheep, rabbit fur,
2.. baby	baby	people in pictures
3..sizo	scissors	nail file, knife, spoon
4. Policeman	policeman	mailman, sailor, doctor
5.Fireworks	fireworks	matches, light, cigarette

Shortly after this stage the child's semantic acquisition advances to the 'mini sentences' level where the following patterns are observed:

Utterance	Intended Meaning	Semantic Relation
1.Baby chair	'The baby is sitting on the chair.'	Agent+location
2. *Doggy bark*	'The dog is barking.'	Agent+action
3. *Jim water*	'Jim is drinking water.'	Agent+theme
4. *Hit doggy*	'I hit the doggy.'	Action+theme
5. Daddy hat	' Look at Daddy's hat'	Possessor+possessed

William (2005) observed that some features of the min sentence stages is that children are already conscious of the appropriate word order. We can infer from this that infants show very early sensitivity to the features of sentence-meaning structure which demonstrates a positive and healthy growth towards the language acquisition process.

Self-Assessment Exercise 3

1. Describe the features of semantic acquisition
2. Mention 2 utterances giving their intended meaning and semantic relation.

7.6 Summary

In this Unit you learnt about the uniqueness of infant's acquisition of semantics. The Unit described the types of the acquisition of semantics and how children demonstrate their concepts of words between sense and reference. With the consideration given to the maturational hypothesis, we also learnt that there is a developmental milestone in infants' semantics where children's semantic capacities grow with their age and maturity.. During the semantic development of infants, they tend to link cognitive concepts and ideas therefore acquiring vocabularies to dissect the world around them. The Unit further explains the features of semantic acquisition which are characterized by stages of holophrases and 'mini sentences'. The levels of meaning at the adult stage of semantic acquisition were also discussed.

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7.8 Possible Answers to SAEs

Answers to SAEs 1

1. Cognitive concepts emanating from linguistic structures are liked for meanings to take shape. These are coded for correct interpretations
2. The first year is characterised by highlights the receptive lexicons and differentiations of objects including word categories. By age 3, higher order of semantics have developed.

Answers to SAEs 2

1. Different pitches in cries, rhythm and intensity convey messages which are recognised by the caregiver. Toddlers exhibit over-extensions and under-extensions. Children develop awareness of environmental meanings.
2. Meanings at denotative levels are interpreted by the ordinary concept described while connotative meanings add colour to the ordinary meanings

Answers to SAEs 3

1. Such feature include: holophrases, telegraphic messages and generalisations; Jimmy swim, push baby, mummy read etc.

2 (a) Doggy bark: When the dog is barking (agent+ action).

(b)John hat Describing that the hat belongs to John (possessor +possessed)

Module 3: Speech Comprehension

Unit 1: What does Speech Comprehension Entail?

Unit 2: Neural Processes for Speech Comprehension/Production

Unit 3: Phenomenon of Speech Recognition

Unit 4: Parsing

Unit 5: The Concept of Interpretation

UNIT 1: WHAT DOES SPEECH COMPREHENSION ENTAIL?

1.1 Introduction

1.2 Learning Outcomes

1.3 Comprehending Speech

1. 3.1 Sentence Processing Component

1.3.2 Sentence-meaning Interface

1.4 Semantic Mapping in Speech Comprehension

1.5 Developmental Milestones in Infants' Speech Comprehension

1.6 Summary

1.7 References / Further Reading/ Web Resources

1.8 Possible Answers to Self-Assessment Exercise(s) within the Content

1.1 Introduction

The previous Unit discussed the acquisition of semantics to give you a grounding of what speech comprehension entails. This will make it clearer that it is an integral part in the understanding of language acquisition process. Researches in psycholinguistics have been very helpful in many ways to help scholars appreciate what comprehension does in language development. In our interpretation of sentences like "the doctor helped the man to the house" and "the doctor helped the man in the house" we observed that they contain distinct messages but these sentences differ in just one small word. Studies are therefore needed to explain the properties of the human mind as well as the structure of the language to justify the comprehension of such sentences. Our discussion in this unit will explain the psychological areas of inquiry

which shows that understanding what speech comprehension entails does not totally depend on linguistics.

1.2 Intended Learning Outcomes (ILO's)

At the end of this Unit, you should be able to

1. Describe what speech comprehension entails
2. Examine the speech comprehension process
3. Analyse inferences in messages
4. Explain developmental milestones in infants speech comprehension
5. Describe semantic mapping in speech comprehension.

1.3 Comprehending Speech

1.3.1 Sentence Processing Component

Researches in Psycholinguistics have established that language is both creative and by imitation. During language acquisition, we store a great deal of information about the properties of words in our mental lexicon so that we can retrieve them when we produce language. Children are also observed to imitate the adult model although with some modification. This has generated a lot of debate termed 'child grammar' which some scholars argue that it is independent of the caregiver speech. However, we now know that frequency of exposure determines our ability to recall words that have earlier been stored in out processing mechanism. In our day-to-day use of language, we engage in conversations. It important to comprehend what is going on to enable us to achieve the primary goal of conversation, which is to understand the message. As a means of social interaction, conversation is purposely to change each other's mental state. Therefore, successful communication will depend on a great deal of shared knowledge and the ability to access the mental state of your listener. You need to take into consideration that your referents are available and that your listener will be able to fill the gap of the dialogue. A speaker who consciously or unconsciously says, 'the Emir of Lagos' or 'Oba of Kano' will be misleading the listener who will detect no referents as such. Lagos has an Oba, Obi is for Onitsha. In the same vein, you cannot have 'the King of France' since there is no monarchical form of government there. You will notice that some premises bear the notice "post no bill". It was reported that a

student who did not understand the import of the message could not send his schedule of school fees to his parents. Similarly, a newspaper report that “Radiographers lament increase in cost of Equipment” was misinterpreted as referring to radio engineers. The medical register used to refer to professionals who use X-ray equipment was not correctly processed in the mental lexicon of some of the readers. Beyond basic sentence processing, psycholinguistic studies in speech comprehension are also concerned with the actual use of language and how sentences are arranged. After a sentence is processed, we store it in the memory combined with other sentences for conversation. In English the same set of words can mean different things when arranged in a different pattern. For example:

1. The senators objected to the plans proposed by the president.
2. The senators proposed the plans objected to by the president.

The two sentences have different meanings even though it is the position of the words ‘objected to’ and ‘proposed’ that differs. The difference in the word order leads to the difference in meaning. The words constituting the same sentence will not make sense if rearranged using another structure like:

*Plans to the proposed the senators the objected by president.

In speech comprehension, the working memory is associated with obtaining the basic building blocks of sentence meaning. People usually recall the gist or general meaning of what they have heard but not the surface form. It is only the representation of the meaning that they comprehend and not the exact form of the sentence below.

1. The rich widow is going to give a million dollars to the university.
2. The rich widow is going to give the university a million dollars.

The hearers are interested in the message only but the deep structure of sentence 1 is not the same as the deep structure of sentence 2. If you attempt to replace ‘give’ with ‘donate’ only sentence I will be acceptable. This means we can have:

1. The rich widow is going to donate a million dollar to the university.
   It is not grammatical to say:
2. * The rich widow is going to donate the university a million dollars.

When bilinguals are given information in two languages they do not bother to remember which language was used to convey the message as far as the content has been understood. For example, any prayer session in English, Yoruba, Igbo and Hausa during national emergency is welcomed by all Nigerians once peace is the theme. I‘ve witnessed many social outings where people who have a smattering knowledge of the import of what the speaker is saying just tag along with the majority that understand. Sometimes, Christians join Muslims to say their Arabic Prayer even incoherently just to sustain the social interaction and vice versa.

Self-assessment Exercise 1

1. Explain what speech comprehension entails.
2. Explain the concept of ‘Child Grammar’

1.3.2 Sentence-meaning Interface

The set of possible sentences for a given language is infinite. Comprehension takes place when the attention system becomes engaged. The long-term memory is filled with information which will be retrieved quickly with the new linguistic input for rapid comprehension to occur. A person speaking Yoruba language must have shared the cultural experience of the people to properly decode an utterance like “put clothes on your body” versus “put your body inside your clothes” in what could be considered a palindrome expression in Yoruba. When you know any language, you should be capable of producing an endless set of novel utterances. As you share the knowledge of this language with others in your speech community, people who hear what you say are able to understand you and they in turn should be able to produce the same type of sentences. It is this bi-directional nature of language that underscores speech comprehension.

Ferreira (2005) reveals that language processing is a complex system because processing takes place in a mental workshop that is severely limited in capacity. Most people only retain three to seven unstructured pieces of information before they can

relate them in a meaningful way. When we decode the meaning of an utterance, we appreciate how the linguistic system works and interacts with the rest of the cognitive architecture. This is because people understand language at the rate of about 300 words per minute and processing of the lexical retrieval, syntactic passing and semantic interpretation takes place simultaneously in an instant.

A major concern of psycholinguistics as a field in language development is an attempt to explain how listeners understand utterances especially when ambiguity, inferences, ironies and puns are involved. Many of us may know how to speak but it is equally important to know the processes involved in understanding speech.

Let us examine the comprehension of these sentences:

1. Can you close the window?
2. Why not close the window?
3. Will you close the window?
4. Must you close the window?

Even though there is no direct relationship between the form and the intended meaning, listeners will have no problem decoding the meaning of the utterances.

The first sentence if literally interpreted wants to know the ability of the interlocutor to perform the action. But people assume that the speaker is requesting in an indirect manner that the window should be closed. In the second sentence, the speaker wants the window closed but he phrased the request indirectly. In the third sentence, he is questioning the willingness of the interlocutor to close the window while the last sentence wants the window open.

In speech comprehension, we need to examine why these requests are phrased the way the speaker did. There are certain principles governing the use of language in social settings including making excuses, giving apologies, exchanging greetings and the rules of politeness. When we make requests, we are making a demand on someone who may otherwise not be predisposed towards our need. It is therefore incumbent on us to request for their cooperation. Indirect request is more polite than a command like “close the window”. The listener who shares the same aspect of the

social use of language will comprehend the sentence as a request instead of taking it literally (Carroll 1994).

Speech comprehension requires more than adding the meaning of the individual words together. We must combine the meaning in a way that respects the grammar of the language and sensitive to the possibility that the language is being used in a metaphoric and non-literal sense (Cacciari & Glucksberg 1994). Psycholinguistic studies have shown that linguistic theories alone are incapable of explaining sentence comprehension and production. There is need to consider the properties of the human mind and the structure of the language.

Treiman et al (2003) exemplified that profound differences could exist in the meanings of some sentences due to the way they are framed:

1. The umpire helped the child to third base.
2. The umpire helped the child on third base.

These are different messages although the sentences differ in just one small word. In the same vein, the following sentences below describe different events.

1. He showed her baby the picture.
2. He showed her the baby picture.

Frazier and Rayer (1982) argued that people sometimes interpret speech by looking for the easy way out. The sentence processor constructs a simple analysis of a sentence and attempt to interpret it as soon as possible. This is called *the garden path theory* where the comprehender takes a simplistic quick understanding of the message until he takes a closer look. For example an ambiguous sentence like, “He greeted the boy in the car”, will confuse a comprehender who is being led down a garden path because preference for certain structural relations plays an important role in sentence comprehension. The prepositional phrase “in the car” can modify the noun ‘boy’ or the verb ‘greet’. Disambiguation will only occur when the comprehender places the sentence in its proper context.

Ambiguity has been noticed to be an important source of misinterpretation for many listeners who would not look carefully at the syntactic properties of the sentence. A

sentence like “Visiting relatives could be boring” should be appreciated as being capable of double interpretations. Is the speaker complaining about relatives who bore him when they visit? Or does his going to visit relatives constitute boredom? Likewise when someone says “We are not teaching machines” Does he mean we are not giving instruction to machines because we teach human beings or we are not electronic gadgets that teach? Speech comprehension would be effective when the listener takes a cue from the subtext underlying the preceding utterances.

Self-assessment Exercise 2

.1. Examine the interface between sentence meaning and comprehension.

2. Give 2 sentences to explain the garden path theory

1.4 Semantic Mapping in Speech Comprehension

When two similar expressions are produced, it is only at the intuitive level that one can understand them. Sentences like ‘put soup inside water’ and ‘put the water inside the soup’ may be misunderstood if the child lacks perception. This is because language is a particular way of expressing thought and understanding. It is a generative procedure that assigns to any possible expression a representation of its form and its meaning. There was need to appreciate that the meaning of an expression is a function of the meaning of its parts and how they are syntactically coded.

Wolf (2007) asserts that when people are familiar with something, it is easier to build a semantic representation of the discourse. The more they know about a topic, the easier it will be to make the bridging inferences they need to integrate each sentence into a global representation. This is why advanced courses are often easier than introductory ones. You will see here that all the topics you are learning in this programme are anchored on what you already know at your lower levels. Your residual knowledge has assisted you in the comprehension of such basic discussion about syntactic order of the English sentence, phonology and semantics. On the other hand,

students at the introductory level have nothing to fall back on as they encounter novel terminologies. They are likely to know very little about the topic and they do not have a knowledge base to help them integrate the type of discourse you are already familiar with in your academic context, seminars, conference, readings and lectures. You will notice that reading the same book or listening to similar lectures at different times of your life leads to different insight. In the case of written language, speech comprehension has a different angle to it because according to Treiman et al (2013) it carries some information that is not available in the auditory signal. For example, word boundaries are explicitly indicated in many languages, and readers seldom have to suffer the kinds of degradation in signal quality that are commonly experienced by listeners in noisy environments. However, writing lacks the full range of grammatically-relevant prosodic information that is available in speech.

1.5 Developmental Milestones in Infants' Speech Comprehension

According to Lust (2006) the following phases could be classified as developmental milestones in infants' speech comprehension:

Year 1

0–2 months. Child distinguishes maternal voice, speech and non-speech.
Perceives wide set of sound distinctions corresponding to possible phonetic contrasts along many major dimensions of phonetic variation

4 months. Prefers to listen to words over other sounds. "Duplex Perception" is evident.

5 months: Capable of linking auditory and articulatory information

6–7 months: Pair of syllables recognized as unit when "supported by rhythmic familiarity" regardless of syllable ordering. When acquiring English, distinguishes English words compared to other languages. Infant appears to know some aspects of possible patterns of words in specific language. First evidence that early perception of sound distinctions is being narrowed to more closely reflect the Specific Language Grammar being acquired; certain distinctions weaken or disappear when not in the specific language being acquired. Word segmentation skills apparent: infant understands words in sentences which were heard in isolation (monosyllabic words

like “dog” or bi-syllabic words like “doctor”) and recognizes words in isolation which were heard in sentences.

8 – 9 months: Recognizes words from stories read two weeks earlier

Distinguishes passages with pauses between words from those with pauses within words. Integrates multiple sources of information to locate word boundaries in fluent speech,

10–11 months: Uses context-sensitive allophones in segmenting words

Loses response to distinctions of some allophonic sound variations

12 months Retains discrimination of phonetic contrasts which are phonemic in the infant’s native Specific Language Grammar; but has ceased to demonstrate discriminations of many. Child experiences onset of first words production.

Self-assessment Exercise 3

1. Discuss the levels of meaning in comprehension.
2. Highlight the developmental milestones in infants’ speech comprehension.

1.6. Summary

In this Unit, we focused speech comprehension and what it entails. The Unit described the language creativity and imitation of the adult model in speech comprehension by children. It explains the role of reinforcement and frequency of exposure as important features of speech comprehension. The Unit mentioned that there is a sentence meaning interface in the way children correctly comprehend words. They also possess

an intuitive sense of interpreting speech due to the genitive procedure in language processing. A developmental milestone of how children comprehend speech from birth to toddler was also highlighted. We also explained that children's mental lexicon is a store house from where words are retrieved for a proper understanding of a concept in the word- world perspective of the acquirer. There is the need for the sense to balance with the reference for conversation to be meaningful.

1. 7 References/ Further Reading/Web Resources

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. Successful comprehension is a manifestation of shared knowledge and the ability to access the mental state of the listener. Arrangement of sentences plays a crucial role in the processing mechanism for comprehension to be realisable.
2. This explains that the imitation of the adult model is not wholesale. Children utterances are somewhat independent of the caregiver speech. Recursive mechanism prompts the child to be creative in their language behaviour.

Answers to SAEs 2

1. The attention system of the listener /hearer must be well engaged. The shared cultural experience of the speech community especially the bi-directional nature of language underscores comprehension.
2. (a) I went to the bank to see the dancing fishermen. (Bank is generally believed to be money bank).
(b) Please take a bow and salute the king. (Bow is used as a collocate of arrow)

Answers to SAEs 3

1. Comprehension adopts a generative procedure that assigns meaning to form. Intuition plays an important role whereby gaps are readily filled and inferences are bridged to integrate each sentence into a global representation that reinforces the principle of known to unknown.
2. The first year consists of sound distinctions. The linking of auditory and articulatory information. The child also integrates multiple sources of information and experiences consists of first words production.

UNIT 2: NEURAL PROCESSES IN SPEECH COMPREHENSION AND PRODUCTION

Contents

1.0. Introduction
2.0. Objectives
3.0. Main Content
3.1. Neural Processes in Speech Comprehension
3.2. Neural Processes in Speech Production
4.0. Conclusion
5.0. Summary
6.0. Tutor Marked Assignment
7.0. References/Further Reading

1. 0. Introduction

Do you still remember what speech comprehension and speech production entail? If you don't, it will be of benefit to briefly go back to the previous Units to refresh your memory in order to equip yourself with the necessary tool for this Unit. Here, we shall examine the neural activities that take place when we listen to people or speak to them, as well as the procedure for these activities. By neural activities, we mean brain-associated activities.

2. 0. Objectives

At the end of this Unit, you should be able to:

- identify parts of the brain that contribute to language comprehension;
- mention parts of the brain that are relevant to language production;

- describe the neural process in speech comprehension; and
- describe the neural procedure in speech production.

3. 0. Main Content

3. 1. The Neural Process in Speech Comprehension

Understanding natural speech is ordinarily so effortless that we often overlook the complex processes that are necessary to making sense of what someone is saying. We not only identify all the individual words, but also understand the meanings of the words and appropriately combine them to make sense of the whole sentence. We even understand long stretches of speech, like when we listen to the news, lectures, conversations, and so on. In the same vain, we read texts of various lengths and clearly get the ideas of the author.

Sometimes, we encounter challenges in our bid to decipher the message. For instance, it may be difficult to segment what the speaker has said, especially, if it is a fast-continuous speech. Other situations include where certain phonemes are omitted in conversational speech and change in pronunciations, depending on the surrounding sounds. Despite these potential problems, we usually seem to perceive speech automatically, with little effort. This can be attributed to certain neural and psychological mechanisms, which are beyond our physical environment.

Medical scholars at the University of Maryland conducted research in which they found that the brain quickly recognizes the phonetic sounds that make up syllables and transitions from processing merely acoustic to linguistic information in a highly specialized and automated way. Their study also showed how the brain has to keep up with people speaking at a rate of about three words a second. It achieves this, in part, by distinguishing speech from other kinds of sound in about a tenth of a second after the sound enters the ears.

The neural process for understanding language can be described as follows:

Acoustic stimuli are perceived by the auditory organ, which is the outer ear we see. By acoustic stimuli, we mean sounds, words, sentences, etc. The stimuli are converted to bioelectric signals on the organ of corti. The electric impulses are then transported through scarpa’s ganglion, also known as vestibulocochlear nerve, to the primary

auditory cortex, on both right and left hemispheres. Charlie (2013: 62) observes each hemisphere treats it differently. However, the left hemisphere recognises distinctive parts such as phonemes. The right hemisphere, on the other hand, takes over prosodic characteristics like rhythm, tone, and stress. The signal is then transported to Wernicke's area on the left hemisphere where the already noted analysis takes place. The information that was being processed on the right hemisphere is able to cross to the left hemisphere through inter-hemisphere axons.

During speech comprehension, activations are focused in and around the Wernicke's area. A large body of evidence supports a role for the posterior temporal gyrus in acoustic-phonetic aspects of speech processing, whereas more ventral sites such as the posterior middle temporal gyrus (pMTG) are thought to play a higher linguistic role linking the auditory word form to broadly distributed semantic knowledge. Also, the pMTG site shows significant activation during the semantic association interval of the verb generation and picture naming tasks, in contrast to the pSTG sites that remain at or below baseline levels during this interval. This is consistent with a greater lexical-semantic role for pMTG relative to a more acoustic-phonetic role for pSTG.

For semantic association, early auditory processing and word recognition takes place in inferior temporal areas ('what' pathway), where the signal arrives from the primary and secondary virtual cortices. The representation of the object in the 'what' pathway and nearly inferior temporal areas itself constitutes a major aspect of the conceptual – semantic representation. Additional semantic and syntactic associations are activated, and during this interval of highly variable duration (depending on the subject, the difficulty of the current object, etc.), the word to be spoken is selected. This involves some of the same sites – prefrontal cortex (PFC), supramarginal gyrus (SMG), and other association areas – involved in the semantic selection stage of verb generation.

Self-Assessment Exercise

Mention five areas of the brain that are involved in speech comprehension.

3. 2. The Neural Process in Speech Production

Just as in speech comprehension, verbal communication is not a simple process. It does not rely only on the simple articulation of sounds. It is rather a parallel and integrative production of linguistic and non-linguistic information. During speech production, the signal is taken from the Wernicke's area to the Broca's area through the arcuate fasciculus. The signal may be the sound, word or sentences we want to utter. Speech production activations actually begin prior to the verbal response in the peri-Rolandic cortices (pre- and postcentral gyri). The superior portion of the ventral premotor cortex also exhibit auditory responses preferential to speech stimuli and are part of the dorsal stream. Also, the motor cortex controls the movements of your mouth through the support of necessary muscles. Involvement of Wernicke's area in speech production has been suggested and recent studies document the participation of traditional Wernicke's area (mid-to posterior superior temporal gyrus) only in post-response auditory feedback, while demonstrating a clear pre-response activation from the nearly temporal-parietal junction (TPJ).

Charlie (2013) notes that the common route to speech production is through verbal and phonological working memory using the same dorsal stream areas (temporal-parietal junction, sPMV) implicated in speech perception and phonological working memory. The observed pre-response activations at these dorsal stream sites are suggested to subserve phonological encoding and its translation to the articulatory score for speech. However, post-response Wernicke's activations are involved strictly in auditory self-monitoring. Several authors support a model in which the route to speech production runs essentially in reverse of the speech perception, as in going from conceptual level to word form to phonological representation.

4.0. Conclusion

There is no gainsaying the fact that speech comprehension is a part of a complex network in the brain. Although our activities of listening and understanding are quite rapid, they contain inherent elaborateness. The same applies to speech formation, which requires many knotted activities, from putting thoughts into words, forming a

comprehensible sentence, and then actually making the mouth move to make the correct sounds – all of which happen in a split second.

5. 0. Summary

In this Unit, you have learnt that speech relies on the activation of multiple areas of the brain working together cooperatively. Broca's area and Wernicke's area are considered the major components of the brain involved in speech, both of which are located in the left hemisphere of the brain. Whereas the Broca's area is primarily responsible for speech production, the Wernicke's area basically takes care of language comprehension. However, other parts of the brain also play an important role. For instance, the motor cortex helps in coordinating the muscles of the mouth to create spoken words. Language-related brain activity happens on the left side of the brain, referred to as the left hemisphere. Damage or injury to parts of the left hemisphere can lead to speech problems such as aphasia or apraxia. The neural systems for speech comprehension and production develop from cortical activity in sensory and motor areas. The comprehension of auditory speech includes the acoustic analysis of the auditory input, the recognition of speech sounds, and access to the semantic system.

6. 0. Tutor Marked Assignment

1. Describe the process of speech comprehension
2. Considering their procedures, distinguish between speech comprehension and speech production.
3. Differentiate between speech perception and comprehension, giving details of what these differences entail

7. 0. References/Further Reading

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UNIT 3: Phenomenon of Speech Recognition

3.1 Introduction

3.2 Learning Outcomes

3.3 The Complex Nature of Speech Recognition

3.3.1 Perception of Speech

3.3.2 Structural Order of Speech Recognition

3.4 The Speech Recognition Process

3.5 Typology of Speech Recognition

3.6 Summary

3.7 References / Further Reading/ Web Resources

3.8 Possible Answers to Self-Assessment Exercise(s) within the Content

3.1 Introduction

Speech recognition in psycholinguistics describes an important stage in oral language development and proficiency. It is a receptive skill whereby a student's lexicon or store of known words can be measured in terms of its breadth and depth. IBM (2020) explains the breath of word knowledge as the number of different words known, whereas the depth includes semantic connection between words. Sometimes, many

people confuse Speech Recognition (S. R.) in natural language with Automatic Speech Recognition (A. S. R.) which deals with computational linguistics. It should be clear from the outset that the latter is an offshoot of the former. Automatic Speech Recognition is the translation of spoken words into text or speech to text (STT). Someone reads sections of a text into the speech recognition system which is analysed, fine-tuned, processed and interpreted to decode a message. Instances are seen in voice dialling and robotized communication system. However, speech recognition in natural language looks at a fundamental problem of how the continuously varying acoustic stimulus produced by a speaker is converted into a sequence of discrete linguistic units by the listener so that the intended message can be understood. This Unit will examine the features of speech recognition and explain the various theories and models. You will also learn that despite useful contributions of the various studies by specialists on the field, efforts are still on to actually produce an all-encompassing and empirically more acceptable model of Speech Recognition (S. R.)

3.2 Intended Learning Outcomes (ILO's)

1. Explain the phenomenon of speech recognition.
2. Distinguish between receptive skill and expressive skill.
3. Discuss the typology of speech recognition.
4. Describe the nature of speech recognition.
5. Distinguish between speech comprehension and speech recognition.

3.3 The Complex Nature of Speech Recognition

3.3.1 Perception of Speech

The phenomenon of speech recognition is more appreciated if we consider what Rastle (2016) refers to as the 'Architecture of Visual Word Recognition' The study confirmed that although the earliest theories of usual words recognition claimed that word were recognized as a whole on the basis of their shapes, there is a strong concession among psycholinguists that words are recognized in a hierarchical manner

on the basis of their constituents. The major theories on the phenomenon of speech recognition has argued that word recognition is only possible when a unique representation in the orthographic lexicon reaches a critical level of activation. The ease with which we perceive speech belies the complexity involved. There are cognitive and neural mechanisms at play which enable us to decode the linguistic signal of the speaker as well as information about their identity such as accent, age, gender and emotional state. In speech recognition, there is no one to one relationship between a speech segment and its acoustic qualities.

Speech recognition begins as a process of perceiving speech at the level of sound signal where the initial auditory signals are processed to extract cues and phonetic information up to word recognition. Bond (1999) asserts that listeners are faced with a phonetic stream termed the rumble of speech. Because of the continuous, rapid and successive pattern of words, there are assimilations and deletions in the speaker's utterance. Most of the time, the listener needs to untangle the rumble of speech and recover the speaker's intended message. They do this by applying strategies based on their extensive knowledge of the structure of their language. Both speaker and listener are sometimes engaged in other tasks while carrying out conversations. They are often distracted or occupied with their own ideas. Listeners also vary in the amount of attention they pay to speech. Such distractions have been noticed when we talk of 'slips of the ear'. A famous poem which contained lines such as:

'They hae slain the Earl of Murray

And laid him on the green'

had the second line wrongly perceived as "And Lady Mondegreen" (Bond 1999).

Self-assessment Exercises 1

1. How is Automatic speech comprehension different from natural speech recognition?
2. Describe the nature of speech recognition.

3.3.2 Structural Order of Speech Recognition

Pisoni and Renex (2005) proposed that infants come pre-wired with general auditory and processing skills that are then modified selectively by experience and activities in the language learning environment. Hocket (1958) corroborates that infants at one month are capable of making fine discriminations among a number of distinctive attributes of speech sounds but the course of development of phonetic competence is one characterized by a loss of abilities overtime if specific experience is not forthcoming. To any casual observer, the speech recognition process often appears to be carried out almost automatically with little conscious effort. However, a complex mechanism is involved. The speech signal is well structured and constrained that even large distortions can be tolerated without loss of intelligibility. You will see here that sometimes when you get incomplete information you can piece together the missing bit and still get the desired result. Many of us are now familiar with missing text on our mobile phone which often suffers from word loss. However, communication can still be carried out reasonably without much damage. Consider a situation where you receive a text message like this:

"Come … urgently, mama … hospital … money … treatment … bill"

It is evident here that you can easily decode the message because you are already familiar with the nuances and linguistic properties of the English language. The speech signal is not entirely new to you. As a speaker of natural language, the listener has available a good deal of knowledge about the structure of an utterance even before it is over produced (Pisoni, 1976). He identified two reasons why a listener can easily decode the import of an utterance. The first explanation is that the listener knows something about the context in which an utterance is produced. He is aware of the facts, events and all that is related to the world of discourse. All these will be used to generate hypothesis and draw inferences from the little bits of information the speaker gives. Secondly, the listener possesses the knowledge of the phonological, syntactic and semantic structures of the language, which provide the means for constructing an internal representation or recognition of the message.

3.4 The Speech Recognition Process

Language processing is a complex array of linguistic cues. During information processing, Dahan and Magnusson (2018) submit that we accommodate variability in talker characteristics, dialects, speaking rate and acoustic environment. All these come to play in the mapping between speech and linguistic categories. The nature of speech recognition becomes evident when language understanding is seen as a distinct sub-system providing the interface between low-level perception and cognitive process of retrieval, passing and interpretation. The process of word recognition is generally described as starting from a string of phonemes which are grouped together to form words and passing the word to the next level of processing. However studies in psycholinguistics have shown that there is increasing evidence that the construction of syntactic and semantic structures relies more than just a sequence of words. According to Hocket (1958), all morphemes have a complex internal structure, which consists of a sequence of phonemes arranged in a particular order. Differences between morphemes result in differences in meanings which are expressed by variations in the sequencing and arrangement of the constituent phonemes and their features. Consider the following: ‘tale’ could be re-ordered as ‘late’ and ‘life’ could be re-arranged and ‘file’. The sequence and arrangement in one order gives a particular meaning and once it is altered, it signals a change in meaning. When people are presented with speech signals, they respond to them as linguistic entitles rather than auditory events. Speech signals are categorized and labeled almost immediately with reference to the listener’s linguistic background. Masoro (1972) in Pisoni (1976) contends that syllables should be the basis of speech recognition. The claim is that phonemes are more abstract entities than syllables because some phonemes cannot exist independently as articulators and acoustic unity whereas syllables can. Phonemes cannot, therefore, be regarded as recognizable units.

Major findings in speech recognition assert that words presented in sentential contexts are more intelligible than the same words presented in isolation. More information than a phonetic sequence is necessary to establish the identity of a phoneme. This implies that there is need for the contribution of syntactic and semantic variables to the speech recognition process. For example, the sound of ‘ough’ exists in six different realizations in ‘cough’, ‘bough’, ‘through’, though’, ‘rough’ and ‘thought’. It will,

therefore, be misleading to use the phonemic segment alone for speech recognition. This corroborates Marslen-Wilson (1975) assertion that the listener analyses the incoming information at all levels of linguistic importance so that decisions at any level can affect processing at other levels. The recognition of connected speech does not rely exclusively on the analysis and recognition of segmental acoustic features. Fernandez and Cairns (2011) exemplifies that when information is given in abstract sense without contextual clues, it will make no meaning thereby making comprehension difficult. They go further to explain by talking of Bottom-up and Top-down information in speech recognition. The bottom-up information gives all the required representation and guides your processing but you still cannot achieve comprehension. For example, you hear your friend say 'baby toy' clearly and unambiguously. You can decode the message at the phonological level and even retrieve it from your lexicon. Yet, in the absence of any contextual clue, it is not meaningful. On the other hand, if you have a baby recently and you are going for shopping and your friend makes a long speech but you can only pick 'baby toy', you only need to add the missing link and still achieve comprehension. This is top-down information which is not part of the acoustic signal. When bottom-up information specifies a word or phrase inappropriately or inadequately, the listener is expected to use top-down information to select among a range of possibilities. However, if bottom-up information is adequate top-down information will not be necessary.

Self-assessment Exercises 2

1. Describe the sentential import of speech recognition
2. Explain the speech recognition process

3.5 Typology of Speech Recognition

Researchers often describe the phenomenon of speech recognition as an amazing phase in language acquisition. Fernandez and Cairns 2011) explain that the phonetic 'eggs' have been mangled and mixed together by articulator process and it

is therefore left for the hearer to identify them from the resulting mess what the speech signals and the original phonetic elements entail.

In an attempt to understand the listeners' attempt at speech recognition the following typology could be identified:

1. The Motor Theory: This states that speech can be recognized by processes that are also involved in its production. Liberman et al (1967) argued that since the listener is also a speaker, it is assumed that the speaker-hearer uses only one common process for language processing instead of two independent processes. This theory remains controversial because its evidence is based on logic and faith and not on any strong empirical foundation. Opponents of the model say that the problem of the motor theory rests on the failure to specify the level of analysis, where articulatory knowledge is employed in speech recognition.

2. Trace Theory: This was propounded by McClelland and Elman (1986). It is one of the earlier and popular versions based on the principles of interactive activation. The theory argued that all the components of speech recognition like features, phonemes and words have their own roles in creating intelligible speech and using TRACE to form them before achieving comprehension. This will enable the listener to complete a stream of speech instead of looking at speech as individual components. The listener uses the model as a framework in which the primary function is to take all the various sources of information found in speech and integrate them to identify single words. Wikiversity (2012) explains that the TRACE model is bi-directional in operation. It allows for either words or phonemes to be derived from a spoken message. By segmenting the individual sounds, phonemes can be determined from spoken words. By combining the phonemes, words can be perceived by the listener.

3. Cohort Theory: If you check your dictionary for the word 'cohort', it means group of related items, allies, or associates. Marslen–Wilson (1980) proposes the model as a representation for lexical retrieval. An individual's lexicon is his mental dictionary of all the words they are familiar with. In using the cohort model, a listener maps out auditory information onto words that already exist in their lexicon

to interpret new words. Each part of an utterance can be broken down into segments. The listener pays attention to the individual segments and maps these unto pre-existing words in the stock of vocabulary. As more and more segments are identified for recognition, the listener discards those that do not match or ally with the pattern in their mental lexicon. For example, when the listener encounters the word 'English', The listener first recognizes 'En' and begins thinking about words they have in their lexicon which begins with 'En' and all other words following this pattern are considered. These include: 'Engage', 'Engine', 'Engrave', 'Engraft', 'Engross', and 'Engulf'. The next level of processing when the sound 'l' is added leaves the listener with the word 'English', when he has run out of speech segments, which consist of discrete linguistic items that make sense of the representation in his memory. This principle has been adapted in the design of computer search engines like Google, Yahoo, My Web Search and Ask.com. When you decide to search for a word like 'language', the search machine keeps guessing the next segment after your entry of 'lan', it may even suggest other words in its memory like 'land'. When you add 'g' it keeps on accepting such entries in cohort until 'language' is suggested or accepted by either you or the machine. An attempt to input an entry in conflict with words stored in the memory will be met with "No items match your search". This implies that your word is not in the cohort. There are other emerging theories being identified to explain speech recognition but not a single one is self-contained. What is important is to consider the aspect of speech and the purpose for you to select a particular theory. There are limitations to each theory and there are no perfect one for speech recognition. Each theory functions in a unique manner and circumstances will determine which one should be adopted.

Self-assessment Exercise 3

1. Distinguish the Trace Theory from the Cohort theory.
2. Give two features of the Motor theory

3.6 Summary

This Unit explores the phenomenon of speech recognition. We appreciate that there is a complex interplay of understanding all the features of language strung together before the hearer could attach meaning to the message. The Unit explained that speech recognition involves the processes of hearing, interpreting and comprehending all the sounds produced by the speaker. It is the amalgam of these features into an order that resembles the speech of a given language that constitute speech recognition. You also learnt that speech recognition combines not only the phonetics and the phonology of the speaker's language but also its syntax and the semantics of the message. Some theories of speech recognition were discussed with a caveat that none could fully explain the mechanism of speech recognition.

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. The former deals with computational linguistics whereby a speech-to-text audio device processes one's speech. The latter is a receptive skill where the speaker's speech is processed by the listener to understand intended message.

2. Auditory signals are processed to extract cues and phonetic information for word recognition. Speakers and listeners apply strategies based on their extensive knowledge of the language to arrive at meaningful word recognition.

Answers to SAEs 2

1. Speech signals are well-structured and constrained without loss of intelligibility. Incomplete information can be pieced together and desired results achievable. Decoders are familiar with the nuances of the linguistic properties of the language.

2. Information processing involves taking into consideration the viability of the speaker's characteristics, dialects and acoustic environment. Construction of syntactic and semantic structure relies more than striging of words together.

Answers to SAEs 3

1. The trace theory holds that components of speech recognition have their own rules before intelligibility is achieved. Listeners complete a stream of speech which is not considered as individual components. It is bi-directional in operation whereas in the cohort's theory each part is broken down into segments which are mapped out into pre-existing words in their vocabulary stock.

2 The features include:

1. Speech recognition is processed by its production process.
2. It is based on logic and faith are it is not empirical

UNIT 4: Parsing

4.1 Introduction

4.2 Learning Outcomes

4.3. The Building Blocks of Sentences

4.3.1 Sentence and its Components

4.3.2 Structural Analysis

4.4 Characteristics of Parsing

4.5 The Procedure in Parsing

4.6 Summary

3.7 References / Further Reading/ Web Resources

4.8 Possible Answers to Self-Assessment Exercise(s) within the Content

4.1 Introduction

In this Unit, we shall look at the building blocks of speech comprehension. The essence is to show the importance of parsing as a grammatical exercise that involves breaking down a text into its component parts of speech so that the form, function and syntactic relationship of each part of the text can be understood. In other word, parsing will enable you to understand how to assign value to the parts of speech for comprehension to take place. Dowty (2005) explains that the term ‘ parsing’ was

derived from the Latin word ‘pars’ meaning ‘part’ which grammatical categories now describe as ‘parts of speech’ Linguists usually parse a sentence by breaking it down to its component parts so that the meaning of the sentence can be understood. Such a process involves the categorization of a sentence into nouns, verbs, pronouns, adjectives or prepositions with the objective of analysing the sentence for clarity and comprehension.

4.2 Intended Learning Outcomes (ILO’s)

At the end of this Unit, you should be able to:

1. Distinguish between ‘full parsing’ and ‘Skeleton parsing
2. State the procedure for parsing
3. Explain the principles of parsing
4. Describe the Tree Diagram with examples
5. Critically examine the role of parsing in sentence comprehension

4.3. The Building Blocks of Sentences

4.3.1 Sentence and its Components

You need to understand from the outset that parsing is a grammatical exercise. It involves the breaking down of a sentence into its component parts through syntactic analysis. According to Dowty (2005) it is necessary to draw a distinction between ‘full parsing and ‘skeleton parsing’. When a text is given a full analysis such as the detailed description of its elements, we can refer to such parsing as full’. One the other hand, a simpler form of analysis when you grasp a sentence’s basic meaning is described as ‘skeleton parsing’. The process of parsing entails breaking down a sentence into different parts of speech and putting the words into distinct grammatical categories. These categories and their relationships are then identified to place meanings in their proper perspectives thus ensuring comprehension. We can exemplify the parsing process by considering this sentence:

The boy kicked the ball

Let us classify the above according to its parts of speech

The – article

boy – Noun

kicked – Verb (kick) + Past (-ed)

the – article

ball – Noun

The ‘boy’ is the performer of kicking the back. He is therefore the subject. The action being performed is the verb (kick). The verb form expressing time is ‘kicked’ showing the action took place in the past. The object of the verb is ‘ball’ on which the action is performed. However, parsing goes beyond classification of words into categories. There is also the need to evaluate the meaning of a sentence and make necessary inference from each word in the sentence. Wikiversity (2012) explains that when a speech is being parsed, each word in a sentence is examined and processed to contribute to the overall meaning and understanding of the sentence as a whole.

The parser must realize that stringing of words together alone cannot give the desired result of a message. There are thematic categorical components when assigned to take on multiple categories that can alter the meaning of a sentence. All these make parsing so complex that we need more than basic grammatical understanding of a word or a sentence to be able to apply it correctly. Carroll (1999) says the parsing procedure is a form of problem solving and decision making about where to place words. In taking such a decision, the parser must bear two principles in mind.

1. Immediacy principle. This involves taking a decision immediately we encounter a word.
2. Wait and see principle. Here the parser waits for further information before deciding several possible interpretations of the sentence.

Self-assessment Exercise 1

1. Explain parsing and its role in sentence composition

2. What are the ‘immediate and wait and see principles’?

4.3.2Structural Analysis

Parsing a sentence involves the use of linguistic knowledge of a language to discover the way in which a sentence is structured. The following represents a fragment of the linguistic knowledge of context free formal grammar of the English language.

S NP +VP

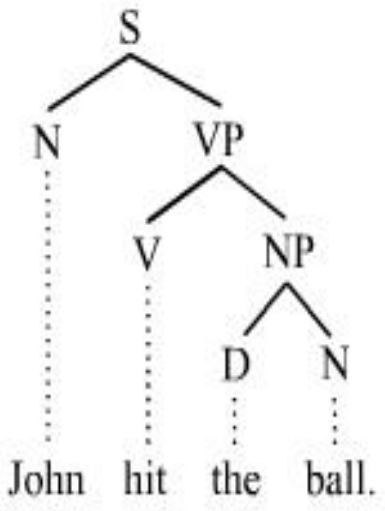
NP Det + N+ Prep

Noun = John, House, bag

Verb = Jump, talk, sleep

Determiner = the, an, a

Schmidt (2012) illustrates the decomposition of sentence into its components with the parse tree generally referred to as Tree Diagram in the following:



Constituency-based parse tree

The parse tree is the entire structure, starting from S and ending in each of the leaf nodes (*John*, *hit*, *the*, *ball*). The following abbreviations are used in the tree:

- S for Sentence the top-level structure in this example
- NP for Noun Phrase The first (leftmost) NP, a single noun "John", serves as the Subject of the sentence. The second one is the Object of the sentence.
- VP for verb phrase which serves as the predicate
- V for verb in this case, it's a transitive verb *hit*.
- D for determiner in this instance the definite article "the"
- N for noun.

Each node in the tree is either a *root* node, a *branch* node, or a *leaf* node. A root node is a node that doesn't have any branches on top of it. Within a sentence, there is only ever one root node. A branch node is a mother node that connects to two or more daughter nodes. A leaf node, however, is a terminal node that does not dominate other nodes in the tree. S is the root node, NP and VP are branch nodes, and *John* (N), *hit* (V), *the* (D), and *ball* (N) are all leaf nodes. The leaves are the lexical tokens of the sentence. A mother node is one that has at least one other node linked by a branch under it. In the example, S is a parent of both N and VP. A daughter node is one that has at least one node directly above it to which it is linked by a branch of a tree. From the example, *hit* is a daughter node of V. The terms *parent* and *child* are also sometimes used for this relationship. He further argues that intuition alone should not be used to parse a sentence because most of the time our intuition guides us to only one interpretation. A parsing process must consider many different possible interpretations. This is possible if the parser pursues all the possible hypotheses at once. This requires that we make reasonable deductions to enable speech comprehension to be more effective.

Carroll (1999) describes two strategies of parsing in the process of understanding speech. These are the Late Closure Strategy (LCS) and Minimal Attachment Strategy (MAS). In the former, the parser attaches new items to the current constituent because his eye fixations last longer on the latter part of the sentence. For example in “Amina

informed that Obi had bought the book yesterday": the adverb 'yesterday' may be attached to the main clause (Amina informed yesterday) or to the subordinate clause (that Obi had bought the book yesterday). Many parsers would prefer the second strategy because it closes up the sentence and their eyes riveted longer on that segment. In the minimal attachment strategy, the parser prefers attaching new items to the phrase marker. In a sentence fragment like, "Mary kissed Jane and her sister..." the parser jumps into a conclusion that both Jane and her sister received a kiss from Mary. No attempt will be made to think of a different way of completing the sentence such as "Mary kissed Jane and her sister became jealous." Parsers prefer the former interpretation because it is quickly decoded (albeit wrongly) and the second sentence requires a new constituent.

4.4 Characteristics of Parsing

Some factors need to be considered to determine the nature of parsing for us to achieve a better comprehension of the sentences to be parsed. These are the thematic and semantic factors. The former are the linguistic elements to be considered because they constitute the most basic understanding of a sentence. The parser needs an initial understanding before any further inferences could be made. When you make a sentence, roles are assigned to every unit in the sentence. These units consist of nouns, verbs adverb, adjectives and other lexico-semantic categories. The thematic features emphasize the lexical information and rely on semantic interpretation of the word in the sentence for parsing to be successful and make for speech comprehension. Christianson (2001) quoted in Wikiversity says the knowledge of these features allows the linkage and coordination of both the semantic and discourse information as well as lexical and syntactic information.

On the other hand we have the semantic factors. The examination of thematic roles may not be enough to parse a sentence because semantic features are affiliated with a particular idea. While the theme of a message is concerned with the general gist that gives a clue to the discourse level, it is not actually so with a semantic unit which gives a specific interpretation to the idea. For example, when we talk of fruit, a lot of ideas on different types come up in one mental lexicon until we specify whether it is orange,

mango or pawpaw. When we mention ‘bird’ in a discourse, we get different ideas like ‘flying’, ‘feather’, ‘hooting’ and ‘pecking’ because they are semantic features related to birds. During parsing, these semantic features are used to describe inferences about the meaning of a sentence. An idiom such as ‘pull someone’s leg’ means the parser knows it is semantically associated with teasing and that there is nothing like a leg being pulled. The reader or listener can only understand the sentence correctly when they are familiar with the idiom.

Sometimes, the semantic features may not be obvious but parsing relies on association with other words to get the correct meaning. When we see a newspaper headline like “Rivers leads Medal Table” as reported in a national daily, a parser will feel that the use of singular verb ‘leads’ is wrong because he assumes ‘Rivers’ is a plural noun. But when he reads further, it will be revealed to him that ‘Rivers’ refers to a state in Nigeria and it is a singular noun which must take a singular verb. The context was a national sports festival in which Rivers state comes first. When we know the overall meaning and association in a sentence, we understand the content better and faster and the time taken to parse decreases. However when we associate wrong inferences with some expressions the semantic import may be misleading. For example in a ‘spot the error’ exercise for my students, they cannot see that “He committed suicide twice before he died” is semantically faulty. Some rewrote the sentence as “He committed suicide twice before dying” and others say “He committed suicide twice before his death”. The focus of the exercise is to teach the parser that the victim cannot die twice and the word assigned should not be ‘committed’ but ‘attempted’. The sentence should be correctly parsed as, “He attempted suicide twice before he died”. Some theories have been used to explain why the parser sometimes fall victim of the problems encountered during parsing. One of them is the Garden Path Theory. The garden path theory is a metaphorical expression used to explain incorrect assumption that people make when they parse words together. During passing, the reader makes mistakes about the context of the noun phrase and is not aware they are being led down through the wrong path. A sentence which begins in one syntactic structure suddenly gets new information being added to it. The new information causes confusion and the reader enters the ‘rabbit hole’. For example in parsing a sentence like “Old men and women are invited to the party.” the parser decides that “Old men

and old women are invited" but a new information was added later to show that the women mentioned are not old because the adjective 'old' may qualify either 'men' or 'women'

Self-assessment Exercise 2

1. Draw a Tree diagram analysis of 'The Student won the prize'

2. Explain some features of parsing

4.5 The Procedure in Parsing

The parser has been described as a structural processor (Fernandez & Cairns 2011). They try to restructure the structure of a sentence to make speech comprehension very effective. The concern of the parser includes reviewing the basic operation of the syntax in three major ways:

1. By creating a basic structure
2. By combining simple units of the sentence with the complex ones
3. By moving elements within the sentence from one structural position to another.

Parsing involves the identification of the basic components of sentence like subject, predicate, preposition, clauses, phrases, etc. by dismantling and reordering them appropriately. The parser must detect the linguistic elements that are moved and link them up to any gap left behind in their original structural positions.

Miller and Selfridge's (1950) experiment shows that unstructured set of words were much harder to recall than structured ones. This shows that syntactic structure is psychologically real. In a sentence like: "*The old man who came here was very happy to see everybody",* we observed that recalling the string of words is easy because the words are related to each other syntactically. It is a different situation when we have another sentence like*:* "Time well see ball talk before jump food bread Lagos to great."* With the admixture of grammatical categories in wrong positions, recall is very difficult. We can conclude here that if you listen to the two sets of utterances comprising twelve

words each, it will be easier to recall Sentence I than to recall Sentence 2. This is because while Sentence 1 is syntactically well-formed, Sentence 2 is syntactically flawed.

A good example of the role of parsing in speech comprehension is Lewis Carroll's opening verse in the poem 'Jabberwocky':

T'wasBrilling and theslithytoves

Did gyre and gimble in the wabe

All mimsy were the borogoves

And the mome raths outgrabe.

We have no problem computing the syntactic relationship in the above poem even when the idea described makes no sense due to, the use of pseudo words. The first clause contains subject N.P 'toves' while 'gyre' and 'gimble' are realized as verbs. We can easily categorize'in the wabe' as a prepositional phrase giving the location of 'toves' as they 'gyred and gimbled' (possibly dancing and singing). In sentence parsing, a clause is an important segment which corresponds to manageable units for storage in working memory for cognitive processing. A clause consists of a verb and its noun element. A sentence can include an independent clause and one or more subordinate clauses. Each clause corresponds to an integrated representation of meaning and an integrated representation of structure. We can therefore regard clauses as reasonable elements in the parsing of sentences.

In a sentence like 'Ngozi knows the girls next door' the parser's job is simple because only one independent clause is present. However another sentence like "Ngozi knows the girls are naughty" presents a greater task for the parser. This is a complex sentence with an independent clause "Ngozi knows" (something) and a sentential complement "the girls are naughty." This creates difficulty for the parser because of the absence of clause boundary marker like 'that', 'who' as in "Ngozi knows that the girls are naughty". Sentence with marked closed boundaries incur less psychological processing than do sentences with unmarked closed boundaries (Fernandez& Cairns 2011).

Self-assessment Exercise 3

1. Distinguish between ‘full parsing’ and ‘skeleton parsing’
2. Discuss the ‘Garden Path Theory’.

4.6 Summary

In this Unit we explained that parsing involves the breaking down of a sentence into its component parts with the sole objective of achieving better comprehension We looked at the two principles to be borne in mind for parsing to be effective. These are ‘immediate principle’ and ‘wait and see’ principle. You were also informed about features of parsing whereby considerations should be given to thematic and semantic features to assist in the correct strategy of speech comprehension. The Unit also mentioned the procedure for parsing to give you an underpinning as to how to avoid falling into the rabbit hole.

4.7 References/Further Reading/Web Resources

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. Parsing enables us to understand the form, function and syntactic relationship of each part of the text and assigns value to the parts of speech

2. The former is instinctive and the parser jumps into conclusion while the latter wait for full information to make a decision for better interpretation.

Answers to SAEs 2

1. Please see example above in 4.3.2 and replicate

2. Consideration should be given to the thematic and semantic features such as nouns, verbs, adverbs, adjectives and lexico-semantic categories.

Answers to SAEs 3

1. In the former, the parser gives full analysis to a sentence by considering the distinct elements, but in the latter, only the basic forms which give meanings are analysed.

2. It is a parser's flaw in making wrong assumptions without considering full details of a sentence.

UNIT 5: THE CONCEPT OF INTERPRETATION

5.1 Introduction

5.2 Learning Outcomes

5.3 The Complex Nature of Meaning

5.3.1 The Meaning of Meaning

5.3.2 Elements of Speech Interpretation

5.4 Levels of Speech Interpretation

5.5 Models of Processing

5.6 Summary

5.7 References / Further Reading/ Web Resources

6.6 Possible Answers to Self-Assessment Exercise(s) within the Content

5.1 Introduction

This Unit will focus on the concept of interpretation of the speech comprehension segment. We shall explain that interpretation is not just the stringing of words together but imposing a unity of thought on the reasonableness or otherwise of the message. It is important to distinguish translation from interpretation. Translation is essentially a type of linguistic process based on principles of contrastive linguistics for two languages. As translation theory evolved, however, the consensus view expanded to include cultural, interpretive, interpersonal, cognitive, and even technical factors as

well. When a message is given the hearer needs to reconstruct the structural units that to convey the intended meaning and use their knowledge of the language to decode the correct interpretation. Where the hearer lacks the linguistic knowledge to interpret appropriately a given message, they would be unable to perceive anything other than a disjointed and indecipherable string of words. This Unit will further give us an insight into the age-old process of interpretation. Studies have shown that children's interpretation of sentence changes in later childhood. This presupposes that they would have acquired a more mature mental and linguistic cognitive process which will enhance their ability to reconstruct and recreate semantic relationships.

5.2 Intended Learning Outcomes (ILO's)

At the end of this Unit, you should be able to:

1. Distinguish between interpretation and translation
2. Describe decoding of an utterance
3. Discuss the elements of speech interpretation
4. Explain the levels of speech interpretation
5. Examine the place of ambiguity in semantic interpretation

5.3 The Complex Nature of Meaning

5.3.1 The Meaning of Meaning

Lorusso (2006) in a study at Bologna University, Italy reveals that the problem of interpretation has long been at the centre of numerous disciplines. Scholars through the ages in their various fields such as philosophy, hermeneutics (study of religious text), literary criticism and psycho-analysis have theorized about the actual nature of 'the truth'. Such a position places a big task on a psycholinguistic analysis "interpretation'. Suffice it to say that .in each of the identified context above, interpretation obviously assumes different meanings. It may mean to attribute sense to a text through a close reading (in a reader-oriented literary criticism, for example),

to bring about a fusion of horizons between the author and the reader of a text, through a philosophical pre-comprehension of the Sense (in a hermeneutical perspective), to reconstruct reasons and anticipations of neurotic symptoms (in psychoanalysis). It may therefore be an act of 'de-codification,' 'reconstruction,' 'verification,' or 'listening,' where the subject-object relationship assumes different forms of balance. However, it is necessary to explain that 'interpreting' is not just a decoding process from a straight–jacket perspective. It involves a dimension present at all levels of semiotic activity from the perceptive one to the cognitive level to enable us appreciate man as a rational being. It is therefore believed that 'interpretation is, in theory a never ending phenomenon whereby an interpretant may also become the object of a new sign, thus setting off an open chain of interpretation. This implies that the interpretation of experiences at the emotional, cultural and cognitive levels lies in the effects they produce just as the meanings it generates. Fernandez and Cairns (2011) exemplify with the role of pragmatics in interpretation. Pragmatic principles are different from those that contribute to grammatical competence. They are concerned with those principles of appropriate use of sentences in discourse. Pragmatic principles govern how people interpret language to convey more and often different information than that contained in the basic meaning of sentences.

I once witnessed an altercation between two young men and one of them out of anger said "Dayo, don't annoy me again, I'm from a far place". The hearer who correctly interpreted the import of such an utterance quickly apologized. The Yoruba know that to be from "a far place' is a 'cult location'. They also call it 'omo odo agba' (child of the elders). Dayo understood that an enemy reported to 'a far place' or to elders could be dealt with in a fetish way. A naive interpreter who thought 'a far place' means a distant location would have provoked the speaker more since he would not understand how 'a far place' should be part of discourse of dispute. Such linguistic nuances characterized speech processing and interpretation.

Idiomatic expressions like 'kick the bucket' 'pull someone's leg, 'cry wolf' are so opaque to interpret that the hearer must have a shared knowledge of the usage of the expressions before they could be correctly interpreted. Nigerians were amused during the second republic of Shagari regime when a governor embarrassed journalists that

asked him to confirm whether it is true that indigenes from his State would now be given bursary award. “Please sir, we want to hear from the horse’s mouth.” He retorted, “Who is a horse?” A politician in Ibadan was also asked why ‘students’ unrest’ was rampant in Nigeria. His reply was, “How can students rest? They read a lot and engage in all sorts of things.” The shortcoming of how the listener misinterprets the message by the speaker could be overcome if processing involves Grice (1975) Cooperative Principles. Grice asserts that conversations sometimes contain implicatures which both speaker and hearer must observe if they want to achieve the desired interpretation. May et al (2003) explains them as the four maxims of cooperative principles:

1. The maxim of quantity which states that you should make your contribution during speech to be as much as it is required.
2. The maxim of quality: This holds that you should not say what you believe to be false or talk about what you don’t have enough information.
3. Maxim of relation; you should make your contribution relevant so as not to mislead your hearer.
4. Maxim of manner: you must avoid obscurity or any ambiguity. Be brief and orderly.

Self-Assessment Exercise 1

1. Explain the complex nature of interpretation.
2. Examine the cooperative principles in the extrapolation of meaning

5.3.2 Elements of Speech Interpretation

Studies have shown that ‘interpretation’ is not just assigning meanings artificially to concepts being experienced at the surface level alone. It considers the different shades of meanings in specific contexts including non-verbal and iconic representations. Alebiosu (2018) reveals that a decoder from Yoruba background with only the linguistic knowledge may not actually be able to interpret correctly the utterance “Eja Mbakan?” literally “fish or crab? However the correct interpretation is

“good or bad” used to clarify situations describing a positive or a negative outcome of an adventure.

During interpretation, we need to bear in mind that the meaning of a sentence is a function of the words in the sentence and their structural organization. However, there should be a clear distinction between linguistic and psycholinguistic processes. When a sentence leaves us with no proper interpretation, we select a preferred one using extra linguistic yardsticks. This is because grammar is blind to plausibility considerations or facts about the real world. Syntactic structures merely create the representations. Psycholinguistic considerations will weigh all the possibilities and make a decision. For example when an interpreter meets an ambiguous sentence like:

“The man saw the boy with the binoculars”, they will be confused with the correct interpretation of the sentence. The sentence can be interpreted to mean that the man saw the boy who holds the binoculars or the man uses the binoculars to view a boy. A good interpreter who knows that binoculars aid vision is likely to arrive at the second interpretation which seems more plausible.

In the Nigerian environment, ability to give correct interpretation to a given speech remains an area that has generated much interest to scholars, educationists and the citizenry. When the late chief Obafemi Awolowo made a speech during the secession period of the defunct Biafran republic, it was given many interpretations. He said, “If by any act of omission or commission, the Eastern region secedes, the Western region will opt out of the federal republic of Nigeria.” Many people interpreted the statement to mean that Awolowo supported the secession. It took the late Bola Ige who moved the motion at the Western region house of assembly in April 1967 to clear the air as to the correct import of the message. This he explained as follows:

> *Only a daft person can read an invitation or encouragement to secede in that speech. Yoruba want to be part of Nigeria unless pushed out or not wanted.*

A good interpreter of any speech must be grounded in the total linguistic import of the message being relayed. When the reggae maestro, the late Bob Marley, released an album titled ‘No Woman No Cry’, male chauvinists interpreted it to be a good life must

be led without reliance on any woman because the presence of a woman carries with it a lot of distraction. However, it took Marley himself to give the proper interpretation saying he meant to console a woman in distress by admonishing her not to cry.

A curious dimension was added to the different shades of speech interpretation when one considers a case reported in Lagos State. An inscription warning people: “Don’t urinate here” went unheeded for a long time. Suddenly a replacement was done saying “Please we need urine here. Kindly donate” Promptly nobody passes urine in that spot again because the interpretation given to such an inscription is that ritualists want to use the urine. We can, therefore, deduce that interpretation deals with an integrative framework whereby the whole gamut of linguistic, social and psychological considerations must be brought to bear on the correct interpretation of any utterance or message.

Self-Assessment Exercises 2

1. Discuss the elements of speech interpretation.
2. Explain the place of irony in the decoding an utterance.

5.4 Levels of Speech Interpretation

Correct speech interpretation is concerned with the hearer’s appropriate understanding of a given message when properly decoded as expected by the speaker. The knowledge of the target language is important for a person to reconstruct and be able to give correct interpretation. Without linguistic knowledge, the person who wants to interpret would only look at the assembly of words as a jumble of disorganized sounds. Have you imagined how illiterate people look at written symbols and letters? Even a cheque, valued at one million naira, is of no use to someone who cannot interpret the message on it. An educationist once said that ‘to an unlettered person A is just three sticks!’

According Muller-Lyer (1889), our perception of linguistic representation is based on the stimulus of a speech signal which is species specific to humans. Some animals like dogs and chimpanzees have been trained to be good communicators but they

have no knowledge of language. They only respond to commands and signals associated with calling their names. In human beings, we go a step further because interpreting a sentence is varied and complex. Speech comprehension involves organizing the sounds, words and sentences in a structured pattern to make sense. When a collection of words is unstructured, no meaningful interpretation could be ascribed to the message intended. When an encoder just strings words together without a principled system to combine them into sentences and get the idea across, the decoder may not be able to give any useful interpretation of the message. Carroll (1999) identifies Top-Down and Bottom-up processing of interpretation whereby a listener tries to comprehend what the speaker is trying to say. He categorises such processing into four levels. These are:

1. Phonological
2. Lexical
3. Syntactic
4. Discourse

At the phonological level the interpreter identifies the phonemes and syllables contained in the speech while the lexical level is used to retrieve words from the semantic memory. The syntactic level is concerned with the organisation of the word into constituents as the interpreter forms a phrase structure for each incoming sentence. The last level is the discourse interpretation stage where the hearer links the meaning of a given sentence with preceding ones. Sentences at this level are organized into higher order units taking into consideration many factors that will facilitate correct inferences of a given speech.

5.5 Models of Processing

There are two types of processing in the concept of interpretation. These are Bottom –up and Top-down processing. Bottom-up processing occurs at the lower level to the higher one whereby all of the lower levels of processing operate without influence from the higher one. When the hearer identifies phonemes, it is not affected by the lexical, syntactic and the discourse levels. This processing model has been criticized as

inadequate in providing a fully comprehensive account of how we understand language.

The second model termed Top-down processing states that some information at the disposal of the hearer will have influence on how they will process language at the lower levels. For example, when the hearer interprets a sentence, the context may influence the identification of words within that sentence. Speaking more intuitively, a top-down model of processing is one in which the hearer's expectation plays a significant role (Carroll, 1999).

In speech interpretation, the Garden Path strategy also comes into play just like we mentioned in our discussion of parsing. The hearer jumps into wrong perception and comprehension of the message until he gets new information which renders the earlier one misleading and unacceptable. When they get the correct perception of what the intended message conveys, they abandon the former interpretation.

Fernandez and Cairns (2011) illustrate that a sentence like:

> *The two masked men drew their gun and approached the bank but the boat was already moving down the river*

will lead the listener towards a wrong interpretation because 'masked men' 'gun' and 'bank' easily suggests a robbery scene in the mental lexicon of the hearer. The first reaction is to give an incorrect interpretation until the realization comes with the new information about 'boat' and 'river'. The initial assessment of bank as financial institution will be abandoned once the hearer reanalyses the sentence on the basis of the clearer information. Also, when a listener meets with some ambiguous sentences funny interpretations may result. Let us examine the following sentences:

1. The injection may contain AIDS Virus.
2. If the baby will not take fresh milk, boil it.
3. Nigerian prostitutes appeal to President Jonathan.

It will require careful consideration for the hearer to give the correct interpretation. The first sentence may mean that we should avoid the injection because it is contaminated with AIDS virus. The second interpretation is to embrace the injection as it could

prevent AIDS. The second sentence could be taken to mean that the hearer should boil the milk to make the child accept it or they should boil the child! The last sentence gives a funny message that president Jonathan admires Nigerian prostitutes whereas the speaker is saying that the prostitutes are pleading with the presidents to allow their business to thrive. It is important for any speaker/reader who wishes to make their message to be correctly interpreted to avoid ambiguity and it is equally expected of the hearer/reader to discern the contextual import of the message to make appropriate inferences and deductions for the goal of communication to be achieved.

Self-Assessment Exercises 3

1. Discuss the categorisation in the processing of meaning.

2. Explain the models involved in the processing of meaning

5.6 Summary

The essence of communication is to get a message correctly decoded. In speech interpretation many factors are taken into consideration in decoding a message correctly. These involve all levels of semiotic activity from the perceptive to the cognitive. The linguistic representation based on a speech signal will require the hearer's linguistic competence which will be extended to syntactic and semantic analyses. When a message is given the correct interpretation the hearer has displayed linguistic knowledge which shows that they understand that language is not just a string of words. The hearer must possess linguistic and communicative competence to be able to give adequate interpretation of an utterance. It is, however, important to note that the cognitive processes involved in interpretation are varied and complex.

The hearer must be wary of the Garden Path strategy and discern ambiguities to avoid misinterpretation of a given message.

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. Interpretation involves imposing a unity of thought on the message. It is a multi-dimensional activity where the total linguistic and extra linguistic nuances are considered.

2. The principles are the maxim of quantity, quality, relation and manner which should be related to the discourse being examined.

Answers to SAEs 2

1. Speech interpretation operates in context with different shades of meaning playing important roles. These include metaphor, irony and ambiguity.

2. Irony is humour based on opposites, such as ‘the dull boy passed in flying colours’. A good interpreter knows better.

Answers to SAEs 3

1. Meaning processing is categorised into phonological, lexical, syntactic and discourse levels.

2. These are: 1 Bottom-up processing which involves picking up the bits of information and generalizing it. It lacks comprehensibility and could be misleading. 2.Top-bottom processing whereby the hearer uses contextual clues to process information and interpret more accurately.

Module 4: Speech Production

Unit 1: What does Speech Production Entail?

Unit 2: Lexical Selection and its Assemblage

Unit 3: The “Slip of Tongue” Phenomenon

UNIT 1: What does Speech Production Entail?

1.1 Introduction

1.2 Learning Outcomes

1.3 The Complex Nature of Speech Production

1.3.1 Elements of Speech Production

1.3.2 Processes of Speech Production

1.4 Speech Production Mechanism

1.5 The Stages of Speech Production

1.6 Summary

1.7 References / Further Reading/ Web Resources

1.8 Possible Answers to Self-Assessment Exercise(s) within the Content

1.1 Introduction

The previous Unit which discussed speech interpretation has given you an insight into meanings in context. This Unit will focus on what speech production entails to enable us appreciate the specie-specific trail in human language acquisition. Speech productions have revealed that it involves the coordination of numerous muscles and complex cognitive processes. In our consideration of what speech production entails we need to take into account other related fields of speech mechanism such as articulatory phonetics, acoustic phonetics and speech perception. Speech production also entails a series of distinct operations and representations at the lexical, syntactic, morphological and phonological level.

1.2 Intended Learning Outcomes (ILO's)

At the end of this Unit, you should be able to:

1. State clearly the complex nature of speech production
2. Describe the speech production mechanism
3. Explain the process of speech production
4. Discuss the stages of speech production.
5. Distinguish between speech comprehension and speech production

1.3 The Complex Nature of Speech Production

1.3.1 Elements of Speech Production

We shall begin a discussion of this unit by a critical look at the positions of some studies in psycholinguistic because it is very difficult to observe how any one actually plans and produces speech. Fodor (1975) once remarked that practically anything one can say about speech production should be considered speculative even by the standard current in psycholinguistics Harley (2014) echoed the same tune when be observed that there has been less research on language production than language comprehension because the investigation of production is perceived to be more difficult than that of comprehension. The above situation underscores the complex nature of the issues involved in speech production. Many of us will agree that we are not aware of what goes on in the mind of anyone trying to speak. The only time we can think of one is when somebody is mentally preparing to remember a forgotten name. During speech production, thoughts are translated into speech. This process includes the selection of words and the organisation of relevant grammatical forms which is followed by the articulation of the resulting sounds by the motor system using the vocal apparatus.

Levelt (1999) reveals that we produce two to three words per second in normal fluent conversation. These words come from a huge repository known as the mental lexicon which contains 50 to 100 thousand words in a normal literate adult. It is remarkable, however, that the biological basis for language production makes words processing inexhaustible through what is psycholinguistically termed recursive mechanism. The

expression “The man is good” can be reproduced endlessly through human capacity for creativity in speech production. We can have “We all agree that the man is good.” It is also possible to say “My teacher informed us during our lecture that the man is good.” Such an endless way of novel utterances being generated and added to the trigger sentence is a species-specific trait of human speech production. The high speed and complexity in word production does not make it error free. Researches have shown that we err once or twice in 1000 words. In an average of 40 minutes of talking per day, we will have produced some 50-million-word tokens by the time we reach adulthood (Levelt 1999).

Study on speech production has its basis in psycholinguistic attempt to know the pattern of errors during utterances. When we speak, our intention is to convey a message. The message to be relayed has varied concepts and the mental lexicon is a reservoir of word from which only those needed for the intended message need to be retrieved. These words have syntactic properties which contain morphological and phonological segments. All the distinct linguistic properties will be energized into the articulatory processes for each of the syllables, words, phrases and sentences contained in the utterance.

Self-Assessment Exercise 1

1. Describe linguistic representation in speech production.
2. Discuss the role of the articulatory system in speech production.

1.3.2 Processes of Speech Production

According to Levelt (1999) the following are the underlying processes of speech production:

1. The speaker selects a word that is semantically and syntactically appropriate.
2. Retrieval of the word phonological properties
3. Rapid syllabification of the words in context
4. Preparation of the corresponding articulatory gestures.

From the foregoing you have now realized that speech production entails a complex but highly organized and systematized operation. It involves the speaker encoding an idea into an utterance. This utterance will carry the information the hearer will use to decode the speech signals by building the linguistic representations that will lead to the recovery of the intended message. The speaker formulates the message into a set of words well-organized to convey meaning which is transformed into intelligible speech using articulatory mechanism. The hearer must reconstruct the intended meaning from the speech produced by the speaker because encoding and decoding are essential mirror images of one another (Fernandez& Cairns 2011).

1.4 Speech Production Mechanism

Before we explain the mechanism involved in speech production, we need to clarify that speech production should not be confused with language production. While the former is concerned with the articulation of language in its physical form, the latter refers to both speaking and writing forms. The physical realization of language in speech form therefore operates as a mechanism which could be explained in a systematic order. According to educheer.com (2021), there are two forms of speech production mechanisms. These are the air stream mechanism and the organs of speech mechanism. An airstream is the basis of speech sounds because we need it for the production of speech. The air stream is activated by some mechanisms categorized as follows:

1. Pulmonic

The pulmonic air-stream mechanism consists of the lung and respiratory muscles. The walls of lungs act as initiator. They are moved so the air is drawn into and pushed out. When this system pushes air out, it is known as ‘egressive’. When this system is used to draw air in, it is ‘ingressive’. Most of the languages use a pulmonic egressive air stream mechanism. A pulmonic ingressive air stream is used but no language sounds are produced. We use this air stream mechanism for yawning and snoring.

2. Glottalic

The closed glottis acts as the initiator for this and the air in the pharynx is used. For this reason, some linguists refer to this air-stream mechanism as pharyngeal. Both egressive and ingressive Glottalic air-stream mechanisms are used by some language

of the world for the articulation of speech sounds. Among Indian languages, Sindhi has sounds articulated with a glottalic ingressive air-stream mechanism.

3. Velaric

The back of tongue is the initiator. Air in the mouth is yet in the motion during this air-stream mechanism. So, it is also known as ‘oral’ air-stream mechanism. Sounds produced with a Velaric ingressive mechanism exist in several African language; sounds produced with a Velaric egressive air-stream mechanism do not seem to exist in any language. The sound produced through the air stream will be realized in its physical form by the organs of speech mechanism. According to educheer.com (2021), these could be divided into three namely:

1. The Respiratory System.

The respiratory system consists of the lungs, the muscles of the chest and the windpipe (trachea). The lungs are spongy bodies. They are made up of small sacs called alveoli. Air is supplied to the alveoli by small tubes called the bronchioles. It is through the trachea or windpipe that the air we breathe in passes through the throat into the lungs. This act, known as respiration involves two processes. These are: ‘inspiration’-(taking outer air into lungs) and ‘expiration’ (throwing out air from the lungs into the outer atmosphere). The lungs serve as a source of air and the source of energy for production of speech is generally the air stream coming out of the lungs.

2. The Phonetary system.

The Phonetary system consists of larynx. The larynx is the little box that is called the ‘Adam’s apple’, situated at the top of the windpipe. The air from the lungs comes out through the windpipe and the larynx. In the larynx, we have a pair of similar structures called vocal cords and these are placed horizontally from front to back. They are attached in front and can be separated to the back. The opening between the cords is called the glottis. The vocal cards can be opened and closed. The vibration of vocal cords is very significant in speech. When they are kept loosely together, they vibrate the vibration produces a musical note called voice. The rate of vibration is called frequency of vibration. This decides the pitch of the voice which helps to create the intonation of a language.

3. The Articulatory System

The articulatory system consists of the roof the mouth, the tongue, the teeth, the lips. The roof of the mouth comprises the teeth-ride, the hard palate, the soft palate, and the uvula. The convex bony part of the roof of the mouth which lies immediately behind the upper front teeth is called teeth-ridge. Immediately after the teeth-ridge the roof of the mouth become concave and it is hard and called hard palate. Immediately after the hard palate the roof of the mouth become soft and it called soft palate. The fleshy structure hanging loose at the extreme end of the roof of the mouth is called uvula. The tongue is most fleecy and is capable of amusing a great variety of position during the articulations of the vowels and consonants. For convenience of description, we divide tongue into four parts: the tip of tongue, the blade of the tongue, the front of the tongue, the back of the tongue. The extreme edge of the tongue is called the tip of tongue. Immediately after the tip is the blade of the tongue. Beyond the blade is called the front of the tongue. Beyond the front is the back of the tongue. The teeth acts as passive articulation for producing speech sound. The Lips play their part in the articulation of certain consonant. e.g. /p/, /b/, /m/ are produced with the lips tightly shut. Also the lips play an important part during the articulation of vowel sounds. The lower lip acts as an active articulator while the upper lip is passive.

Self-Assessment Exercise 2

1. Distinguish between the air stream mechanism and speech organ mechanism.
2. Explain the speech production process.

1.5 The Stages of Speech Production

It is important to stress that speech production is essentially a mental operation which is followed systematically by turning an idea into a linguistic representation. At the cognitive level, the mental representation is transformed into a speech signal which

will be produced fluently at an appropriate rate with the correct intonation. Scovel (1998) identified the following stages when such a transformation is manifested:

1. Conceptualization

The first one is called the Conceptualization Stage. It is the very beginning of spoken utterance where there are two concurrent and parallel modes of thought, which are; syntactic thinking and imagistic thinking. This is when a speaker spontaneously thinks of what he or she is going to say. It is an immediate reaction to external stimuli and is often based on prior knowledge of the particular subject. No premeditation goes into these words and they are all formulated based upon the speaker's knowledge and experience at hand. It is spontaneous speech. Examples of this can range from answering questions to the immediate verbiage produced as a result of stubbing your toe.

2. Formulation

This is when the speaker thinks of the particular words that are going to express their thoughts. It occurs almost simultaneously with the conceptualization stage. At this level the messages are framed into words, phrases, and clauses by the speaker. Essentially, this process involves translating the conceptual representation into a linguistic form. Speech production here also includes the process of lexicalization; where the words that the speaker intends to say are selected. We also have syntax planning; where words are combined to make a sentence which involves detailed phonetic and articulatory planning, and includes the process of phonological encoding where words are turned into sounds. In short, this process involves; grammatical encoding, morphological encoding, and phonetic encoding. However, this time the speaker thinks about the response before responding. The speaker will formulate his or her words and decide how best to reply to the external stimuli. Where conceptualization is more of an instant and immediate response, formulation is a little delayed.

3. Articulation

The third stage is the Articulation Stage. This is when the speaker physically says what he or she has thought of saying. This is a prepared speech or planned wordage. In addition, the words may have been rehearsed such as when someone practices a presentation or rehearses a lie. It involves the training of physical actions of several motor speech organs such as the lungs, larynx, tongue, lips, and other vocal apparatuses. Of course, the first two stages also involve these organs; however, the articulation stage uses these organs multiple times for the same word patterns.

4 .Self-Monitoring

The fourth stage is called the Self-Monitoring Stage. This is when the speaker reflects on what he or she has said and makes an effort to correct any errors in his or her speech. Often times this is done in a rebuttal or last words argument. In addition, it could also be done during a conversation when the speaker realizes that he or she slipped up. This is the action of reflecting on what you said and making sure that what you said is what you meant.

Self-Assessment 3

1 Describe the stages of speech production?

2. Explain the features of speech formulation.

1.6 Summary

The Unit was able to explain the complex nature of speech production. When a speaker attempts to communicate an idea, it is pictured in his mind and he selects the words from his mental lexicon. He then arranges these words to convey a meaningful sentence in an acceptable syntactic pattern. Through the phonetic representation, the speaker transfers the message to his vocal apparatus through which the actual utterance is produced. The Unit highlighted the complexities involved in the speech production process and identified the related fields of speech production mechanism. During the speech production process, the selection of words and the organization of grammatical forms will trigger the articulation of the resulting sounds through the vocal

apparatus. The Unit explained the important roles of the air stream and speech organs mechanisms to acquaint us with the stages of speech production.

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. Thoughts are translated into speech by selection of and organisation of relevant grammatical forms followed by articulation.

2. Words are retrieved from the mental lexicon and the distinct linguistic properties will be energized into articulatory processing beginning from syllables to sentence formation.

Answers to SAEs 2

1. The former operates through the activation of the pulmonic, glottalic and velaric mechanism while the latter uses the respiratory, phonetary and the articulatory system.

2. Speaker's selection of a word process

Retrieval of the phonological properties

Syllabifies the word

Prepares corresponding articulating gestures

Answers to SAEs 3

1. The stages are:

1. Conceptualization 2. Formulation 3 Articulation 4. Self-monitoring.

(These should be described by the students)

2. Speech formulation involves a spontaneous production of words based on immediate reaction to the external stimuli. The speaker indulgences in syntax planning and phonological encoding by turning words into sounds.

UNIT 2: LEXICAL SELECTION AND ITS ASSEMBLAGE

2.1 Introduction

2.2 Learning Outcomes

2.3 Sentence Ordering

2.3.1 Assemblage of Words

2.3.2 Theories of Lexical Selection

2.4 The Process of Lexical Selection

2.5 Stages of Lexical Selection

2.6 Summary

2.7 References / Further Reading/ Web Resources

2.8 Possible Answers to Self-Assessment Exercise(s) within the Content

2.1Introduction

When you answer the question ‘what is a sentence?’ what comes to your mind is to think of an utterance that conveys a complete element of thought. This unit will explain how lexical selection is arranged to make a meaningful component. Producing a word to express meaning requires the selection of appropriate lexical concepts and the assembly of syntactic framework relevant to the discussion. Though research still continues to determine all that is involved in lexical selection in producing speech, two prominent theories have tried to examine the phenomenon. These are: *cascade selection theory and discrete selection theory.* We will discover the frequency rate of some words and the motivations behind them.

2.2 Intended Learning Outcomes (ILO’s)

At the end of the Unit, you should be able to:

1, Describe the process of lexical selection

2. Discuss the order of assemblage of words
3. Explain the sense in sentences formation
4. Identify the theories of lexical selection
5. Determine what is word frequency?

2.3 Sentence Ordering

2.3.1 Assemblage of Words

Caramazza (1997) posits that lexical selection refers to the mechanism by which a lexical item is chosen during speech production or recognition for further processing. It is still debatable to determine the nature of this selection and the level at which selection is made considering all the factors responsible for lexical selection and its assemblage. This is especially so when we recognize that lexical selection is sensitive to the activation level of the lexical representation. Prish (2021) avers that a sentence is an assemblage of words so arranged as to convey a determinate sense or meaning, in other words, to express a complete thought or idea. No matter how short, it must contain one finite verb and a subject or agent to direct the action of the verb. “Birds fly;” “Fish swim;” “Men walk;’’ are sentences. A sentence always contains two parts, something spoken about and something said about it. The word or words indicating what is spoken about is called the *subject* and the word or words indicating what is said about it; is called the *predicate*. In the sentences given, *birds*, *fish* and *men* are the subjects, while *fly*, *swim* and *walk* are the predicates. You will realize that sentences classified by structure are generally identified as simple, complex, and compound. The *simple sentence* expresses a single thought and consists of one subject and one predicate, as:

A ‘Life is short’
B. God is able
C. Mother is gold

A *compound sentence* consists of two or more simple sentences of equal importance such as:

A. *Our progress is slow but steady*
B. *Work and pray*

C. I came in and shut the door.

A *complex sentence* consists of two or more simple sentences so combined that one depends on the other to complete its meaning; as; “When he returns, I shall go on my vacation.” Here the words, “when he returns” are dependent on the rest of the sentence for their meaning. A *clause* is a separate part of a complex sentence, as “when he returns” in the last example. A *phrase* consists of two or more words without a finite verb. Without a finite verb we cannot affirm anything or convey an idea, therefore we can have no sentence. Infinitives and participles which are the infinite parts of the verb cannot be predicates. “I looking up the street” is not a sentence, for it is not a complete action expressed. When we hear such an expression as “A dog running along the street,” we wait for something more to be added, something more affirmed about the dog, whether he bit or barked or fell dead or was run over. Thus in every sentence there must be a finite verb to limit the subject. When the verb is transitive, that is, when the action cannot happen without affecting something, the thing affected is called the *object*. Thus in “Cain killed Abel” the action of the killing affected Abel. In “The cat has caught a mouse,” mouse is the object of the catching.

The above will show you that meaningfulness in the message being relayed is key to lexical selection and its assemblage. Prish (2021) exemplifies this with the following sentences which although are variations of the same message still obey the syntactic order of speech production.

1. The ploughman plods his weary way homeward.
2. Plods homeward the ploughman his weary way.
3. His weary way the ploughman homeward plods.
4. Homeward his weary way plods the ploughman.
5. Plods the ploughman his weary way homeward.
6. His weary way the ploughman plods homeward.
7. His weary way homeward the ploughman plods.

Lexical selection is determined to some extent by the activation level of the target node. This means the higher the activation of a target lexical node at the moment of selection, the easier the retrieval (Dell, 1990). Word frequency and context constraint

are quite important in lexical selection. Words that are high in frequency are processed with greater speed and accuracy than those of low frequency. This is because those words that are more predictable are identified more rapidly and successfully than less predictable words. A speaker's lexical selection is somehow driven by the thought to be conveyed than by the store of words in his lexicon. During word production, there is need for lexical selection and phonological encoding to express any meaning. Theories of word production examine the relationship between lexical frequency and word selection including assemblage of words. Retrieving a word during normal speech requires at least two lexically specific steps:

1. Lexical, semantic and syntactic information (meaning/word order)
2. Phonological information (sounds)

Dell et al (1997) corroborate that speech production involves a step in which lexical entries for words called lemmas are selected based on message specification and making grammatical information available. The second step is that in which phonological information is retrieved and assembled. However, the relationship between these two steps is controversial. One school argues that phonological encoding can begin before word selection is completed though the two stages are not mutually exclusive. This is termed the cascade theory (Dell et al, 1997). For example, upholstery can be called a 'couch' or a 'sofa'.

The second school posits that selection and phonological encoding takes place in discrete stages (Roelofs, 1992). Word selection precedes phonological encoding with selection completed before encoding begins. There is no influence from activity during lemma selection on phonological encoding. For example, in a picture naming experiment, the word 'sheep' was not interfered with even though a phonologically related word 'sheet' was presented to the subjects. At no point was there simultaneous sensitivity to both semantically and phonologically related distractors. This is consistent with the idea of independent processing stages. However, it is still debatable to determine the extent to which lexical selection is affected by word frequency in speech production (Ferreira & Griffin, 2003).

Self-Assessment Exercise 1

1. Explain the role of lexical selection in speech production.

2. Distinguish simple from complex sentence formation.

2.3.2Theories of Lexical Selection

Many studies on lexical selection and assemblage of words tend to agree on the existence of the two functional stages described above. However, there are divergent views on the relationship between them. Two prominent theories have emerged: the *cascade lexical selection model* and the *discrete lexical selection model.* These two models have some features that need to be considered.

The discrete model: - According to Dell (1997) the following features have been identified as typical of the discrete model of lexical selection:

1. Only one word is activated.
2. The grammatical features are selected prior to word form encoding.
3. Lemmas compete for selection because there are no links of the lexical entries.
4. Effects at different levels should not affect one another.

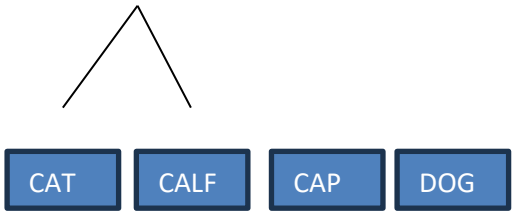
For example, in a picture naming experiment containing the labels:

The frequency rate of retrieving CAT to match the correct picture was high.

The Cascade Model:

1. All active lemmas spread activation to their respective word forms.
2. Word forms also compete for selection.
3. Semantic and phonological effects are predicted to interact.

In the experiment, the word frequency rate was slow because word forms compete for selection e.g.



You are expected to take note here that studies in the area of speech production are not exhaustive and that these models are not mutually exclusive. Mahon et al (2007) in their experiment report that frequency of words is determined according to their semantic familiarity or otherwise.

	Picture	Semantically Close	Semantically Far	Unrelated
1.	Bottle	Jar	Saucer	Corn
2.	Dress	Start	Glove	Fence
3.	Cow	Goat	Seal	Pearl
4.	Arrow	Spear	Grenade	Saucer
5.	Stool	Chair	Futon	Caption

2.4 The Process of Lexical Selection

During speech production the speaker goes through two processes. The first one is the stage whereby he creates the skeleton of the utterance to be spoken, while the second stage is where he puts flesh to the skeleton. The former is referred to as lexical selection entries in the speaker's vocabulary and assemblage of words while the latter is phonological encoding which is the assembly of sound forms and the generation of intonation (Bock & Levelt, 1994). A speaker who intends to say "meals on wheels" but says "wheels on meals" usually knows that the lexical selection and the way those words were assembled is faulty. It is, however, through the analysis of speech errors that appropriate lexical selection is determined because it is intended to account for

normal speech production model. For example, how do speakers choose the correct words corresponding to intended message? See figure below:

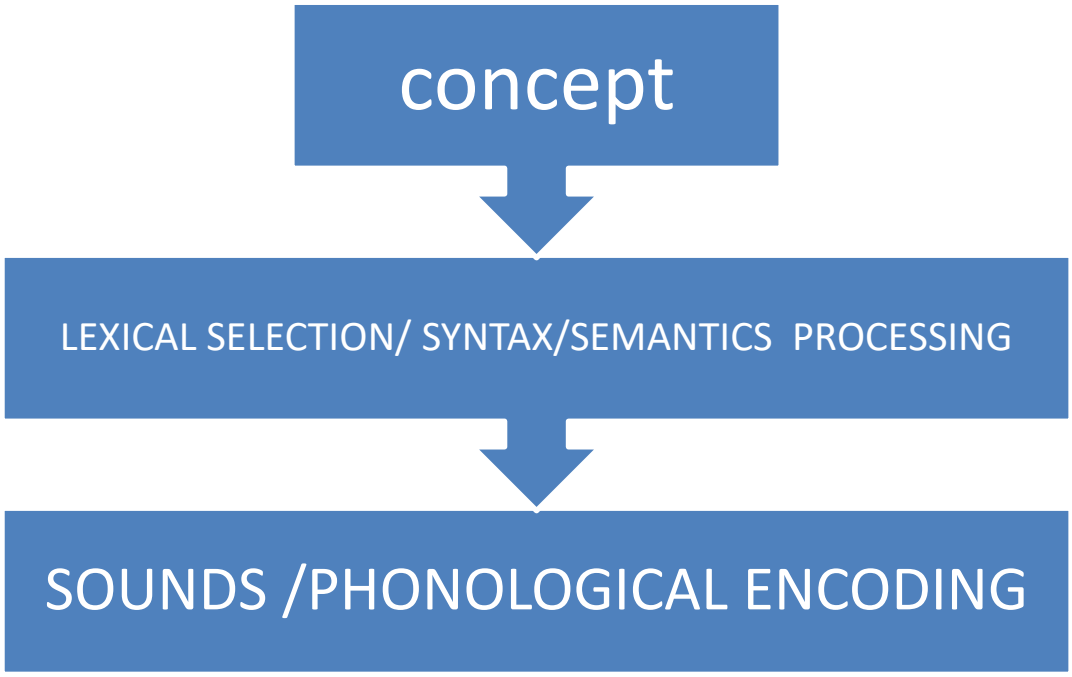


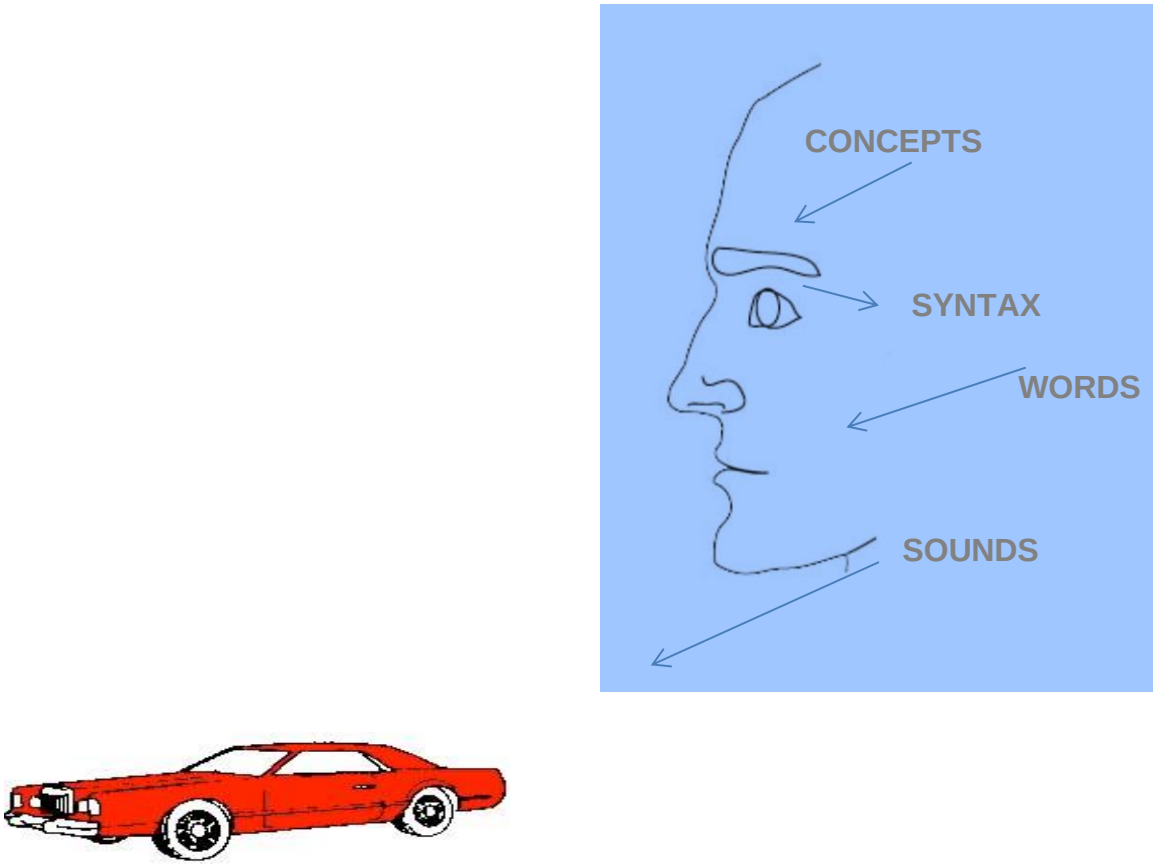
Figure 2: Schema showing the process of lexical selection

In the figure above, you can see the three levels of speech production being described. These are the message level, the processing level and the phonological level. The message captures the features from the speaker's intended meaning and provides the raw materials for the processing of lexical selection. The lexical selection level deals with the

Identification of lexical concepts that are suitable for conveying the speaker's meaning. Processing at this level involves the creation of a well-arranged set of word order items and assemblage of words. The third level is phonological encoding which spells out the phonological structure of the utterance and the prosody of the large units. For instance, when you say:

“Ojo will go to Yaba. He will also visit Ikeja.” The first step in lexical selection involves identifying the lexical concepts such as form class, nouns pronouns, verbs etc. since Ojo is male, any selection of ‘she’ for the second sentence will be wrong.

Melinger (2020) also explains that a speaker intending to say ‘A red car’ first conceives the idea in their mental lexicon which is then subjected to syntactic and semantic processing and later realised as sounds. (See figure 3).



A RED CAR

Fig 3: Showing the lexical formation matrix

Adapted from Melinger (2020)

Self-Assessment 2

1. Distinguish between the Cascade and Discrete models of speech production.

2. Explain the process of lexical selection.

2.5 Stages of Lexical Selection

Bock and Levelt (1994) also exemplify the stages of lexical selection in their explanation of a network model of lexical selection.

First stage: sheep (domestic animals, wool pelt, produce milk)

Second stage: sheep (syntactic properties noun)

Third stage: sheep = (Phonological encoding) /ʃi: p/

This description differs from semantic properties of ‘goat’ even though the two are animals. Related words that bear similar description may come to mind but there is a distinction between lemmas and lexemes. This could be likened to a situation when you try to remember the name of someone you met before. If wrong names are proposed you ignore them because they will not fit into the frame. As you try to recall someone named ‘Musa’ people might suggest ‘Moses’ but you will be able to discern that it does not fill the gap. This implies that appropriate lexical selection must fit the intended message.

Consider the following errors of lexical selection. Where the speakers became conscious of such errors, they attempt to correct them:

“Get out of the clark (car).”

“A branch fell on the tree (roof).”

“He’s a man to emanate (emulate).”

“Release the hostages unarmed (unharmed).”

Self-Assessment 3

1. Re-arrange in two varieties “The rich man spends his money wisely”.

2. Describe the stages of lexical selection.

2.6 Summary

This Unit discussed what is involved in lexical selection and its assemblage. The choice of a lexical item and how it is processed in the human mental lexicon is highlighted. We mentioned the role of frequency of words and the notable theories of lexical selection. The Unit described how lexical words are crucial to understand the meaning of a text so that when you leave out all other words but retain the lexical words, the meaning will be understandable. We also explained how linguistic units are assembled in a network model from concept level to syntax and phonetic coding and we highlighted that the study of speech production provides an insight into the process whereby the speaker selects words from their mental lexicon.

2.7 References/ Further Reading/Web Resources

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. A mechanism is activated whereby a lexical item is chosen during speech production for further processing. A complete sentence combines two segments of the subject and the predicate.

2. While a simple sentence expresses a single thought, a complex sentence is made up of two or more clauses arranged in such a way that one depends on the other.

Answers to SAEs 2

1. The discrete model activates one word and the grammatical features are selected before encoding while the cascade model involves the activation of lemmas to their respective word forms.

2. Two processes are involved:

1. The speaker creates a skeleton of the sentence skeleton of the utterance

2. The utterance is fully developed in this order: Concept → syntax → word → sounds.

Answers to SAEs 3

1. (a). The rich man wisely spends his money.

(b).The money is wisely spent by the rich man.

2. The Three stages could be described in a network fashion:

1. Idea of what to produce
2. Syntactic property
3. phonological encoding

UNIT 3: THE ‘SLIP OF TONGUE’ PHENOMENON

3.1 Introduction

3.2 Learning Outcomes

3.3 The Slips of the Tongue

3.3.1 Occurrence of Slips

3.3.2 Causes of Slips

3.4 Features of slips of the tongue:

3.5 Nature of the Slips of Tongue

3.6 Summary

3.7 References / Further Reading/ Web Resources

3.8 Possible Answers to Self-Assessment Exercise(s) within the Content

3.1Introduction

In Unit 2 above, you learnt about lexical selection and its assemblage where you were exposed to how speakers choose their words to correspond to the intended message. However, there are occasions when ‘slips’ occur. These include instances like: ** “the last I knowed about it” (to mean I know about it), **“He was too drank” (to mean he was too drunk). This Unit will focus on the slip of tongue phenomenon by examining why they occur, their nature and attempt by speaker to correct them. The Unit will enable you to appreciate the psycholinguistic implication of slips as they form an essential component in data collection in language study and development such as a how a speaker retrieves a sound several words away and accidentally activates it before it is needed.

3.2 Intended Learning Outcomes (ILO’s)

At the end of this Unit, you should be able to

1. Explain slips of the tongue
2. Identify the nature of the slips of the tongue
3. Describe how slips occur
4. Identify some slips of the tongue

3.3 The Slips of the Tongue

3.3.1 Occurrence of Slips

Research reveals that slips of the tongue occur when speakers make mistakes in their speech. Such slips have provided psycholinguistics with evidence regarding the way we store and retrieve lexical items and how we assemble speech. Yule (2010) explains that most everyday slips of the tongue are often simply the result of a sound being carried over from one word to the next, as in *black bloxes* (for 'black boxes'), or a sound used in one word in anticipation of its occurrence in the next word, as in *noman numeral* (for 'roman numeral'), or *a tup of tea* ('cup'), or *the most highly played player* ('paid'). The last example is close to the reversal type of slip, illustrated by *shu flots*, which may not make you *beel fetter* if you're suffering from a *stick neff*, and it's always better to *loop before you leak*. The last two examples involve the interchange of word-final sounds and are much less common than word-initial slips."

Slips have also been shown to explain our capacity for language productivity. Aitchinson (1992) reports that the term 'slips of the tongue' is derived from a Latin expression 'lapsus linguae'. They are described as conscious or unconscious deviations from the apparent intended form of an utterance which may be spontaneous or intentional as in puns or word plays. Speech errors are common among children who have not yet refined their speech. Sometimes, slips frequently continue into adulthood thus leading to embarrassment and often betray regional or ethnic origins. For example, in northern Nigeria, it is not uncommon to meet speakers who exchange /f/ for /p/ as in "can I use your fen?" (Pen). A typical Igbo speaker who met me when I was just settling down in my new residence at Ayobo-Ipaja, Lagos, talked patronizingly "Oga, come and buy lice" (rice). Likewise, you are likely aware of a popular Fuji musician in Yoruba who alluded to Ibadan people's speech errors like "kini so? (show), cikin (chicken), etc. Wang (2012) submits that slips of the tongue occur in the course of information processing in the brain and the production of the utterance. Slips may be conscious when the speaker enters conscious activities the moment the slips occur. The person will perceive it and sometimes makes attempt to correct them. Speakers who commit unconscious slips are not aware of such errors and often fail to do any correction. It is the conflict and confusion of concepts during the period of processing information which underlie speech errors. Carroll (1994) argued that slips are important source of data in psycholinguistic because they have implications for theories of speech production. It is possible to determine the error pattern which can be explained through cognitive and perceptual mechanism acting on linguistic knowledge. This implies that a current language experience may be a source of slip as well as language competence acquired in the past.

Self –Assessment Exercise 1

1. Examine the manifestation and forms of the Slips of the Tongue
2. 'No single factor can account for the occurrence of slips' Discuss

3.3.2 Causes of Slips

According to Aitchinson (2008) a normal person often utters 200 syllables per minute while at the same time they are expected to activate the phrase of two or three words in advance in their phonetic form. Slips are bond to occur given the volume of linguistic items being processed and within a short space of time. She quoted the complexity involved in speech production by referring to Lenneberg thus:

> The sequence of speech sounds that constitute a string of words is a sound pattern somewhat analogous to a mosaic; the latter is put together stone after stone, yet the picture as a whole must have come into being in the artist's mind before he began to lay down the pieces.

You can now appreciate that everybody's tongue slips now and again especially when you are tired, nervous or impatient of speech. Nordquist (2021) illustrates that a former British Prime Minister, Gordon Brown made a "slip of the tongue" when he said the world was in a depression, a Downing Street spokesman said today. . . . Brown has acknowledged that Britain is in a recession, a fact that became indisputable recently." (Andrew Sparrow, "Gordon Brown's Use of the Word 'Depression' was a Slip of the Tongue, Says No 10." *The Guardian*, Feb. 4, 2009). Traxler (2012) reports that one of the major causes of slips is the intricate nature of speech articulation which has been described as the most complex motor skills. Furthermore, language is a complex system and under a vocabulary of 40.000 or more, a speaker has to decide to choose normally three words per second, and under pressure. This will naturally set off multi-tasks that are normally underway in a speaker´s brain, like; word choice, sentences construction, and at the same time earlier parts of the same phrase are being uttered. Three different reasons are therefore proposed for the occurrence of slips of the tongue. These are:

1. Interference from intended elements of the utterance (Plan Internal Errors), as in the case of anticipation, perseveration or transposition of the elements.
2. Interference from an alternative formulation of the intended thought (Alternative Plan Errors), as in the case of blends.

3. Interference from an unintended thought (Competing Plan Errors)

Some studies also reveal that whenever a speaker feels some anxiety about possible lapse; he will be led to focus attention more than normally on what he just said and on what he is just about to say. Slips have been noticed due to cerebral dysfunction which may cause peculiar speech, as in the case of spoonerism.

Aitchinson (1992) explains that all speakers have a spell of speech errors occasionally. These occur when they are nervous, tired, anxious or intoxicated. During interview sessions, you will observe that even you may not be sure of some utterance which can make you commit slips. I was in a panel one day and one of the candidates gave a different name from the one stated in his curriculum vitae. When queried it was discovered to be his younger brother's name. Stress session can actually be a cause of slips. Fromkin (1973) posits that psycholinguistic studies have revealed that slips are non- random and predictable. Although it could not be determined when an error will occur or what the particular error will be, one can predict the kinds of error that will occur. Such predictions are based on our knowledge of the mental grammar utilized by speakers when they produce their utterance. For example, two segments may be transposed as in "Yew Nork" instead of "New York". In some instances, segmental errors can involve vowels as well as consonants e.g. "bud begs' in place of 'bedbugs' etc.

Speech production comes very rapidly and the mechanism involved is very complicated. Through speech errors we can get an insight into the nature of language processing and production. Slips of the tongue provide linguists with empirical evidence for linguistic theories and give opportunities to learn about language competence and performance models Studies on speech errors explain the sequential order of language production processes. We now have clues on how language interaction modules operate. During speech it is now evident that speakers typically plan their utterance ahead but slips come in between competence and performance which is significant psycholinguistically.

Self –Assessment Exercise 1

1. ‘Slips are non-random and predictable’. Discuss.
2. Explain how slips occur.

3.4 Features of slips of the tongue:

Carroll (1986) identifies four features of slips of the tongue:

1. Linguistics elements tend to come from a similar linguistic environment. This means that elements at the initial, middle and final segments interact with one another e.g. “Take my bike.” *(bake my bike).
2. Distinctive elements and discrete items which interact with one another tend to be phonetically or semantically similar to one another e.g. consonants exchange with consonants, vowels go with vowels e.g. *“You have hissed my mystery lecturers.” (You have missed my history lectures).
3. Slips are consistent with phonological rules of the language e.g. *“I didn’t explain clarefully enough.” (I didn’t explain carefully enough).
4. Stress patterns of slips are consistent. Segments that interact in the utterance received major and minor stress e.g. “burst of beaden’ when the target is ‘beast of burden’. These features underscore the fact that slips of the tongue are systematic because language production is systematic.

Fernandez and Cairns (2011) assert that words are often organized by their meanings during language processing so that close associates are stored near one another. Slips can give us clues into this meaning-based organisation. A word retrieval error somehow results in the selection of semantically and structurally similar word. Instead of “All I want is something for my elbows” you will get (“All I want is something for my shoulders”)

(2) “Put the oven on at a very low speed” when the speaker intends to say “put the oven on at a very low temperature.”

In each example the speaker has erroneously selected a word that is of the same grammatical class (nouns) and that shares many aspects of meaning with the intended word referred to as the Freudian slip.

3.5 Nature of the Slips of Tongue

You may have wondered when reading the last sentence in the segment above what is meant by the 'Freudian slip'. It refers to Sigmund Freud, the Austrian psychologist who postulated the theory of repressed memory. When a situation like this occurs, peoples' attitudes and behaviours may unconsciously be affected resulting into what is called the Freudian slip. With such a notion, studies in psycholinguistics have tried to explore the nature, form and characteristics of tongue slips especially when we now recognize that it falls under the purview of language production mechanism.

It will be simplistic to categorize the nature the slips of tongue in a one-way conception. Slips vary in their occurrence and the motivations that engender them are multifaceted. The two broad types identifiable are at the phonological and lexical levels. These are further sub-divided into smaller units. Phonological slips are noticed in the production of the sound segments such as phonetic features, phonemic units, consonant clusters, rhythms and tones. Lexical errors comprise morphemes, words and phrases. If the unit containing the error is the same as that of the target, then we talk of *substitution*. If there is an extra unit in the utterance, we call it *addition* while any omission in the intended utterance is *deletion.* Aitchinson (1992) reports that during tongue slips, speakers adhere to a set of linguistic rules in language production. Morphemes are systematically combined with other morphemes and given specific pronunciation. This order governs the occurrence of speech errors e.g. a speaker who tries to say:

(1) "He likes to have his team rested may say (He likes to have his rest teamed).Note that the positions of 'team' and 'rest' contrast with 'rested' and 'teamed'.

(2) Both Kids are sick (both sick are kids).

These rules which tell language users how to produce speech are likely responsible for a systematic pattern of the mental organisation of language. When a speaker engages in substitution, it is one segment substituted in the same category as nouns for nouns, adjectives for adjectives.

.The following typology of slips of the tongue has been identified:

	TYPE	DESCRIPTION	EXAMPLE
1.	Substitution	A unit of the sentence contains an intruder.	The queer old dean instead of (the dear old queen).
2.	Deletion	A unit is omitted in the utterance.	He wasn't there (He was there).
3.	Perseveration	An earlier segment reappears in a latter one.	Pulled a tantrum. (pulled a pantrum)
4.	Addition	A new unit is added	The optional number (the moptional number).
1.	Swapping	Two words are exchanged	To let the cat out of the bag (to let the house out of the cat)
2.	Shifting	A segment or unit is relocated somewhere else in the utterance.	She decides to hit it. (she decide to hits it).
3.	Anticipation	A later segment is used to replace an earlier one.	Reading list (leading list)
4.	Blending	Where more than one item is untended, two	Person/people (perple)

		items are fused together	
5.	Malapropism	Inappropriate word selection	The two cars collide. (collude)
6.	Spoonerism	Taken from the Rev. W. Spooner noted for puns and word plays	Drink is the curse of the working classes (work is the curse of drinking classes).

Now, you will realize that it is possible to detect some overlapping in the categorisation highlighted above. This is not unexpected as features in one segment have a way of being reflected in a similar segment.

Self –Assessment Exercise 3

1. Describe the nature of the slips of the tongue.
2. Provide two examples each for deletion, blending and substitution as features of Slips of the tongue.

3.6 Summary

This Unit based its discussion on the phenomenon of the slips of the tongue as a feature of the speech production mechanism. We explained that slips are not random because segments occurring initially in syllables seem to interfere with other syllable-initial segments which revealed that tongue slips are not due to errors of speech production but are as a result of incorrect neural programming due to psychological processes that underlie language processing. Much is now known about the cognitive procedures involved in metal processing of language. Through speech error, we can now assess better and distinguish between language competence and performance.

Such a study will contribute to the establishment of models of speech production. Attempt will also be made to effect corrections where necessary as some slips are made consciously. In this Unit we explained that normal speech contains a number of slips. Almost everybody commits slips of the tongue because it shows our capacity for language productivity. The Unit discussed the causes of slips which are attributable to the volume of linguistic items being processed within a short pace of time. The anxiety generated due to the pressure on the speaker may trigger errors in production. Such errors are realized as slips. However, studies reveal that slips are non-random and predictable because they are segment-related either at the initial, middle or at the end of an utterance. The Unit was concluded with the nature of tongue slips where you learnt that they can be categorized into different types with a measure of some overlapping. Your study of slips of the tongue is another way to broaden your knowledge in the exploration and perception of theories of language production.

7.0 References/ Further Reading/ Web Resources

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1.8 Possible Answers to SAEs

Answers to SAEs 1

1. Slips occur in the way we store and retrieve lexical items and assemble them. They occur as carryover sounds from one word to the next or interchange consciously or unconsciously.

2. Occurrence of Slips is due to several factors. These are linguistic, psycholinguistic or psychological.

Answers to SAEs 2

1. The sheer number of linguistic items in a short time accounts for the complex nature of the occurrence of slips.

2. Slips occur when speakers make mistakes in their speech and retrieve a sound several words away and accidentally activates it before it is needed. These are realised as follows:

1. Interference from intended elements of the utterance as in the case of anticipation, perseveration or transposition of the elements.

2. Interference from an alternative formulation of the intended thought as in the case of blends.
3. Interference from an unintended thought.

. Answers to SAEs 3

1. Features include when linguistics elements come from a similar linguistic environment. Secondly, distinctive elements and discrete items interact with one another and tend to be phonetically or semantically similar to one another. When slips are consistent with phonological rules of the language and the stress patterns of slips are consistent.

2. Students are referred to our discussion in 3.5 above to replicate.

Module 5: Psycholinguistics and Neurolinguistics

Unit 1: Language and the Brain
Unit 2: Identifying Language Disorders
Unit 3: Language Disorders: Causes, Types and Remedies
Unit 4: Language Attrition in Individuals

UNIT 1: LANGUAGE AND THE BRAIN

Content

1.0. Introduction

2. 0. Objectives

3. 0. Main Content

3. 1. What is the Relationship Between Language and the Brain?

3. 2. Language Areas in the Brain

4. 0. Conclusion

5. 0. Summary

6. 0. Tutor Marked Assignment

7. 0. References/Further Reading

1. 0. Introduction

So far, this course has enlightened you on the first linguistic milestone in children and the nature of speech processing, comprising comprehension and production. These are what the previous Modules in this course led you to. But the question is: What is the source of language? Or, where is language located? Well, researches have established that language is located in the brain. Neurolinguistics studies how

language is represented in the brain: that is, how and where our brain structures store the knowledge of the language or languages we understand, speak, write and so on. This is the focus of this Module – exposing you to the nexus between neurolinguistics and psycholinguistics. Particularly, in this Unit, we shall examine the relationship between language and the brain, how they affect each other. In addition to this, we shall identify parts of the brain that contribute to language comprehension and production, and their distinct roles in language processing.

2. 0. **Objectives**

At the end of this Unit, you should be able to:

a. identify the role of the brain in speech production and comprehension
b. examine ways that language affects the brain
c. discuss parts of the brain responsible for language use.

3. 0. **Main Content**

3. 1. What is the Relationship between Language and the Brain?

The relationship between language and the brain can be approached from two different positions: the impact of the brain on language and the impact of language on the brain. Although our concern is on the former, we shall also briefly look at the latter in order to intimate you with comprehensive knowledge of language and the brain.

The Impact of the Brain on Language

It was the ancient Greek scientists who were known to first observe the impact of the brain on language. They discovered that loss of speech often followed brain damage, thus the brain must be responsible for speech. However, in the 19th century, notable surgeons like Marc Dax, Paul Broca and Karl Wernicke expanded the knowledge through real scientific investigations. Marc Dax, a French doctor was the first to observe that lesions of the left hemisphere were responsible for the loss of word memory (lesions here are damages to the left hemisphere of the brain due to injury or sickness). His discoveries were based on observations and post-mortems of his patients, who were mostly soldiers with war wounds. In 1861 and 1865, Pierre Paul

Broca, a Parisian neurologist and surgeon made presentations on his findings from post-mortem examinations of patients with damaged brains. Surakat (2003:2) observes that three findings from Broca are relevant to understanding the relationship between language and the brain. One of his key findings is that each hemisphere of the brain has specialized functions. Two, he observed that functions of language or speech, writing, drawing and embroidery are located in the left hemisphere. In essence, any damage to this area of the brain may interfere with either speech, writing and reading. Third, Broca claimed that the hemisphere controlling speech is on the same side as the preferred hand. Modern research has refuted this finding, because for most people who are right-handed, the left hemisphere controls speech. Even for the small percentage that are left-handed, many of them have speech or language functions located in the left hemisphere (ibid). Years after Broca's discovery, Carl Wernicke, in 1874 discovered the back portion of the left hemisphere (now known as Wernicke's area). Wernicke, a German neurologist, was 26 years old when he made the breakthrough. He identified apraxia, agraphia, and other types of aphasia which are different from the ones previously identified by Broca. He even went as far as outlining a general theory of language and language disorders.

The pioneering works of Dax, Broca and Wernicke have proven overtime to provide basic insights in the understanding of language and the brain. Some of their findings have been confirmed many times over by researchers of our modern time. With the benefits of advanced technology and techniques such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET), modern researchers have extended the frontiers of knowledge about the relationship between language and the brain. However, they have also complicated matters in certain respects such that further research becomes necessary in order to get fuller and comprehensive pictures of the issues involved. For instance, much modern empirical work has demonstrated that language is integrated with, and in constant interplay with a broad range of neural processes. What it means is that every area of the brain plays a significant role in language processing. Thus, it is wrong to say that language is domiciled in the left hemisphere.

In concert with the above, researchers at the Washington University Medical Centre are of the view that many areas of the brain are involved in even the simplest tasks,

so any simple modulation of hemispheric specialization such as saying that ‘language is on the left side of the brain is wrong (Cattell, 2000). This suggests that the findings of Dax, Broca and Wernicke are being challenged. To read more on the criticisms against the findings of the pioneer researchers, click here.

Self-Assessment Exercise

Mention three effects of the brain on language.

The Effect of Language on the Brain

Recent studies have proven how the brain not only plays a key role in speech production and comprehension but also shown the impact of language on brain functions. Language plays a central role in the human brain, from how we process colour to how we make moral judgments. It directs how we allocate visual attention, construe and remember events, categorize objects, encode smells and musical tones, stay oriented, reason about time, perform mental mathematics, make financial decisions, experience and express emotions, and on and on.

A growing body of research is documenting how experience with language radically restructures the brain. People who were deprived of access to language as children (e.g., deaf individuals without access to speakers of sign languages) show patterns of neural connectivity that are radically different from those with early language exposure and are cognitively different from peers who had early language access. The later in life that first exposure to language occurs, the more pronounced and cemented the consequences. Furthermore, speakers of different languages develop different cognitive skills and predispositions, as shaped by the structures and patterns of their languages. Experience with languages in different modalities (e.g., spoken versus signed) also develops predictable differences in cognitive abilities outside the boundaries of language. For example, speakers of sign languages develop different visuospatial attention skills than those who only use spoken language. Exposure to written language also restructures the brain, even when acquired late in life. Even

seemingly surface properties, such as writing direction (left-to-right or right-to-left), have profound consequences for how people attend to, imagine, and organize information.

The normal human brain that is the subject of study in neuroscience is a “languaged” brain. It has come to be the way it is through a personal history of language use within an individual's lifetime. It also actively and dynamically uses linguistic resources (the categories, constructions, and distinctions available in language) as it processes incoming information from across the senses.

3. 2. Language Areas in the Brain

Earlier in this Unit, we stated that language is located in the brain. We can also say that the brain runs a language operating system. But the real question is, ‘where exactly is language located in the brain?’ Research has identified two primary ‘language centres’. These centres are usually located on the left side of the brain, otherwise called the left hemisphere, in 97% of people (Charlie, 2019: 59). The centres are Broca’s area and Wernicke’s area. These areas are considered the most important areas for language processing that if a person experienced a brain injury resulting in a damage to one of the areas, it would impair their ability to speak or understand what is said. This explains why language is considered a localised and lateralised function. However, Charlie (ibid) observes that the less-dominant hemisphere – the right hemisphere – also participates in this cognitive function, and there is an ongoing debate on the level of participation of the less-dominant areas. Let us look at the parts of the brain responsible for language, one after the other.

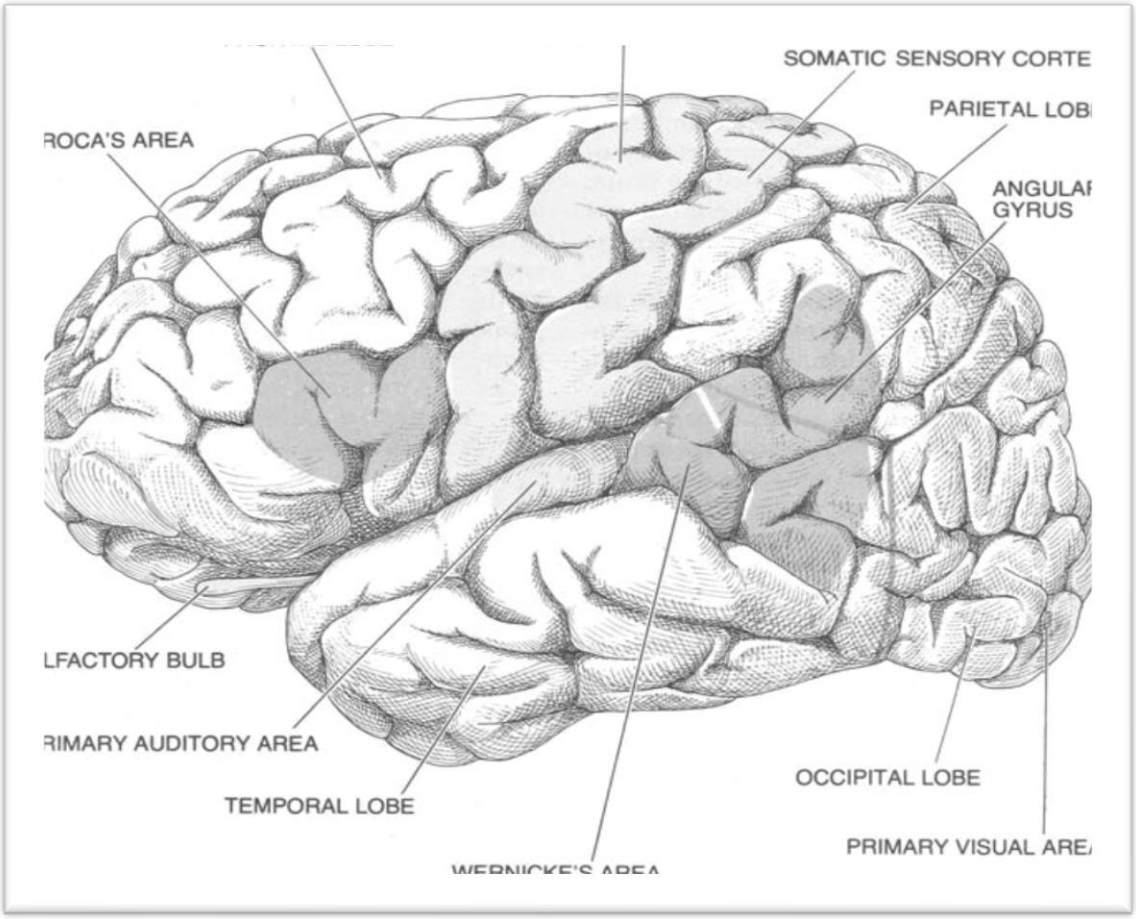
Broca’s Area

Broca’s area is located at the posterior part of the third frontal convolution of the left hemisphere, adjacent to the motor cortex. It has an important role in turning your ideas and thoughts into actual spoken words. In other words, the area is primarily responsible for language production. Broca’s area has been found to be most active right before you speak. Broca’s area also helps to pass the information to the motor cortex, which controls the movements of your mouth during speech production. Given its proximity to the motor cortex, neurons from Broca’s area send signals to the

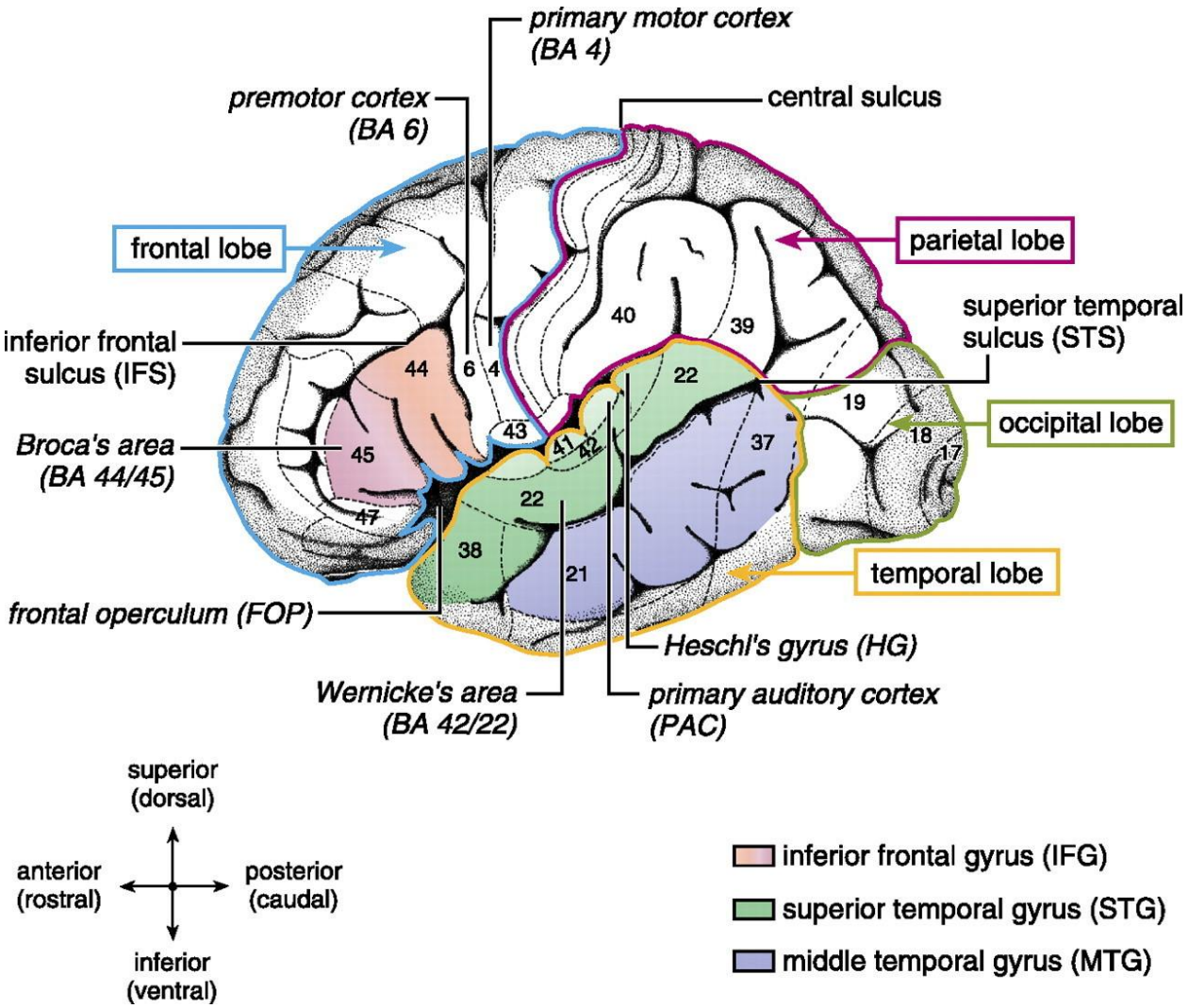
corresponding muscles, thus allowing the creation of sounds. A recent analysis of the specific roles of these sections of the left inferior frontal gyrus in verbal fluency indicates that Brodmann area 44 (pars opercularis) may subserve phonological fluency, whereas the Brodmann area 45 (pars triangularis) may be more involved in semantic fluency. Recent studies have shown that it also plays a significant role in language comprehension. Damage to Broca's area results in productive aphasia, which is the disturbance of the formulation of language, also known as Broca's aphasia (Details about aphasia is discussed in Module 6.) or an inability to speak/difficulty in speaking. Patients with Broca's aphasia can often understand language, but they cannot speak fluently. Broca's area works in conjunction with working memory to allow a person to use verbal expression and spoken words.

Wernicke's Area

Wernicke's area is classically located in the posterior section of the superior temporal gyrus of the dominant hemisphere (Brodmann area 22), with some branches extending around the posterior section of the lateral sulcus, in the parietal lobe. Considering its position, Wernicke's area is located relatively between the auditory cortex and the visual cortex. The former is located in the transverse temporal gyrus (Brodmann area 41 and 42), in the temporal lobe, while the latter is located in the posterior section of the occipital lobe (Brodmann areas 17, 18 and 19). Wernicke's area is primarily responsible for language comprehension, both speech and written. However, recent studies have demonstrated that the less dominant (right hemisphere in 97% of people) homologous area participates in the comprehension of ambiguous words, whether the language is spoken, written or with signs. Wernicke's area was first discovered by Karl Wernicke in 1876.


SOMATIC SENSORY CORTE
PARIETAL LOB
ROCA'S AREA
ANGULAR
GYRUS
LFACTORY BULB
RIMARY AUDITORY AREA
TEMPORAL LOBE
OCCIPITAL LOBE
PRIMARY VISUAL ARE

Ingram (2007) illustrates the brain structure, in relationship to language processing.



Adopted from Friederici (2011)

Insular Cortex

The insula is a region of neocortex hidden beneath the intersection of the frontal, parietal, and temporal lobes. More recently, Dronkers (1996) linked lesions in a specific region of the insula to an inability to plan and coordinate the appropriate movements necessary for articulation. She found that all patients studied with this disorder, known as `apraxia of speech', had lesions in the superior tip of the precentral gyrus of the insula while those without speech apraxia did not. In keeping with this conclusion, recent neuroimaging studies have reported activation in the insula with

tasks such as articulation of single words, word reading, picture naming, and word generation (see Indefrey & Levelt 2000.)

Auditory Cortex and Angular Gyrus

The primary auditory cortex, located in the temporal lobe and connected to the auditory system, is organized so that it responds to neighbouring frequencies in the other cells of the cortex. It is responsible for identifying pitch and loudness of sounds. The primary auditory cortex identifies pitch and loudness of sounds. Simply put that the auditory cortex is responsible for hearing. The angular gyrus is responsible for several language processes, including (but not limited to) attention and number processing. The angular gyrus, located in the parietal lobe of the brain, is responsible for several language processes, including number processing, spatial recognition and attention.

Arcuate Fasciculus/The Temporal Lobe

The arcuate fasciculus is a band of nerves that connects Wernicke's area and Broca's area. Thus, it is an important association area. It helps you form words, speak clearly, and understand concepts in language form. Since some branches of the arcuate fasciculum extends further into the parietal lobe, it is believed that it plays an essential role in attention. The temporal lobe, on the other hand, is the region where sound is processed.

Cerebellum

The cerebellum is located at the back of your brain. The cerebellum is involved in coordinating voluntary muscle movements like opening and closing your mouth, moving your arms and legs, standing upright, and maintaining balance. It also controls language processing. A review published in the *American Journal of Speech-Language Pathology* suggests that the cerebellum is actually more important to language processing than previously thought.

Click here to read more on the brain regions involved in language processing.

Self-Assessment Exercise

What are the differences between Broca's area and Wernicke's area?

4. 0. **Conclusion**

It is from our brain that speech and language originate. Neural studies have shown that some areas of our brains are specific to language processing and production. Take for example, certain parts of the brain are responsible for understanding words and sentences, while some parts help us to produce speech. When any of these areas are damaged or injured, capabilities for speaking or understanding, as the case may be, can be impaired or lost. These brain areas are mainly located in two regions, in the left side of the brain, and are connected by nerves. Together, these brain regions and their connections form a network that provides the hardware for language in the brain. Without this brain network, we would not be able to talk or to understand what's being said. What it means is that these areas must function together in order for a person to develop, use, and understand language.

5. 0. **Summary**

Scholars, especially in the medical field, have linked language and the brain. Some of them are Paul Broca and Karl Wernicke who demonstrated that speech mechanisms could be localized in the human brain. They did this by carrying out post mortem investigations on patients with severe speech disorders. Their research has thus established that language is located in specific areas of the brain, and that injuries to those areas result in language disorders, either in comprehension or production, or both. In this Unit, we X-rayed the nexus between language and the brain, noting how they affect each other. Furthermore, we identified parts of the brain that contribute to language comprehension and production; they include Broca's area, Wernicke's area,

insular cortex, auditory cortex, and arcuate fasciculus. Although these areas have their distinct roles in language processing, most times they work together for effective communications to take place.

6. 0. **Tutor-Marked Assessment**

a. Examine four structures of the brain responsible for language processing, stating their functions.
b. Discuss the contributions of Marc Dax, Paul Broca and Karl Wernicke to the field of neurolinguistics.
c. What is the relationship between language and the brain?

7. 0. **References/Further Reading**

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UNIT 2: IDENTIFYING LANGUAGE DISORDERS

Content

1.0. Introduction
2. 0. Objectives
3. 0. Main Content
3. 1. Ways to identify language disorders?
3. 2. Approaches to identifying language disorders
4. 0. Conclusion
5. 0. Summary
6. 0. Tutor Marked Assignment
7.0. References/Further Reading

1.0. Introduction

Language disorder is not the same as language delay and language difference. Earlier, in Module 4, Unit 5, you learnt that a language disorder is a deficit or problem with any function of language and communication. But language delay is characterised by the emergence of language in a relatively late pattern of development. In contrast to a disorder or a delay, a language difference is associated with systematic variation in vocabulary, grammar, or sound structures. Bland-Stewart (2005) avers that such variation is “used by a group of individuals and is determined by shared regional, social, or cultural and ethnic factors” and is not considered a disorder. In this Unit, our goal shall be to highlight signs of language disorders, as well as the approaches for identifying them.

2. 0. Objectives

At the end of this lesson, you should be able to:

a. briefly explain language disorders;
b. point out a language impairment when you come across one;
c. discuss approaches for identifying language disorders; and

d. suggest practicable remedies for language disorders.

3. 0. Main Content

3.1. Signs of Language Disorders

Language disorders embrace a wide range of conditions that have, at their core, challenges in effective communication. American Speech-Language Hearing Association (1993) in describing the concept states that it refers to impairments in the use of the spoken (or signed or written) system and may involve the form of language (grammar and phonology), the content of language (semantics), and the function of language (pragmatics). These may also be described more generally as communication disorders, which are typically classified by their impact on a child's receptive skills (that is, the ability to understand what is said or to decode, integrate, and organise what is heard) and expressive skills (that is, the ability to articulate sounds, use appropriate rate and rhythm during speech, exhibit appropriate vocal tone and resonance, and use sounds, words, and sentences in meaningful contexts). There are common conditions in infants, toddlers, and pre-schoolers that are associated with receptive and expressive communication challenges.

The origin of most cases of language impairments is unknown but diverse causes are suspected. The range of causes or origins includes anatomical abnormalities, cognitive deficits, faulty learning, genetic differences, hearing impairments, neurologic impairments, or physiologic abnormalities (Owens et al, 2003). Speech and language impairments may be acquired (that is, result from illness, injury or environmental factors) or congenital (that is, present at birth).

Typically developing children may have trouble with some sounds, words, and sentences while they are learning. However, most children can use language easily around five years of age.

Language development has different parts, and children might have problems with one or more of the following:

- Understanding what others say (receptive language). This could be due to
  - Not hearing the words (hearing loss).
  - Not understanding the meaning of the words.

- Communicating thoughts using language (expressive language). This could be due to
    - Not knowing the words to use.
    - Not knowing how to put words together.
    - Knowing the words to use but not being able to express them.

Language and speech disorders can exist together or by themselves. Examples of problems with language and speech development include the following:

- Speech disorders
    - Difficulty with forming specific words or sounds correctly.
    - Difficulty with making words or sentences flow smoothly, like stuttering or stammering.
- Language delay – the ability to understand and speak develops more slowly than is typical
- Language disorders
    - Aphasia (difficulty understanding or speaking parts of language due to a brain injury or how the brain works).
    - Auditory processing disorder (difficulty understanding the meaning of the sounds that the ear sends to the brain)

Study Table 1 below by Prelock, Hutchins, and Glascoe (2008) on Disorders in Young Children Commonly Associated with Receptive and Expressive Communication Problems

Condition & Cause	Receptive Communication Problems	Expressive Communication Problems
Psychosocial risk, abuse and neglect		Less talkative and fewer conversational skills than expected; seldom volunteer

		ideas or discuss feelings; utterances shorter than peers
Autism spectrum disorder	Difficulty analysing, integrating, and processing information; misinterpretation of social cues	Variability in speech production from functionally nonverbal to echolalic speech to nearly typical speech; use of language in social situations is more challenging than producing language forms (e.g., articulating speech sounds, using sentence structure); tendency to use verbal scripts; difficulty selecting the right words to represent intended meaning; often mechanical voice quality
Brain injury	Difficulty making connections, inferences and using information to solve problems; challenges in attention and memory which affect linguistic processing; challenges in understanding figurative language and multiple meaning words	Greatest difficulty is commonly in pragmatics – using language appropriately across contexts, especially narratives and conversations
Cerebral palsy	Speech sound discrimination, information processing and attention can be areas of challenge;	Dysarthric speech – slower rate, with shorter phrases or prolonged pauses; articulation is often imprecise with distorted vowel productions; voice quality

	language comprehension is affected by cognitive status	can be breathy or harsh, hypernasal with a low or monotone pitch; apraxic speech – sound substitutions that can be inconsistent, groping for sound production and nonfluent volitional speech with more fluent automatic speech; language production is affected by breath support as well as cognitive status
Fetal drug or alcohol exposure	Difficulty comprehending verbal information, especially understanding abstract concepts, multiple word meanings, and words indicating time and space	Fewer vocalizations in infancy, poor use of gestures and delays in oral language; poor word retrieval, shorter sentences, and less well-developed conversational skills
Fluency disorders		Difficulty with the rate and rhythm of speech; false starts; repetitions of sounds, syllables and words; may or may not be accompanied by atypical physical behaviors (eg, grimacing, head bobbing)
Hearing impairment	Difficulty with sound perception and discrimination, voice recognition, and understanding of speech,	Sound productions made until about 6 months; limited oral output depending on degree of hearing loss; for oral communicators, vocal

	especially under adverse hearing conditions	resonance, speech sound accuracy, and syntactic structure often affected
Intellectual disability	Comprehension of language is often below cognitive ability; difficulty organizing and categorizing information heard for later retrieval; difficulty with abstract concepts; difficulty interpreting information presented auditorily	Production is often below cognitive ability; similar but slower developmental path than typical peers; tendency to use more immature language forms; tendency to produce shorter and less elaborated utterances
Specific language impairment	Slower and less efficient information processing; limited capacity for understanding language	Shorter, less elaborated sentences than typical peers; difficulty in rule formulation for speech sound, word, and sentence productions; ineffective use of language forms in social contexts sometimes leading to inappropriate utterances; poorly developed vocabulary

Self-Assessment Exercise

Mention four causes of language disorders and describe their expressive communication problems.

Characteristics of Communication Disorders

Table 2 highlights characteristics of communication disorders as described in Prelock, Hutchins, and Glascoe (ibid)

Characteristics	Expressive Language Disorder	Mixed Receptive-Expressive Language Disorder
Standardized tests indicate skill area is substantially below what is expected considering chronological age (CA), IQ, and education	Expressive language development (e.g., vocabulary, tense errors, word recall, sentence length, and complexity) is below nonverbal IQ and receptive language	Battery of measures of receptive and expressive language development (e.g., understanding words, sentences, or specific word types-spatial terms) is below nonverbal IQ
Difficulties interfere with academic or occupational achievement or with social communication	X	X
If mental retardation, environmental deprivation, sensory or speech motor deficit is present, difficulties are greater than what is expected	X	X
Criteria not met for mixed receptive-expressive language disorder	X	

Criteria not met for pervasive developmental disorder	X	X

3. 2. Approaches to Identifying Speech and Language Disorders

There are two broad approaches to assess language disorders, especially in children. These approaches offer different solutions to the problems of identification and description of language impairments. The approaches are traditional and contemporary. The traditional approach is governed by an etiologic model, in which children are first sort out according to the condition thought to be the "cause" of the language disorder. On the other hand, the contemporary approach is governed by developmental communication models, in which children are first sort out by the "consequences," or the presenting symptoms of the language disorder. In Miller's view (1983: 61), the traditional approach has led to fragmented solutions to the problems of finding children with language disorders and describing the similarities and differences in their communication skills over time. The contemporary model looks good but requires better procedures and more data of various kinds to be fully functional; these include procedures allowing comparison across linguistic domains within and across processes and standards for data sampling, analysis, and interpretation.

4. 0. Conclusion

A language disorder is an anomaly in language comprehension or/and production. If it occurs from birth, it is called etiological language disorder. A developmental disorder takes place in childhood, whereas acquired language disorders takes place in adulthood due to accidents, stroke and others. A language disorder is different from language delay, which is associated with relatively late or slow development of language, especially, in children. It is also different from language difference, which has to do with systematic variation in vocabulary, grammar, or sound structures of a language due to social or regional differences. Language impairments are common among adults and children. There are many ways and approaches one can deploy in

identifying and classifying deficits of language. It is expected that you use these strategies and approaches in defining language disorders among the affected people in your community. The signs of language impairments you studied here should, in addition, serve as a guide for early detection and subsequent treatment.

5. 0. Summary

In this Unit, you learnt the difference between language disorder, delay, and variation. The Unit also highlighted the signs of language disorders such as hearing loss, inability to choose the right word, difficulty in understanding what is said, difficulty in forming sentences, reading difficulty, etc. Some causes of language disorders were presented to you. They include: abuse/neglect, brain injuries, autism, and intellectual disabilities. We also looked at two broad approaches - traditional and modern – for identifying language impairments.

6. 0. Tutor-Marked Assessment

a. Differentiate clearly between language disorder and language delay.

b i. Discuss in details five characteristics of language disorders

ii. Recommend two remedies/treatments for each.

c. Critique the two approaches for identifying language disorders, noting their strengths and weaknesses.

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UNIT 3: LANGUAGE DISORDERS: CAUSES, TYPES AND REMEDIES

Content

1. 0. Introduction
2. 0. Objectives
3. 0. Main Content
3. 1. What is a Language Disorder?
3. 2. Causes of Language Disorders
3. 3. Classifications of Language Disorders
3. 4. Remedies for Language Disorders
4. 0. Conclusion
5. 0. Summary
6. 0. Tutor Marked Assignment
7. 0. References/Further Reading

1. 0. Introduction

Language disorders are a menace among children and adults. They come at different levels and types. In the previous Unit, we highlighted signs of language disorders. We also looked at the approaches for identifying them. In this current Unit, we shall discuss language disorders in details. Our discussion here will also include the whys and wherefores of language impairments, taking cognisance of their types. Finally, we shall look at the ways in which language deficits can be prevented and managed in children and adults.

2. 0. Objectives

At the conclusion of this unit, you shall be able to:

- define language disorder;
- mention causes of language disorders;
- group language impediments according to different factors; and
- prescribe measures for preventing and managing disorders in linguistic processing.

3. 0. Main Content

3. 1. What Is a Language Disorder?

Speech pathology is the term used for the study of all aspects of language disorders. A language disorder is a deficit or problem with any function of language and communication. It is a significant delay in the use and understanding of spoken and written language. Speech pathology is concerned with the diagnosis of communication and language problems due to disease or disorder. It encompasses many aspects of not only speech, but also language and communication. This explains why it is often called speech-language pathology (SLP). It is important to distinguish speech disorder from language disorder. Whereas speech disorders affect a person's ability to produce sounds that create words, language disorders have more to do with difficulty in learning words or understanding what others say. It can also mean difficulty in accessing language skills like reading, writing, listening, etc.

Difficulty in speech and language generally are common in children and adult. For instance, children born with autism and down syndrome most times have problems in

communication. In some instances, a child may be able to understand what is said to him, but may not be able to send the feedback. Another child may be able to make sounds in an attempt to speak, but the words are not clear or loud enough for comprehension. An adult who develops problems with communication may experience this as a result of disease or brain and/or spinal cord injury. Examples of these include strokes, brain and throat cancer. A speech pathology seeks to find out where the exact disconnect is in the process of communication, then looks for ways to fix it.

3. 2. Causes of Language Disorders

Damage to certain areas of the brain: Speech disorders, especially, in adulthood, is mainly caused by damage to the area of the brain where language is localised. Crystal (1997) states that the brain is totally dependent on the oxygen conveyed by its blood supply, and brain cells will die if deprived of oxygen for more than four minutes. Cerebro-vascular accidents (popularly known as stroke) can cause this to happen and actually accounts for about 80% of all cases of aphasia, a major type of speech disorder, where the left hemisphere is affected. Apart from stroke, cerebral humus head injuries can occur during child birth or after, through road accidents, falls and acts of violence, leading to speech impairment. Non-violent causes during and after birth are forceps deliveries, neonatal jaundice, convulsion, meningitis as well as abnormal neurological development.

Genes and Hereditary: It has been discovered that twenty to forty percent of children with a family history of speech and language impairments (SLI) deficit have the condition themselves, compared with about four percent of those with no family history of SLI.

Parental Nutrition: Some researches have shown that when a woman does not take prenatal folic acid supplement during pregnancy, her baby is likely to have severe language issues due to brain malformation.

It is important to note that some persons, especially children, exhibit language disorders that are not traceable to any of the factors mentioned above. According to

Surakat (2003: 7), “this has generated some controversies in the classification of disorders: ‘organic’ versus ‘functional’, ‘acquired’ or ‘congenital’ versus ‘developmental’ disorders, and so on.”

Self-Assessment Exercise

Mention five causative factors of language impairments.

3. 3. **Classifications of Language Disorders**

Language disorders can be classified into different categories, depending on the factors in consideration. Disorders can be developmental or acquired. They can also be production or perception. Developmental disorders are disorders that occur during child developmental stages. It ranges from problems in the womb to early stages of infant growth, which could result from damage to one or some parts of the brain. Studies have shown that between 20% and 40% of children with language impairments have an affected family member. On the other hand, acquired disorders are caused by damage to parts of the brain as a result of injuries. Language disorders can also be classified under production and reception disorders. Production refers to the whole sequence of neurological, physical and anatomic steps required to encode a linguistic message and make it ready for transmission. Any disruption of the normal chain of events would result in expressive disorders, such as stuttering. Reception, on the other hand, refers to the sequence of anatomical, physical and neurological steps required to decode a message. Disruption here could result in receptive disorder, of which the most common case is deafness. A disorder may affect any of the linguistic levels (phonology, morphology, pragmatics, semantics, etc.), as well as language skills (listening, speaking, reading and writing). There are numerous language disorders such as aphasia, dyslexia, dysgraphia, deafness, stuttering etc.

a. Aphasia

The word aphasia is derived from the Greek word “aphatos”, meaning speechless. It is the disturbance of the comprehension and formulation of language, caused by

dysfunction in specific brain regions. This specific brain portions are responsible for language. This form of language disorder ranges from having difficulty remembering words to losing the ability to speak, read or write. The common cause of aphasia is cerebro-vascular accidents (popularly known as stroke), with about 80% of the cases. Other causes are traumatic head injuries suffered through violence or accident, and usually occurs suddenly. It may also develop slowly, as a result of a brain tumour or a progressive neurological disease. Although most people who have aphasia are middle-aged or older, anyone can acquire it, including young children. There are different types of aphasia, including **Broca's aphasia**, **Wernicke's aphasia**, **global aphasia**, **conduction aphasia**, and **transcortical aphasia**.

Broca's aphasia is a drastic loss of speech frequency, making speech effortful and telegraphic. Telegraphic because the aphasics' sentences are usually characterised by omission of words – articles, prepositions, pronouns, and auxiliary verbs. The aphasic often sounds as if they are reading a Western Union message, which is why their speech is termed telegraphic. Wernicke's aphasia is characterised by the fluency of the speech of the subjects. That is why it is also known as fluent aphasia. Speech is produced with normal (and sometimes above normal) pitch and intonation. It complements Broca's aphasia, which is effortful and slow. The utterances are fluent and more or less grammatical, but there is lack of sense and frequent neologisms and word substitutions. Damage to both the Broca's area and the Wernicke's area gives rise to global aphasia. It is the complete loss of language, both in comprehension and speech. Global aphasics' deliberate speech production is limited to a few words and sentences. The aphasics can neither read nor write. Global aphasia is often witnessed immediately the patient has suffered a stroke, and Malmkjaer (1991) notes that it may rapidly improve if the damage has not been too extensive. However, with greater damage, severe and lasting disability may result.

Conduction aphasia shares three features with Broca's and Wernicke's aphasia: word substitution (phonemic aphasia), naming problems, and the lack of capacity for verbatim repetition. Conduction aphasia is distinguished by the preservation of auditory comprehension (unlike Wernicke's aphasia) and speech production (unlike Broca's aphasia). It is caused by damage to Brodmann's area, located in the posterior region of the temporal lobe, just above Wernicke's area, the left primary auditory area.

Transcortical aphasia, unlike the other types of aphasia, is distinguished by the relative preservation of verbatim repetition (Barley, 1995). It is divided into two variants: sensory and motor variants. Speech is non-fluent and comprehension is largely intact. Transcortical aphasia occurs when there is a damage to the left frontal cortex, sometimes involving Broca's area. Finally, anomic aphasia has to do with persistent inability to supply the words for the very things the patients want to talk about, particularly, the significant nouns and verbs. Pure anomics do not suffer from the symptoms of the other kinds of aphasia. They are fluent, with normal comprehension and no severe substitutions of words or inflections. However, such patients have problems with naming and finding the right words.

Studies indicate some differences in intelligence among aphasics: whereas Broca's aphasics and anomics are not intellectually impaired, Wernicke and global aphasics have been shown to have below normal intelligence. People with Broca's aphasia are aware of what they would like to say but the inability to articulate their thoughts results in low self-esteem issues and the development of depression.

b. Apraxia of Speech

Like aphasia, apraxia of speech (AOS) is caused by damage to parts of the brain. However, it affects motor speech production. This means that the part of the brain that coordinates the movement in producing speech gets 'a fuzzy signal or no signal at all'. Someone with AOS has trouble saying what he or she wants to say correctly and consistently, because the brain cannot properly plan and sequence the required speech sound movements. Apraxia and non-fluent aphasia (Broca's aphasia) are related. Apraxia, however, requires that the brain damage be located in a very specific part of the brain. This area is right next to the area that results in non-fluent speech. The severity of AOS varies from person to person. It can be so mild that it causes trouble with only a few speech sounds or with pronunciation of words that have many syllables. In the most severe cases, someone with AOS might not be able to communicate effectively by speaking, and may need the help of alternative communication methods. Apraxia can be acquired, especially, in adults or developed

in childhood. Symptoms of the speech disorder include distortions of sounds, making inconsistent errors in speech, groping for sounds, and errors in tone, stress, or rhythm.

c. Dyslexia

Dyslexia is extreme difficulty or underachievement in reading, spelling and even prose writing, in spite of ordinary educational opportunities. Asher (1994) can be defined as ‘a difficulty with words and linguistic processes. Brain damage in adult life frequently leads to a disorder of reading and writing in people who have once been literates. This reading disorder is also referred to as acquired dyslexia or alexia to distinguish it from the more widely known developmental kinds of dyslexia, which occurs in young children where there is no evidence of brain damage. Specialists and researchers are not sure about the main cause of developmental dyslexia. Some point to the possibility that the condition is inherited as it often runs in families. However, the most common cases of acquired dyslexia are brain injuries, stroke or other types of trauma. Dyslexia can be grouped into phonological, deep, and surface dyslexia. People with phonological dyslexia are unable to read on the basis of the phonic rules that relate graphemes to phonemes. That is, they can manage to read familiar words but have great difficulty with new words. For deep dyslexia, the people in addition to difficulty in new word reading also commit many semantic errors like reading ‘act’ as ‘play’, ‘dinner’ as ‘food’, visual errors that combine visual and semantic properties like reading ‘shock’ as ‘stock’, ‘sausage’ as ‘saucer’. Words with concrete meanings, as opposed to the abstract ones, are easier to read. On the contrary, people who suffer from surface dyslexia have difficulty with recognising words as wholes and rely greatly on the process of ‘sounding out’ the possible relationship between phonemes and graphemes. Irregular words like ‘yacht’ pose particular difficulty.

d. Dysgraphia

Dysgraphia is used to describe a severe problem of handwriting. The onset of brain damage in adult life, apart from resulting in dyslexia, can also lead to a disorder of writing in people who have once been literate. The writing disorder is also referred to as acquired dysgraphia or agraphia. The label ‘acquired’ as we stated before is to

distinguish this disorder from the more widely known developmental kinds of dysgraphia, which occur in young children. Symptoms of dysgraphia ranges from general illegible writing, letter inconsistencies, mixture of uppercase with lowercase letters and irregular sizes and shapes, to unfinished letters and a struggle to use writing as a communication tool. Just as in dyslexia, dysgraphia can be phonological, deep or surface.

e. Stuttering

Stuttering, also known as stammering, is characterised by repetition of sounds, syllables, or words; prolongation of sounds and interruptions in speech. People who stutter know what they want to say but have trouble producing a normal flow of speech. There are different patterns as well as degrees of stuttering. Degrees go from mild to severe. Prior to the popular belief that stuttering is caused by anxiety, experts believe the cause of stuttering to be complex, involving a combination of genetic in addition to environmental variables. However, it has been found that anxiety and tension can worsen stuttering. Stuttering affects people of all ages, although it occurs often in children between the ages of 2 and 6 as they develop language skills (Cunha, 2019). Most of these children recover but for about 25% of patients, stuttering can persist as a lifelong communication disorder. The most widely recognised symptom of stuttering is the abnormal amount of repetition of sounds, syllables, words or phrases. For example, ‘m-m-m-m madam’; ‘she’s a stu- a student’. Sounds may be abnormally lengthened, for example, ‘t-t-tea’, where the initial ‘t’ can last several seconds, often with an uncertain rhythm. Sometimes, extra words are introduced at points of difficulty. Other times, words and phrases may be left unfinished and speakers may avoid words and phrases that contain sounds they find difficult and replace them with simpler alternatives.

f. Deafness

Deafness has to do with hearing impairment. It is the most common case of receptive language disorders. About 1 in 1000 children have a hearing loss that is present at

birth, or acquired soon after, caused by pathology of the inner ear and its relationship to the auditory nerve (Crystal, 1997). Common causative factors of deafness are maternal rubella (German measles), meningitis, infections, noise, drugs, toxins and inherited disorders. Deafness can be partial or complete hearing loss. People who were born profoundly deaf or lost their hearing early in life cannot speak except for some noises and sign language. This is because to use one's voice well, one needs the auditory feedback. If you cannot hear others nor hear yourself, you cannot learn how to modulate your voice. Many more children have a hearing loss that they acquired in the preschool period because of the infection of the middle ear. Several middle problems get better without intervention, but others become chronic and do not respond well to treatment. In such chronic situations, there can be serious consequences for speech development and comprehension.

3. 4. **Remedies/Treatment for Language Disorders**

Early Detection and Intervention through Therapy: It is important to detect speech impairment as early as possible, especially, in children. According to the American Speech Language Hearing Association (ASHA), about 200 studies have found that speech language therapy helps people with these impairments. In fact, 70% show improvement after treatment. For traumatic head injuries resulting in speech impairment, the therapist provides oral-motor exercises to assist the individual in speaking. Longer term rehabilitation may be performed individually, in groups, or both, depending upon the needs of the individual. Most individuals respond best to programs tailored to their backgrounds and interests. The most effective therapy programs involve family members who can best provide this information. Computer-assisted programs have been successful with some individuals (National Institute on Deafness and Other Communication Disorders, 2008).

Brain Scan

The brain can be scanned through the advent of new methodologies such as computerised axial tomography (CAT or CT), positron emission tomography (PET), magnetoencephalography (MEG), and magnet resonance imaging (MRI), which can be used in vivo to image cognitive functions in the brain (fMRI) as well as grey matter anatomy and white matter fibre tracts (diffusion-weighted MRI). The techniques can

be used to detect the location of language in the brain as well as areas of lesion, which result in language deficit in an individual. Unfortunately, some of them entail some risks due to radiation. At the moment, MRI scans, particularly fMRI, are the most promising of the body imaging diagnostic tools relevant to language research since they are not invasive and do not carry the biological risk of radioactivity. MRI depends on ultrasonics to produce high quality images of cross-sections of the brain.

Brain Surgery

There are different brain surgeries for language pathology. Hemispherectomy helps to remove one diseased hemisphere or another. Related to this is hemidecortication, which is the removal of a large chunk, or a half, of the cortex in diseases hemisphere so that it does not spread to the other areas of the brain.

Special Education Centres: Children who show signs of speech language disorders should be referred to special schools where they have study teams who can screen, assess and administer treatment. Communication problems may involve cooperative efforts of speech-language pathologies, audiologists, psychologists, classroom teachers, dentists, and so on.

Instructional Intervention: The effect of speech language disorders can be ameliorated by a change in the way patients are taught. This can help to improve their learning and achieve adequate progress, particularly individuals with mild cases. There is also need for a reading specialist who provides training seminar and guidance to teachers so that they can be successful in the use of various instructional programmes and practices.

Self-Assessment Exercise

Examine four remedies for language disorders.

4. 0**. Conclusion**

Although speech development is universal, there are often cases of disorders both in childhood and adulthood. Speech delays and other anomalies are caused by different factors. For adults, it has been proven that any damage to the left cerebral hemisphere

could hinder the production of speech as well as its perception. Since speech and language impairments are unavoidable in human society, the knowledge of these disorders and their treatments/management can make them occur less. While some of the disorders can be cured through medical attention, a few such as acute aphasia may not totally be cured. However, their devastating effects can be ameliorated through therapy.

5. 0**. Summary**

In this Unit, you learnt that a language disorder is an impairment, anomaly or deficiency in one or more language skills. The methods include listening/comprehension, speaking, reading and writing. There are different types of language disorders such as development and acquired disorders. A developmental disorder occurs during the formative years of the child, right from the womb to infancy. An acquired language disorder, on the other hand occurs in adulthood. Language disorders are caused by varying factors such as heredity, brain injuries, jaundice in children, complications during birth, malnutrition, and so on. However, the problem can be managed through early detection and medical intervention. Children who show signs of speech language disorders should be referred to special schools where they will be given necessary attention.

6. 0. **Tutor-Marked Assessment**

a. What is the difference between speech disorders and language disorders?
b. Language disorders constitute a threat to society. Examine this assertion.
c. Make a visit to a big hospital in your area and see a speech therapist or speech pathologist. Enquire a number of ways in which his/her hospital treats patients with language disorders.

7.0. **References/Further Reading**

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UNIT 4: LANGUAGE ATTRITION IN INDIVIDUALS

Content

1.0. Introduction
2. 0. Objectives
3. 0. Main Content
3. 1. What is Language Attrition?
3. 2. Causes of Language Attrition in Individuals
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7. 0. References/Further Reading

1. 0. Introduction

This Unit will introduce you to the concept of language attrition. We shall distinguish language attrition in persons from language attrition in society; but our interest in this course is the former. Whereas societal language attrition is more associated with sociolinguistics, we shall examine causes of language attrition in an individual and remedies to the disorder in this course.

2. 0. Objectives

At the end of this Unit, you should be able to:

i. explain language attrition in persons;
ii. differentiate language attrition in persons from language attrition in society;
iii. mention causes of language attrition in individuals, and
iv. recommend some remedies to individual language attrition.

3. 0. Main Content

3. 1. What Is Language Attrition in Individuals?

A person may be exposed to one or more languages after the first language due to migration and other factors. This situation may negatively affect the linguistic skills of the individual in the first language, to the extent that he/she may lose the language totally. Language attrition in an individual describes the loss of, or changes to, grammatical and other features of a language as a result of declining use by the speaker. We can also say that it is the diminishing of proficiency in a language as a result of reduced contact with it. A language user might be at risk of attrition when situations change such that they are no longer in daily contact with the target language or its speech community.

First language attrition is the process in which a person loses fluency in their first language as a result of becoming bilingual or multilingual. It is the gradual loss of a first language (L1) as one gains proficiency in a second language (L2). Language attrition is not attributed to first language alone as one may lose a second or third language after learning it. In fact, the regression hypothesis holds that L2 loss occurs

more quickly than that of L1 due to psychological as well as social factors. Second language attrition describes the reduction of competence in a second language or its complete loss. Most times, language attrition in individuals is due to migration. Bardovi-Harlig and Burghardt (2020) point out that:

> daily language contact may be reduced when students graduate, semesters come to an end, requirements are fulfilled, sabbaticals are over, students return from study abroad, employees get transferred, missions are concluded, troops get reassigned, students and their families return from graduate programs abroad, or other events take people from richer language environments to more impoverished ones (pg. 67).

According to them, the opposite of language attrition is language retention, which can be defined as the conscious engagement in activities that will slow or impede attrition (ibid).

It is important to note that language attrition in an individual is different from language attrition in society. Societal attrition has to do with the loss of one or more languages in a speech community as a result of multilingualism, colonialism or conquest. Whereas individual language attrition is linked to language acquisition and pathology, societal language attrition is linked to diachronic language change (Schmid, 2004).

Self-Assessment Exercise

Distinguish between language attrition in persons and language attrition in society.

3. 2. Causes of Language Attrition in Individuals

Language attrition is dependent on a large variety of factors, internal and external. Let us look at some of these factors one after another.

a. Plasticity

Plasticity is a brain mechanism that is most often cited as the reason for language acquisition and/or learning. It is commonly likened to the immigration. Take for instance, when there is a drastic change in the linguistic environment of an immigrant,

he/she is required to adapt to the new language environment, including learning the host language, in combination with reduced L1 use. Köpke (2014) points out that “the concept of brain plasticity predicts that adapting to a new language is easier and quicker in younger subjects” (2). As a matter of fact, the younger the subject, the easier and faster the process. Faster language learning due to greater plasticity might also imply stronger L1 attrition in young immigrants, whereas in older immigrants, reduced brain plasticity would both prevent the adaptation to the L2 environment and prevent L1 attrition. This implies that age is one of the most predictive factors in attrition since an L2 learned early in life quickly replaces the first language, while in later bilinguals the L1 appears largely resistant to attrition.

b. Memory

According to research, memory can be related to attrition in a number of ways. The first notion which has to be considered is long term memory (LTM) where linguistic knowledge is stored over time just as many other kinds of knowledge (e.g., riding bicycle, playing piano, knowing historical facts, etc.). If the information stored in LTM is not activated regularly, it might be forgotten. If the stored knowledge is linguistic related, it results in language attrition. Memory processes are also involved in online processing of information and control of two language systems. Such functions rely on working memory (WM). Working memory is defined as “… a limited capacity system responsible for the temporary storage and processing of information while cognitive tasks are performed” (Collette, van der Linden and Poncelet 2000: 46).

c. Forgetting

Studies about L1 attrition, for instance: As (1963) and Fromm (1970) are based on hypnosis data. These researchers show that their patients are able to recover an otherwise completely forgotten L1 under hypnosis suggesting that, in some cases, even total L1 attrition remains a question of retrieval failure. What all the studies point out is that language attrition might be tackled as a memory problem. In his detailed discussion of different forgetting theories within the context of L1 attrition, Ecke (2004) distinguishes different processes: decay, interference, regression and suppression, distortion, retrieval slowdown and failure, cue dependency, and interaction and dynamic systems. There is no doubt that many of these processes are likely to be

interrelated. For example, language decay can cause failure or slowdown in retrieving linguistic items from the brain. The most important point here is that, similar to forgetting, there is not just one possible process of attrition, but rather a variety of processes which are likely to be influenced by a multitude of factors.

d. Language aptitude

Language aptitude is a cognitive skill which may be relevant to language attrition but has not so far been investigated in this context. Within research on L2 acquisition, the concept has been defined as the potential or talent a person has for learning foreign languages. It has been found to vary considerably between individuals, while remaining relatively independent of other cognitive factors such as general intelligence. Although the implications of aptitude for L1 attrition have not yet been discussed, all the more since L2 proficiency is not usually assessed in attrition research, the concept is nevertheless relevant in understanding attrition and might be better suited to capture individual variation in attrition. Consequently, we can predict that greater language aptitude, which is generally assumed to lead to higher L2 proficiency, could prevent attrition — at least to some degree. But lesser language aptitude in a language could result in faster attrition in the same language.

e. Literacy

From a more psycholinguistic perspective, it has been proposed that literacy might contribute to the cognitive organisation of language and contribute to age effects observed in L1 attrition, together with other factors such as brain plasticity and type of memory involved in language learning. Köpke (2014: 11) posits that literacy can be seen as a factor which might prevent attrition in several ways. On the sociolinguistic level, literacy (a) allows the speaker to maintain contact with the L1 by reading, which might be an important source of keeping in touch with the L1, and (b) the wish to have access to written input may enhance motivation for maintaining the L1. But more importantly, from the neurofunctional and psycholinguistic perspective, (c) it is likely that literacy contributes to the grounding of a language in memory as it adds orthographic representations. We can then claim that less attrition is to be expected in

subjects who have had the opportunity to become literate in the L1, especially, if they frequently use that skill.

f. Language use

The issue of language use has often been assumed to be an important factor for language attrition, even though it is difficult to measure. Intuitively, it makes sense that individuals who make little use of a language suffer more from attrition than speakers who use the language more frequently. The discussion of the inhibition mechanism, however, clearly shows that frequency of use is not the only aspect of use that matters. As stressed also by Schmid (2004), quality of use, or type of contact, is equally important. Unfortunately, this aspect has received hardly any attention. First of all, a distinction needs to be applied to the use of productive skills and receptive skills. In other words, is active language use (i.e., in production) necessary in order to prevent the L1 from deteriorating, or is regular input sufficient to maintain a language once completely mastered? One can say that input would be crucial for the maintenance of a language. This implies also that input might be sufficient, for example in the case of a speaker who has no opportunity to interact with other L1 speakers but may nevertheless maintain the L1 through written exchanges, or simply by the input received from books, films or the internet. Secondly, this raises the question of the quality of that input, which may, to some degree, be dependent on the sociolinguistic environment of the immigrant.

g. Motivation

Motivation usually arises from internal and external factors. An immigrant may be intrinsically motivated to acquire a native-like competence in the target language due to the love or fun of the process. In other words, there is satisfaction that comes from such an achievement. On the other side, social variables may impose the exclusive use of the target language, in which the immigrant has no other choice but to use the language in everyday life. This situation is more common than the first as people are more motivated to learn a new language due to external factors, like the need to integrate and communicate effectively in their speech community. Either way, language maintenance is higher, meaning less attrition for the target language. Other

aspects of motivation may be directly linked to age: for example, adults differ from children in that L1 is an important part of their identity that cannot easily be abandoned. On the other hand, a very young child does not have the same motivation with respect to language as a child of school age who is much more oriented to the peer group than to the family. School children should therefore be most prone to attrition since they are the age group most motivated to integrate into the L2 environment. However, age and previously-acquired literacy skills in L1 might counteract such a tendency.

Read more on causes of language attrition from here.

Self-Assessment Exercise

1. Mention four causes of language attrition.
2. What is the relationship between language attrition and plasticity?

a. Prevention Language Attrition in Individuals

As Cohen (2018) notes, more energy goes into helping learners acquire language than to maintain what they have acquired. In line with Cohen's observation, it would be equally worthwhile to alert language instructors and learners of strategies for preventing attrition. Against this backdrop, we shall consider some ways in which language attrition can be prevented in an individual, as provided by Bardovi-Harlig and Burghardt (2020).

a. *Engagement with other speakers:* Engagement with other speakers not only provides additional opportunities for input, it obligates the retainer to produce language, which is a desirable outcome because production is at greater risk for attrition. To that end, retainers may undertake community service in which speakers of the target-language are also engaged, join clubs known for bilingual or multilingual members, seek out cafes which cater to speakers of the L2, or establish a conversation group or a tandem learning partnership. Writing to pen pals (with or without computer mediation) is a time-honoured tradition. There are also a range of traditional resources. These include, for example,

listening to the radio (whether live or podcasts) or watching the television and movies.

b. *Extensive reading:* The benefits of extensive reading for acquisition are well known, as it increases motivation as well as language proficiency. For those who prefer solitary activities, reading for pleasure also supports retention (as it does acquisition); reading materials include both fiction and nonfiction, and come in a variety of forms, including magazines, books, graphic novels, and bilingual books.

c. *Consultation of dictionaries:* Distinct from pleasure reading, dictionaries are a resource that may support other retention activities. Overall, studies suggest that the effectiveness of using dictionaries is not necessarily tied to proficiency level but rather to being a skilled dictionary user and the type of task it is used to accomplish (e.g., comprehension versus production). Moreover, electronic versions of learner dictionaries may hold an advantage. Dziemianko (2010) found that intermediate and advanced learners showed better retention of meaning and recall of vocabulary and collocations during acquisition. It is worthy to point out that consulting as many dictionaries as possible produces higher a retention level due to varied explanations and examples such an act provides.

d. *Membership of book clubs:* Many libraries organize book clubs where L2 learners can engage in face-to-face discussion with wider readership, including native speakers. Online book clubs may provide an option for participation via reading and writing in the L2. A speaker who wants to prevent attrition in his/her L1 or L2 can seek appropriate book clubs and join them accordingly.

e. *Technology-mediated resources:* One may listen to podcasts, read public discussion forums on topics of interest, or follow websites, blogs, Instagram, or Twitter in a variety of languages; to convert listening into listening with a production activity, language retainers may undertake to respond to a post and thus take part in a conversation. Retainers can play online games in the target

language while communicating with other gamers. On the most independent end of the continuum, some retainers might start their own blog, Instagram posts, or podcast in their target language.

f. *Enhanced reading:* Learners can complement pleasure reading by simultaneously listening to the recorded version of a short story, as facilitated by audiobooks. Audiobooks engage learners' listening skills by delivering content on a computer or mobile device. Learners, depending on their proficiency and/or interest may choose the listen-only mode. Accessible content can be downloaded from library websites or purchased online, or through pre-loaded audio devices such as Playaway. Such reading-while-listening activities increase word recognition skills and listening fluency, in addition to enhancing the vocabulary. In their review of audiobooks in language teaching, Alcantud Díaz and Gregori-Signes (2014) cite research showing that audiobooks with content recorded by trained professionals can also serve as models of pronunciation and fluency.

g. *Enhanced listening:* In addition to audiobooks, listening content for L2 self-study is also accessible in the form of podcasts, and many podcast sites include transcripts of the podcasts. Rost (2014) notes that Podcast apps may also allow listeners to manipulate playback speed, and this, in turn, may improve word recognition and comprehension. Learners can benefit from listening to the target language spoken at a normal tempo and by listening to speakers representing different varieties of the target language.

h. *Apps and websites:* Technology is a potentially valuable source that allows language learners access to the target language and opportunities for learning anytime, anywhere, at their own level and pace (Larsen-Freeman & Anderson, 2011). There are various online materials as well as a limited number of paid apps (or combination of free access and paid) such as Duolingo and Livemocha (two apps with linguists on their boards, although Livemocha has recently been

retired). Language learning apps pride themselves on offering access to multiple languages. Depending on their purpose, they utilise different methods and materials to appeal to language learners and promote different skills. For example, Duolingo, offers language practice in the form of translation-based activities complemented by grammar and vocabulary exercises, and it is often evaluated as 'for beginners.' Livemocha emphasizes the role of peers in language learning. In their speaking and writing activities, learners record parts of a text or submit a prompt-based essay and receive feedback from their peers; they could also engage with native and/or non-native speakers to practice dialogues. The Tandem Language Exchange app emphasizes interaction by offering an opportunity to chat with native speakers. Among the advantages of these different apps, cost-free access is often cited. However, access to the paid version of the same app may provide access to different types of exercises and materials. According to Lloyd (2012), apps promote motivation through their game-like design, and potentially further self-autonomy by advising learners to monitor their progress and choose content that meets their goals and needs.

4. 0. Conclusion

It appears that external factors such as language use, literacy and others are of crucial importance in attrition. Even if attrition as a process is based on brain mechanisms and cognitive processes, external factors are most likely to play a major role in determining whether there will be attrition, to what extent, and what type of attrition will occur. In sum, we can say that attrition is cumulatively predicted by a) internal cognitive factors arising, for example, from characteristics of the memory structures underlying linguistic competence, b) structural organisation of the linguistic system (in relation with literacy) and c) linguistic aptitude of the subject, together with more task

dependent factors. Many of these cognitive aspects are closely linked to brain mechanisms and depend on constraints due to the characteristics of the human brain and mind. But the claim in what follows will be that the human mind does not develop in complete isolation, but rather in permanent interaction with the subject's social environment.

5. 0. Summary

In this Unit, you have learnt what language attrition in individuals entails. It is the loss of or reduction in the quality of language as a result of declining use by the speaker. Declining use is usually attributed to reduced contact with the language due to migration. Attrition can occur in first, second, or third language, depending on some peculiar factors. You have also learnt causes of attrition such as plasticity, memory, forgetting, literacy, language use, and motivation. These factors can be grouped into brain mechanisms, cognitive processes, and external factors. They are not mutually exclusive; they are interrelated, as the mechanism of attrition is a complex one. Furthermore, preventive measures against attrition are discussed in the Unit. They include extensive reading, joining book clubs, use of language learning apps, engaging speakers of the target language, and deploying technology-mediated resources. It is hoped that you will harness the knowledge you have garnered in the Unit to master the concept of attrition better, and prevent its future occurrence in your family and personal life.

6. 0. Tutor Marked Assignment

a. How does language use contribute to individual language attrition?
b. Examine four causes of language attrition in individuals.
c. Describe the impact of attitudinal factors on language attrition in a person.

7. 0. References/Further Reading

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