

Role of Speech Therapy in Overcoming Lexical Deficit in Adult Broca's Aphasia

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Abstract

This is an exploratory study and qualitative in nature. Unit of exploration is 'Adult Broca's Aphasic Patients.' This paper aims to explore the function and integrity of 'Speech Therapy' for adult Broca's aphasia. Aphasia is the after-effect of brain damage, commonly found in left hemisphere which disrupts language faculty. Present study focuses on 'Lexical' aspect of language in which an individual faces trouble in processing of words. In Broca's aphasia affected individual suffers from diminished capability of speaking/communication. To recover such diminished capabilities, speech therapy is utilized. This study intends to investigate the effectiveness of speech therapy that how speech therapy helps to adult Broca's aphasia to recover their speaking or conversing skills? Participants of the study are 'Speech therapists.' Purposeful sampling, particularly Snowball sampling has been undertaken. Semi-structured interviews have been conducted from five speech therapists, which have been analyzed through thematic analysis under the light of 'Sketch Model' given by De ruitter and De beer (2013). Findings of the study suggest that speech therapy may be proved helpful for Broca's aphasia to recover their communicating capabilities but it requires much time (minimum 6 months). Moreover, recovery depends upon certain factors. For instance; Age, Level of disorder and Willingness.

Keywords: Broca's aphasia; Lexical deficit; Speech therapy; Communication; Speaking skills

1. Introduction

This research paper affiliates with neurolinguistics, which is one of the fields of linguistics that investigates language impairments that follow brain injury in terms of language structure (Basso, Fobes & Boller, 2013). Neurolinguistics converses about neural processes that regulate language acquisition, comprehension, production, and communication disturbances. Therefore, it undertakes 'Speech identification,' 'Lexicon' and 'Sentence formation,' 'Semantics' and 'Discourse' in both; normal talkers and those who have language disabilities (Ingram, 2007).

Lots of people believe that the physical basis of language is in the lips, tongue or ear. But deaf and dumb people may have complete linguistic system. People, who are incompetent to move their vocal cords, may still be competent to apprehend language. Language is most precious possession of humans that is omnipresent. It is as essential as air for breathing to humans. All language-deficit conditions are not always genetic. Aphasia is also one of them. There are numerous reasons that can cause aphasia. For instance; 'stroke,' 'head injury,' 'accident,' 'shock' or even an infection in the brain. However, stroke is considered as the largest threat to language skills. Due to this illness, the link between brain areas governing language and organs connected with language is shattered, which affect language skills (Qayyum, 2015).

There are diverse categories of aphasia. But, present study deals with Broca's aphasia which is one of the types of aphasia. Broca's aphasia is also known as 'non-fluent aphasia' because in this, affected individual have flaw in the area of language production. While, comprehension of language remains unimpaired (Goodglas & Kaplan, 1972). Broca's aphasia may be found in people with varied ages. However, this study has particularly centered adults.

Aphasia can disrupt different levels of linguistics such as, morphology, phoneme, syntax, semantics, pragmatics and lexis (Edward & Salis, 2015). However, this research

paper on the whole deals with lexicality (Lexical deficit condition), which is diminished condition of vocabulary. Basically, it is deterioration to one or more of the systems in the processing of words. For instance; difficulty in practicing words during reading, spelling, comprehension and even producing single word. (Rapp & Caramazza, 1991). Every person requires to do contact with one another. So, language is the tool to make this contact possible, and means of communication as well. Language process does not experience any impediment for normal people, because language simply slides from utensil. On the other hand, who have restraints in their minds, they experience difficulty in the communication process as well. Such difficulty is experienced by people with Broca's aphasia (Hartini, Sudana & Gunwana, 2021). In order to get better and cope with lexical deficit condition, present study has selected Speech therapy as gear for people with Broca's aphasia. Speech therapy is a technique or service that supports to progress language development, practical and communicative language skills (Smith, 2014). Usually, process of speech therapy begins by determining disorders. When disorder is identified, then best way is acquired to treat present condition. In speech therapy, exercises may differ according to age and condition. Some activities have been mentioned by Longhurst (2019) for children:

- Develop connection via talking, playing and by means of books, pictures and other things which can arouse language progress.
- Upskill children through apropos age games that can correct their sounds in terms of uttering syllables.
- Provide suggestions to parents or care giver to perform some activities at home for speech therapy.

While, Rowden (2021) have suggested following different tactics for adult speech therapy:

- Train them through problem sorting activities and conversation practices.
- Employ breathing exercises to assist echo problems.
- To make verbal communication stronger, carry out mouth drills.

Succeeding section (2) reviews all the related studies that have been done in the line of work of speech therapy for adult aphasic patients. Alongside, historical background of aphasia and theoretical framework has been discoursed. Moreover, methodology section (3) talks over following aspects of present article: paradigmatic, epistemological, ontological and axiological stances of study; employed sampling and tool; site of study, procedure of data gathering and its analysis. Whereas, section (4) reveals the results of gathered data. Lastly, section (5) provides conclusive lines with the implications of study and recommends propositions for forthcoming researches.

1.1 Aim and Objectives

This paper aims to explore the role of speech therapy in terms of its function and integrity for adult Broca's aphasia to overcome lexical deficit condition during speaking or communicating with others. This study intends to investigate the effectiveness of speech therapy for people with Broca's aphasia to recover their performance in terms of speaking or conversing skills.

- To explore the use of speech therapy for adult Broca's aphasia to deal with lexical deficit state in communication process.
- To investigate the effectiveness of speech therapy to recuperate speaking and conversing capabilities of people with Broca's aphasia.

1.2 Research Questions

Q: 1 How does speech therapy help to adult Broca' aphasic patients to overcome their lexical deficit state in order to enhance their communicating abilities?

Q: 2 To what extent speech therapy is effective for people with Broca's aphasia to recover their speaking and communication skills?

2. Literature Review

In this part, historical background of aphasia and contributions of different researchers have been discussed, regarding the starring role of speech therapy in aphasic condition. Additionally, it has demonstrated the theoretical frame work that imparted dimension to the study for research questions and data analysis.

2.1 Historical Context of Aphasia

Study of aphasia associated with specific areas of brain, particularly left hemisphere was initiated in 19th century by two well-known neurologist; Paul Broca and Carl Wernicke. Paul Broca was basically a surgeon in France. For a long time, he observed a patient, named M. Leborgne. Leborgne seemed to comprehend, but was incapable to speak save for a meaningless recurrence of "tan." After some time period, he became paralyzed by his right arm and leg. Later, Leborgne's death autopsy unveiled substantial brain damage in his brain. The part of brain that got damage was fronto-temporal, undoubtedly caused by cyst. Broca also examined other cases related to this, and revealed his findings in 1861. He proclaimed in 1865 that our left side of brain is involved when we talk. Carl Wernicke was a German neuro-psychiatrist. After nine years, he provided description of eight persons, who also had language impairment following brain damage. Though, this language disorder was not similar to that was described by Broca. These individuals had trouble in apprehension, could speak smoothly. Whereas, Individuals with Broca's discovered disorder were capable to apprehend, but their speaking had many lexical and semantic omissions and meaning was tapered. On the behalf of investigation, held during post-mortem, both physicians detected that the lesions are in the left cortex. Broca described a lesion in the frontal lobe. On the other hand, the injuries examined by Wernicke were posterior to this (Edward & Salis, 2016).

2.2 Reviews Related to Speech Therapy

Speech therapy or speech pathology is a domain of skill, applied by clinician. Its beginning lies in America around 1925, when speech disorders and speech correction were taken into consideration at the level of practice. Far ahead in 20th century, its execution commenced at broader level. Various studies indicate that speech therapy is being used as a mediating service that works on language improvement. Speech and language therapy is being used widely for aphasic patients, having different etiologies. It has shown to be effective. It targets to maximize the performance. A meta-analysis recognized thirty controlled trials with speech therapy that were performed between 1969 and 2009. It shown beneficial results in a variety of linguistic parameters. For instance; impulsive speech, use of gestures, severity of aphasia, expressive written skills and most important apprehension. During therapy, patients learn new tactics of interaction to use in everyday life that improve his/her communication abilities by engaging them in many language-based activities (Farrajota, Maruta, Maroco, Martins, Guerreiro & Mendonca, 2012).

As, Latif (2015) stated that aphasia is a condition that disrupts communication skills. In this regard, speech therapy is taken as an implied option to boost communication skills. Further, he added, speech therapy is an individualized in nature, depend upon patients' state and requirements as gauged by speech therapists. Majority of the patients pass through a period of prompt recovery, following brain injury in which they recuperate a great deal of language function. During practices, patients repeat words and phrases. Patients recover a great deal of language function with different pace.

However, some researches reveal the role of speech therapists in the recovery of language for aphasic patients. Quality professional therapy can considerably passage stroke

patients' recovery. Actually, therapists are the ultimate resource for stroke patients because initially, they evaluate the deficit condition of patients then they pay attention on required challenges (Saebo, 2016). Correspondingly, Brady, Godwin, Enderby, Kelly & Cambell (2016) mentioned outcomes of their study in which they pointed out two important aspects: first, Speech and language therapy (SLT) is a convoluted rehabilitating intervention, aims to improve language and communication skills. SLT is considered operative for people with aphasia, for the development of following skills; reading, writing, communication and useful interaction. Second, higher degree of therapy may be useful, but may not be appropriate for all.

Moreover, Stephens (2017) stated that speech language therapy (SLT) reinforce aphasic patients to communicate their feelings and thoughts in everyday life circumstances. Further, he said while denying the role of society that there was no proof of social support or stimulus that leads to any advancement in functional communication. Besides, there are certain factors which influence on the recuperation of linguistic recovery. Aphasic condition includes two factors; first one is stroke age and the second one is receiving aphasia treatment because language therapy keeps a powerful and long term influence (Jhonson, Vasilakos & Yourganov, 2019).

2.3 Theoretical Framework

For this study, The Sketch Model has been used as theoretical framework, which was given by De ruiters and De beer (2013), has been presented in figure 1. Model expounds the association between gestures and speech, along the communicative purpose of gestures. Gesture and speech emerge from a joined communicative meaning and work interactively to articulate that meaning. This model elucidates that development of gestures and speech, pre-linguistically originate in the conceptualizer, where thoughts get generated. Propositional and imagistic info retained in working memory, are regained and then speaker selects, which bit of the communication will be transferred through gestures or in verbal mode. Sketch and proverbial message are devised and directed to the Gesture Planner and Formulator, respectively. Both, Gesture Planner and Formulator work freely from one another, which give rise speech and gesture as output. In the development of message and speech, lexicon/lemmas and forms play a significant role which assist to the grammatical and phonological coding. While, environment influence in the production of gestures. This model provides following implications. On the basis of these implications data has been analyzed:

- Gesture and speech get up from a conjoint communicative purpose.
- They work together to deliver that intention.
- Isolated pathways allow for interruptions between speech and gesture, following brain damage.
- Gestures can compensate for troubles in the Formulator (grammatical and phonological encoding) and Articulator (speech).

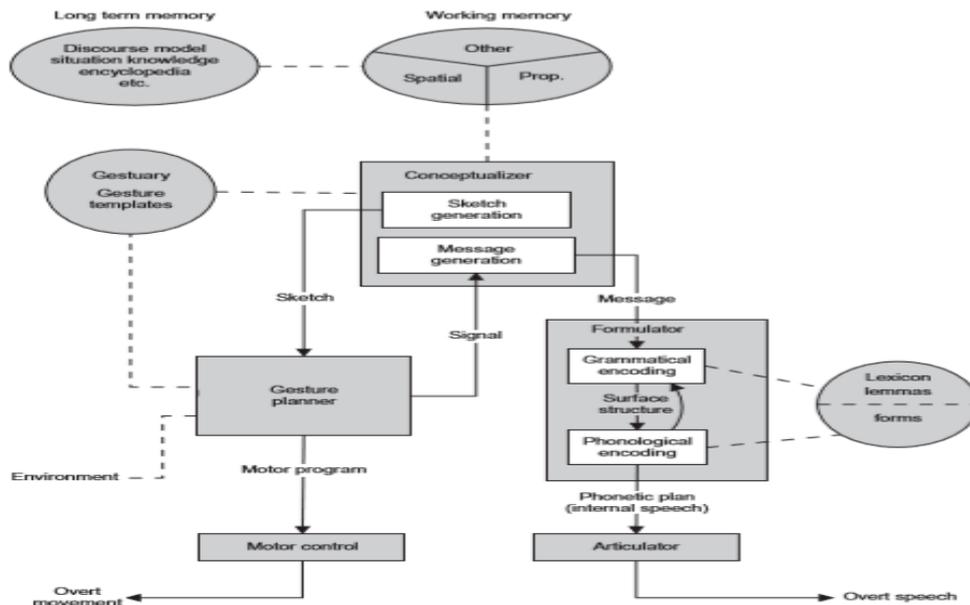


Figure: 1. The Sketch Model” given by De ruijter and De beer (2013).

3. Methodology

3.1 Paradigm

Paradigm provided channel to present study apropos of choosing method and tools to detect the role of speech therapy for adult Broca’s aphasia to overcome lexical deficit condition during speaking and conversing. Paradigm is a way of studying and interpreting the reality of the world (Rehman & Alharthi, 2016). It is essential to deem paradigm of research before initiating it, because it proposes extensive groundwork of view, understanding conviction within which theories and practices operate. A research paradigm is considered as a researcher’s worldview about how to accomplish research. Paradigm of present article is ‘Constructivism.’ Constructivism deals with interpretation from an insider stands point. Hence, this is also named as ‘Interpretivist.’ This paradigm says that truth is socially organized. Therefore, this paradigm is known as Constructivist. (Bogdan & Biklen, 1997).

3.2 Epistemology

Epistemology means ‘Knowledge.’ Constructivism takes on Subjectivist Epistemology in which researcher builds understanding through social constructs and his/her personal engrossment in the real life within the natural surroundings (Punch, 2005). In this study, source of knowledge is authoritative, because data has been collected through speech therapists. If data is collected from people, books or leaders of the organization, then epistemology is based upon Authoritative Knowledge (Kivunja & Kuyini, 2017).

3.3 Ontology

Ontology refers to what reality researcher wants to investigate and recognize? Constructivism paradigm takes on Relativist Ontology. Relativist ontology denotes the faith of researcher in terms of, examined condition has numerous truths and those truths can be explored by human collaborations between the researcher and issue of the research and the research members (Chalmers, Manley & Wasserman, 2005). In this article, researcher wants to investigate whether speech therapy function for adult Broca’s aphasic patients or not? Can lexical deficit be overcome with the help of this gear? And if yes then, up to what extent this gear endeavors?

3.4 Method

This is an exploratory study in which qualitative method has been employed, because researcher was interested in exploring the action in natural setting in respect of role of speech therapy through real life practices of speech therapists. Qualitative method incorporates data collection practices that are mostly open ended and researchers aim to seek responses to broad. It denotes a variable and greatly contextual micro perspective of everyday reality of a particular field (Dornyei, 2007).

3.4.1 Study site

Region of present study is “Hyderabad City.” It is the second largest in Sindh province and 8th largest in Pakistan. Particularly, Private Treatment Centers of Speech Therapists” were preferred for the conduction of interviews. Five treatment centers were chosen, where speech therapists were easily available. Preference of clinics did not depend upon researcher’s choice, rather it merely depended upon the accessibility of clinics in Hyderabad. Following are the names of centers:

- Inaya Day Care Centre; A project of Faraz Speech Centre, unit #8 Latifabad.
- The Talk Clinic Speech Language Therapy and Audiology, Doctors Lane Saddar.
- The Real Audiology Hearing Aids and Speech Therapy Center, Doctors Lane Saddar.
- Speech World Center, Quaid-e-Azam Complex Cantonment.
- Sehat Medical and Trauma Centre, unit #6 Latifabad.

3.4.2 Sampling and Participants

Adult Broca’s aphasic patients and Speech therapists are the targeted population of present article. Sampling refers to picking a segment of population, which are known as participants. Whereas, population is a cluster of people that a researcher studies in his/her research. Present has employed Non-Probability Sampling, which is also known as Purposeful Sampling. Qualitative researches undertake non-probability sampling because it offers in-depth understanding apropos of any issue. Therefore, this study has utilized Purposeful Sampling to gather data. In purposeful sampling, researchers intentionally choose individuals and sites to understand the central phenomenon (Creswell, 2012).

3.4.3 Research Tool

Research tool has provided pathway to researcher, for organizing information, bringing them together and then transforming it into productive data (Hinds, 2000). This study has utilized interviews as research tool. Interviewing is the practice of asking open-ended questions by researchers to one or more participants (Creswell, 2012). To explore the role of speech therapy, Semi-structured interviews were conducted because such interviews allow researcher to construct in depth perception (Cousin, 2009). One-on-one interviews have been conducted. Five interviews have been incorporated.

3.4.4 Data Gathering procedure

In this study, two different ways have been used for the collection of data; Primary and Secondary, which are usually undertaken by researchers (Douglas, 2015). For main data collection, primary resource has been used. Whereas, secondary data has been used for literature review. Primary data is assembled for stating the problem at hand and first time formulated by researcher. While, secondary data is the previously existing data, which is piled up through researchers, agencies investigators and associations (Ajayi, 2017). Survey, observation, experiment, questionnaire and interview are the instances of primary data. While, government books/magazines, websites, papers, editorials and internal records come in secondary data.

For the conduction of interviews, researcher visited in evening and night to the clinics of speech therapists. Designed tool has been utilized for data collection. Before, during and afterward interview, some stances were considered, have been mentioned in table 1.

Table: 1. considerations before, during and after interviews	
✓	Researcher got the permission from the participants to take part.
✓	Researcher used probe during the interview to simplify the response.
✓	Researcher asked open ended questions.
✓	Researcher did not debate with participants about their views.
✓	In last, researcher articulated gratitude to the participants.

3.4.5 Data Analysis

Collected data has been analyzed through Thematic Analysis, by means of examining and validating themes or patterns in the recorded data. In present study, it has been accomplished by way of drawing a profound description on the relevant topic from the answers of the speech therapists. Responses have been cited in analysis part in the form of themes and codes, and then have been mentioned diagrammatically in results. Thematic analysis is one of the extensively used method of data analysis in qualitative studies. Thematic analysis is the process of recognizing patterns which are significant in collected data (Maguire & Delahunt, 2017). Theoretical framework has performed a chief role during data analysis, in bonding notions and narration to prevent incursion between event and personal standpoints of the participants and the researcher. Data has been analyzed under the light of Sketch Model. Analysis of data has been mentioned in table no 2.

Table: 2. Analyzation of data		
Questions	Themes	Codes
Q: 1. How does speech therapy help to adult Broca' aphasic patients to overcome their lexical deficit state in order to enhance their communicating abilities? Q: 2. To what extent speech therapy is effective for people with Broca's aphasia to recover their speaking and communication skills?	Appropriate treatment	<ul style="list-style-type: none"> ▪ Mind therapy ▪ Motivation ▪ Practice/Drills ▪ Gestures
	Factors affecting	<ul style="list-style-type: none"> ▪ Age ▪ Disorder ▪ Time ▪ Environment
	Linguistic level	<ul style="list-style-type: none"> ▪ Lexicon ▪ Retrieving words/ phrases ▪ Articulation ▪ Reduce errors

3.4.6 Axiology

Axiology brings up the ethical concerns that need to address during research process. Ethics should be a key issue rather than an afterthought. It should be in a front part of researcher's line up (Hesse-Biber & Leavy, 2006). During data collection, Privacy and Accuracy were top priorities of researcher. Participants were not enforced at any point to disclose personal or irrelevant information. Researcher considered honesty in data presentation, its analysis and results.

4. Findings and Discussion

On the basis of data analysis following findings have been obtained. Diagrammatic representation has been mentioned in table 3, 4 & 5. While, theoretically has been presented in discussion part.

Q: 1. How does speech therapy help to adult Broca's aphasic patients to overcome their lexical deficit state in order to enhance their communicating abilities?



Table: 3. Findings of question no 1.

Q: 2. To what extent speech therapy is effective for people with Broca's aphasia to recover their speaking and communication skills?



Table: 4. Findings of question no 2.

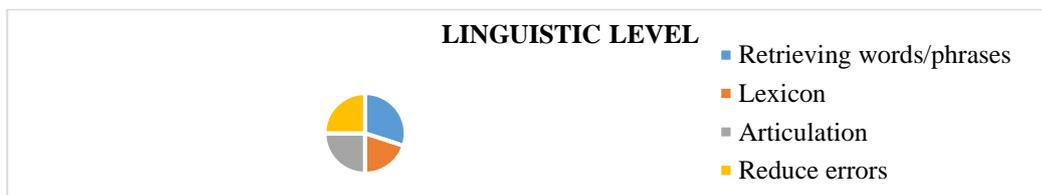


Table: 5. Findings of question no 2.

Results of the study suggest that speech therapy may be proved helpful for adult Broca's aphasia to overcome lexical deficit state. Their communicating capabilities can be recovered by giving treatment. But, recovery is merely probable with appropriate treatment in terms of speech therapy. According to the responses of speech therapists, appropriate treatment embraces following four facets:

- All of the speech therapists responded that practicing or drilling is the top most exercise of speech therapy. By this exercise, Broca's aphasic patients try to overcome the troubles which they face while speaking, and learn to communicate.
- At second level, speech therapists replied that speech therapy also boost up the development of gestures because there are certain patients who even do not possess gestural skills. Gestures are the alternative pathway of speaking.
- Some responded that speech therapy engrosses the motivation into affected individual. Because their willingness for speaking very much influence on their linguistic recovery.
- A few speech therapists replied that mind therapy is also need which can only be provided by speech therapy.

On asking question regarding the effectiveness of speech therapy, they stated that first we need to know about the factors that effect on speech therapy. According to them, recovery depends upon following four factors:

- Foremost factor is age. According to their responses, early age is considered golden age for the linguistic recovery in aphasic condition. Whether it is Broca's or Wernicke's.
- Secondly, level of disorder or stroke does matter that how much is a patient's brain injured? If a patient has higher intensity of stroke, so it requires longer time for recovery.
- Some included environment too as influential factor during therapy. Through active environment, competence can be in term of lexicality can be improved.
- A few speech therapists replied that time is also one of the constraints during therapy. They said minimum 6 months are always required for recovery.

After deliberating factors, they pointed out the effectiveness of speech therapy for the recovery of speaking or communicating skills at following linguistic levels; retrieving words or phrases while speaking, stimulate lexicon or mental vocabulary that creates messages into the mind, articulation of words for communicative purpose and reduction of errors during speaking and conversation.

5. Implications, Conclusion and Recommendation

Present study is valuable for linguists related to the field of neurolinguistics and psycholinguistics. This study affirms that language is not an isolated entity, where it is tied up with society and culture along it is knotted with brain. This study imparts the facts of cognitive linguistic phenomenon. Particularly, it is beneficial for contemporary and future researchers of neurolinguistics because this study reviews the consequences of language impairment and its recovery. Hence, outcomes of this study is chiefly conducive for both researchers and readers of aphasia, who are extremely engrossed in Broca's aphasia and will add into the literature. Findings of the study devise that lexical skill is a central element of language conception and production.

Since, aphasia is an unusual cerebral effect. Due to this neurogenic language syndrome, affected individuals go through either weakened ability of speaking or listening. Therefore, different tools are used by/for affected individuals to cope-up with such ailments. Subsequently, findings of the study reveals that people with Broca's aphasia can overcome lexical deficit condition through speech therapy, but overcoming settings varies according to age and magnitude of brain damaged or stroke. Where implications of the study are significant for linguists, likewise it is worthwhile for speech therapist, apropos the treatment of adult Broca's aphasia. Because, findings of the study also reports that what factors influence on performance and how much time an adult Broca's aphasia may need for their linguistic recovery.

When some disorders rob your competence which can affect your ability to speak, write and understand language. So, there is need to address such issues which can reveal the grounds of language impairment and its treatment. Broca's aphasia causes disruption in the production of language. Whereas, understanding does not get impaired. Affected individual faces trouble in word finding and suffers during speaking that makes one-sided communication. Competence remains unaffected, while performance becomes impoverished. Because, aphasia is considered as loss of words not thoughts. So, why people with Broca's aphasia become deprived in daily life conversation? If, there are tools like Speech therapy to overcome lexical deficit condition.

This article has determined the role of speech therapy. However, future researches may be followed by determining more tools, other than speech therapy for adult Broca's aphasia. Likewise, this study has focused on lexical aspect of language. While, aphasia may affect different aspects of language. It can be expressive or receptive. So, other linguistic levels should be taken under account.

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