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EXPLORING SYNTACTIC PROCESSING IN URDU SPEAKING BROCA'S APHASICS

[1]Tahira Shahid Nayab, [2]Muhammad Farman, [3]Shumaila Shoukat

[2]*Lecturer at UMT, Center for Language*
[3]*Lecturer, Lahore Leads University*
[1]tsnayab89@gmail.com, [2]muhammad.farman@umt.edu.pk
[3]shumaila.eng@leads .edu.pk

Abstract

Broca's aphasia is a kind of language disorder that results from damage to the posterior part of the frontal lobe of the brain. Aphasics largely retain their language comprehension abilities, however, they struggle with the production of speech. It is a consequence of the brain's weaker control over the muscles that produce language. The spoken expressions of aphasics vary from single to four words or so due to this difficulty in pronouncing the words. A deficit in syntactic structure is the natural outcome of this situation. It has been found about the English speaking aphasics that their expressions are very short, mostly consisting of content words. Occasionally an alteration in the semantic roles has also been noted. However, none of the studies has discussed the behaviour of Urdu speaking aphasics so far. An analysis of their expressions can contribute to the understanding of this aphasia in general. Speech samples and short histories of 5 aphasics have been examined for this study. It has been found that although their expressions do not follow any specific order, and vary from person to person, however, some universal attention grabbers have been found prominent in these expressions. Secondly, they put extra effort while telling about the objects that they personally liked. These findings can be helpful in understanding the nature and implications of Broca's aphasia in general.

Key words: Broca's aphasia, syntactic structure, Urdu, content words, function words.

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INTRODUCTION

Broca's aphasia is a kind of language disorder that results from damage to the posterior part of the frontal lobe. It can also be caused by various neurodegenerative diseases or aging. It is characterized by a difficulty in speech production. The aphasics can comprehend simple sentences (Johnson & Cannizzaro,2009) but their response to that comprehension is affected. The type and degree of inability to produce proper syntax depends on the severity of the disease. In most cases the aphasics know what they want to say but the frustration to get the right words and the difficulty in uttering words makes it difficult for them to say longer sentences. Their responses are, usually, limited to single words. (stroke association, 2020) However, when a single word is not enough to serve the purpose of communication, they make "utterances limited to 4 words or less". (Megan, 2024)

As the Broca's aphasics can hardly manage uttering a few words, they can't help missing the words that they consider "less important". Long ideas, undoubtedly, cannot be described in a few words. So, even with the few available words, they need a sequence to make sense. A deficit in syntactic structure is the natural outcome of this situation. Linguists have always been interested in discovering the syntax structure that they use while creating phrases and sentences. Many studies have been conducted for this purpose. Most of these studies are focused on the sentence structure of the English speaking community. Thus it has been found that they choose keywords like nouns and verbs. (Megan, 2024) While "the function words are usually omitted" (Damasio, 1992), and the sentences have "simplified structures". (Rezaii, 2023)

Some studies have been conducted in other languages too. For instance, Nurhayati has studied the sentence structure of Indonesian language (Bahasa), and has found 11 syntactic patterns in "Sentence Analysis in Broca's Aphasia". (Nurhayati, 2017) Some studies include Urdu speaking aphasics as well but the focus of these studies is different. So these studies do not contribute to the understanding of the syntactic structure of the phrases and sentences made by Urdu speaking aphasics. This study intends to explore the way Broca's aphasics structure their sentences in Urdu language. The aim is to discover if they retain the standard sentence structure SOV in Urdu or deviate from this pattern. This research is important in several ways. First of all, it provides data of the Urdu speaking Broca's aphasics. This knowledge, in turn, can facilitate a deeper understanding of the cognitive processes that take place inside the Broca's aphasics while they involve in language based interaction. Furthermore, on the basis of the results, the techniques used for the treatment of Broca's aphasics can be improved.

OBJECTIVES

1. To analyze canonical and non-canonical sentence processing with individual aphasics to understand their syntactic limitations.
2. To explore the syntactic processing of Urdu speaking Broca's aphasics.

RESEARCH QUESTIONS

1. What kind of sentence structure do the Broca's aphasics living in Urdu speaking communities use?
2. What kind of words do they not include (as they make shorter sentences), If they follow the same structure as the normal people do?
3. How do they alter the sentence structure, and how different is it from the standard structure?

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Vol. 3 No. 5 (2025)

LITERATURE REVIEW

Broca's aphasia has been associated with agrammatical sentence structures after Adolf Kussmaul (1877) coined the term "agrammatic aphasia" to describe the errors found in the sentence structures of those aphasics. He found two types of errors in particular, "aktaphasie" - the inability to put the words in the correct syntactic order, and "agrammatismus" - the inability to inflect words for numbers and tenses.

Another inability was pointed out by Jakobson in 1956 when he mentioned the breakdown of normal language functions in all aphasics in general, and the inability to use "shifters" in Broca's aphasics in particular. In his paper, "Two Aspects of Language and Two Types of Aphasics Disturbance", he argued that they struggle with "shifting reference" and are unable to convey spatial and temporal elements in speech.

Although the agrammatism in Broca's aphasics is basically due to omitting the function words, another study has found that this is also due to the "lack of verbs (compared to nouns)". The different inflections of verbs become a hurdle in the way of making a frequent use of verbs (Thompson et al., 2012). It requires more morphosyntactic encoding for tense, aspect and agreement, etc (Caplan et al., 2007). In addition to these organizational competencies, the aphasics, sometimes, lose the ability to assign correct semantic roles to the "agent", "theme", and "patient", etc, thereby reversing the semantic roles in their speech (Harold Goodglass, 1993).

In addition to omitting linking words that connect words in sentences, Hellicar found that "Broca's aphasia causes difficulty with spontaneous, fluent speech" (2023).
It was also found that the comprehension of Broca's aphasics was intact only for short sentences. However for longer and complex sentences as well as for passive voice sentences their comprehension abilities were not good. They struggled understanding passive sentences (De Barcelona, 2014).

Caramazza studied "Syntactic Processing Deficits in Aphasia" in 1981. This study was conducted at The Johns Hopkins University. They researched syntactic processing deficits in different kinds of aphasics. These aphasics were all right handed men who had an accidental injury on the frontal lobe of their left hemispheres three to four years before this study. Those aphasics included two Broca's aphasics too. Although both of those patients had different levels of the severity of the issue, both made considerable syntactic mistakes. Those aphasics were found "violating basic syntactic ordering relations". At times, they changed the natural order of nouns and verbs in the English language. For instance, "the chasing a cat are dogs" and "the gave to boy the it dog" included the sentences made by those Broca's aphasics.

Nurhayati has conducted a similar research in "Sentence Analysis in Broca's Aphasia, in 2017. She has found 11 sentence patterns that Broca's aphasics use in Indonesian Bahasa. Her findings suggest that these aphasics can produce declarative, interrogative and imperative sentence structures like normal people do. They don't alter the basic sentence structure.

A group of scholars has made a cross sectional study of 50 aphasics aged 40 - 70 years, and developed a "specific aphasia screener for adults in Urdu language (SAS-U)". They have found that patients with Broca's had low scores on social conversation, naming and sentence formation. This study does not provide any insights into the syntactic processing of Broca's aphasics.

Policy Journal of Social Science Review
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Nadir Ali and Muhammad Shaban Rafi have conducted a "Bilingual Aphasia Test in Urdu and its Clinical Implications" but again this test does not help understand what kind of sentences do the Broca's aphasics make.

This study has been designed to discover the syntactic structure of Urdu speaking aphasics. It will contribute to the understanding of the cognitive activity that controls the formation of phrases and sentences in those aphasics. It will be helpful, in return, to facilitate diagnosis, treatment and rehabilitation techniques for people suffering from Broca's aphasia.

METHODOLOGY

RESEARCH METHOD

This study used the qualitative research approach to discover the syntactic structure used by the Urdu speaking people with Broca's aphasia. This study aimed to get a deeper understanding of the cognitive activity of those aphasics by considering their speech expressions as well as their short histories including their age, sex, educational background, handedness, origin of the disease and other relevant details, etc.

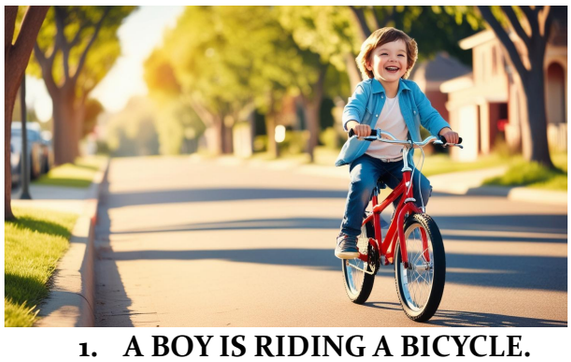
It is a descriptive research design as the collected data has been accurately described. The transcribed data has been analyzed for the dominant patterns in the characteristics of language production, errors and omissions, etc.

RESEARCH TECHNIQUE

The data collection method used for this study is the controlled observation method. The participants were not observed in their natural setting. A controlled environment was created for them to respond. They were shown different pictures and were asked to describe what they could find in those pictures. As they were going through the process of picture description, they were observed for their responses. Their responses were noted down for further analysis. This study can also be considered as a within-subjects design because each participant's response has been recorded after showing them different pictures.

RESEARCH TOOL

A set of 5 pictures was used for this study. While creating the pictures on Canva, it was ensured that every picture must show a complete action - there should be a subject and a predicate. All of these pictures contain at least one noun and there is a clear action taking place. Secondly, the actions shown in the pictures can be easily identified by aphasics. Similarly they can easily relate with the characters shown in those pictures. The underlying purpose was to eliminate the possibility of a single word answer. Those who responded with a single word were encouraged to speak more. However, when they did not add a word to their initial response, it was recorded as it is. These 5 picture have been given below:



1. A BOY IS RIDING A BICYCLE.

2. A GIRL IS EATING PIZZA.

Policy Journal of Social Science Review

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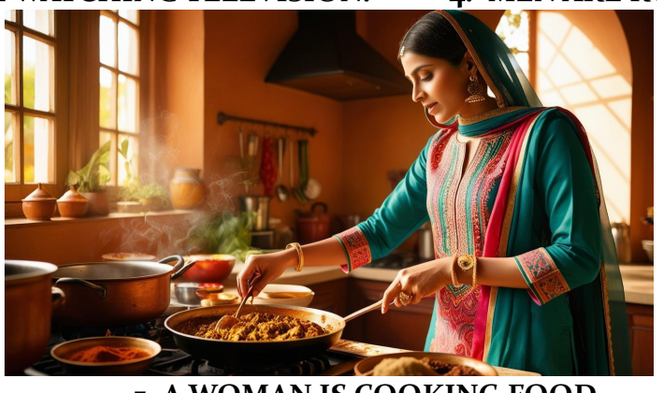
Vol. 3 No. 5 (2025)

3. CHILDREN ARE WATCHING TELEVISION.

4. MEN ARE RUNNING.



5. A WOMAN IS COOKING FOOD.

SAMPLE

The population of this study includes all of the people who have developed the language production disorder due to the malfunctioning of the Broca's area. However, this study was conducted on 5 Urdu speaking Broca's aphasics. One of them is a family member of one of the researcher. While other 4 participants were chosen from the people who visited Mayo Hospital Lahore on Tuesday April 29, 2025. People, who had difficulty in speech production due to other neurological disorders or impairments, were excluded from this study. The decision of their inclusion or exclusion from the study depended on their responses.

PROCEDURE

As a person's "spontaneous language" is the most suitable source of information to study his word choice, fluency and speech production, (Lezak et al., 2012), the method of showing some pictures to the Broca's aphasics and asking them for immediate response seemed a good strategy to get spontaneous speech samples. In order to provide them a stimulus, each of the participants was shown 5 pictures, one at a time. After showing them each picture, they were asked, "What is this?" While a participant was preparing his response, the picture remained in front of him/her. Only after the response to a particular picture had been recorded, that picture was removed. The participants were not given any clue or support. The purpose of the study was to discover the way they structure their response. Any support could affect their natural response. Moreover these responses were collected separately. Once a participant's response had been recorded, the next participant was contacted. Response of a participant could affect others' response.

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Every single word uttered by the aphasics was recorded. External support provided by the researcher was also noted down. Later, their responses were translated into English, and transcribed for further analysis.

In addition to the responses collected from the aphasics, the attendants and caregivers of the aphasics were requested to share brief histories of the aphasics, including the obvious reasons for this aphasia (if any), their language production abilities, their comprehension abilities, the activities like they can do independently, and the activities that they love doing, etc. This idea originated from the discovery of the fact that one of the participants, Pasha, who is the first cousin of one of the researchers, had an injury on the right side of his head. It was an unexpected fact because usually the left hemisphere of the brian is associated with language. The next task was to find out if Pasha turned left-handed after that incident (fall from the rooftop) or if he was left-handed by birth. It was a valuable insight as scientists are still researching the exact location of the language center in the brain. According to recent studies, it has been found that in 97 % of the people, the left hemisphere is responsible for language production and comprehension. However, in 19 % of left-handed people, the areas responsible for language are located in the right hemisphere (Nesw-Medical 2023). So narrative data was collected from the attendants of the aphasics to enhance understanding of the language abilities of the aphasics.

Before starting this study, a formal permission was taken from the attendants of the aphasics. When they agreed to the initial oral permission, they were asked to sign a written document for recording their permission to participate in the study. The document for permission was very simple and in their mother language, Urdu, to avoid any misunderstanding.

DATA COLLECTION

PATIENT 1. PASHA, AGE: 34 YEARS

His Responses:

Picture 1. *Bachha cycycle (child cycle)*

Picture 2. *Pizza larki* (pizza girl)

Picture 3. *Tee larkay* (television boys)

Picture 4. *Football (*football*) object (*he misunderstood it for playing football. Although there isn't any football in the picture*)*

Picture 5. *Larki khana paka* (woman food cooking)

PATIENT 2. AYESHA, AGE: 14 YEARS

Her Responses:

Picture1. *Larkay ki picture* (boy's picture)

Picture 2. *Khana kha rahay hein* (are eating food)

Picture 3. *TV dekh raha hae.* (is watching TV)

Picture 4. *Bhag rahay hein* (are running)

Picture 5. *Khana bana rahi hae* (is cooking food)

PATIENT 3. SANA, AGE: 37 YEARS

Her Responses:

Picture 1. *Bacha* (child)

Picture 2. *Egg* (pizza)

Picture 3. Bachay (children)

Picture 4. *Bachay* (athlete)

Picture 5. *Khana* (food)

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

PATIENT 4. FALAK SHER, AGE: 26

His Responses:

Picture 1. *Larka* (boy)

Picture 2. *Roti* (chapati) object.

Picture3. *Yeh cartoon dekh rahay hein.*

Picture 4. *Banday khel rahay hein.* (Men are playing)

Picture 5. *Salan* (curry)

PATIENT 5. REHANA, AGE: 45

Her Responses:

Picture 1. No response

Picture 2. No response

Picture 3. No response

Picture 4. No response

Picture 5. *Khana* (food)

KEY:

- Subject only
- Object only
- Sentence without tense/action
- Complete sentence with function words.
- Subject followed by object
- Verb followed by subject
- Object followed by verb
- Subject in possessive form
- Object followed by subject
- Subject, object and verb
- Object, verb and function words without subject

Serial	Aphasic's name	Picture 1	Picture 2	Picture 3	Picture 4	Picture 5
1	Pasha	*Bachha cycycle*	*Pizza larki*	*Tee larkay*	*Football*	*Larki khana paka*
2	Ayesha	*Larkay ki picture*	*Khana kha rahay hein*	*TV dekh raha hae.*	*Bhag rahay hein*	*Khana bana rahi hae*
3	Sana	*Bacha*	*Egg*	Bachay	*Bachay*	*Khana*
4	Falak Sher	*Larka*	*Roti*	*Yeh cartoon dekh rahay hein.*	*Banday khel rahay hein.*	*Salan*
5	Rehana	No response	No response	No response	No response	Food

Syntactic structure of the responses made by Broca's aphasics.

Policy Journal of Social Science Review

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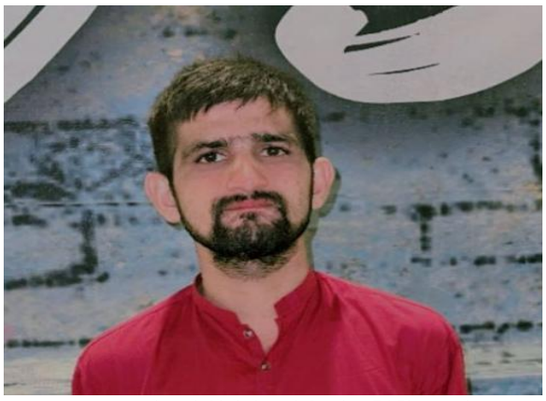
Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

DATA ANALYSIS

PATIENT 1. PASHA



Pasha is 34 years old. He was a weak child by birth. When he was six months old, he was unable to support his neck and head. Gradually he became somewhat better at these actions. When he started picking up things, he used to do it with his left hand. Although he couldn't eat independently at the age of one year, he used to put things into his mouth with his left hand. It indicates that he was left handed by birth. At the age of one and a half years, he fell from the rooftop. There was a serious injury on the right side of his head. There were 4/5 stitches on his head.

His parents aren't educated. They couldn't understand medical terms. All that they could make of what the doctors had said was that when the child would grow up and would start responding to different things, only then it would be found if his brain can work normally. When he grew up, it was found that his comprehension was unaffected by the injury but his speaking skills were highly affected. His memory was also affected in this incident. Otherwise, he can do many things independently: he can handle money, for instance. He keeps money in his wallet. Occasionally he buys different things and pays the correct amount. He understands how much is to be paid and how much to get back as balance. As he spends most of his time at home and watches his mother doing chores, he assists his mother in doing these tasks. He is interested in doing a job (although he can't do it) but he asks his parents to send him to work.

With this solid comprehension, which is characteristic of Broca's aphasics, he struggles to communicate properly. When he saw the picture of the boy riding a bicycle, he could utter only two words, *"Bachha cycle" (child cycle)* subject and object. The syntactic organization of this incomplete sentence is partly correct in the sense that it begins with the subject which, in turn, is followed by the object. However, the sentence is incomplete. Moreover, both of these words are content words. As Broca's aphasics struggle with function words, he didn't utter a single function word in any of his responses.

The second picture was perhaps interesting for him because he immediately responded with a single word, "pizza". Most probably the presence of a popular edible item motivated him to speak quickly. However he was encouraged to speak more by the researcher by saying, "What pizza? Say more." He added a word to this conversation and said: "pizza larki (pizza girl)". Here the syntactic structure of the expression is totally inverted. He placed the object first of all, which was followed by the subject. It suggests that although these aphasics fully understand the conversation, when it comes to speaking, they start with the word that they find more interesting in the context.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

For the third picture, his response resembled his previous response. However there was an improvement. This time his initial response consisted of two words. For the previous picture, he was encouraged to say more than a single word but this time he spoke two words without any delay. He just said: "Tee larkay" (TV boys). A television is usually called a TV by most of the people here in Pakistan. However he couldn't even say TV. The syntactic structure of this expression contains an object followed by a subject.

His fourth response consisted of a single word. This single word too is odd. Two athletes can be seen running in picture 4. There isn't a football in the picture. However, after seeing the picture, he said: "football". It appears that he watches football matches on TV. He thought that those men were playing football. As their feet and ground were not visible in the picture, he might have thought that there was a football near their feet. It depicts the cognitive activity that takes place inside the brains of Broca's aphasics. They can imagine the things which are not visible based on the visible things.

His fifth response was the longest one. He might have overcome his initial hesitation. Alternatively, he might have felt encouraged to speak more. Whatever the case, he made a sentence near to perfection. Instead of saying "Larki khana paka rahi hae", he just missed the verb inflection and the function word. He said: "Larki khana paka". The syntactic structure of this sentence is correct as it contains a subject followed by an object and a verb. Perhaps a practice session everyday can make him speak better.

Summing up, he did not use any function words in his responses. Only one verb was used by him. All of his responses started with content words, sometimes with objects and sometimes with subjects. It indicates that he does not use the accurate syntactic structure. Most of his responses were single words and the longest expression that he could make contained three words.

Another valuable insight from his case study suggests that the language controlling hemisphere in the left handed people might be the right hemisphere.

PATIENT 2. AYESHA

Ayesh is a 14 years old girl. Two years ago, while she was getting up from the floor, she hit a part of the kitchen slab. Consequently a part of the head was swollen but there wasn't any bleeding. Gradually the swollen sphere-like body on the head disappeared. She didn't have any health issues until last year when she started having a headache. It became frequent. The frequency and duration of the headache went on increasing. This headache was almost spread to the whole head but it was more severe in the left part of the head. She was studying in class 8 last year. She was unable to focus on her studies. She left her school. The severity of the headache made her cry. Later it was diagnosed that the injury that she had a

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Vol. 3 No. 5 (2025)

year ago had produced a lump of blood in the brain. It had started growing in size. It has spread to Broca's area. She had not only difficulty in speaking but also an unwillingness to speak. She felt and looked uneasy all the time. This feeling of uneasiness was visible on her face. She did not take interest in the conversation taking place around her. However, her comprehension had not been affected in this incident. She was visiting the hospital for the weekly check up.

When she was shown these pictures, she wasn't very interested in responding. Upon her mother's insistence, she participated in this study. On seeing the first picture, she made a sentence that was complete but it was a simple description of the picture. There wasn't a verb in the sentence, and it didn't indicate any tense. She said "*Larkay ki picture*" (boy's picture). This descriptive sentence is the only one example of this type, no one else made a similar sentence. Although she could see a boy riding a bicycle, she didn't mention the bicycle at all.

After seeing the second picture, she made a sentence for a plural subject. There is only one girl in the picture. However, she said: "*Khana kha rahay hein*" (are eating food). This expression starts without a subject. After the subject, there should be an object, so it starts with "khana" which means food. It is followed by verb inflection and a function word. Why did she use the form of the verb that is used only with plural nouns, could not be investigated.

Similar confusion is found in the third response where many boys are watching TV. She could see them clearly in the picture but the verb inflection that she used is appropriate only with a singular subject. In the previous picture, there was only one girl but she used the verb inflection that is used with plural subject. In this case, the subject of the action is plural: there are many boys but the verb inflection that she used is appropriate for one person only. Again she did not mention the subject and started her expression with the object. She said: *"TV dekh raha hae" (is watching TV)*. Again she has used a function word too. Starting with an object, there is a verb and a function word. The syntactic structure of the phrase is, however, correct.

Her next response was similar to the previous responses in the way that it lacked the subject. When she saw the picture, she said: "Bhag rahay hein". Such a response could be expected from the questions, "What are they doing"? Or, "What is happening in the picture"? Such questions were carefully avoided. Instead she was asked, "What do you see in the picture"? There was no confusion at all. The question posed to her clearly demanded her to say whatever she could see in the picture. The syntactic order of the remaining sentence (phrase) was correct and complete with the correct verb inflection and a function word.

Her next response followed the same pattern. After omitting the subject at the beginning, she started with the object, "*Khana bana rahi hae*" (is cooking food). The syntactic order of the phrase is correct and the same as made by healthy people. In short, most of her responses started without the subject of the action. She might have thought that the subjects of the sentences were visible and understood. That's why she ignored them. She used verbs in their correct inflection. However some of her responses indicate some problems of comprehension.

She is at the initial stages of the disease and is very young. The syntactic structure of her responses seems intact and preserved yet. It enabled her to use verb inflections and function words.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

PATIENT 3. SANA

Sana is 37 years old. She can comprehend instructions very well. She can do chores as well. She cleans the house, does dishes, cooks food and washes clothes independently. However, her memory is not good. She remembers days and dates but she forgets where she had put something. She is unmarried. When she was 3 years old, she had fallen from the swing and hit the ground on the left side. There wasn't any visible injury on the head. She became unconscious. She regained consciousness after a few minutes. Her left eye got affected by this fall. Her vision became blurred. It wasn't realized immediately that her speaking skills also got affected. She could easily communicate before this incident. It was realized after a few months that she had stopped making the long sentences that she used to make.

Her mother said that before the incident, she made the sentences like "*Mein nay bhi roti khani hae*". (I also want to eat food.) "*Mein nay yeh salan nahi khana*". (I don't want to eat this curry.)

After this incident, she was found struggling with the delivery of words. Initially she made sentences with content words only- the telegraphic speech that is characteristic of Broca's aphasia. Later she settled with one word or two words only. The main purpose of her visit to the hospital was for a problem related to vision but she wanted to avail this opportunity to connect with a doctor related to Broca's aphasia to get any possible support. For all the pictures that were shown to her, her responses were limited to single words. However there were different syntactic elements that she chose for her responses.

On the whole she was hesitant to respond. When she was motivated by her mother to speak, she saw the first picture and said, "*bacha*" (child). Although there are two nouns in the picture, a child and a bicycle, she chose the subject. For the second picture, however, she chose the object, "egg". She used the English word, egg, instead of saying "*unda*". It is a common practice in Pakistan to use English words in Urdu or Punjabi conversation (code mixing). However, there isn't an egg in the picture. It is a pizza. Her choice might not be due to any problem with comprehension. Rather it might be due to the fact that she might not have eaten a pizza. It is an expensive food item. People living in villages and poor people living in cities cannot afford to buy this food item. She used an object for her response which is not a normal order of the sentences.

The third picture could stimulate her to say only *"bachey"* (children). TV and cartoons could also be seen in the picture. She chose only the subject and didn't say anything about the subject. For the fourth picture, she used the word "bachay" (children). This word is the plural form of the word "bacha" (child) that she had used for the first response. The people shown in the picture are not children; they are men. The previous picture of "children watching TV" might have caused her to think that they were also children.They are running. Perhaps the idea of running made her think that they were children. As the current study is not related to the comprehension of Broca's aphasics, that's why the act of calling men "children" can be ignored.

In her fifth response, she chose the object. She said "khana" (food), although the woman is much larger in size. She chose the words (more precisely nouns) independently of their sizes. The syntactic structure of such a response cannot be considered correct.

PATIENT 4. FALAK SHER

Falak Sher is 26 years old. He could communicate normally like other children do. When he was about 10 years old, while flying a kite, he slipped and fell down on earth. There was a broken brick lying over there. Left side of his head hit that brick. He was badly injured. His head was bleeding. He was taken to a nearby hospital. He got some stitches on his head.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

There is no hair on that part of his head. After that injury he couldn't speak properly. Although he listens to everything, understands it, and carries out the commands. However, when it comes to speaking, it's so laborious and difficult that he usually responds with body gestures and very short sentences. He lives in a village where people don't have awareness of Broca's aphasia. Children living around his house think that he has turned mad. They call him "pagal" which means "mad". He understands it and reacts to it. He is annoyed at it. He abuses them in return. That's why he doesn't like going outside. His parents had brought him to the hospital because lately he has started stuttering (stammering), and takes reletively a long time to start a word.

After having a look at picture 1, he said just one word "larka" (boy). There was a bicycle too in the picture. Moreover the boy looked very happy. But he didn't seem interested in the picture and pointed to the subject of the action. When the syntactic structure of his response is considered, it seems following the standard pattern because he started his sentence with a subject.

The main response for the second picture was the object of the action. This response was totally opposite to the previous one. He lives in a village. He might not have heard of "pizza". As it resembles something that he eats everyday, a "*chapati*", he called it "*roti*".

His response to the next picture 3, was surprisingly elaborate. He might have liked the activity shown in the picture or it might contain something that he liked very much. Whatever was the reason, his response followed the correct syntactic structure, "Yeh cartoon dekh rahay hein". (They are watching cartoons). Although his sentence is a bit different from what was expected. He didn't use the words, boys or children. He said "yeh". Its literal translation is "these". His mother said that he likes watching cartoons. His favourite activity is to sit in front of the TV and watch cartoons for hours. It might indicate that if the aphasics have a personal liking for something, they might make extra effort to express it. Not only the syntactic structure is correct but the verb inflection is also accurate. At the same time, a function word has also been added to make it a complete and correct sentence.

In his next response, he maintained this high energy and used the correct subject instead of using a vague pronoun. The expression, "Banday khel rahay hein" (Men are playing,) is the perfect sentence that anyone can make in this context. Its syntactic structure is made up of a subject and predicate. Use of plural noun, verb inflection to suit that plural subject and the function word is accurate and perfectly assembled. Although men are running in this picture, they appear to be playing. Running seems to be a part of their sport.

However, in his last response he uttered just a single word, "*salan*" (curry), which is the object of the action shown in picture 5. The syntactic structure of this response indicates violation of the natural order of constituent parts of speech.

PATIENT 5. REHANA

Rehana is 45 years old. She was in the surgery ward of the Mayo Hospital at that time when this study was made. She has been suffering from Broca's aphasia for a long time. However these details were not known to her attendant (her sister-in-law). She was admitted to the hospital due to a road accident. She had surgery two days before this investigation. When she was contacted, she was lying in bed. Her attendant was trying to make her drink juice but she was shaking her head. She did not like saying anything. When her attendant made a forceful effort to make her drink juice, only then she uttered a word, *"nahin"* (no).

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Online ISSN 3006-4635
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Vol. 3 No. 5 (2025)

She saw the pictures and hopefully understood everything that was happening in the pictures as there was no confusion on her face. However she was in so much pain that she couldn't say anything. Her attendant said that before the surgery she used to communicate with very short sentences. Most of the time she used a word or two to say something. Using three or more words was not a common practice for her. About her comprehension she said that it was mostly intact. However she had some issues with memory. When she was shown these pictures, she moved her head towards the pictures and saw all of these with interest but remained silent. She responded after picture 5 (when she had seen all of the pictures). She said one word, "knana" (food). The only response that she made contained an object. From this single response, it can be deduced that the syntactic structure cannot be correct. Normally sentences start with a subject not with an object. Although passive voice sentences start with objects but in Urdu language, passive voice sentences are not that common, particularly in this case. It would be highly improbable to say "*khana aurat say pak raha hae*" instead of saying "*Aurat khana paka rahi hae*". (It would be improbable to say "The food is being cooked by a woman" instead of saying that "A woman is cooking food". So the syntactic structure of her expression is not the same as common people use.

FINDINGS

Most of the responses came as single words which suggests the difficulty that those aphasics face in uttering the words. Although they could understand what was happening in the picture, articulation of the ideas was so difficult that they preferred to say a single word. At the same time, their longer responses suggest that they have settled with short answers. The habitual use of single words is also a hindrance in the way of longer expressions.

As it was expected, most of the responses consisted of the telegraphic speech which is a characteristic of Broca's aphasics. Most of the expressions were formed with content words, while function words were omitted. However the youngest participant made use of the function words. It suggests that with age as well as with severity of the disorder speech becomes devoid of the function words. The younger participants also made use of the verb inflections. It is suggestive of the fact that aging and severity of aphasia causes this loss.

Some of the responses started with the subject of the action. It suggests that the aphasics had retained the knowledge of proper syntactic structure. It was preserved in spite of suffering from aphasia. It was an effort on their part to follow the standard canonical structure.

Some of the responses started with the object of the action.

This sentence structure is non canonical. Active voice sentences usually start with a subject. The pictures were deliberately chosen to show an action that requires active voice structure. The passive voice sentences of these actions are not common in Urdu language. Secondly these aphasics struggle with the comprehension of passive voice sentences. Hence, production of such a sentence cannot be expected from those aphasics (De Barcelona, 2014). So, it cannot be assumed that they were trying to make passive voice sentences for their responses. It would be very unusual.

This choice of putting the object first can be interpreted in several ways:

The aphasic might be more interested in the object of the action rather than its subject.

Alternatively, saying the subject word might demand more effort than the subject.

Some of the responses started with the main verb of the action.

Only imperative sentences start with a verb in Urdu language as in English language. These imperative sentences can be used to make a request or to order someone. Definitely the

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Online ISSN 3006-4635
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Vol. 3 No. 5 (2025)

context of these pictures was not relevant to either of these situations. So, starting a sentence, can also be interpreted in various ways:

The aphasics might have chosen to ignore the subjects to make their responses shorter. As speaking is effortful, ignoring the subject could simplify the expression.
Alternatively, the aphasics might be more interested in the actions rather than the subjects or objects of these actions.

When there were two words the combination was not the same. It was different in different responses and with different participants.
Sometimes the subject was followed by the object, which is a natural order in Urdu language. Sometimes the object was followed by the subject, which is a non canonical structure in Urdu.

Sometimes the object was followed by the verb, which is a normal order in Urdu language. It suggests the preservation of natural syntactic processing. Different aphasics produced responses of different lengths. Even within the responses of a specific participant, the length of various responses was different. Some of the responses were single words while the responses made by the same participant were of five words. The reasons behind this versatility can be investigated but were beyond the scope of this study.

Picture 2, where a girl was eating a pizza got the most unusual responses. All of the participants ignored the agent of the action and pointed out the object (pizza). Although somebody called it "pizza", somebody"egg" and somebody "roti". However, there was a uniformity. They named the food item. It suggests that when there are different objects in the context, focus turns on food. Thus the food items are more attention grabbing than other objects. Perhaps it was due to the relevance of food to everyone's life.

LIMITATIONS

While this study has made some important findings, there are some limitations too.

In the first place, its sample size is not very large. Only 5 people's responses were recorded. These responses might not be a true representation of all of the possible responses, so, any conclusion cannot be applicable to the larger Broca's aphasics community.

Secondly the aphasics might not have responded the way they respond in their natural setting. The researcher's presence and a sense of being observed might have affected the way they commonly communicate. They might have behaved somewhat formally.

Thirdly the aphasics were of different ages and had different levels of the severity of the disease.

However the contribution of this study is undeniable.

It has been found that the aphasics do not always follow the syntactic structure that normal people do. They do deviate from the standard syntactic structure.
Some deviations have been found in their responses.
Moreover these deviations do not follow any fixed pattern and differ from aphasic to aphasic.

Similarly the additional information about the aphasics has facilitated understanding their cognitive activity.

At the same time, it has opened the door for further research. There are many things that can be discovered about them. For instance when there are two or more nouns in the same picture, it can be researched which one they choose for response.

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CONCLUSION

It can be inferred from this study that all of Broca's aphasics do not communicate in a similar way. The structure and length of their speech is varied and heterogeneous. Most of them prefer to use single words to communicate. The single words that they use to describe an action, can be the subject, object and sometimes the verb of the action they want to talk about. It was also observed that as the people around them understand their single word expressions, they become habitual of using shorter expressions and do not like putting extra effort to make longer expressions.

When they use speech expressions longer than a word, they do not follow any syntactic structure. These non canonical structures may contain a subject followed by the verb, a subject followed by the object, an object followed by the subject or even a verb followed by the subject or object of the action. They have the tendency to order the words in different ways to convey their meanings. They do not follow the natural syntactic structure of Urdu language, and have been found altering it in a variety of ways. The natural syntactic structure has been found somewhat intact and preserved in younger aphasics than the older ones. Similarly the aphasics whose disorder was not very severe or they were at the early ages of the disease, their syntactic processing was slightly impaired. As the disorder becomes more serious or the aphasics age, they lose the ability to structure the sentences correctly. It has also been observed that if they have a personal liking for something, they make extra effort to say more about that thing and make longer speech expressions.

Their language comprehension abilities were mostly unaffected. There was not even a single example that could be used as evidence to show that they could not understand what they could see or what they were asked to do. However, while organizing their response, they faced some confusion. However there weren't any examples of the expressions in this study where semantic roles were reversed.

Food is among those universal attention grabbers that remain prominent whatever the context. The picture containing a food item provided evidence for this statement. All of the aphasics pointed out the food item after looking at that picture.

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