MODULE 3 SPEECH COMPREHENSION

UNIT 1 WHAT IS SPEECH COMPREHENSION?

CONTENT

1.0 INTRODUCTION

In this Unit, we shall examine what is speech comprehension and the processes involved in decoding the meaning of an utterance. When we use language properly and it is well understood people are able to communicate and convey information as well as interact among themselves. When we are not able to understand the import of a message we get frustrated and irritable.

Some of you will appreciate the response of Casca in Shakespeare's Julius Caesar when asked about what transpired at the capitol when Caesar was thrice offered the crown. "Those that understand him smiled at one another and shook their heads, but for mine own part, it was Greek to me" This statement underscores the importance of speech comprehension in conversation. It is the interplay of linguistic knowledge and the processes involved in language use that underlie speech comprehension.

2.0 OBJECTIVES

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

- explain speech comprehension;
- see the source of ambiguity in speech;

- discuss the process of speech comprehension;
- describe the Gricean Cooperative Principles; and
- detect inferences in speech.

3.0 MAIN CONTENT

3.1 General Overview

In our day to day use of language, we engage in conversation. It is therefore important to comprehend what is going onto enable us achieve the primary goal of conversation, which is understanding 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 general.

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 only interested in the message only but the deep structure of sentence 1 is not the same with 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 don't 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 Arabic Prayer even incoherently just to sustain the social interaction.

3.2 Decoding the Meaning of an Utterance

In language processing, comprehension takes place when the attention system became engaged. The long term memory is filled with information which will be retrieved quickly with the new linguistic input for rapid comprehension to occur.

The set of possible sentence for a given language is infinite. 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 other 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 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 is 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 sentence differs 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.

3.3 Speech Processing and Comprehension

Johnson et al (1973) in a study on how respondents perceive speech, report of instrumental inference in speech comprehension. When listeners were given two sentences

1. He was pounding the nail when…
2. He was looking for the nail when…

They responded that they heard the word hammer associated with the first sentence only. However, it is likely the first sentence is framed differently. "He was pounding the nails when it started to rain (note that hammer is not mentioned). The second sentence was "He was looking for the nail when the hammer was stolen" The first sentence shows that we might infer something about the instrument that was being used because many people associate hammer as the instrument to pound nails. The second sentence might not generate such an inference.

Decoders are always building a representation of the meaning of an utterance through processing of related sentence chunks. Each new sentence is integrated into that growing mental representation. When the sentence is related to the discourse structure, more processing effort will be required to integrate it to the semantic map. Sentences that have been more difficult to integrate or information that is not very related will be more available for recall after the processing is complete (Fernandez& Cairns 2011).Let us consider the following sentences:

1. We went to the zoo and saw different animals.
2. We went to the zoo in a big van.

The relatedness of 'zoo' and 'animals' is easier and more complete in sentence 1 than 'zoo' and 'van' in sentence 2.

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 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.

Fernandez and Cairns (2011) give further insight into the study of speech comprehension. They explain the role of pragmatics in the processing of speech and comprehension. 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 use language to convey more and often different information than that contained in the basic meaning of sentences.

I once witnessed and 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 already knows the import of such a sentence quickly apologized. The Yoruba know that to be from "a far place' is a 'cult location'. They also call it 'omoodoagba' (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 comprehension

Idiomatic expressions like 'kick the bucket' 'pull someone's leg', 'cry wolf 'are so opaque to comprehend that the hearer must have a shared knowledge of the usage of the expressions before proper comprehension could be effective. 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 comprehenders misrepresent the message by the speaker could be overcome if processing involves Grice (1975) Cooperative Principles. Grice asserts that conversations sometime contain implicatures which both speaker and hearer must observe if they want comprehension to be effective. May (2001) 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; argues 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

Explain the cooperative principles.

4.0 CONCLUSION

We have discussed what speech comprehension entails and explained that conversation is the primary goals of communication. It is important for the listener to understand what the speaker is saying so that the bidirectional nature of communication can be effective. The unit discussed what happens in decoding the meaning of an utterance and the dynamics of processing speech. We also mentioned the place of ambiguity in speech comprehension. Some theories of speech comprehension were examined while the maxims of cooperative principles by Grice offer insight into a better way of making speech comprehension more effective.

5.0 SUMMARY

In this Unit, we looked at what comprehension is and examined the process of decoding the meaning of an utterance. You were told that successful communication depends on both the speaker and the hearer who must ensure that the information being exchanged gets the desired outcome. Speech comprehension is more than the surface expression of utterance. Some shared knowledge and deeper level of understanding are necessary for correct interpretation of the message. You also learnt that decoding ambiguity is an essential part of speech comprehension. The garden path theory where the listener interprets an utterance before taking a close look was explained as incapable of giving you a total comprehension of the message. We explained that a better way of processing utterance is to consider the context and adopt the cooperative principles by Grice (1975).

6.0 TUTOR MARKED ASSIGNMENT

1. Explain speech comprehension.
2. Discuss sources of conflict in understanding speech.
3. What is ambiguity?
4. Distinguish between a request and a command with examples.

5. What are the 4 maxims of cooperative principles?

7.0 REFERENCES/FURTHER READING

Cacciari, C. & Glucksberg, S. (1994). *Understanding Figurative Language*. San Diego C. A: Academic Press.

Carroll, D. (1994). *Psychology of Language*. London: Brooks Cole Publishing.

Fernandez, E. & Carins, H. (2011).*Fundamental of Psycholinguistics*. West Sussex: Wiley Blackwell.

Ferrira, F. (2005). Psycholinguistics, Formal Grammars and Cognitive Science. *The Linguistic Review* 22, 365-380.

Frazier, L & Rayner, K. (1982). Making and Correcting Errors During Sentence comprehension. *Cognitive Psychology* 14, 178-210

Grice, H. P. (1975). *Logic and Conversation*. New York: Academic press.

Johnson, M, Brandeford, J., Solomon, S (1973). Memory for Tacit Implication of Sentence. *Journal of Experimental Psychology*. 98: 203-5

May, J. L. Clifton, C. Meyer, A & Wurm, L. (2003). Language Comprehension and Production. *Comprehensive Handbook of Psychology Vol. 4: Experimental Psychology*. NewYork: John Wiley & sons.

Wolf, M. (2007). *Proust and the Squid: The Story and Science of the Reading Brain.* New York: Harper Collins.

UNIT 2 SPEECH RECOGNITION

CONTENT

1.0 INTRODUCTION

Speech Recognition is an important area of study in psycholinguistics. It is concerned with how we perceive speech, interpret and then derive meaning from the message. 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 analyzed, fine-tuned, processed and interpreted to decode a message. Instances are seen in voice dialing 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.)

2.0 OBJECTIVES

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

- Define Speech Recognition (S. R.);
- discuss the features of Speech Recognition;
- describe some Speech Recognition models;
- distinguish between Bottom-up and Top-down information; and

- explain the processes of Speech Recognition (S. R.).

3.0 MAIN CONTENT

3.1 General Overview

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.

Wikipedia (2012) explains that Speech Recognition otherwise described as speech perception is the process, by which the sounds of language are heard, interpreted and understood. Studies in the area of speech recognition attempt to explain how human listeners recognize speech sounds and use the information to understand spoken language. Findings from such researches are coded and used to build computer systems that can recognize speech. Results are also helpful to language-impaired listeners and foreign language teachers. 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 Monde green" (Bond 1999).

Aslin and Pisoni (1986) quoted in Pisoni and Renex (2005) propose 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.

SELF ASSESSMENT EXERCISE

Explain the role of speech recognition in communication.

3.2 Features of Speech Recognition

Hocket (1958) reveals that human language has a distinctive characteristic that set it apart from other communication systems. It is symbolic and entails a dual patterning of sound and meaning. It is also grammatical thus allowing the generation of an infinite set of utterances. During the normal course of linguistic communication, we are conscious of the words and sentences spoken to us but rarely note the sounds. Most of the listener's awareness of spoken language is based on meanings not

sounds. An utterance consists of a sequence of discrete elements. These are the segments a listener perceives, which are based on the functional sound category of their speech community.

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 that 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', through', 'rough' and 'thought'. It will therefore be misleading to use the phonemic segment alone for speech recognition.

This corroborates Marslen-Wilson's (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) exemplify that when information is given in abstract sense without contextual clues, it will make no meaning and therefore comprehension becomes 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.

3.2.1 Levels of Processing in Speech Recognition

Speech Recognition could be seen as a process originating from the lowest level as acoustic waveform to the highest level of conceptual representation of an utterance as a linguistic object. Pisoni (1976) identifies four levels of processing in Speech Recognition. These are:

1. Auditory Level: It is the first stage in speech recognition when the acoustic waveform is transformed or recorded into some neural representation in the nervous system. All the information for speech recognition including the frequency, duration and intensity of the linguistic signals is extracted and coded by the auditory system. The linguistic information stored in the sensory memory will enable subsequent operations to be carried out to facilitate speech recognition.

2. Phonetic Level: The features and signal required for phonetic classification are obtained from the auditory representations of the acoustic signal. It is at this stage that sounds which represent phonetic segments are perceived in discrete form. The listener will match these representations with what is stored in the long term memory and pick the relevant ones that match the target language.
3. Phonological Level: Here, the listener will convert the linguistic signals in the phonetic segment into phonological segments. The phonological components will give the required information about the sound structure of a given language. Processing at this stage involves the application of phonological rules to the phonetic input to determine the extent to which the phonological segment functions as a distinctive element in the language. It is at this level that linguistic variations at the phonetic level are eliminated and only phonologically distinctive information is coded for further processing.

4. Higher Level Processing: This is the last stage of processing which involves lexical, syntactic and semantic interpretation of the original input. Here, the listener will generate the structure into which the phonological segments are placed and specify the

grammatical organization of the input. This information will guide the listener in the correct interpretation of the speech and subsequent word verification processing.

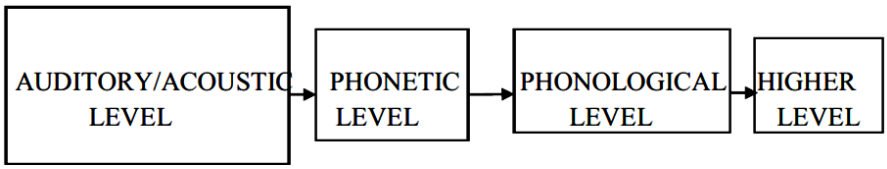


Figure 3: showing the levels of processing in speech recognition

SELF ASSESSMENT EXERCISE

Discuss the features of Speech Recognition.

3.3 Models of Speech Recognition

Though no model is presently acceptable as conclusive in determining what goes on in the Speech Recognition process, some models have been identified as good enough to give us some insight into the mechanism involved in a listener's attempt at speech recognition. A few of them will be examined in our discussion below:

1. **The Motor Theory Model**: 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 Model**: This model was propounded by McClelland & Elman (1986). It is one of the earlier and popular models 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 role 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 Model**: If you check your dictionary for the word 'cohort', it means group of related items, ally, or associate. 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 word. 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.

Apart from those discussed above, there are other emerging models being used 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 model. There are limitations to each model and there are no perfect models for speech recognition. Each model functions in a unique manner and circumstances will determine which one should be adopted.

SELF ASSESSMENT EXERCISE

Discuss any two models of Speech Recognition.

4.0 CONCLUSION

Speech Recognition deals with how the various linguistic segments perceived by the listener can be converted into a meaningful unit so that they can achieve comprehension. Despite the distortions, deletions and omissions involved in the structure of the utterance, the listener will impose a unity by relying on the highly organized pattern of their language and interpret accordingly the phonological, syntactic and semantic variables of the message. The four levels of processing in speech recognition should be noted. These are: Auditory, phonetic, phonological and higher analysis levels. Some theories of speech recognition have been propounded but they are still at the exploratory stages and no single model has been able to account for all that goes on during the process of speech recognition.

5.0 SUMMARY

In this Unit, you learnt about speech recognition as an important feature of comprehension in language development. We have 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. Your study in the unit was concluded by examining the features of speech recognition and the four levels of processing. Some models of speech recognition were discussed with a caveat that none could fully explain the mechanism of speech recognition.

6.0 TUTOR MARKED ASSIGNMENT

1. What is Speech Recognition?
2. Discuss the features of Speech Recognition.
3. Describe the levels involved in the recognition of speech.
4. Explain Bottom up and Top down information.
5. Distinguish the Motor Theory Model from the Cohort Model.

7.0 REFERENCES/FURTHER READING

Bond, Z. S. (1999). *Slips of the Ear: Error in the Perception of Speech of Casual Conversation.* San Diego, C. A. Academic Press.

Chomsky, N. & Halle, M (1968*). The Sound Pattern of English*. New York: Harper and Row.

Fernandez, E. & Cairns, H. (2011).*Fundamentals of Psycholinguistics*. West Sussex: Blackwell.

Liberman, A. M., Cooper, F. S., Shankweiler, D. P., & Studdert-Kennedy, M. (1967). "Perception of the Speech Code". *Psychological Review* 74 (6): 431–461

Marslen– Wilson, W. D. (1980). Sentence Perception as an Interactive parallel Process. *Science* 189, 226 – 228.

Pisoni, D. (1976). *Research on Speech Perception.* Bloominton: Indiana University

Pisoni, D. & Remez, R. (2005). *The Handbook on Speech Perception*. Oxford: Blackwell Publishing.

Hocket, C. F. (1958). *A Course in Modern Linguistics*. New York: Macmillan Press.

McClelland, J & Elman, J. (1986).The TRACE Model of Speech Perception. *Cognitive Psychology*. 18, 1 - 86

UNIT 3 PARSING

CONTENT

1.0 INTRODUCTION

In this Unit, we shall consider parsing as an important process in speech comprehension. Parsing could be described as a form of problem solving language strategy which involves decision making about where to place words and the way these words interrelate within sentences. During parsing you are expected to assign words in a sentence to their appropriate linguistic categories to allow understanding of what is being conveyed by the speaker. It is essential that the parser obey the grammatical rules suitable for speech comprehension. It is also important to note that linguistic information by the parser is accessed quickly in both comprehension and production for the goal of effective communication.

2.0 OBJECTIVES

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

1. define parsing;
2. distinguish the late closure and minimal attachment strategies;
3. discuss the features of parsing;
4. state the procedures for parsing; and
5. explain Garden Path Theory in parsing.

3.0 MAIN CONTENT

3.1 General Overview

The overall goal of speech comprehension is for both the encoder and the decoder to understand the message being relayed. Parsing comes in as a strategy to assist in the production and comprehension of the message. Carroll (1999) describes passing as a method of assigning the

elements of a sentence into linguistic categories. In considering a sentence like 'The boy goes to school', the parser assigns determiner + Noun+ Verb + preposition phrase. 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.

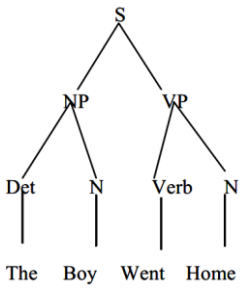
Carroll (1999) says the parsing procedure is a form of problem solving and decision making about where to place words. In taking such a decision, the parser must bear two principles in mind.

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.

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 a sentence into its components with the parse tree of 'the boy went home'



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.

SELF ASSESSMENT EXERCISE

Explain the two principles of parsing.

3.2 Features of Parsing

The parser needs to consider some features to enable them give a more effective interpretation to the message encountered. These include

1. Thematic Features
2. Semantic Features

1. Thematic Features: These are important linguistic elements to consider 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.

2. Semantic Features: 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 "Eko 2012: Rivers leads Medal Table as reported in the Daily sun of 29th November,2012, 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 is the on-going 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
Distinguish between Thematic and Semantic features.

3.3 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 the 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," it is observed that recalling the string of words is easier because the words are related to each other syntactically. It is a different situation when we have another sentence like:*"Time we'll see ball talk before jump food bread Lagos to great." With the admixture of grammatical categories in wrong positions, recall becomes 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 1 because 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'was Brilling and the slithytoves
Did gyre and gimble in the wabe
All mimsy were the borogoves
And the momerathsoutgrabe.

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 "Ngoziknows 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

Explain the procedure for parsing.

4.0 CONCLUSION

This Unit examined parsing as an important aspect of speech comprehension. In the process of understanding speech, parsing comes in to enable the parser consider all the essential segment of the message. A good parser will be able to grasp all the thematic and semantic

features of speech before taking decision where to assign the elements into appropriate linguistic categories.

5.0 SUMMARY

In this Unit, you were told that parsing is a problem solving strategy which enables the parser to take decisions before assigning words and sentences into appropriate linguistic categories for the ultimate goal of speech comprehension. Two principles are to be borne in mind for parsing to be effective. These are immediate principles and wait and see principle. You were also informed about features of parsing whereby consideration 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.

6.0 TUTOR MARKED ASSIGNMENT

1. Explain parsing.
2. Discuss the Garden Path Theory.
3. Examine the procedure for parsing.
4. Distinguish between Thematic and semantic features.
5. Describe Minimal Attachment strategy.

7.0 REFERENCES/FURTHER READING

Asheraft, M. H. & Klein, R. H. (2006). *Cognition*. Toronto: Pearson Canada.

Carroll, D. (1999). *Psychology of Language*. London: Brooks Cole Publishing.

Ferreira, F & Patson, N. D. (2007). The "Good enough" Approach to Language Comprehension. *Language and Linguistics Compass*, 1, 71-83.

Schmidt, C. (2012). *Understanding, Interpreting and Remembering Events*. Retrieved on November 9 2012 from https//www. parsing.html.

Wikiversity (2012). *Psycholinguistics/Parsing*. Retrieved on 5th Nov. 2012 from http://en.wikiversity.org/w/index.

UNIT 4 INTERPRETATION

CONTENT

1.0 INTRODUCTION

In this Unit, we will explain interpretation as an integral part of speech comprehension. We shall see how any speech process that is fully understood enhances communicative competence and how the reverse can lead to breakdown in communication. When a message is given the hearer needs to reconstruct the structural units that 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. The unit will further give us an insight into age-related process of interpretation. Studies have shown that children interpretation of sentence changes in later childhood. This presupposes that they would have acquired a more mature mental and linguistic cognitive processs which will enhance their ability to reconstruct and recreate semantic relationships

2.0 OBJECTIVES

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

- explain interpretation;
- describe the processes involved in interpretation;
- discuss features of speech interpretation;
- describe strategies of interpretation; and
- state causes of ambiguity.

3.0 MAIN CONTENT

3.1 General Overview

It is necessary at the outset to make some clarification that word interpretation could be misleading to an unwary observer. Some people take it to mean language interpretation which is the facilitating of oral communication between users of different languages. In this sense an interpreter is taken to be a person who converts a thought or an expression in a source language into an expression with similar meaning in the target language. When this interaction is in written form we talk of language translation. For example we can translate "let the good people come to me" into Yoruba language as "E jekienirerewasiodo mi"

In speech comprehension however, interpretation takes a completely different form. Here, we are 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 (1989), 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.

During interpretation, we need to bear in mind that the meaning of a sentence is a function of the words in a sentence and their structural 99rganization. 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 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 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 regions 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 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 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 EXERCISE

What is Interpretation?

3.2 Features of Speech Interpretation

Fernandez and Cairns (2011) posit that a linguistic representation based on the stimulus of a speech signal requires the hearer to have linguistic competence because they need the knowledge of the language to perceive the phonological representation which will unlock the sequence of words at the syntactic and semantic levels. The processes of understanding a sentence involve a systematic procedure which begins from the organization of sounds which are realized as words graduating to sentences. You know that all these stages derive from the hearer's knowledge of language which takes on the form of mental representation reconstructed indirectly from the physical speech signal.

McDaniel et al (1998) reports that during language acquisition children's interpretation of a sentence changes in later childhood because of increased knowledge about the grammatical characteristic of lexical items and an enhanced ability to create grammatical structures. Let us examine these sentences:

1. John met Mary before the exhibition.
2. John invited Mary to see the exhibition.

It was observed that young children interpret the two sentences to mean Mary will see the exhibition. The adult interpretation however is that John will see the exhibition in the first sentence while Mary will see the exhibition in the second sentence. The difference in the interpretation of young children and that of the adult is as a result of higher cognitive processing of the adult. An adult hearer possesses better linguistic knowledge of the properties of verbs and subordinating conjunctions.

In the same vein, Trueswell's (2008) experimental studies reveal that children interpret a sentence quickly until more cognitive processing is done before they are inclined to revise it. When they got an instruction such as: "Put the frog on the napkin into the box", a toy frog was quickly put on the napkin because an empty napkin and a box were provided. Adults did not interpret such a sentence in a similar way because they know that 'in the box' superseded 'on the napkin'. When the young children also interpreted "Cut the tree with the leaves", they assume that leaves will be used to cut the tree instead of the adult processing that only the tree with leaves should be cut.

The studies concluded that only in later childhood will children be able to alter their interpretation of such instruction because they have not overcome their 'cognitive impulsivity' which prevents them from revising initial hypothesis about meaning (Fernandez & Cairns, 2011).

However, as children mature in age, the development of cognitive control allows them to be more linguistically flexible in their modification of initial interpretations and thus they will need to reprocess such commands and sentences.

Since the ultimate goal of speech comprehension is to arrive at the correct interpretation of a given message it is important for the hearer to be aware of Grice's Cooperative Principles of relevance in an utterance.

According to Grice (1975), participants in any conversation assume that the other person will abide by the principles of relevance which states that the information given should be relevant to the matter under discussion. However, a shared knowledge of the issues relating to the conversation will form the basis of relevance. You will appreciate better this feature in the conversation below:
Emma: (talking to his sister) is papa at home?
Mercy: Music is playing.

On the surface, Mercy's response bears no relevance to the question by Emma. However, Emma can correctly interpret the reply to mean that papa is not around the house. This is because papa frowns at music being played to disturb the neighborhood and it is only in his absence that you can hear music being played aloud. The correct interpretation is possible because of the shared knowledge of both participants in the conversation: Emma and Mercy. Any violation of the shared knowledge will engender wrong interpretation of the message.

SELF ASSESSMENT EXERCISE

Explain 'Cognitive impulsivity' in children's interpretation of speech.

3.3 Strategies in Speech Interpretation.

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 categories 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 103rganization 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.

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 level. 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 play 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 reanalyzes the sentence on the basis of clearer information.

Also, when a listener meets with some ambiguous sentence 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 EXERCISE

Examine the strategies involved in interpretation of speech.

4.0 CONCLUSION

Interpretation in speech comprehension is the key that enables participants in a conversation achieve the goal of communication. 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 misrepresentation of a given message.

5.0 SUMMARY

In this Unit, we examined interpretation of speech as an important aspect of language development. We learn that when a message is correctly interpreted, the goal of communication is easily achieved. On the other hand an incorrect interpretation of an utterance can evoke severe frustrations and communication breakdown. You also learnt that young children undergo a period of ‘cognitive impulsivity’ whereby they quickly interpret a sentence as they see it until they analyze and discover that it may mean another thing. Adults, on the other hand, are more reflective, taking into consideration many factors before interpreting a message. The Unit mentioned the strategies of interpreting

speech as Top-down and Bottom – up processing and explained the Garden path model and the role of ambiguity in speech interpretation.

6.0 TUTOR MARKED ASSESSMENT

1. Explain speech interpretation
2. Discuss some features of speech interpretation
3. Describe Top-down and Bottom up Processing
4. What is 'Cognitive Impulsivity' in Children?
5. Write two interpretations of 'I wrote a poem on Niger Bridge.'

7.0 REFERENCES/FURTHER READING

McDaniel, D., Cairns H.S. & Hsu, J.R. (1990). Control Principles in the Grammars of Young Children. *Language Acquisition: A journal of Developmental Linguistics*. 4:297 -336.

Trueswell, J. C. (2008). Using Eye Movements as a Developmental Measure Within Psycholinguistics. *Developmental Psycholinguistics*. 73-96