"LANGUAGE ASSESSMENT OF PATIENTS SUFFERING FROM BROCA'S APHASIA. A CASE STUDY OF BILINGUALS"

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DECLARATION

I declare that this thesis 'Language Assessment of Patients Suffering from Broca's Aphasia: A Case Study of Bilinguals' submitted in the partial fulfillment of MS degree is my own and is carried out under the supervision of Dr. AnsaHameed. I certify that this work contains no material which has been accepted for the award of any other degree at this or any other educational institutions. To the best of my knowledge and belief I hereby declare that this research contains no material previously published or written by any other person except where due reference has been made in the text.

Signature

Komal Malik

DEDICATION

With affection to my Parents

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ABSTRACT

The study attempts to bring forth language hindrances that are faced by the patients of Broca's Aphasia who are essentially bilinguals. In its broadest sense, the current study stands under the very wide domain of Applied Linguistics; however, the particular area of research in this study is neurolinguistics. Inception of neurolinguistics can be traced back to 1968, from where it began the journey of expanding and exposing and is still on its way to progress. However, the study of neurolinguistics with reference to the bilinguals is rather a recent line of research and very little of any work was done on it until Michele Paradis highlighted it with his 'Neurolinguistic theory of Bilingualism'. In this theory he marked his point that language is characterized as a 'neurofunctional system' disseminated into numerous 'neurofunctional modules' which respectively sub-serve phonology, morphology, syntax, semantics, pragmatics etc.

The present research is a multiple case-study that endeavors to focus particularly on the patients of Broca's aphasia. Five diverse cases of no production, phonemic, morphological, semantic and syntactic levels, respectively, have been considered for research and further their recovery patterns has also been presented as a chief part of the study. The patients responded through Bilingual Aphasia Test (BAT). According to the analysis of the data collected Broca's aphasia is principally caused by any damage to the frontal lobe of left hemisphere; resultantly, language production is affected; nonetheless, it was observed that in case of bilinguals, no link in the nature of errors or recovery of L1 and L2 were found. The study also found that the restitution patterns of these patients were different from one another. These findings hold great importance in the area of research that has been taken up for study.

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CHAPTER 1

1.1 INTRODUCTION

With studying of human language one actually approaches the human essence a feature that has been known uniquely to human beings so far (Chomsky 1968) Therefore it is evident that human beings are the supreme creaturespossessing the ability to use language that distinguishes them from animals Most of the religious and mythological philosophies opine that the reason of human life and power, most of all, is "the language" It is only through language that we can communicate most intricate thoughts and ideas to one another Religion is one of these intricate ideas which has been source of belief for millions of people and it can only be done through language

However language may malfunction at times in view of American Speech-Language-Hearing Association language disorder is a loss of the ability to receive send process and comprehend language ideas which may be verbal non-verbal or any other kind of symbol Language disorders may be experienced due to variety of reasons which may be in-born or acquired due to any damage injury or trauma The constraints of age and gender do not apply on language disorders it is the phenomenon of 'in any age, to anyone"

Locating the origin of language disorders, its causes and patterns of language loss under the title of 'Aphasia' are common areas of research within the domain of clinical and theoretical neurolinguistics However surviving in the world of global communication most people today tend to have competence of more than one language thus referred as bilinguals in case of two languages and multilinguals in case of having command over more than two Thus a new line of

research in neurolinguistics is bilingual aphasia. According to Grosjean(1994) the word 'bilingual' denotes all those people who make use of more than one language for everyday conversation. When such people, because of certain damage to their brains, lose some areas (vocabulary, grammar, meaning etc) of language, it is significant to observe their loss of linguistic patterns in both languages.

A traditional 'localizationist' school of thought proposes the view that in bilingual aphasic patients, usually one language is lost because of the reason that two languages (of a bilingual person) are localized in two different brain areas or even in different hemispheres. In this regard (Albert &Obler, 1978) report that 'focal brain lesion within a language-specific area could then influence one language only, leaving the other language intact'. On the contrary, the recent theories of bilingualism and aphasia have rejected this idea. In this regard (Paradis, 2004) marks in his Neurolinguistic Theory of Bilingualism that in brain everything is virtually interconnected, thus languages, as subsystems of neurofunctional language systems, are also interconnected. We cannot assume that languages localized in different areas of brain do not have any sort of connection and further that losing one language does not necessarily cause damage to the other language. Recent researches are focusing this area in detail, thus setting grounds for practical issue that is related to loss of linguistic patterns in case of bilingual patients in different parts of the world (Ojemann, 1991, Ardila and Ramos, 2007, Lapointe, 2005). The present study is also an extension to such studies within Pakistani context.

1.2 STATEMENT OF THE PROBLEM

This study will examine the linguistic patterns of Patients suffering from Broca's Aphasia in particular context of Bilinguals. The researcher tends to highlight through investigation that with

what sequence the patients lose control of both the languages i e L1 and L2 after the aphasia occurs It would also encompass the recovery patterns with which the patients are or will recover Moreover it is an attempt to figure out the diverse cases of Broca s Aphasia and also the restitution patterns which may be more beneficial and comparatively quicker

1.3 RESEARCH OBJECTIVES

- To determine the linguistic patterns with which bilinguals patients tend to lose L1 and L2 after the Broca s Aphasia occur
- To investigate which of the two languages tend to be forgotten earlier, L1 or L2after the Broca's Aphasia occur
- To explore which of the two languages tend to be recovered earlier L1 or L2after the Broca's Aphasia occur
- To find frequent inter and intra linguistic errors in L1 and L2after the Broca s Aphasia occurs

1.4 HYPOTHESES

- The patients of Broca s aphasia tend to lose L1 quicker than L2
- The recovery pattern for patients of Broca's aphasia is similar for both L1 and L2
- The linguistic errors of L1 and L2 are similar for Broca s patients

1.5 SIGNIFICANCE OF THE STUDY

The current study is multi-disciplinary study in its nature which is why it is likely to be significant for more than one fields of study The study is beneficial both academically and practically, since it would add to the research areas of linguistics and neurosciences Academically, it would enlighten the area of neurolinguities and neurosciences for the students of the relevant fields While, practically it will help the scientific areas and researchers to explore the field in a new dimension In view of the fact that there is least work done on the subject of neurolinguistics in Pakistan thereof the study would be highly beneficial in this regard Moreover, the research would be helpful in bringing about the treatments and therapies for the patients with Broca s Aphasia especially bilinguals and widen the horizon of this realm

1.6 DELIMITATIONS

- The research is only intended to study the patients of Broca s aphasia
- The study is carried out only on bilinguals (regular users of English and Urdu)
- Since the research is "multiple case study" where the researcher has undertaken five patients, the results may be applicable to most of the patients but not necessarily to each of the kind
- The patients were multilingual but the researcher focused on English and Urdu to facilitate the study

1.7 OPERATIONAL DEFINITIONS

- Linguistic Patterns The levels of language that is phonetics morphology semantics and syntax
- Bilinguals The speakers who use Urdu as L1 and English as L2
- Subject Patient or case under study
- Broca's Aphasia A language disorder which is caused by any injury blow or stroke in the frontal left hemisphere of the brain that causes production disorder of language

1.7 STRUCTURE OF THE STUDY

The first chapter of this study is an overview of the entire purpose of the study stating that why this study is being carried out Along with it the objectives and research queries of the study are discussed in chapter bringing the points of research which are to be found in the process to the limelight This chapter also gives the operational definitions of certain terminologies that are being used for this study A very important heading of "Hypotheses" is also a part of this study since it is through these hypotheses that the study is making its statement Last but not the least this chapter also briefs about the significance and delimitations of the current study

The second chapter which provides with a detailed account of previous and ongoing researches in the area of research is under the title of Literature Review This chapter is dedicated to bring out the fact and figures of all the previous literature that is found in this field The chapter is designed to link the idea together more thoughtfully than chronologically Starting from the introduction of the language to the levels of languages and then its connection found in the brain

and then making a logical link of it with the aphasia and then its restitution the chapter unfold every minor detail of the field

The third chapter of the current study delineates the methodology that has been used to carry out this particular research The researcher has chosen multiple case study technique to get the desired data Furthermore the ordinal scale has helped the researcher to mark the level of severity found in the patients under study

The data that has been collected from the patients would be thoroughly analyzed in the fourth chapter by bringing in use various statistical and mathematical operations Primarily the quantitative strategies have been used where the researcher has tried to focus on every case in detail The chapter brings about the tabular and graphical representation of the fact and figures which were deduced form the data collected This chapter also layouts a detailed discussion part on the analyzed data which shall also bring about the findings of the study

The final chapter provides a detailed conclusion of all the assembled facts and research including the summary of findings along with suggestions recommendations and future implications for the current study

CHAPTER 2

LITERATURE REVIEW

2.1. LANGUAGE AND LINGUISTIC PATTERNS

Quoting the beliefs put forth by most of the religions and myths language is the foundation of human life and supremacy (Fromkin, Rodman &Hyams 2007) They continue to point that if a language is known by a person one can speak it and get understood by a person who already has command over that particular language However they comment language can not only be confined to speech in fact it is a lot more than that Kracht (n d) elucidate in his lectures that it is basically the set of signs which makes a language A series of letters alphabets and sounds which he named as exponent together with meanings form a language However once these exponents and meaning are amalgamated together they form a whole new concept which is not in no way alike the basic patterns Having been a package of signs language is a semiotic system which is a means to communicate The capacity of language to form numerous signs is derived from the fact it is capable of forming complex structures from simple signs The grammar of these signs is called as Lexicon

This system of signs has been explained thoroughly by Saussure (1986) with what he named as 'Signified' and 'Signifier' The signifier may be called as the exponent and the signified as meaning Conceding to the point Kracht (n d) describes that this process of signified and signifier is endless, since one can have limitless thoughts and that makes the language endless In this regard Prasad (2012) makes his point saying that language produced by humans is a universal and evident share of human behavior He says that this human faculty is essentially one of the most extensive intricate and valuable capabilities in human possession

Being intricate there are certain levels of language learning and acquisition which Karcht (n d) provides to he the levels or in other words the **linguistic patterns** of a language in his lectures, commenting that language has four levels that is Phonology Morphology Semantics and Syntax Parsad (2012) supporting them includes another two levels that is Phonetics and Pragmatics and explain these terminologies further in following way

2.1.1. Phonetics The terminology contains the word 'phone' that means sound therefore phonetics enshrines the analysis of general mechanism of production transmission and perception of any sound (p 13) It is classified as a pure science that includes the anatomy speech manner and all other associated speech pathological and neurological features (Roach 2001) He puts forth his point saying that muscle contractions consequently produce speech sounds when one speaks He goes on to say that the chest muscles which are primarily functioning for passing air are actually required for producing all sound

He goes on to explain the figure saying that the stream of air that is passed from chest to mouth is carried out by Larynx which is responsible for producing various modifications in the flow or stream of air The entire passage from Larynx to the mouth and nostrils is regarded as the 'Vocal Tract' So, once the air is passed through the Larynx it goes through entire vocal tract and concludes on the mouth and nostrils, from where the air emits into the atmosphere However the usage of different articulators within the vocal tract is subject to the particular sound that is being produced Sounds whereas are differentiated into *vowels* and *consonants* on major level nevertheless vowels are further divided into *short* and *long vowels*, and long vowels then into *monophtongs*, *diphthongs* and *triphthongs* producing single double and triple vowel sounds respectively within an utterance Roach (2001) comments that vowel sounds are free of any

barricade as the flow of air passes from the larynx to lips whereas consonant sounds are produced with an obstruction in passing air Study of this entire system of producing sounds by bringing in use various parts within the vocal tract is called as *Articulatory Phonetics* Roach (2001) gives away the symbols for short and long vowels

Kracht (n d) opines that if the features of the sounds are looped together they can be named Nevertheless one has to maintain the difference of the vowel and that of the consonant sounds He continues to elucidate his point by quoting the example of two consonant sounds that is p and m He explains that p is rather voiceless, bilabial "stop" while m is more of a voiced bilabial "nasal" sound

He continues to give a detailed chart of IPA consonant row labels and IPA vowel row and column labels, which are aforementioned in Fig 4

Close	In this position the tongue is closest to the roof of mouth making the tongue
	greatest in height, as compared to the other vowel sounds
Open	In contrast to the Close the open position has the lowest height of the tongue is
	in comparison to the other vowels Mouth, in this position is most open
Close Mid	This is a rather intermediate and half way position with upper-mid lower-mid
Open Mid	and mid
Front	In the Front position the tongue is positioned more forward if compared with
	other vowel sounds
Central	As the name entails it is the central position of the tongue

Back	Standing in opposition to the Front, tongue is positioned at the back of the mouth near pharynx
Rounded	Projection of lips is rather forward in this position and is founded inward

Table 1: IPA Vowel and Column Labels.

Contrary to the easy flow of the vowel sounds stand the obstructed sounds of the constants

IPA Consonant Row Labels:

Plosive	It is a pulmonic-egressive with an oral stop
Nasal	It is also a pulmonic-egressive but it stops with nasal flow. This can be differentiated from the plosive because it is not oral
Fricative	These are the sounds with a fricative constriction degree. This infers the fact that the air flow in this type of sound is central
Lateral Fricative	Unlike the Fricative the airflow in lateral fricative is lateral rather than central
Approximant	This is a sound with approximant constriction degree which entails that it has more central airflow
Lateral Approximant	This type of the sound stands in contrast to the Approximant because in approximant the airflow is central while this particular sound has lateral

Table 2: IPA Consonant Row Label

However, in Urdu in total there are three vowel sounds which are *Alif* əlɪf, *Wow* wau and *Yay* jaɪ. However, they are further divided into short and long vowels, which together make them ten vowel sounds.

Alif əlɪf

Urdu symbols	Phonetic	English Transcription	Words in Urdu	Meaning in English
		ə	Bas bəs	Enough
			Jin n	Ghost
			Uska ska	His her
آ			Aam m	mango

Wow wau

Vowel name in Urdu	English phonetic symbol	Words in Urdu	Meaning in English
Wow Maroof wa m ru f	u	Ooncha u n a	High
Wow Majhool wa mə hu l	ɔ	Dou dɔ	Give
Wow Leen wa li n		Kon k n	Who

'Yay ɟaɪ

Vowel name in Urdu	English phonetic symbol	Words in Urdu	Meaning in English
Yay Maroof ɟa_m _ ru f'	ɪ	Bibi 'bi bi '	Lady
Yay Majhool ɟa mə_ hu l	e_	Bay-nam be - na m	Nameless
Yay Leen ɟa_li n	a_	tay ta_	told

Table 3: Vowel and Consonant Sounds of Urdu Language.

These three vowels may also act as consonants on certain occasions (Dr. N. Arif, Personal Communication, 29th October 2014).

Nonetheless, Phonetics cannot only be confined to the productions of speech sounds it also has a lot to do with the physics of the speech signals, which is known as *Acoustic Phonetics*. The journey carried out by the air produced from mouth of the speaker to the ear of the listener has to travel in the form of vibrations. With immense advancement in technology one can measure these vibrations by mathematical techniques and at times with the help of specifically developed computer software to produce spectrograms. Besides, Acoustic phonetics also encompasses the study and analysis of the relationship between movement in the vocal tract of the speaker and the sounds produced as a consequence. The analysis of sound that is done through acoustic phonetics tends to be rather objective and scientific than the conventional auditory procedure, which relies on the dependability of the skilled ear of a human. It is in major about speech perception that

how the listener perceives sounds that are being produced by the articulatory system. Primarily in the ear sound is in the form of air pressure and the fluctuations in this air pressure are converted into the neural impulses that help establishing an adequate hearing ability. Auditory phonetics, thus, bounds itself for perceiving the full range of frequencies contained within various speech sounds, filtering out irrelevant background and adjusting to speakers idiosyncrasies (habitual vocal tract settings). But the most important feature of auditory phonetics is that of its relation with the Central Nervous System and Brain. Certain localized areas of the cerebral cortex are essential for performing various mental and physical functions including speech production and perception. Besides linguistic abilities have long been known to be localized primarily in the left hemisphere of the brain as in the 19th century it was determined that damage to particular areas of the brain caused consistent aphasias speech disorders this can be supported by quoting the fact that auditory part of human mechanism is also responsible for decoding the speech signal into meaningful elements, associate identified elements with mental representations and associate recognized representations and combinations and constellations thereof with semantic concepts.

2.1.2. Phonology: Yule (2006) defines phonology as account of the organization, pattern and arrangement of a language's speech sound mechanism. In contrast to the study of phonetics where the physical aspects of sound production is studied stands phonology within which the abstract or mental features of a language are studied, the basis of phonology is on the theory of unconscious knowhow of speech sounds in a language. Parsad (2012) simplifies it saying that phonology is the exploration of speech sounds of a particular language. He differentiated it with phonetics saying that where phonetics deal with the speech patterns for all the languages in the

world phonology particularly focuses on the sound of one language that is under study He continues to explain that the formal organization of the language to form communication function is the major subject of phonology Every language has its own material voices and organization which are studied under the domain of phonology Yule (2006) adds to the comment saying that with each different circumstance there is different physical articulation which serves as the basis of variation Therefore, one can say that phonology is what deals the abstract set of sounds in a language which enables a person to make a difference between the meanings in the actual physical sounds one says and hear

To understand phonology Parsad (2012) defines phoneme that it is the smallest unit in a definite language that differentiates a word from another He continues to define another important feature of phonology known as allophones remarking that a phoneme can have more than one sounds and this variation is called as allophone Henceforth, an allophone is something which is likely to produce different sounds from a single phoneme because it has different articulatory locations This is one of the major reasons why a phone is differentiated from a phoneme since phone means sound and a single phone can have a single sound but a phoneme as according to the definition of allophone can have more than one sounds

Therefore, the study of formation of speech sounds is termed as phonology and it encapsulates both the knowledge a speaker has of his language and the description of knowledge given by the linguist A speaker s phonological knowledge is infinity, this is said because it encompasses the capability to identify a foreign phonological pattern, to design new words to make changes in grammatical structures addition or omission of sounds and also about the legal or actual words in contrast to the wrong words (Fromkin Rodman &Hyams 2007)

2.1.3. Morphology: Krcahl (n d) explains the notion of morphology saying that the smallest meaningful unit which is generally thought to be a word is not actually the smallest unit He believes that the mimmal part of speech that has some meaning attached to it is called as Morpheme which must be taken as the smallest unit of a language He further clarifies it by an example that the word "dogs cannot be taken as the smallest unit of English Language although it is a single word He says that that dog has been used as a plural with s which makes it though one word but not smallest Therefore the word dogs has four different manifestations the meaning or semantics it carries, the sound structure it has, the morphological structure it presents and the syntactic structure it follows These levels of manifestation have been termed as "Strata" and sometimes it is called as "Level of Representation

In words of Yule (2006) this terminology can be defined as the study of forms however not only confined to this, it has also been associated with the examinations which analyze all basic elements which are used in a language Nevertheless these elements have a rather technical name in form of linguistic message and are termed as Morphemes Yule (2006) put morphemes as "a minimal unit of meaning or grammatical function (p 63) The word morph is a derivation from Greek language which means the form and logy" means study Therefore one can say that morphology is the study of form of language which includes the identification analysis and description of the structure of words Moreover it encapsulates the study of patterns of word formation, their uses and different constructions The term was coined by August Schleicher in 1859 (Parsad 2012)

2.1.4. Semantics: This sub-field of linguistics generally deals with the meaning of a language Whatever utterances are made it essentially has to have a meaning, commonly To understand

and interpretation of these meanings are thereof studied under the name Semantics The word originally was found in French as semantique and is explained a sign so semantics is then understood as significant or meaningful Semantics also deals with the association between referents (names) and referends (things) Semantics is often studied with two aspects i e diachronic and synchronic Synchronic is also known as descriptive semantics and it offers to explore the semantic relationship which can be a simple one or may occur in multiple facet Whereas diachronic on other hand is also called historical semantics deals with the chronological semantic changes that have taken place through years It focuses on the methods of paraphrasing, transforming and identifying ambiguities which are present within a text A semantic analysis deals with the antonyms synonyms homonyms polysemy anomalies contradictions paraphrase relations ambiguities, implications transformations etc within a language (Parsad, 2012)

2.1.5. Syntax: Syntax particularly deals with the sentential structure of a language Unlike semantics it has nothing to do with the meaning of the text in fact it can apparently make no sense but as long as it has proper grammatical structure it s linguistically correct The meaning of syntax thus is putting words in order to form a sentence Syntax focuses on two fundamental points that form and function "Form is the internal structure of a unit of a grammatical analysis of phrase or clause Function is essentially a rational concept (p 74) (Pardas 2012) Yule (2006) elaborates in this regard that the structure of the sentence in traditional grammar is usually named as active or passive voice while linguistically it is called as deep and surface structure As he elaborates in the following example

Charlie broke the window

The window was broken by Charlie

So in a traditional grammar it is simple active and passive structure but linguistically it has difference in the surface and deep structure The overall sense apparently is same however the focuses of the subject or the emphasis of the sentence over subject or object has been shifted from one thing to another Charlie was in focus in the first sentence where the action was focusing on the subject has been shifted to the object in the later sentence

2.1.6. Pragmatics: Pragmatics essentially deals with meaning of language but it is different from that of semantics Since pragmatics focuses on deeper meanings or underlying meanings of a sentence while semantics may or may not look into this Pragmatics centers itself on the symbolic satirical, ironic or simply the stylistics of a language Where words may apparently seem entire different may carry completely different meaning therefore analyzing understanding and interpreting of such meanings is what pragmatics is known for An important dimension to be kept in view is the context in which the particular situation is being discussed Where semantic deals with the logic-sense relationship pragmatics tends to make relation with the contextual meaning of the text

2.2. LANGUAGE AND BRAIN: NEUROLINGUISTICS

However the whole world of language is not as simple as this for instance (Ingram 2007) states that the utmost intricate of human artifacts is nothing but language This is said because keeping aside the levels the question arises that how these levels or patterns are composed uttered understood and analyzed According to Paradis(2004) Henry Hecaen was the first researcher who used the term 'Neurolinguistique' in his publication (Hecaen 1968) he was

one of the founders the International Neuropsychological Symposium and co-founder of Neuropsychologia which together established Neuropsychology as a sovereign arena He defined this terminology as sub-discipline of neuropsychology which is related to the study of oral deficits which are the consequences of cortical lesions In his viewpoint it is to act a bridge between the realms of neuroscience and human communication Hecaen(1972) marks that neurolinguistics assimilates the methods models and techniques of linguistics and psycholinguistics and familiarizes them to its own requirements

Hécaen & Dubois(1971) gave a four-step program for Neurolinguistic enterprise in this regard, (1) explanation and classification of discrepancies on the basis of hypotheses about the primary reasons (2) identification of correlation between such types of discrepancies and lesion locates (3) analysis of the role of cerebral mechanism in language processing on the aforementioned grounds and (4) authentication of these hypotheses

After Hecaen Ingram(2007) states that **Neurolinguistics** is a scientific term which was inaugurated in the academic world by Harry Whitaker (1971) who also found the journal entitling as same At that particular point of time Whitaker noted that an appropriate and succinct comprehension of language depends upon the correlating facts from diverse domains which are related together with the structure and function, of both, brain and the language He continued to make his point that the growth and development of brain has been swift in contemporary evolution The brain had been noticed to get doubled in size, in less than one million years He said that resilient point in this regard can be made, that the expansion of brain was the result of progress of spoken language and the language processing It had also been noted that the brain areas which have gone through major changes and developments are particularly the language areas, within which specifically the frontal lobe the POT (Parietal Occipital and Temporal

Lobes) junction He believed that the study of relationship of brain and language is very significant and productive, since it derives from language itself its production acquisition and processing

Fromkin, Rodman &Hyams (2009) elaborate that the brain is the utmost complicated part of human self It carries nearly 10 billion neurons and fibers in it under the skull Fibers interconnect these 10 billion neurons together The 'grey matter which is found on the surface of the brain is the decision-maker part and is also called cortex The cortex is responsible for the storehouse of our memories along with which it also functions in response to all sensory organs and initiates all voluntary actions It is cortex where grammar dwells and represents knowledge of language

They go on to explain that other than this the brain consists of cerebral hemispheres the right and the left hemisphere Both the hemispheres are linked together with something called 'Corpus Callosum The corpus callosum is a network of nearly two million fibers The communication that takes place within the two hemispheres which is the right and left hemisphere is carried out by Corpus Callosum

The cerebral cortex is the chief level of the central nervous system and constantly functions in association with the lower centers The cerebral cortex obtains massive quantity of data and retorts in a defined fashion by carrying out suitable variations Clinicopathologists have created confirmations that diverse zones of the cerebral cortex are functionally specialized (Snell 2010)

He continues to say that the frontal lobe inhabits the area anterior to the central sulcus and superior to the lateral sulcus The precentral area is located in the precentralgyrus and

comprises the anterior wall of the central sulcus and the posterior parts of the superior middle and inferior frontal gyri it spreads over the superomedial boundary of the hemisphere into the paracentral lobule Certain nervous activity is executed predominantly by one of the two cerebral hemispheres Handedness perception of language and speech are functional areas of behavior that is usually controlled by the dominant hemisphere Snell finds that more than 90% of the grownup population is right-handed and therefore left hemisphere is foremost About 96% of the adult population is left hemisphere dominant for speech Researches have revealed that the speech area of grownups cortex is greater on the left than on the right It is assumed that the two hemispheres of the newborn have equipotential abilities In the course of childhood one hemisphere gradually dominates the other and it is only after the first ten years that the dominance gets permanent Snell assumes that this would illuminate why a 5-year old child with impairment in the dominant hemisphere can learn to become left handed and communicate well with no troubles, while in adults it is next to impossible

Ingram (2007) states that it is commonly believed that the disciplinary study of language and brain was not very well established until the era of scientific learning of brain and language affairs initiated with the identification of 'the language centers' in cerebral cortex in the concluding nineteenth century It was then that some neurologists started to realize and observe that the patterns of aphasia patients might have deep relevance with the higher mental functions in brain

Caplan (1987) further takes this point to the fact that it was the first half of the nineteenth century that the scientific studies related to the brain damage or aphasia came on forefront of medical sciences These studies inaugurated with an address by Paul Broca before the anthropological society of Paris in 1861 Broca amazed the entire sitting with his autopsy

demonstration that in the inferior frontal gyrus of left frontal lobe the seat of articulate language' is present He goes on to remark that this discovery has taken the legendary status in the history of aphasiology The presentation and the work of further four years by Broca subjugated the entire field of aphasiology The assertions that language areas were essentially located in the anterior portions of the brain remain attached to the further studies in the field till the date Broca further explained that the right hemisphere was definitely working in the vast language psychology as the understanding of language by patients of aphasia show The relationship between meaning and expression is also involved in it This signifies that the domination of left hemisphere was particularly for speech

As will become apparent Caplan (1987) marks that approximately all the conclusions drawn above that is the left hemisphere is responsible for expressive language and the right hemisphere may play part in regaining from aphasia, since the right hemisphere has ability for receptive language

2.3. NEUROLINGUISTICS AND BILINGUALISM

Grosjean (1994) says that bilingual represents all such people who bring in use two or more than two languages or dialects in daily conversations Liddicoat (1991) attempts to explain bilingualism in quite a detailed document making his point about bilingualism by quoting (Haugen1953) that bilingualism can be referred to person who is able to utter complete logical sentences in both the languages He continues to write that the definition of bilingualism given Bloomfield which says that bilingualism refers to the native-like proficiency in both the languages needs revision and modifications He continues to give the types of bilinguals that are co-ordinate and compound bilinguals simultaneous and successive bilinguals additive and subtractive bilinguals, elite and folk bilinguals All these variant kings of bilinguals may not have

native-like proficiency for both the languages they use, yet they are categorized as bilinguals and these dichotomies are valid and approved round the world by linguists

Genesee (1982) points out in his writings that concerns in **bilingualism** with reference to Neurolinguistics is not a nascent phenomenon In fact studies of bilingualism and brain relationships have been put forth since the mid-1880s and to this time there is a bulk of literature that could be found on the subject, where the works of Albert &Obler 1978 Paradis 1977 and Whitaker 1978 etc are worth mentioning He continues to argue that in current times the investigations of brain mechanism along with the language functions of monolinguals and bilinguals equally can only be studied by inspecting aphasics Genesee (1982) further comments that earlier what was confined to monolinguals (that is speech production vs comprehension) is now enshrining bilingual which is focusing on the relationship between two languages These researches however make their astute focus upon the fact that whether the language of bilinguals encompasses similar or different neurophysiological substrates In this regard most of the attempted studies are case studies where a certain individual was found to have language impairment caused from some kind of brain damage Confirmations from such studies have brought about the facts that it is common for the bilingual s languages to have distinct neurophysiological substrates i e they are found to be operating and processing in different parts of brain Paradis (2011) in this regard remarks that the manifestations of aphasia of bilingual or multilingual have aided as a prized foundation of facts for the expansion of hypotheses about the cerebral association of cognitive tasks The researchers have been endorsed by the bilingual aphasia studies to have improved and enhanced comprehension of the representation and processing of language in the typical or average brain of a monolingual Some of the discoveries have helped clinicians formulate tactics to rehabilitation

Paradis (2004) brings forth his framework in this context presenting that language is epitomized as a neurofunctional system distributed into several neurofunctional modules which correspondingly sub-serve phonology, morphology, syntax, semantics, pragmatics etc. and as per the number of languages spoken by an individual each module further divides into the same number

He proposes a few characteristics of the neurofunctional modules which are

1) Isolable

2) Computationally autonomous

3) Specific purpose and function as a component of larger unit

He continues to explain these characteristics saying that the internal structure of one component has no influence on the inner structure of another giving an example in this regard he says that the arrangement of syntax has no influence on the structure of phonology for an instance It means that the phonological structure of the language is liberated of whether the syntactic structure has a subject-verb-object or subject-object-verb word order He points that neurofunctional modules are functionally autonomous domain specific informationall encapsulated and have a characteristic pattern of development(p 120) (Paradis 2004)

Paradis goes on to argue that although everything is ultimately linked to everything else some definite parts of the whole network are in charge for particular functions Portions of the overall network set up systems which may comprise subsystems that retain their own distinctive set of procedures Therefore mechanisms of mental processes are conjectured to be embodied in definite areas of brain A language s Neurofunctional modular system is subject to discerning impairment (Aphasia)

2.4. LANGUAGE DISORDERS AND NEUROLINGUISTICS

Benson &Ardila(1996) mark their point, saying that **aphasia** has been a very controversial and long debated domain not only among aphasiologists but neurologists clinicians, psychologists, linguists and so on. Viewpoint on aphasia had never been coolly discussed, rather it is always contentious and hotly argued. However, in latest years investigators of the field tend to show up progressively more inclined to agree and employ various approaches resultantly, majority of the aphasiologists have come up to be consented upon the definition of aphasia which says (Ahlsen, 2006) that aphasia is the loss of language caused due to any damage in the brain. He explains that this cause can be an 'infraction' blockage of any blood vessel in brain, 'hemorrhage' bursting of a blood vessel in a brain or a 'head trauma'.

According to the Factsheet Aphasia(2008) by National Institute of Deaf and other Communication Disorders (NIDCD) aphasia is a disorder which is caused due to mutilation of portions of brain, which are defined for language purposes. Benson & Ardila(1996) continue to assert that aphasia results in disorders in behavior which further makes grave adjustment issues not only psychiatrists but also clinical psychologists have started to show interest in aphasic patients. The NIDCD Factsheet Aphasia(2008) confirms the fact that aphasia occurs suddenly often because of a stroke or any other sort of head injury. However it may also take shape of a slow-developing process which is usually found in cases of brain tumor, any sort of infection or dementia. The Factsheet also points out that such sort of disorder is likely to impair the expression and comprehension of language including writing and reading. Moreover in some cases aphasia can be the result of certain speech disorders including dysarthria and apraxia which are also cause by brain injury.

The Factsheet further describes that aphasia is not particular in terms of age, gender or genes, rather anyone can acquire it at any time of age, regardless of them being male or female. Quoting National Aphasia Association it comments, that nearly 80,000 individuals acquire aphasia from strokes each year. Elucidating strokes the Factsheet puts forth that when blood cannot be reached to a part of the brain, due to any reason the cells present in brain die. This is because blood carries important nutrients and oxygen. Consequently the stroke occurs. Nevertheless, there can be several other reasons of stroke occurrence including brain tumors, brain hemorrhage, brain infections, sever blows to the head or any other situation that affects the brain.

Caplan(1987) briefs that after 1861 the neurological researches and literatures oozed out with the case studies, reports and such kind of aphasic patients with diversity of lasting problems relating to the psychological and intellectual realms of the field, not only this but the autopsies of brain also accompanied it.

Paradis(2004) refers to the term neurofunctional modules explaining that even though each portion in brain is interconnected but still each of it is specifically functioning for its particular purpose, therefore every module or portion can be separately impaired. The proponents of **localization** comment in this regard (Ahlsen&Benjamins, 2006) that localism attempts to inquire locations and centers in the brain for variant language functions. Whereas Sabbatini(1997) explains the localizationist view further saying that the theory of Localization as given by Franz Joseph Gall points that the brain is composite of various specific organs and every single one of them is responsible for a provided mental faculty. In 19th Century Gall proposed Localization adhering to the fact that various parts of brain are responsible and carrying out various behaviors.

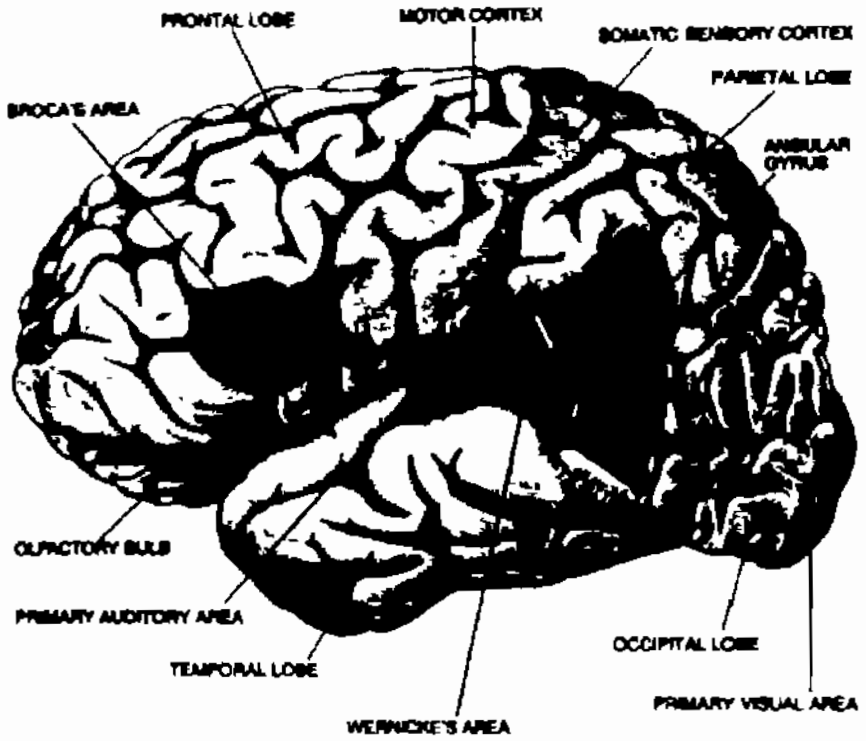


Fig 1: The localization of brain, various areas located. ((Caplan, 1987), source Geschwind, 1979:111)

Dynamic localization of this function undertakes that entire systems of localized sub functions execute language processes. Such systems are dynamic and accordingly they can be restructured in the course of language development or after brain damage.

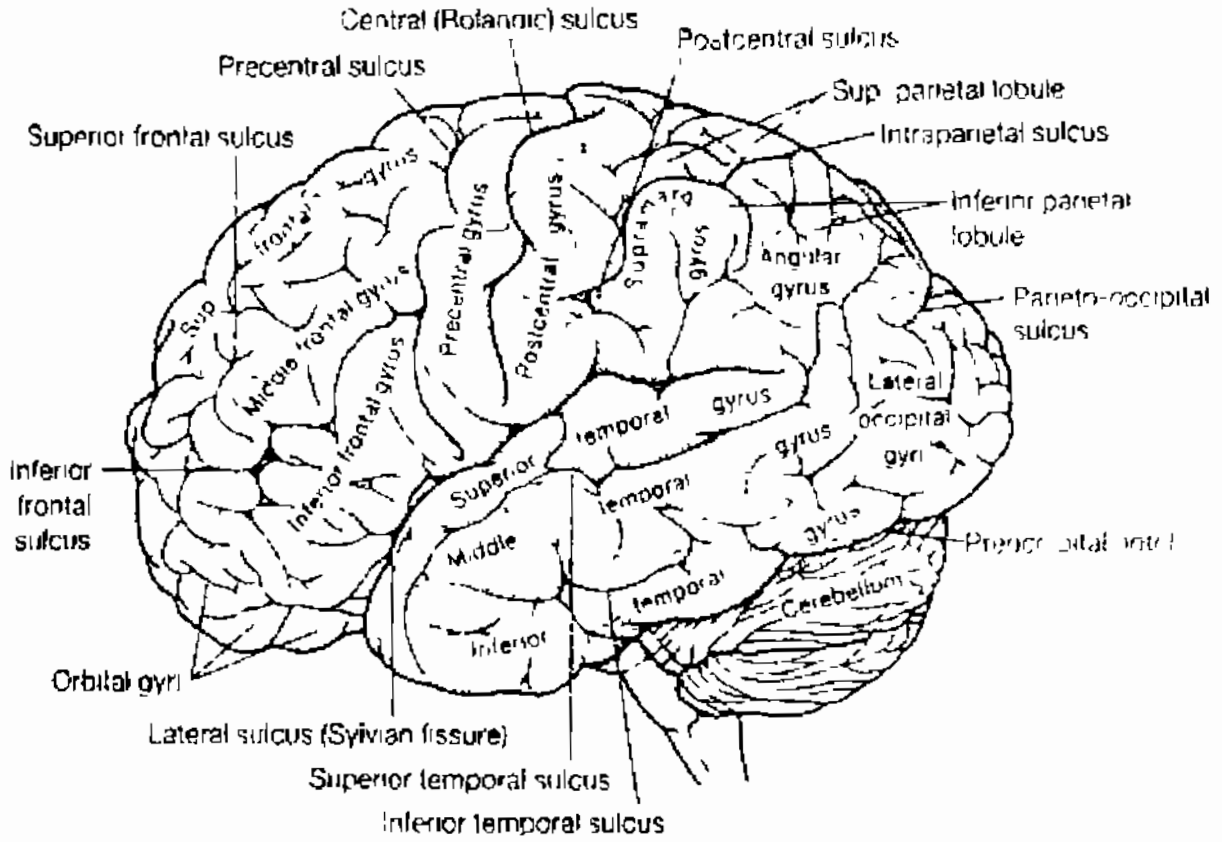


Fig 8: Localized brain image. (Caplan, 1987).

2.5. RECOVERY PATTERNS IN APHASIACS

Patients who suffer from strokes and encounter aphasia are always treatable and curable However the forms of recovery may differ from person to person and from environment to environment Recovery patterns include daily drills and sessions with patients which help them to regain the control of language by producing different sounds and phonemes Nevertheless the time duration of recovery cannot be determined beforehand because usually it depends on the capability and motivation of the patients that how sooner or later they try to recover

Paradis (1977) elaborates the recovery patterns of the patients suffering from Broca - aphasia he delineates that there are various patterns of recovery He says that mainly five diverse patterns can be traced out in modes of restitution which are

1 Synergistic

2 Antagonistic

3 Successive

4 Mixed

5 Selective

1 Synergistic

In this kind of recovery the improvement in one language go together with the other language Under the domain of synergistic type of recovery comes the **Parallel** and **Differential** type of recovery In the Parallel recovery both the languages are simultaneously and similarly impaired and are recovered in the same manner this rather common type of recovery Whereas on the other hand the Differential type of recovery is one which the recovery pattern may remain same or it may vary, nevertheless the rate of impairment is essentially different A study shows that out of 138 cases of aphasia, 67 were of Synergistic nature, and from amongst these 67 patients 11 were of differential restitution while 56 were of parallel which substantiates that it is more common in its nature (Paradis 1977)

2 Antagonistic

In this type of restitution the regression in one language is accompanied by the progress of the other language According to the study by Paradis (1977) 6 out of 138 cases of aphasia were recovering through antagonistic restitution, which is rather rare

3 Successive

Successive is radically a type of recovery where one language cannot show any progress until the other language has been reinstated Out of 138 cases of aphasia 8 were following the successive pattern of recovery (Paradis 1977) After the tenure of the successive recovery a mutual restitution of successive and antagonistic recovery may be seen Successive recovery may make its pair with the selective restitution pattern (Paradis 1977)

4 Selective

This is the kind of restitution pattern where the patient is found not to regain one or more of the languages 37 out of 138 cases were found to have been getting recovered with this pattern

5 Mixed

As evident from the name in this type of restitution the patients use both of the languages every now and then

However the beginning of the pattern of restitution is entitled to Ribot (1882) and Pitres (1895) Both were found astutely interested in the mystery that how one language gets preference in recovery as compared to another (Paradis 1977) Paradis (1977) goes on to elaborate the nature

of recovery possible in Aphasias saying that there are instances when the recovered language is neither the mother tongue nor the second language or any other in fact it is the language used by the staff present in the hospital He continues to give another reason for preference of one language recovery over another by commenting that at times it may be the language which was last used before the accident or in some cases it may be the language used immediately after the accident or the occurrence of Aphasia

Paradis (1977) goes on to bring forth various factors involved in the restitution of the Aphasia along with the contributions of various other renowned scholars of the field These factors are

1 Psychological Factor

2 Visual Factor

3 The Automaticity Factor

4 The Severity Factor

5 The Appropriateness Factor

6 The Multiple Factor

1 Psychological Factor

Minkowski (1927) settles on the argument that in the pattern of recovery after Aphasia the psychological factor plays quite a vital role in many aspects In one of Minkowski s (1965) other works he determined the fact that the psychosexual and psychosocial mechanisms of effective and emotional aspects play a very influential role in determining the selection of language after or while the recovery This is done as very scientifically put forth by A powerful psycho-

neurobiological dynamic force and by a special set of psycho-physio-pathological conditions (p 80)" (Paradis, 1977)

2 Visual Factors

Minkowski (1927) puts forth his observation that the visualization of language helped them to restitute their language, primarily because they could visualize the text in written form He further added that the patients through reading and writing, were able to recover their lost or impaired language

3 The Automaticity Factor

Pick (1921) believed that the recovery at times is subject to the automaticity of the language He elaborates his point further that the order of the language may start off with the most automatic language at the time of accident to the least automatic language The most automated language tends to recover earlier He comments that anything which might be acquired later may surpass what was an automatic mechanism earlier

4 The Severity Factor

Potzl (1925) marks in this regard that patterns of recovery are bound with the severity of the stroke or Aphasia As a proponent by 1963 Mankowski was confident that in case the hubs of the language are severely damaged after the stroke it is likely to be the case that the polyglot would be bound to use one language where he was, initially using more than one language This situation he comments may not be forever in fact it may last just for some time and then the patient would recover the languages He further substantiates his point rather scientifically and technically that the portions of language severely damaged are subjected to the general neural

physio-pathological laws , which makes it rather impossible to let more than one language exist simultaneously

Supporting his point Halpern (1949, 1950) agrees that when the cortical structures in the brain which also serve the linguistic functions are damaged exceedingly hard it is likely to be the case that the patient would be left to speak only one language

5. The Appropriateness Factor

The appropriateness factor as evident from the name refers to the recovery of the most appropriate language Whichever language is more appropriate for the patient it is recovered The fact that which language is appropriate and who is to determine it varies sometimes the patient does it sometimes the therapists and sometimes the guardians of the patient (Paradis 1977)

6. The Multiple Factor

Apart from all the other factors such as Psychological Visual, Automaticity Severity and Appropriateness, there are numerous other factors which are part of restitution patterns such as the literacy level or the intellectual or cognitive level of the patient (Fierschner 1948) In few cases the degree of daily usage of writing and reading may also play a pivotal role in the restitution pattern (Anastasopoules 1959)

Therefore, it is evident that it is not necessary that only one factor would get integrated in bringing about the restitution in fact at different points of time different factors may involve which may be more than one No fixed rule can be silhouetted for the recovery pattern as it

varies from patient to patient and case to case. Even there can be instances where the case might be similar but the pattern of recovery might differ (Weisenburg& McBride, 1935).

Thus, language is the most important part of human existence; a person is handicapped without it. Language has many defined areas in brain which perform different functions however, the productive part is handled by the frontal lobe of the right hemisphere in the particular area called Broca's Area. Any damage to the Broca's area affects the production of language, or in other cases any damage in the left hemisphere will alternatively affect the right hemisphere, which ensuing the language disorder. Nevertheless, language can be recovered by many recovery patterns and methodologies. However, in very common and obvious methods stands the one which is done by starting with the phonetic reinforcement following the enhancement of levels later, such as morphological, semantic and syntactic (subject to the severity of the Aphasia in the patient). Studies in Neurolinguistics, in this regard, have widened the field and it is still progressing in many other lesser known facts.

CHAPTER 3

METHODOLOGY

As the basic aim of this study is to highlight the language levels and patterns of the patients of Broca s aphasia, the following chapter would thereof deal with the scheme of carrying out the procedure of testing hypotheses of loss and recovery of language patterns which have been mentioned in chapter one The study would attempt to focus on the selective sample in context of the effects of Aphasia that is Broca s in its very nature along with the association it has with the field of neurolinguistics

3.1. Type of Research

The current study is **quantitative** in the broadest sense Quantitative study is primarily the statistical analysis of the data collected The researcher s endeavor to hold up the method of quantitative analysis is primarily because of the fact that the data collected would be presented in form of tables and graphs, so that the representation of the aphasia with regard to the increase or decrease of any fact finding or other information may be characterized This will serve a twofold purpose that is one it would make clear distinction of each of the sample regarding where they stand in the analysis process and secondly it would make an attempt to highlight the variations found in each of the cases

However, within the realm of quantitative analysis it is **case study** Quoting Robson (2002) in their work Saunder, Lewis and Thronhill (2009) explain case study to be a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence (p 178) Yin (2003) too signifies

context's integrality. However, he adds to Robson's point commenting that the boundaries of the phenomenon and the context in which it is being studied are not clearly silhouetted when it comes to a case study. Questions like 'why', 'how' and 'what' carry a greater degree of getting understood by using the case study strategy. Thereof, case studies are usually carried out in the exploratory and explanatory research. However, one cannot confine the tools for case study since it can vary from questionnaires to tests, interviews, documentary analysis or observations.

Yin (2003) further proposes that case study strategies can be single case study vs. multiple case studies or holistic vs. embedded case study. Nevertheless, as per the requirement of current study, the researcher would remain confined to the multiple case study strategy. A case study can integrate more than one case. The underlying principle of using more than one case study is to inquire if the findings of case are present in any of the other cases or not. If so, what are the similarities, differences or degrees. As a consequence, as certain generalization is drawn out, this is preferable to single case study (Yin, 2003). This method of case study is particularly beneficial when a theory or any theoretical model is under testation, which is carried out in the real world situations. An existing theory can be very well explored by using the case study strategy, besides a well-formed and strongly designed case study can even challenge an existing theory and pave way for innovative research questions (Saunder, Lewis & Thronhill, 2009). Keeping in view the above mentioned details, the researcher has chosen 'Multiple Case-Study' as a type of study where the researcher would undertake five patients encountering different stages of aphasia. Researcher finds it much feasible that the sample must be 'Multiple Case-Study' because the nature of the impairment and aphasias is subject to individuality and two persons may or may not be alike. Moreover, one of the aspects of the study is to find the deteriorating language levels, so a patient from each linguistic level is required for analysis; therefore, it is practical and reasonable

to opt for Multiple Case-Study. Another reason of prioritizing Multiple Case-Study over other sampling methods is that all the previous researches made in this context are case studies.

3.2. Research Tool

The tool employed by researcher to collect data from the patients of Broca's aphasia is Bilingual Aphasia Test acronym as BAT. The Quebec-France Cooperation Program of the Ministry of Intergovernmental Affairs sponsored a collaborative project between 1976 and 1982. It took place between Dr. Henry Hecaen, Director of the Paris INSERM Neurolinguistic Unit, and Michele Paradis, who together developed BAT. Initially Dr. Henry Hecaen used tools to assess patients in his laboratory, but then along with Paradis this test was designed for an equal assessment of each of the languages of bilingual or multilingual patients. Henceforth, the various versions of the BAT are not only translations in fact they are all together culturally and linguistically different from each other, nevertheless, the equivalence remains the same. As according to the operational framework, most fitting taxonomy may be used. Furthermore, on the basis of the scores achieved by the patient a specific kind of aphasia can be characterized (Paradis, 2011). For the current study, nevertheless, the researcher would only use the Part C of the test, since it is acutely relevant to the Broca's Aphasia.

3.2.2 Structure of BAT

The BAT contains three different parts which are named as (A), (B) and (C). Part A contains the history of bilingual questionnaires, including their parents and family backgrounds, educations, and friends etc. part B includes a language-specific test, whereas part C encompasses a test for each specific language pair that presents same information in both the languages and the patient is thus required to identify, comprehend or reproduce the sentences in both languages. The

Researcher has remained confined to Part C of the test, since these parts can be used individually as per the use of the study. As the research of the current study only targeted the bilingual linguistic patterns so the importance of Part C was more accurate. Moreover, as the study was a multiple case study that encompassed patients from mild to severe, so it was no point getting language test, that's present in Part A and B from the patients since they would not be able to understand, comprehend and respond to it. Therefore, the most feasible option for the researcher was to opt for section C, which contained the test for linguistic patterns.

3.2.2 1. Validity and Reliability

Prior to the researcher of current study, the BAT has been successfully and fruitfully used by various other researchers like five case studies of bilingual aphasia, one on cognates in therapy (Kurland and Falcon), one on therapeutic effects (Kiran and Iakupova) and one on unilingual children with autism (Schneider and Hopp), followed by three reports on the development of a BAT for less-studied languages (Miller-Amberber, Postman), (Adrover-Roig et al., Green et al., Kambanaros and Grohmann, KoumanidiKnoph, Kong and Weekes), three clinical experiments (Tsegaye, de Bleser and Iribarren) and a computerized interactive oral version (Achimand Marquis) and one study of bilingual primary progressive aphasia (Zanini, Angeli and Laviano). These offerings initiated from 10 countries (Australia, Canada, China, Cyprus, Greece, Italy, Norway, Spain, the United Kingdom and the United States of America) and concern 16 languages (Amharic, Bahasa Indonesia, Basque, Cantonese, Catalan, English, Farsi, French, Friulian, German, Greek, Italian, Putonghua, Rarotongan Maori, Russian and Spanish).

3.3. Population and Sample

As aforementioned the estimation given to the researcher by the concerned authorities regarding the patients of Broca s aphasia was five patients a week, so it is evident that this type of aphasia is common and frequently occurred The researcher has undertaken the hospitals of Islamabad and Rawalpindi for a detailed study of patients, nevertheless, the researcher was not allowed to get the data from all the hospitals Fortunately, only NIRM (National Institute of Rehabilitation and Medicine) allowed the research to study and collect data from the available patients As said earlier, average number of patients visiting the hospital per week is five so a large number of patients of Broca s Aphasia were present at the hospital that included all children adults and oldies However, remaining confined to the type of study which is multiple case study the researcher has chosen five patients of Broca s aphasia, depending upon the severity of aphasia These five patients resultantly became the sample of this study entailing that the sample would start from mildest to the most severe stage of aphasia encompassing five patients on different levels

3.4. Methodology and Critical Framework

The researcher has taken up the BAT to analyze the patients for which the researcher has visited various hospitals of the twin cities, Islamabad and Rawalpindi in order to ensure that there are several patients of Broca s aphasia (aphasia that is under consideration in the current study) which could be undertaken as the research sample Researcher has visited Al-Shifa Hospital Islamabad, NIRM (National Institute of Rehabilitation and Medicine, Islamabad and AFIRM (Armed Forces Institute of Rehabilitation Medicine), Rawalpindi for the purpose According to the doctors of the concerned department there was an approximation of five patients a week as

an average The researcher formally took permission from the relevant authorities for conducting the tests Whereas it was not permitted by Al-Shifa Hospital and NIRM to conduct the tests however they allowed the researcher to meet and talk to the patients of Broca's Aphasia which proved to be of much help The researcher was then left with the only option of NIRM for the data collection The procedure that was employed by the researcher was that an individual session was held with each of the patients on different days since the patients are not very candid to the foreigners the researcher spent some time in developing acquaintance with the patients and then the patient was asked to fill the test Since the sampled patients varied in the severity of the aphasia so researcher as according to Paradis (2011) could assist patients to fill the test since they were unable to write and unable to produce answers vocally As per the requirement of the research only the Part C of the test has been used for patients to solve The researcher started surveying the hospital around March 2014 and by July 2014 was able to collect most of the data

3.4.1. Critical Framework

The researcher has adopted the framework by Michele Paradis given formally in a form of a written text (modified) in 2004 He named it as Neurolinguistic Theory of Bilingualism In this regard, Paradis points to the fact that a human brain is responsible for every function that is being carried out either internally or externally and for the purpose there are various operational neurofunctional modules He points that neurofunctional modules are functionally autonomous domain specific informationally encapsulated and have a characteristic pattern of development (p 120) (Paradis, 2004) These neurofunctional modules respectively sub-serve phonology morphology, syntax semantics pragmatics etc and as many languages a person can speak these modules (each one of them) further divides itself to similar number (Paradis 2004) These

neurofunctional modules are isolable computationally autonomous and are for specific purpose and therefore function as a constituent of a larger unit Paradis (2004) argues that the internal structure of each of the neurofunctional module is idiosyncratic, nevertheless eventually there are connections and links found on a larger scale He points that having been linked together does not influence the distinctiveness of the subsystems in any regard A language s Neurofunctional modular system is subject to respective impairment (Aphasia)

The researcher attempts to assimilate the theoretical framework of Michele Paradis into the case studies of Broca s Aphasia found in Pakistan Through the BAT the researcher would endeavor to bring forth the fact that how various levels of language are affected and how they are recovered As aforementioned the researcher would study five patients on five stages of aphasia that is, no production phonetic level, morphological level semantic level and finally syntactic level The researcher would study the patients keeping in view the operational framework along with the prior cases which may be similar or different from the case studies of the current study

It would also be focused that what are the patterns of restitution found in the sampled case studies and how they can be related to the earlier researches in the domain The pattern of recovery of both the languages that is L1 and L2 would be studied along with the fact that which language was affected the most and which recovered the most

3.5. Problems

During the tenure of working on this study the researcher came across many glitches that include the scarcity of the literature, in the process of data collection etc Since the field is quite recent in Pakistan so very little of literature was available The researcher had troubles finding the relevant books and material Inaccessible articles and internet sources made it tougher and longer for the

researcher to get the pertinent material Moreover as aforementioned in 3 4 that researcher faced unfavorable reactions from authorities of hospitals where they completely refused to give any data and denying the fact that the research is actually for the betterment of their patients in future Moreover, patients were very reserved in the beginning and the researcher had to arrange more meetings with them in order to grow familiarity first and then getting the test done

3.6. Data Analysis

The current study would carry the data analysis done on quantitative basis The data collected from the bilingual Broca's aphasia patients, through BAT would be analyzed The researcher as aforementioned has carried out 'multiple case-study' taking five patients suffering from Broca's aphasia at different levels of severity For this purpose, the researcher would bring in the use of Ordinal Scale, which is a statistical scale The reason of using this scale is that it has a set of numbers that define certain categories It is also used in operations where one has to make estimations of sensitivity or specificity This scale allows marking out various thresholds as per the requirement The researcher, in this study has used ordinal scale to mark the threshold of patients as per the level of severity they are facing after the stroke The Scale that would be used for the categorization is as follow

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Mild				Severe
Case 1	Case 2	Case 3	Case 4	Case 5

(Syntactic) (Semantic) (Morphological) (Phonetic) (No Production)

Particularly, the researcher has focused on levels of language that is Phonetic Morphology Semantic and Syntactic One of the patients taken as case study was however with no production at all making him the most severe case of Aphasia The test contains four portions of questions of varying nature, which are further divided for Urdu language and English language The researcher would analyze the nature of answers given by the patients according to the scale presented in BAT that is correct, incorrect or nearly correct Furthermore, the researcher would include the additional remarks about the patients which were observed during the test for an instance, various gestures sign or any particular sound used by the patient or not etc

The study will also show the data in the form of graphs and tables wherever required Both languages would be analyzed and also the fact that which language is improving at faster pace The data of each patient would then be compared and their pattern of recovery would also be determined

CHAPTER 4

DATA ANALYSIS

The collected data has been intended to analyze through various statistical and mathematical operations. Firstly, the case studies of five patients have been marked on the Ordinal Scale. Ordinal Scale is a statistical scale that "has a set number of categories and estimating the sensitivity and specificity at different thresholds of the test." (Rajan, 2008)

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Mild				Severe
Case 1	Case 2	Case 3	Case 4	Case 5
(Syntactic)	(Semantic)	(Morphological)	(Phonetic)	(No Production)

Fig 3: Ordinal Scale for the Stages of Broca's Aphasia Selected for Case Study.

4.1. CASE 1

The first case studied by the researcher was a male of 21 years who had done his graduation. He was reported to have fallen of the second floor and suffered a stroke in his frontal region causing him Broca's Aphasia. According to the BAT solved by the patient it can be claimed that he was suffering from mild Broca's Aphasia. The statistics for this claim has been provided underneath

PART 1: Word Recognition

Urdu: Out of five questions three were rightly answered and two were left unanswered

PART 2: Word Recognition

English: Out of five questions, four were rightly answered and one was left unanswered

PART 3: Identification of Word-Translation

Urdu-English: Two out of ten questions were right while eight went unanswered

PART 4: Identification of Word-Translation

English-Urdu: Two out of ten questions were right two were nearly right and six were no answered

PART 5: Translation of Sentences

Urdu: Sentences in Urdu were repeated one time by the researcher for all six questions for which the patient did not give five answers and only one was rightly given in a group

PART 6: Translation of Sentences

English: Four sentences were repeated once while two sentences were repeated twice. Two answers were given with two groups rightly translated. One of the answers was given with one group rightly translated. One answer was given with nearly same meaning while two answers were not given at all.

PART 7: Grammaticality Judgment

Urdu: Out of the total of eight questions six were rightly judged as incorrect sentences while two were not answered. After correction five were nearly correct, one was wrongly answered and two were left answered.

PART 8. Grammaticality Judgment

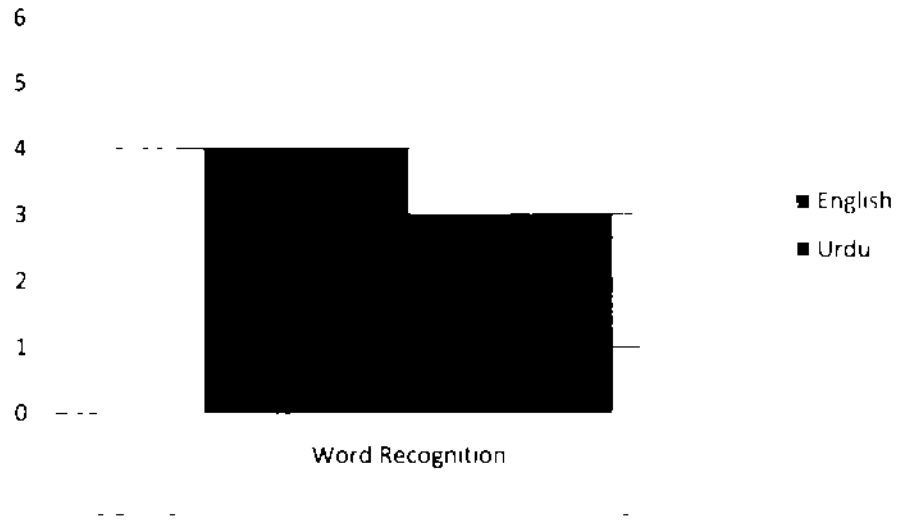
English: Out of the total of eight questions four were rightly judged to be incorrect, after correction three were close to correct answer and five were not answered.

4.1.1. ANALYSIS

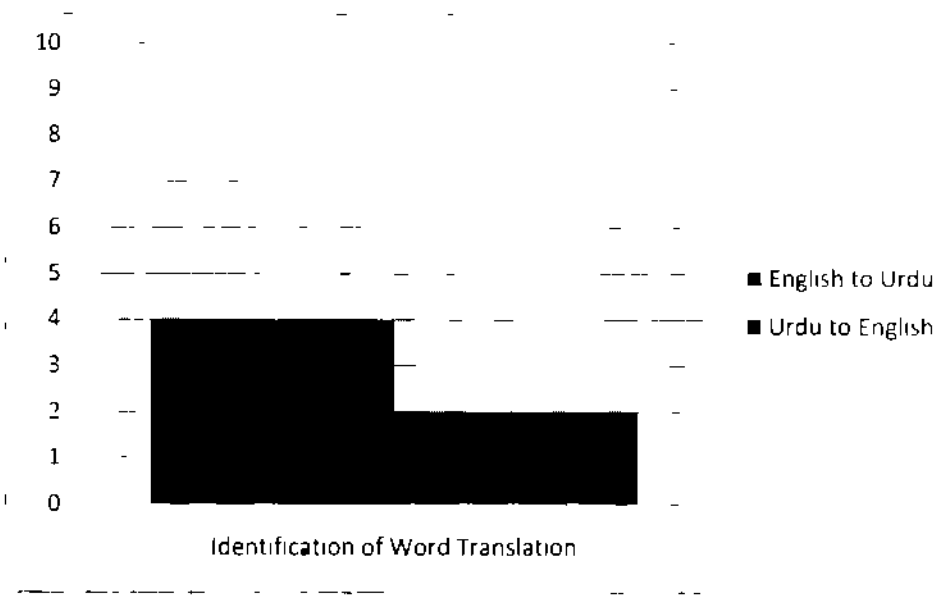
- The above discussed patient has been observed to be a mild case of Broca's. This is said because one observes that the subject has been successful in answering most of the questions right or nearly right. However, it is seen that the instances where any language structure was somewhat similar to another, the patient was found confused and apprehended.
- Eight different parts of the test have been responded by the patient. These parts mainly concerned with both the languages, that is, English and Urdu. Each part has been found to have varying number of questions with varying themes, as per the demand of heading.

For an instance the part called translation of sentences encompass the sentences in one language which is to be translated in another language (English and Urdu in context of the current study)

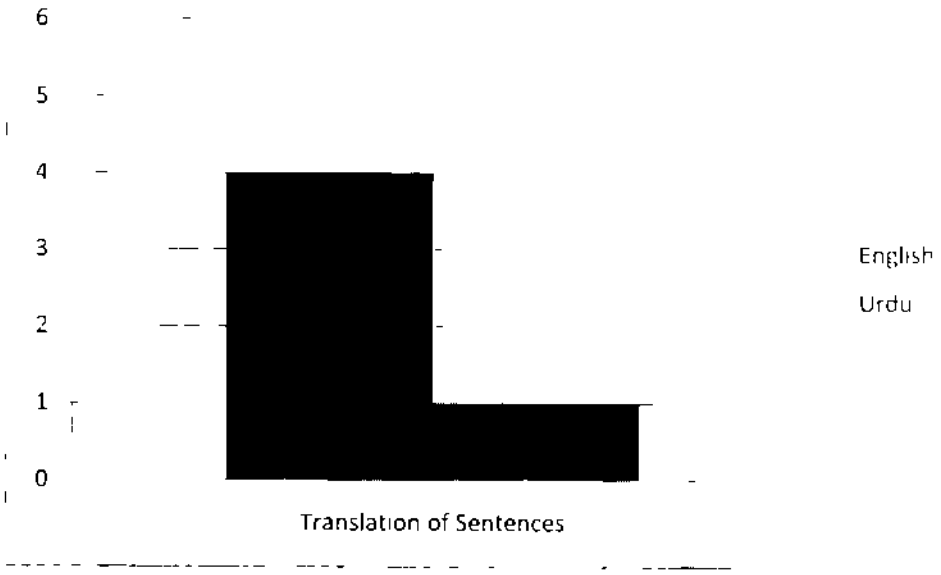
- From amongst four portions that is 'Word-Recognition' 'Identification of Words' 'Translation of Sentences' and 'Grammaticality-judgment' the patient was found more accurate responsive and correct in English Language as compared to Urdu language in three portions, which are 'Word-Recognition' 'Identification of Words' and 'Translation of Sentences'. Nevertheless, in the fourth portion of Grammaticality judgment the patient was more responsive and correct in Urdu language. The detailed description of the number of questions answers correct or incorrect has been aforementioned
- While answering though the patient had the knowledge of the words and otherwise language but he was found struggling with the words while speaking. He reported to the researcher that he feels frustrated while speaking because it demands a lot of effort from him
- Type of recovery: The patient seemingly has Parallel pattern of restitution where both the languages are recovering simultaneously however the progress in L2 is greater than of L1. This may be because of the psychological factor or the appropriateness factor that the patient is sticking on to
- The graphical representation of the patient is as follows



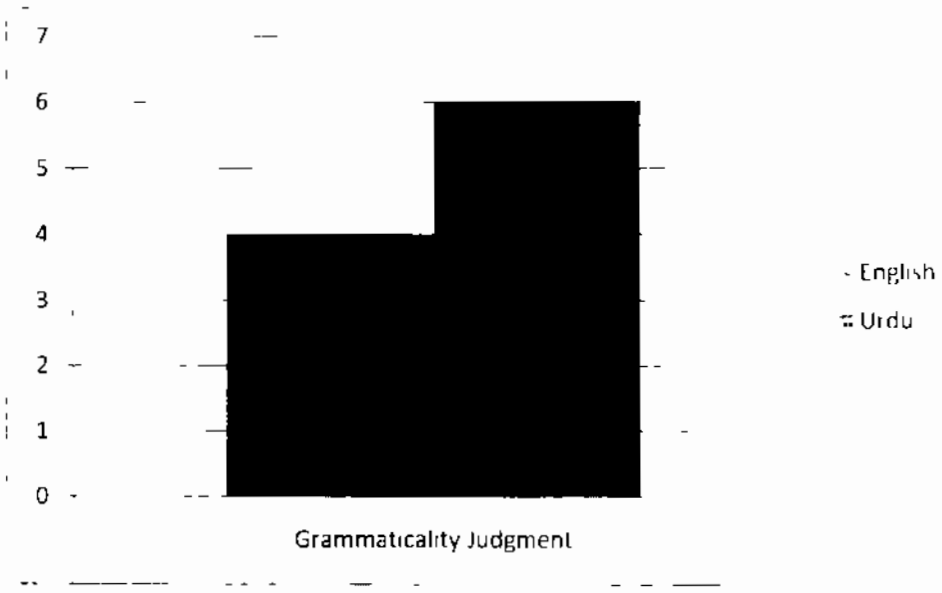
The Graph attempts to represent the number of answers given by the patient which were present in BAT. The graph shows that the patient answered four right answers in English and three right answers in Urdu. The total number of the questions was six. This explains that the patient had better grasp of English Language which was his second language than the grasp on Urdu language which is his first Language. This is, however, only confined to the word recognition of both the Languages.



The Graph represents that the patient answered four right answers in English to Urdu translation and two right answers in Urdu to English translation. The total number of the questions was ten. This explicates that the patient has shown more improvement in English Language which was his second language than in Urdu language which is his first Language. This representation is restricted to the Identification of Word Translation only.



The Graph embodies the translation of sentences In this section the patient showed great progress in Second Language that is English Language The patient answered four right answers in English to Urdu translation and only one right answer in Urdu to English translation The total number of the questions was six This expounds that the patient has better hold of English Language which was his second language than of Urdu language which is his first Language This is representation is limited to the Translation of Sentences only



Above is the graphical representation of the patient who answered four right answers in English Grammar and six right answers in Urdu Grammar. The total number of the questions was eight. This clarifies that the patient has better judgment of Urdu language grammar as compared to English Language, which is in complete contrast to all the other sections.

Graph 1. Bar Chart Representation of Case 1.

4.2. CASE 2

Case 2 is a female of 40 years who is a Pakistani born woman but had been living in England with her family She had a stroke due to high blood pressure She has been reported as a victim of depression since her husband died She also possesses a family history with heart attacks Due to stroke both of her languages that is English and Urdu had been affected Her comprehension of meaning of language has improved a great deal making her stand on the semantic level however her production in syntactic form is not very progressive which is why she failed to answer many questions of the test Her test results are as under

PART 1. Word Recognition

Urdu: Out of five questions, four were rightly answered and one was left unanswered

PART 2: Word Recognition

English: Out of five questions, none was answered

PART 3: Identification of Word-Translation

Urdu-English: Recognition of Urdu words was correct but translation in English was left unanswered

PART 4: Identification of Word-Translation

English-Urdu: Recognition of Urdu words was correct but recognizing it in English was left unanswered

PART 5: Translation of Sentences

Urdu: Since the patient was at Semantic level so answers in form of sentences were not uttered

PART 6: Translation of Sentences

English: Since the patient was at Semantic level so answers in form of sentences were not uttered

PART 7: Grammaticality Judgment

Urdu: Out of the total of eight questions seven were rightly judged as incorrect sentences while one was not answered. After correction three were nearly correct, one was wrongly answered and four were left answered

PART 8: Grammaticality Judgment

English: None of the questions was answered

4.2.1. ANALYSIS

- The patient has been found to be more active in restitution of Urdu Language
- However, the understanding and comprehension of English language was fine to some extent when it came to some words which were asked with pictures or with backing up with the initial sound production, but no effort by the patient herself was seen
- Particularly, in English language the patient could not differentiate between alphabets or digits written in English language. Nevertheless, if the alphabets or digits are said in

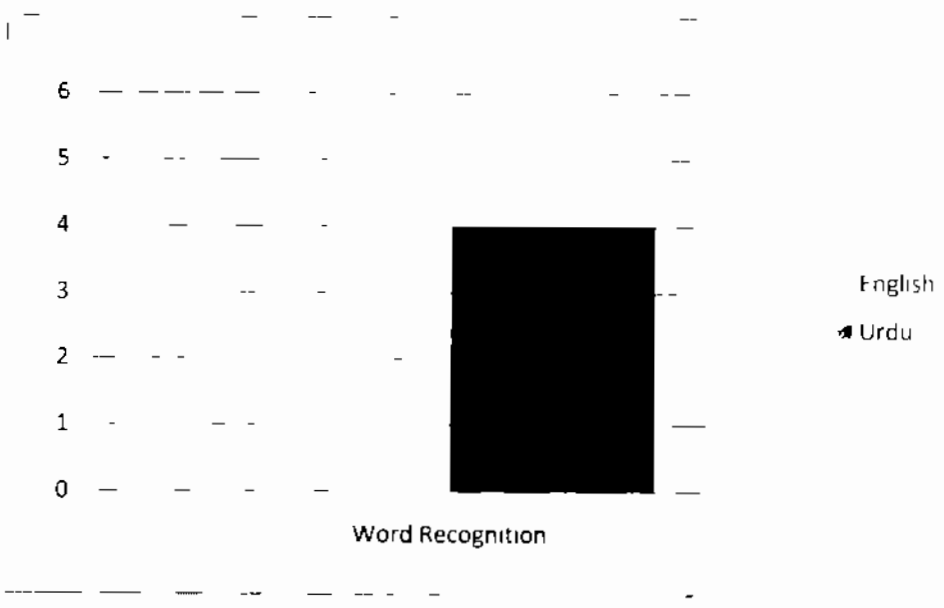
repetition with order then the patient is able to repeat but if they are produced asymmetrically the patient is found detained

- Another very interesting fact noticed in the patient was that she was comfortable in writing down her answers Even a few words of English were well written by her This is evidence to the fact that the semantics of the language was intact in her Being a victim of Broca s aphasia it was obvious that production of language was a predicament for her but her efforts for better written expresston withheld the believe that her semantics of the language was better

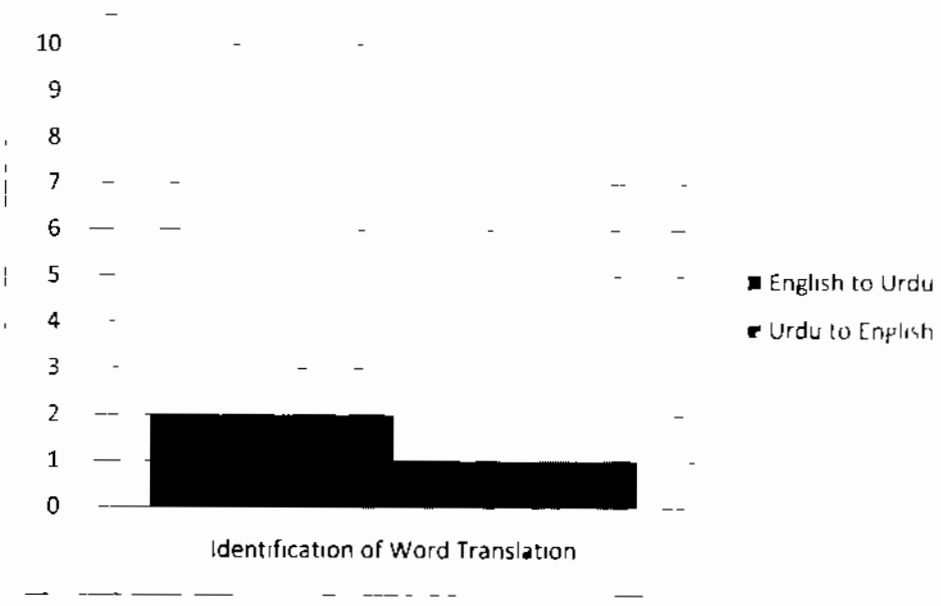
- For the analysis purposes the researcher indicated the ceiling fan to the patient and asked her to name it which she answered correctly in Urdu but when she was requested to do so in English she could not speak it

- The pattern of recovery is rather complex It can be the amalgamation of Antagonistic and Selective patterns of recovery, with visual factor intervening Antagonistic because one language is progressing while other is regressing Or in case if it is not regressing then it is Selective because the patient is unable to recover the second language But it may not purely be selective because the patient shows a few traces of English language production in the repetition manner or if a support of initial phonemes is given

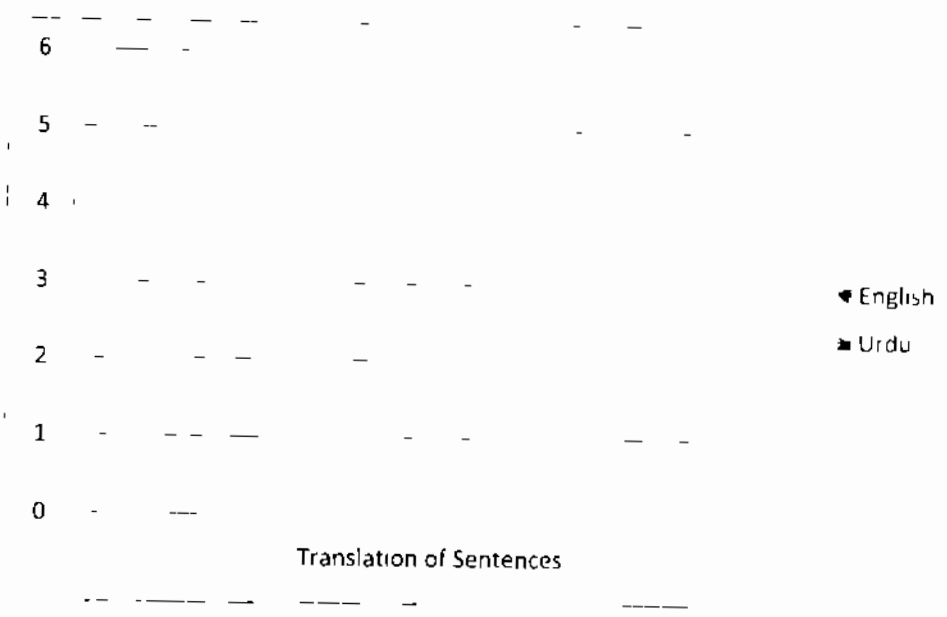
- The graphical representation of the patient is as follows



The graph shows that the patient did not give any answer in English Language however a good average of four answers out of six in Urdu language has been shown. This shows that the patient who has been residing in England for quite a long time has completely lost her second language.



The Graph represents that the patient answered two right answers in English to Urdu translation and one right answer in Urdu to English translation. The total number of the questions was ten. This is rather vague apparently if patient was better in English language or in Urdu Language so this is to clarify here that the patient was comfortable and responsive in Urdu Language as compared to the language in both the translations that is from English to Urdu and from Urdu to English.



The Graph has been intentionally kept vacant in order to show that the patient has shown no progress in the Translation of Sentences. The prime reason the researcher could deduce was that the patient was at semantic stage and therefore had good comprehension of meaning but giving them a sentential outlook was not possible for the patient

4.3. CASE 3

The third case under consideration of the researcher as per the sample was a 34 years old superintendent of Pakistan Army. He had a left hemisphere stroke leading to right side of the body paralyzed due to hypertension. The patient was on the morphological level since he was only able to utter words only. Both languages of the patient were lost as a result of Aphasia. Although the patient had good understanding and comprehension of the instructions given to him but it was only after repeating it several times that he was able to respond. The test solved by the patient gave results as under

PART 1: Word Recognition

Urdu: Out of five questions, four were righty answered and one was nearly correct.

PART 2: Word Recognition

English: Out of five questions, five were rightly answered.

PART 3: Identification of Word-Translation

Urdu-English: Recognition of Urdu words correctly, but translation in English demanded a little help. Seven were rightly answered, two were left unanswered and one was wrongly answered.

PART 4: Identification of Word-Translation

English-Urdu: Six were rightly answered, while remaining four were left unanswered.

PART 5: Translation of Sentences

Urdu: Since the patient was at Morphological level so answers in form of sentences were left unanswered

PART 6: Translation of Sentences

English: Since the patient was at Morphological level so answers in form of sentences were left unanswered

PART 7: Grammaticality Judgment

Urdu: Since the patient was at Morphological level so answers in form of sentences were left unanswered

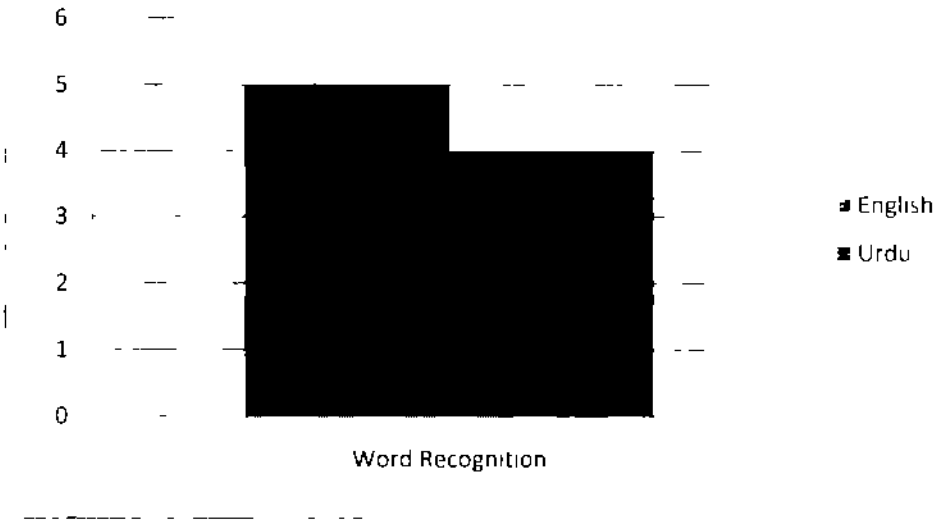
PART 8: Grammaticality Judgment

English: Since the patient was at Morphological level so answers in form of sentences were left unanswered

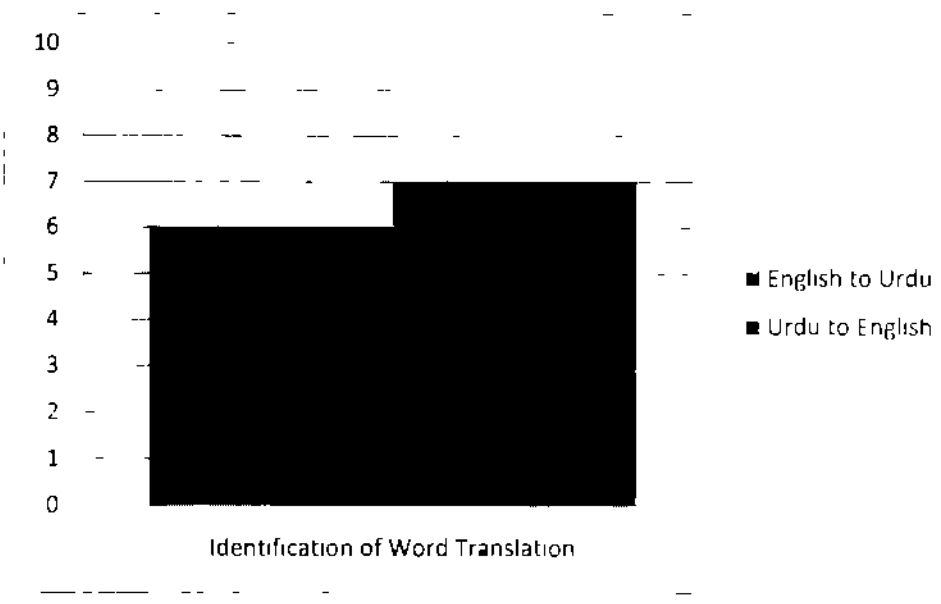
4.3.1 ANALYSIS

- The patient was found to have a great deal of comprehension of instruction although more in Urdu
- The patient was unable to produce sound which was produced as s sound
- The patient made excessive use of t sound which was more of alveolar than dental
- With the words having p sound the patient was found to face difficulty

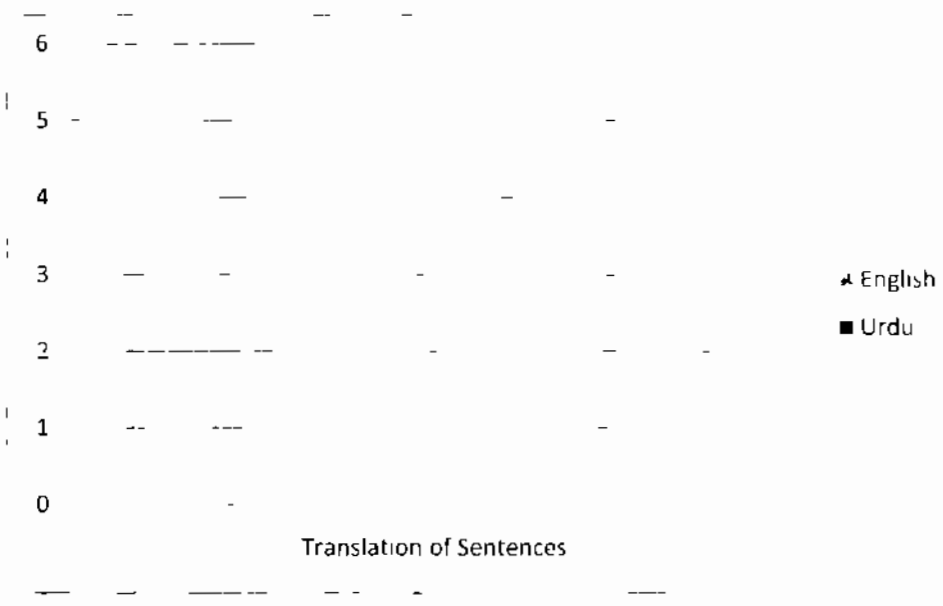
- The Urdu production of the patient was better than the English pronunciation
- The patient was more responsive with the pictures
- The basic communication of the patient was through gestures and signs
- The patient was taught to recite the Holy Kalma-e-Tayyaba which he could recite but with a lot of efforts
- The patient could also count from 1-10 both in Urdu and English
- Patient had difficulty in producing long words
- Long vowels such as 'a' and 'u' were excessively used
- The patient was able to recognize various asked alphabets and words of both English and Urdu from a cluster of other words and alphabets
- The patient progressed in Urdu language more mainly because that was the language used by hospital staff
- The pattern of recovery is simply parallel recovery where patient is progressing in both the languages
- The graphical representation of patient's progress is mentioned underneath



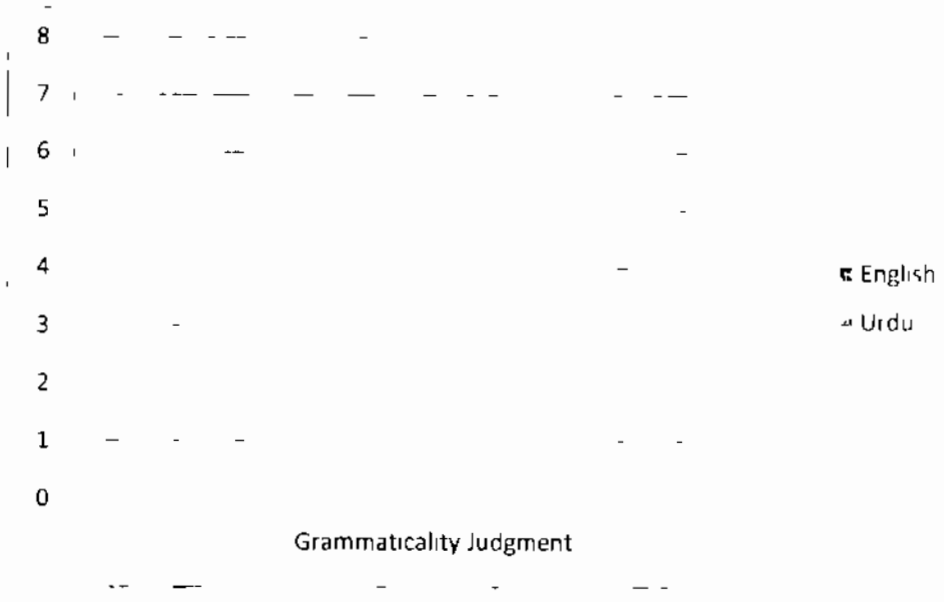
The graph represents the Word Recognition of a patient at morphological stage. It shows that the patient correctly answered five out of six questions in English language and four out of six in Urdu language. The patient pointed at the word usually and uttered them with a little degree of vagueness, however, if listened with concentration one could make sense of what was being uttered.



The above graph shows the Identification of Word Translation section's graph. Here the patient stands at the morphological stage and shows translations from Urdu to English better than English to Urdu, though the difference is not very huge as in English to Urdu it makes a difference of one point only. But difference does matter when the recovery patterns are being traced



The above formed graph has been left vacant on purpose in order to show that no answer was given by the patient since he was at Morphological stage



Since the patient was at Morphological stage, no answer of the grammaticality judgment was expected

Graph 3: Bar Chart Representation of Case 3.

4.4. CASE 4

The patient was 49 years old woman who suffered from stroke a month before she showed up at the rehabilitation center She was reported to have been alone at home in the morning time when she suffered the stroke It was told by the guardian that she apparently had no tensions and no traces of high blood pressures However a very interesting fact was told about her pre-stroke conditions It was told that she had applied henna on her hair Logically living in a region as cold as Kashmir and applying henna on hair in the cold weather would have resulted in clotting of blood in certain areas of brain etc which ensued in a stroke The patient had affected memory in the beginning but it was retained automatically within sometime On her first visit she was reported have no sound but was able to cough

The patient could barely do the test since she was on phonemic level and was only able to produce a few sounds, amongst which a sound was strongest It was told by the guardian that she was able to communicate quite well with gestures and signs She was reported to be on the most initial stage of phonemic level because she was not able to utter all kinds of sounds The patient was observed to have difficulty in moving the tongue or lips Therefore sounds associated with lips and tongue or teeth were not produced The patient silent most of the time except for trying the a sound which usually ended as nasal which was unique

The pattern of recovery at this point of time is little untimely to determine as the concurrent factors and therapies later may change the dimension to anyway Having been unable to answer the questions given in the test the graphs may not help much since none of the questions was answered

4.5. CASE 5

Case 5 was the most severe case of Aphasia that the researcher undertook. This is said because the patient made no production at all. The patient was aged 49 and was teacher by profession. The patient suffered from high blood pressure and hyper tension which led to heart stroke. he was immediately taken to the hospital. After three days of the heart stroke while he was still at the hospital he suffered the brain stroke. The researcher happened to meet the patient five days after the stroke. The patient had some understanding of the language. Like for an instance he could make very minute gestures of yes and no by nodding and shaking head respectively.

As obvious the patient could make no production so there was no room left for solving the test. However, few facts remain intact to the case such as.

- Both languages were affected by Aphasia
- The patient could make comparative better understanding in Urdu as compared to English
- The patient was psychologically disturbed and distressed
- The Patient used the gestures of nodding and shaking head in answer to yes and no respectively
- The patient was timid and unresponsive in the first few sessions

Since the patient made no answers so the graphs may not be formed. The pattern of recovery may also not be possible to make at this point of time. Nevertheless, the starting point can be that with the phonetic level.

4.6. DISCUSSION AND FINDINGS

Reviewing and critically examining all the above analyzed data one may understand the fact that the reasons of stroke may be paralysis direct hit or blow, heart strokes leading to brain strokes clotting etc but in any case, any damage to the frontal region of the right hemisphere would apprehend the production of a person which is usually associated with the Broca s area which is in the left hemisphere This is the basic principle on which the human brain works that is the damage to the right hemisphere cause apprehension of left hemisphere and vice versa

The patients of Broca's aphasia have an adequate understanding of language even on the very crucial stages of aphasia and therefore, can make sense out of basic instructions that they are given this fact makes the aphasia more of a productive aphasia since the receptive domain works efficiently It is also observed in some cases that the patients can point out certain things they want or calling a person by points or making bodily gestures This shows that the brain has subsets of the larger units which serve autonomously, yet connected to their parent neurofunctional module

Additionally the patients of Broca s aphasia are found to have very little of any connection between the levels of language after the aphasia occurs However their lost is very much linked as in all the five cases it was found that both the languages were lost simultaneously Yet the recovery was totally dissimilar In some instances the patient was better at recovering the first language and in some cases it was more inclined towards the second language

The Data shows that the pattern of recovery was different for all the five patients however apparently the patients on phonetic level and that of no production are comparatively on too initial level to demonstrate any restitution pattern Primarily, the reason may be that the recovery

from aphasia needs various factors which assist a person to recover the language The factors may be psychological environmental severity or appropriateness etc Thereof the recovery of such patients is radically dependent upon the environment they would be provided with in their journey of recovery

Moreover the data shows that along with having no link in the recovery of language one may also notice that there are no links between natures of error of L1 and L2 Both the languages are lost at same point of time but any connection of their regaining and nature of errors is not found or observed The intervention of the treatment and environment plays a pivotal role in regard

Another interesting fact that some patients were more comfortable and responsive by looking at the pictures and one of them was more comfortable in answering by writing the answers Other than the BAI test, the researcher attempted to ask some other language related questions which were in both the languages, by either writing them or drawing them to which patients were more responsive and easy

A few patients of premorbid nature were capable of pointing and making gestures for their basic communication and the initiation of the treatment of almost all the patients start with phonetics Within the domain of phonetics it is observed that the rudimentary sounds such as a i u were practiced by the patients and each day the sound was elongated a little more than the previous day This helps regulating the speech organs of the patients

Interestingly the reason of stroke found in case 4 was very unique and different the guardians of the patient reported that she was perfectly fine until the morning of the day the aphasia occurred to her It was told that the patient applied henna on her hair and within sometime she was unable to speak no external damage of any kind such as heart arrest or paralysis etc was found In this

case one can say that since the patient was residing in Kashmir and the area is particularly cold Therefore in the cold area such as Kashmir with a cold month of December the patient applied henna on her hair which is again essentially cold in its nature may have caused the veins numb and ultimately causing the blood clotting etc which would have resulted in aphasia

Nevertheless, very little of any assumptions and findings could be made out of case 4 and 5 since they were the case on the extreme side of the ordinal scale which signifies the severity of aphasia The patients could not utter a single morpheme and therefore no application of test was possible It was only with case 4 who was at phonemic level that she could produce sounds like a / or u with an ending on the nasal usually but with the case 5 the researcher was unable to figure out any production

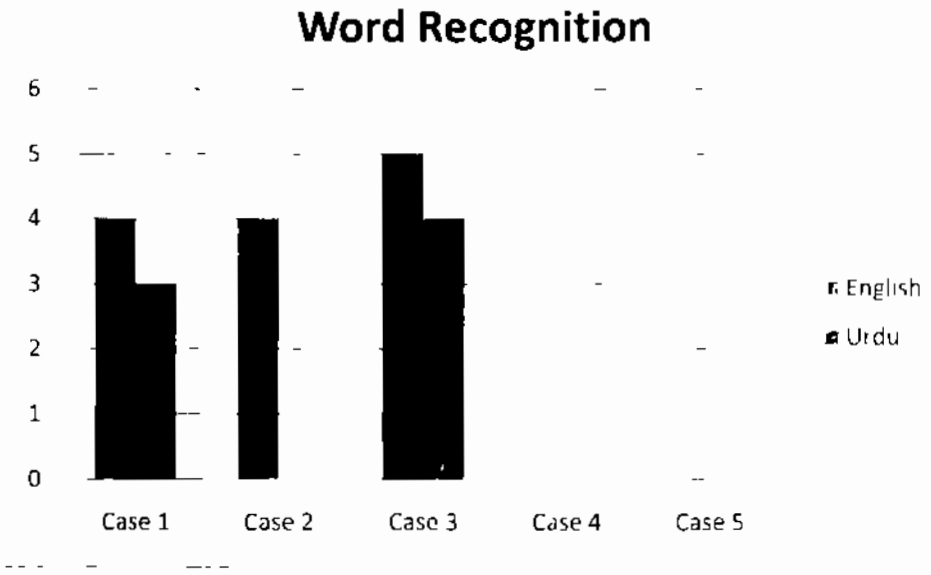
The sections of Word recognition, Translation of sentences Identification of word translation and Grammaticality judgment, both in English and Urdu language attempted to bring forth all the language levels and made it easier to gauge the capacity and compatibility of the patient on which so ever stage they belonged to The BAT helped marking out the stages of severity of patients through which the ordinal scale was partially formed Though the test was remarkably tough for patients to carryout but in some cases it helped and assisted the overall study by determining various points of discussions and findings which were essentially constructive in their nature

The data collected and analyzed, thereof brings about with it a detailed account of the nature and responses of patients of Broca s aphasia and also endeavored to achieve study s aims and objectives in a very definite and assiduous fashion

An overall outlook of the progress of the patients is shown in the graphs below

Patients	English	Urdu
Case 1	4	3
Case 2	4	0
Case 3	5	4
Case 4	0	0
Case 5	0	0

Table 4 Representation of all Patients for Word Recognition

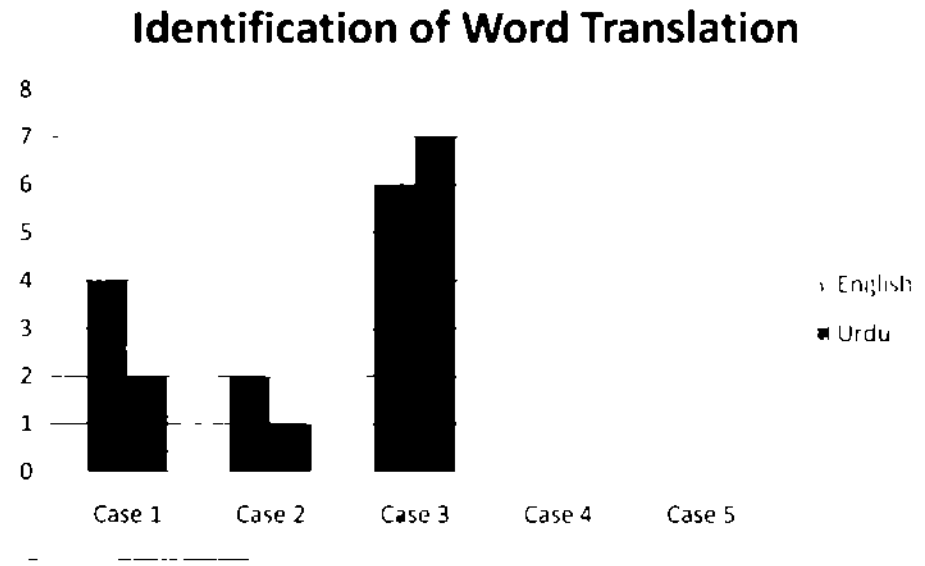


The Above Graph and table show the data representation of word recognition of all the sampled cases for both the languages that is English and Urdu

Graph 4: Bar Chart Representation of Word Recognition of All Five Cases

Patients	English	Urdu
Case 1	4	2
Case 2	2	1
Case 3	6	7
Case 4	0	0
Case 5	0	0

Table 5 Representation of all Patients for Word Translation

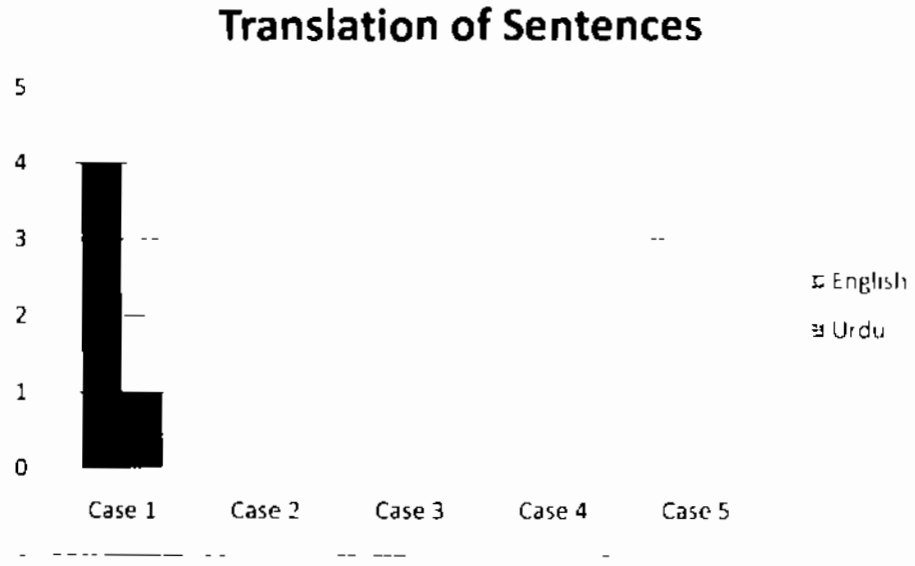


Above is the illustration of identification of word translation for all the five cases for English and Urdu Language

Graph 5: Bar Chart Representation of Identification of Word Translation of All Five Cases

Patients	English	Urdu
Case 1	4	1
Case 2	0	0
Case 3	0	0
Case 4	0	0
Case 5	0	0

Table 6 Representation of all Patients for Translation of Sentences

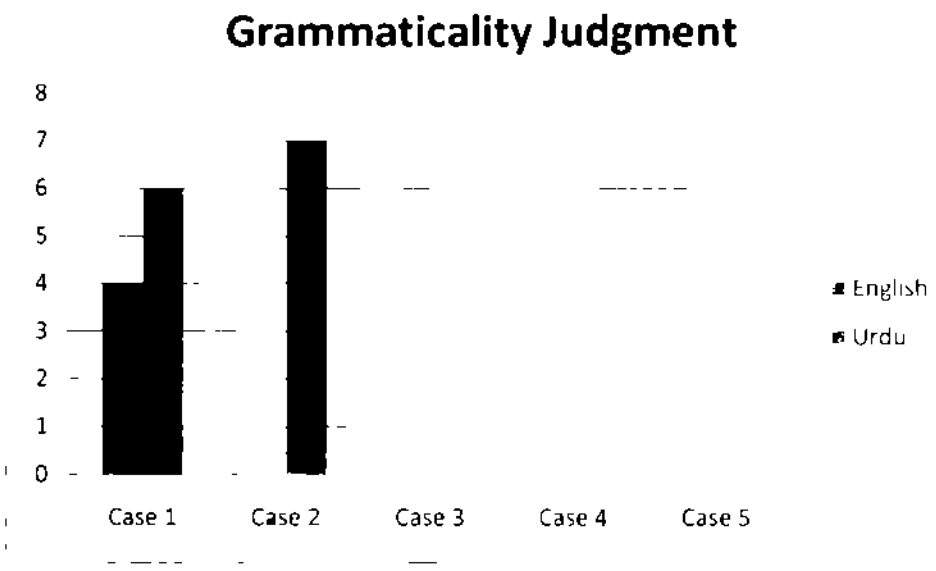


The above shown graph and table are the data representation of English and Urdu language of the patients of Broca's Aphasia for translation of sentences

Graph 6: Bar Chart Representation of Translation of Sentences of All Five Cases

Patients	English	Urdu
Case 1	4	6
Case 2	0	7
Case 3	0	0
Case 4	0	0
Case 5	0	0

Table 7 Representation of all Patients for Grammaticality Judgment



The table and Graph attempt to show the grammaticality judgment of patients of Broca's Aphasia for both English and Urdu Language

Graph 7: Bar Chart Representation of Grammaticality Judgment of All Five Cases.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

The following chapter deals with detailed account of the findings and analysis of the study. The chapter would also enshrine the suggestions and recommendations that are to be kept in mind for future studies and considerations

5.1. Summary of Findings

The considered hypotheses of the study were attempted to be proved by the researcher through acute analysis of the data. It was thus found out that as the first hypothesis stated that the patients of Broca's aphasia tend to lose L1 quicker than L2 is not valid. This is said because all the sampled patients lost both the languages at the time of aphasia simultaneously. Even the patients who were on syntactic or semantic level were reported to have lost both the languages at the time when aphasia occurred to them

The second hypothesis identified that the recovery patterns for the patients of Broca's Aphasia is similar for both the languages that is L1 and L2. However the researcher found that recovery patterns are subject to sundry factors which include the psychological physical environmental and many others. Similarly the patients sampled for the current study had several patterns for recovery. One of the reasons of varying recovery patterns of these patients is that they were at different stages of aphasia, from mild to severe. From amongst five cases the researcher found that the restitution was not subject to the L1 or L2 since the patient might recover L2 quicker than L1 and in some cases its vice versa. Hence, any claim of recovery particular to the language would be binding since it varies as per the factors of restitution. Moreover the pattern of

restitution intensely depends upon the environment where the patient is being treated The patients under study ranged from a very common parallel recovery to a rather complex amalgamation of Antagonistic and Selective patterns of recovery Besides the intervention of other factors such as visual or appropriateness factors etc play their vital role in recoveries Therefore it cannot be hard and fast rule that the pattern has to be similar for all the patients and for all the languages

The third hypothesis discussed that the linguistic errors of L1 is similar to L2 This hypothesis is not very effective for the current study since the data analyzed brought forth the fact that there is no linguistic relationship between L1 and L2 any progress in L1 would not assist L2 and vice versa With the samples of the current study the researcher was able to deduce that in few cases the errors of L1 were completely different from that of L2 Thereof it can be said that there is no connection between the errors of L1 and L2 except that both the languages are lost together

As the point put forth by Paradis (2004) that language is represented as a neurofunctional system disseminated into several neurofunctional modules which harmoniously sub-serve phonology morphology, syntax semantics pragmatics etc each module further divides into the same number as according to the number of languages spoken by an individual In the same context he presented a few characteristics of these neurofunctional modules which are that they are isolable computationally autonomous and have specific purpose and function as a component of larger unit So this point has also been ascertained through the fact that the patients under study had very less link of both the languages they were speaking as the linguistics levels of one language differs entirely from that of the second language However both the languages being part of larger unit of neurofunctional module were lost at the same time yet their restitution in this regard varies

Aphasia in fact is the loss of language which is all of sudden and altogether This is evident because of the fact that all the five patients who were considered for the current study were found to have lost both the language simultaneously and also that both languages were lost all of sudden soon after the stroke occurred

Next the researcher sought after to investigate that which of the two languages were found to be lost earlier from amongst L1 and L2 For this as aforementioned that none of the considered cases have shown any traces of losing one language earlier than other All the patients revealed that both languages are lost concurrently It was observed that soon after the occurrence of aphasia the patients lost both of their languages, and were totally speechless The extent was to the point where the affected was unable to utter the basic sounds of a etc

Following this the study aimed to explore that which of the languages L1 or L2 can be recovered sooner This was countered by considering patients of diverse stages This factor of variant stages facilitated study to discern various patterns of recovery at various stages The researcher was able to find that the recovery patterns are subject to numerous factors which may be individual, medical scientific or environmental As extensively discussed in the pertinent chapters that the patterns of restitution is subject to many aspects that may include psychological, appropriateness visual automaticity severity or multiple factors Therefore the issue of initial recovery of any language is associated with the fact that which language the patient is being exposed to Whichever language is used with the patient most and frequently it is likely that the patient would recover it first However, there can be cases such as psychological where the patient may feel more comfortable with a particular language and therefore prefer to speak that language over the other Similarly there may be cases as discussed earlier that

patients may also learn language which is being spoken by the hospital staff which may have never been part of the patient's linguistic history

Finally the researcher targeted to find the frequent linguistic errors of L1 and L2 after the aphasia takes place In this regard the assessment through BAT (Bilingual Aphasia Test) was carried out where the patients solved the sections like Word recognition Translation of sentences. Identification of word translation and Grammaticality judgment both in English and Urdu language This aided to find that how the patient is making use of English and Urdu The researcher was able to able to witness that there are no traces of any homogeneity in the errors of English and Urdu language For an instance a patient would make a mistake in Urdu language but the same thing when asked in English is rightly answered This was observed and inferred by the detailed analysis of the data collected by the researcher which has been debated and elucidated intensely in chapter 4 The graphic representation shows no equal amount of right and wrong answers in English and Urdu by any of the patients However a remarkable point of observation was that the losing of language was similar for both languages but once the recovery started to take place no connection between the errors of L1 and L2 were noticed The restitution of all the patients was dispositional according to the factors with which their recovery was being aided and facilitated

Other than the abovementioned finding the researcher also witnessed that the reasons for strokes are more or less same for all the patients nevertheless it was mark out that the different degrees and stages of aphasia they were withstanding. played a significant role in achieving the objectives of the study The BAT contained four sections which started with word level and exceeded on to semantic and syntactic level Since the researcher had variant classifications of patients which were divided into five major categories that is no production phonetic

morphological, semantic and syntactic level the answers in each case has been observed to be entirely different from the other

The reasons of stroke in three of the patients are much the same that is blood pressure hypertension etc However, this is not the end result of every kind of aphasia This is believed because the nature of cause Aphasia of the remaining two patients that is case 1 and case 4 are dissimilar to the previous cases 2 3 and 5 Therefore it is to keep in mind that on the broadest level Broca's Aphasia is caused due to any damage to the frontal lobe of left hemisphere nonetheless the damage can be due any reason The reasons may encompass paralysis direct hit or blow heart strokes leading to brain strokes clotting etc

The patients showed sundry patterns of restitution which enshrined various other factors The patients have been showing progress which is again subject to personal intellectual level and psychological disposition towards regaining the language Broca s Aphasia is more of a productive apprehension since it was evident in almost all cases including one with no production at all that the comprehension of language or at least the instructions given to the patients were completely or partially understood

Another interesting fact was beheld that some patients were more comfortable and responsive by looking at the pictures and one of them was more comfortable in answering by writing the answers Therefore it can be one of the aids for the patients to recover language where they are provided with pictures to encourage them for production of words or language And secondly the visual factor where the patient finds the written text more helpful in uttering the words can also be utilized

The present study very meticulously and diligently looked into the various matters that are associated with the Broca s Aphasia and was able to find and achieve all the targeted objectives and also was able to prove the hypotheses under consideration

5.2. Suggestions and Recommendations

While carrying out the entire process of data collection the researcher was able to discern that BAT is only for patients who are on syntactic level, since the sections such as grammaticality judgment or translation of sentences may not be possible to solve for the patients of poorer and inferior levels Nonetheless the patient of semantic level could at least comprehend the meaning of both these sections but not answering in the same way as per the requirement test may be pointless, since Broca s Aphasia is more concerned with the production Therefore an attempt of not answering is consequently no production which is an immense impediment in determining the stage recovery and position of the aphasic Therefore it is suggested that a number of tests must be developed in order to get better results of patients who are on initial stages of aphasia These tests should be different for the patients on the severe stage of no production then the patients on phonemic level which may include the sounds per minute or number and type of sounds that are being produced by the patient Similarly a test for morphological stage should be made where the patient would only have to deal with words and their meaning and understanding And finally a test for semantic level in which the aid of pictorial stories visual aids etc may be used so that the patient may show a compatible level of comprehension in this regard Moreover as some of the patients showed inclination towards writing or they were found more responsive with the pictures So test with such parts inculcated in it should be made where patients may see the pictures and either write or point to the right answer

The patterns of restitution for the patients on the levels such as no production or phonemic level must be determined. Since this would assist the language pathologists to form a scheme of holding sessions with the patients. Moreover, the study of recovery patterns of the patients of Aphasia would be determined.

Another significant point of concern in this regard is that the BAT which has been proposed for the aphasics is way too long for a patient to deal with. Personally, the researcher has seen that the patients do not have ample stamina to carrying out such a long test. They usually gave up somewhere in the middle of the test. They were found either distressed or exhausted since they had to think harder and obviously the difficulty in production remaining intact. However, the researcher only considered part C of the BAT as per the requirement of the study, but still it was observed that the patients were even tired with doing that one of three sections. So it was evident that it would not be possible for carrying out three sections by the patients. Thus, a shorter but all-inclusive test should be developed, which would have all levels of language intact but in a concise way, so it may prove easy for the patient to solve it without getting frustrated.

The case studies of the current study can be considered for future researches in order to seek guidance for various linguistic patterns, which were found to be getting affected by any aphasia that may other than Broca's aphasia. As there are number of other aphasias such as Wernick's Aphasia or Global Aphasia and the like thereof they can be considered for research as well. So similar researches can be carried out for other aphasias where the researchers would figure out their similarities or differences with that of Broca's Aphasia.

The study may help paving way for future concerns in the field of Neurolinguistics and speech pathology. This is said because the current study has only considered a few aspects of language

and a few types of patients however the world of language is way enormous which is why it is likely that the field may encompass as many aspects as possible for further extension of the field Additionally, the field is nascent in research in many areas particularly in Pakistan hence a gigantic amount of research may still be carried out for enhancing the domain of neurolinguistics

Besides the study may not only be confined to the realm of linguistics in fact it has bright prospects in the areas of neurosciences speech pathology etc Thereof a wide-ranging research in these domains would also benefit the field Along with this the researches done in the fields of neurosciences and speech pathology can be correlated to the researches in neurolinguistics and eclectic network of researches may be established

5.3. Future Research Implications

Providentially the current field of study is very nascent and has a lot of scope for developing further into a wider field Most importantly, as it is widely known that only 10% of human brain has been discovered so far which also defines that many of human abilities and capacities are still unknown therefore this gives a much wider significance to the future researches which can be held in many ways Moreover as the researcher has taken bilinguals as a case-study a wide scope in multilingual is present along with that the sample may be increased or decreased for a new research Other than adults aphasia is extensively found in children so a vast field in this regard is also open for new researcher Another important field of study can be the development of tests in a better way with easier versions and also with more regional and internal languages which have not been included in the available tests

5.4. Conclusion

The study has very profoundly beheld the issue of aphasia in context to the field of Neurolinguistics. The researcher has, however, delimited the study to Broca's aphasia only, since it is the productive disorder which is rather closely related to the linguistic patterns that were under study. The study can be concluded by revisiting the essentials that may be that the frontal lobe left hemisphere of human brain is responsible for the production of language, and that it has less concerns with the understanding and comprehension of the language. Any internal, external or psychological damage to the opposite part, that is right hemisphere would apprehend the language production of a person.

The entire mechanism of brain, majorly, works with the structure called neurofunctional modules. These neurofunctional modules are further divided into subsets. Each subset is responsible for a specific and autonomous function, but this does not make them independent completely. Peculiar, it may sound, but it is the principle mechanism that in brain everything is related to everything else but then simultaneously everything has its own specific function to perform. The traditional localization viewpoint withstands the fact that the brain has partitions for every function and task, which may work in collaboration with other parts or more scientifically with the other subsets which are present in brain, but it does not dissolve or lessen their autonomy.

The relationship of language and brain is very momentous and productive. Language enables human beings to communicate and brain assists it in making it more useful and effective. Therefore, the link and bond of language and brain is very crucial and radical. Without language a person would be more of a handicap just as without brain.

In this context, keeping in view the essentials of the current study bilinguals make different subsets for both the languages which are predominately independent in their nature but being a part of the bigger neurofunctional module that is language they do collaborate with one other another a significant example in this regard can be that of inter-language translations code-switching etc can be considered

The study thoroughly discusses the point that L1 and L2 may be lost at same point of time but there are scarce chances that both the languages would simultaneously recover The exposure brings language back to the aphasics The more exposure they would have to a certain language the more chance it would produce for their regaining it In some instances it can be a language which was not previously part of patient s linguistic history but since it was being spoken at the time if treatment therefore the patient may be able to learn and gain that altogether new language The language that gets apprehended can be recovered by making better use of the language abilities which may improve language skills It may be done by relearning them altogether and making everyday communications This pattern of recovery largely depends upon the degree of severity of aphasia

The pattern of restitution, fundamentally depends upon the aphasic The subject may recover with any kind of pattern which includes parallel, differential antagonistic selective etc it also enshrines other factors which play their part in regaining of the language These factors are psychological visual severity or may be multiple factors Therefore it is evident that aphasics usually recover independently and individually However major classification of the recovery patterns may be made as done earlier but none of the patients can be clustered under one category for having so and so aphasia

The patients of Broca s aphasia are best treated through language and speech therapies The therapists would essentially start from the phonemic level because in most severe cases the patients are unable to utter a single word Therefore the first step in the recovery is getting aligned and acquainted with the speech sounds and making the articulatory organs active Once the patient is gets accustom to the sounds then basic and simple words can be inculcated into them through practice As afore discussed that there can be patients who would be more comfortable with writing or drawings so this can be another helpful feature in the developmental stages of recovery

Categorically language is an essential part of human self and this is what makes it a rather superior creation Language is undoubtedly a very intricate mechanism and it becomes way more intricate when it is studied in context with the brain The study is but an initial contribution in exploring the gigantic universe of brain which is just discovered of about one tenth of the total till the date The study of intricacies and complexities of brain in all regards is vital however language is exceedingly complex because it is related to psychological and physiological aspects both Once the communication is lost a person becomes handicap of so many otherwise abilities one used to have earlier Therefore it is essential to make deep and thorough studies in this regard so that better future of the field of neurolinguistics can be made

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APPENDIX A

مریض کی شناخت _____

جائزے کی تاریخ _____

مدت سے _____ تک _____

ٹیسٹ کا ناظم _____

Michel Paradis
McGill University

BILINGUAL APHASIA TEST

PART C

English-Urdu Bilingualism

دو زبانیں بول سکنیں والے افراد میں گویائی کے امراض کا ٹیسٹ

Part "C" of the Bilingual Aphasia Test has been adapted to English–Urdu bilingualism by Najma Janjua and Afshan Bukhari

دو زبانیں بولنے والے افراد میں گویائی کے امراض کے اردو ٹیسٹ کا حصّہ ج انگریزی اردو میں نجمہ جنجوعہ اور افشاں بخاری نے اجرا کیا ۔

The development of the Bilingual Aphasia Test materials was supported by Grant MRQ 01-07-k (1976-1983) from the Quebec Ministry of Intergovernmental Affairs Grant FQ 1660 (1980-1985) from the Quebec Ministry of Education FCAC Fund and Grants 410-83-1028 (1984–1985) and 410-88-0821 (1989-1991) from the Social Sciences and Humanities Research Council of Canada

دو زبانیں بول سکنے والے افراد میں گویائی کے امراض کا ٹیسٹ
BILINGUAL APHASIA TEST

Part C/حصہ ج

English–Urdu bilingualism

انگریزی - اردو

WORD RECOGNITION/لفظوں کی پہچان

*** مریض کو ایک ایک کر کے الفاظ دکھائیں اور ساتھ ہی ہر لفظ کو اونچی آواز سے پڑھیں۔ مریض کو دس الفاظ کی فہرست میں سے وہ لفظ بتانا ہوگا (زبانی یا ہاتھ لگا کر) جو دیئے گئے لفظ کا انگریزی میں متبادل ہو۔ مریض جو جواب دے اس نمبر پر دائرے کا نشان لگائیں۔ اگر پانچ سیکنڈ تک مریض کوئی جواب نہ دے تو صفر پر نشان لگائیں اور پھر اس سے اگلے لفظ سے شروع کریں۔ اگر مریض پڑھ نہیں سکتا تو فہرست میں دیئے گئے دس الفاظ کو اونچی آواز سے پڑھیں۔ اگر فہرست کو مسلسل تین بار پڑھنے کے بعد بھی مریض کوئی جواب نہ دے تو صفر پر نشان لگائیں اور پھر اس سے اگلے لفظ سے شروع کریں۔

*** یہاں سے پڑھنا شروع کریں۔
اب آپ کو اردو کا ایک لفظ دکھایا جائے گا۔ پھر آپ کو انگریزی کے لفظوں کی فہرست میں سے وہ لفظ بتانا ہوگا جس کے وہی معنی ہوں جو اردو کے لفظ کے ہیں۔ کیا آپ تیار ہیں؟

(428)	10	9	8	7	6	5	4	3	2	1	0	1 apple	درخت	428
(429)	10	9	8	7	6	5	4	3	2	1	0	2 rain	بارش	429
(430)	10	9	8	7	6	5	4	3	2	1	0	3 lightning	کھڑکی	430
(431)	10	9	8	7	6	5	4	3	2	1	0	4 hammer	ہتھوڑی	431
(432)	10	9	8	7	6	5	4	3	2	1	0	5 door	مچھلی	432
												6 fish		
												7 window		
												8 pliers		
												9 tree		
												10 sheep		

***Start reading here

Now I am going to show you a word in English and you are going to tell me which of the words in the list means the same thing in Urdu Ready?

433 milk	1 کرسی	0	1	2	3	4	5	6	7	8	9	10	(433)
434 horse	2 دودھ	0	1	2	3	4	5	6	7	8	9	10	(434)
435 shirt	3 قمیض	0	1	2	3	4	5	6	7	8	9	10	(435)
436 flower	4 میز	0	1	2	3	4	5	6	7	8	9	10	(436)
437 chair	5 پھول	0	1	2	3	4	5	6	7	8	9	10	(437)
	6 پانی												
	7 ٹوپی												
	8 گھوڑا												
	9 کاغذ												
	10 گندم												

*** مندرجہ ذیل الفاظ کو ایک ایک کرکے اونچی آواز سے پڑھیں۔ اگر مریض کا جواب وہی لفظ ہے جو مائیں طرف دیا گیا ہے تو "+" پر دائرے کا نشان لگائیں ، اگر جواب دیئے گئے لفظ سے مختلف ہے مگر صحیح ہے تو "1" پر نشان لگائیں ۔ اگر ترجمہ غلط ہے تو " - " پر نشان لگائیں۔ اگر پانچ سیکنڈ تک مریض کوئی جواب نہ دے تو "0" پر نشان لگائیں اور پھر اس سے اگلے لفظ سے شروع کریں۔

*** یہاں سے پڑھنا شروع کریں۔
اب آپ اردو کا ایک لفظ سنیں گے اور آپ کو مجھے اس کا انگریزی ترجمہ بتانا ہوگا ۔

438 چاقو	(knife)	+	1	-	0	(438)
439 دروازہ	(door)	+	1	-	0	(439)
440 کان	(ear)	+	1	-	0	(440)
441 ریت	(sand)	+	1	-	0	(441)
442 صندوق	(suitcase)	+	1	-	0	(442)
443 غصہ	(anger)	+	1	-	0	(443)
444 بدصورتی	(ugliness)	+	1	-	0	(444)
445 ہمت	(courage)	+	1	-	0	(445)
446 اداسی	(sadness)	+	1	-	0	(446)
447 وجہ	(reason)	+	1	-	0	(447)

***Read aloud the following words, one at a time If the patient's answer is the word in paranthesis, circle "+", if the word is different but acceptable, circle "1", if the translation is incorrect, circle "-" If the patient has given no answer after 5 seconds, circle "0" and read the next word.

***Begin reading aloud here

I am going to say a word in English and you will give me its Urdu translation
Are you ready?

448 bed	(اُستوا)	+	1	-	0	(448)
449 wall	(دیوار)	+	1	-	0	(449)
450 neck	(گردن)	+	1	-	0	(450)
451. butter	(مکھن)	+	1	-	0	(451)
452 hat	(ٹوپی)	+	1	-	0	(452)
453 hatred	(نفرت)	+	1	-	0	(453)
454 joy	(خوشی)	+	1	-	0	(454)
455 fright	(خوف)	+	1	-	0	(455)
456 madness	(پاگل پن)	+	1	-	0	(456)
457 beauty	(خوبصورتی)	+	1	-	0	(457)

*** جملوں کو اونچی آواز سے مریض کے سامنے پڑھیں۔ مریض کے کہنے پر جملہ زیادہ سے زیادہ تین بار دہرایا جا سکتا ہے ۔ جیسی مرتبہ جملہ پڑھا جائے اسی نمبر پر دائرے کا نشان لگائیں۔ دوسری لائن میں دیئے ہوئے سکور یہ ظاہر کرتے ہیں کہ الفاظ کے کتنے مجموعوں کا صحیح طور پر ترجمہ کیا گیا (بریکٹ میں تحریر کئے گئے ترجمے سے موازنہ کرتے ہوئے)۔
الفاظ کے جتنے مجموعوں میں کوئی غلطی نہ ہو اس نمبر پر دائرے کا نشان لگائیں۔ اگر مریض کوئی لفظ چھوڑ دے تو اسے غلطی شمار کریں۔ اگر لفظوں کے تمام مجموعوں میں ایک یا ایک سے زیادہ غلطیاں ہوں یا اگر جملے کو لگاتار تین بار دہرانے کے بعد بھی

مریض کوئی جواب نہ دے تو '0' پر نشان لگائیں۔ اگر مریض کا کیا ہوا ترجمہ ٹریکٹ میں تحریر کئے گئے ترجمے سے مختلف ہے مگر پھر بھی قابل قبول ہے تو '+' پر دائرے کا نشان لگائیں۔

*** یہاں سے اونچی آواز میں پڑھنا شروع کریں۔

اب آپ اردو کے چند جملے سنیں گے ۔ آپ کو ان جملوں کا انگریزی میں ترجمہ کرنا ہوگا ۔ کیا آپ تیار ہیں ؟

458	چھوٹے بچےکو پیاس لگ رہی ہے ۔	جملہ حتمی مار پڑھا گیا	1	2	3	مار		(458)
	(The little boy is feeling thirsty)							
		بعیر علطیوں کے الفاظ کے مجموعوں کی تعداد	+	0	1	2	3	(459)
460	سائرہ نے خواب میں اپنے والد کو دیکھا ۔	جملہ حتمی مار پڑھا گیا			1	2	3	مار (460)
	(Saira dreamt of her father)							
		بعیر علطیوں کے الفاظ کے مجموعوں کی تعداد	+	0	1	2	3	(461)
462	آج صبح سمیر نے فرح کو سیب دیے ۔	جملہ حتمی مار پڑھا گیا			1	2	3	مار (462)
	(Samir gave apples to Farah this morning)							
		بعیر علطیوں کے الفاظ کے مجموعوں کی تعداد	+	0	1	2	3	(463)
464	سپاہی چاہتا ہے کہ تم ایک سیگریٹ مانگو۔	جملہ حتمی مار پڑھا گیا			1	2	3	مار (464)
	(The soldier wants you to ask for a cigarette)							
		بعیر علطیوں کے الفاظ کے مجموعوں کی تعداد	+	0	1	2	3	(465)
466	علی آٹھ بجے اوفس جائے گا اگر وہ جا سکے تو۔	جملہ حتمی مار پڑھا گیا			1	2	3	مار (466)
	(Ali will go to the office at 8 o'clock if he can)							
		بعیر علطیوں کے الفاظ کے مجموعوں کی تعداد	+	0	1	2	3	(467)
468	چور تین گھنٹے سے مسجد کے پیچھے چھپا ہوا ہے ۔	جملہ حتمی مار پڑھا گیا			1	2	3	مار (468)
	(The thief has been hiding behind the mosque for 3 hours)							
		بعیر علطیوں کے الفاظ کے مجموعوں کی تعداد	+	0	1	2	3	(469)

***Read the sentence aloud to the patient up to three times in accordance with the patient's request for repetition and circle the digit corresponding to the number of times that the text was read The score corresponds to the number of word groups (as indicated in the suggested translation in parenthesis) correctly translated Circle the number corresponding to the number of word groups containing no error An omission also counts as an error If all groups contain one or more errors, or if the patient says nothing, after three consecutive repetitions circle "0 If the patient's translation is not the one suggested but nevertheless acceptable, circle "+"

***Begin reading aloud here

Now I am going to give you some sentences in English You will translate them into Urdu Are you ready?

470	The old woman is feeling hungry	Text read			1	2	3	times (470)
	بوڑھی عورت کو بھوک لگ رہی ہے ۔	Groups without error	+	0	1	2	3	(471)
472	Ahmed thought of his mother	Text read			1	2	3	times (472)
	احمد نے اپنی والدہ کا سوچا ۔	Groups without error	+	0	1	2	3	(473)
474	Reza bought oil for Kamil this afternoon	Text read			1	2	3	times (474)
	آج دوپہر کو رضا نے کامل کے لئے تیل خریدا ۔	Groups without error	+	0	1	2	3	(475)
476	The mailman wanted him to wait for the bus	Text read			1	2	3	times (476)
	ڈاکیہ چاہتا تھا کہ وہ بس کا انتظار کرے ۔	Groups without error	+	0	1	2	3	(477)
478	Ayesha will go to the cinema at 9 o'clock if she wants	Text read			1	2	3	times (478)
	آئیشہ نو بجے سینیما جائے گی اگر وہ چاہے تو۔	Groups without error	+	0	1	2	3	(479)
480	The beggar has been begging near the hospital for 2 months	Text read			1	2	3	times (480)
	فقیر دو مہینے سے ہسپتال کے نزدیک بھیک مانگ رہا ہے ۔	Groups without error	+	0	1	2	3	(481)

*** اس حصے میں مریض کے سامنے چند جملے پڑھیں جائیں گے اور اسے یہ بتانا ہوگا کہ کیا وہ جملے صحیح اردو کے جملے ہیں یا نہیں۔ اگر وہ کہے کہ جملے کی گرائمر صحیح نہیں ہے تو اسے جملے کو صحیح کرنے کے لئے کہا جائے گا۔ اگر مریض کہے کہ جملہ صحیح ہے تو + پر دائرے کا نشان لگائیں قطع نظر اس سے کہ مریض کا جواب صحیح ہے یا نہیں۔ اگر مریض کہے کہ جملہ صحیح نہیں ہے تو "-" پر نشان لگائیں ، اور اگر وہ کوئی بھی جواب نہ دے تو "0" پر نشان لگائیں۔ اگر مریض کا جواب نہیں میں ہے تو اسے جملے کو صحیح کرنے کو کہیں۔ اگر مریض کا صحیح کیا ہوا جملہ قابل قبول ہو تو "صحیح کیا ہوا جملہ" کے آگے "+" پر نشان لگائیں۔ اور اگر وہ جملہ قابل قبول نہیں ہے تو "-" پر نشان لگائیں۔ اگر مریض یہ کہے کہ وہ جملے کو درست نہیں کر سکتا، یا اس نے غلط جملے کو صحیح بتایا ہو جس صورت میں اسے جملے کو صحیح کرنے کے لئے کہنے کا کوئی جواز ہی نہیں ہوگا اور یا اگر مریض کوئی جواب ہی نہ دے تو "0" پر نشان لگائیں۔ اگر مریض صحیح جملے (492، 486) کو غلط بتائے اور پھر بعد میں جملے کو صحیح کرنے کے لئے کہنے جانے پر اسے غلط کر دے تو دونوں حصوں کے لئے "-" پر نشان لگائیں۔ اور اگر وہ جملے میں کوئی ایسی تبدیلی کرے جو جملے کو غلط نہ بنائے تو صحیح کیا ہوا جملہ" کے حصے میں "+" پر نشان لگائیں۔

*** یہاں سے اونچی آواز میں پڑھنا شروع کریں۔

اب آپ اردو کے چند جملے سنیں گے۔ آپ کو یہ بتانا ہو گا کہ کیا یہ جملے صحیح اردو کے جملے ہیں۔ اگر جملہ صحیح نہیں ہوگا تو آپ کو اسے صحیح کرنے کو کہا جائے گا۔ مثال کے طور پر اگر میں کہوں "وہ اپنی ماں کو ساتھ جارہا ہے" تو آپ کہیں گے "غلط اور پھر جملے کو اس طرح صحیح کر کے بتائیں گے "وہ اپنی ماں کے ساتھ جارہا ہے"۔ کیا آپ تیار ہیں؟

482 اعشاں جائے گی جب عمر پہنچتا ۔	مریض کا دیا ہوا جواب	+	–	0	(482)
	صحیح کیا ہوا جملہ	+	–	0	(483)
484 سیمہ باغ کو گئی۔	مریض کا دیا ہوا جواب	+	–	0	(484)
	صحیح کیا ہوا جملہ	+	–	0	(485)
486 کھسی بے ریوہ کو ایک گھڑی دی	مریض کا دیا ہوا جواب	+	–	0	(486)
	صحیح کیا ہوا جملہ	+	–	0	(487)
488 وہ معیر کھائے ہوئے ناشتا کیا ۔	مریض کا دیا ہوا جواب	+	–	0	(488)
	صحیح کیا ہوا جملہ	+	–	0	(489)
490 کیا ریاض کو رہا تھا	مریض کا دیا ہوا جواب	+	–	0	(490)
	صحیح کیا ہوا جملہ	+	–	0	(491)
492 گھوڑا تیز بھاگا	مریض کا دیا ہوا جواب	+	–	0	(492)
	صحیح کیا ہوا جملہ	+	–	0	(493)
494 رشید سیگریٹ پینا چھوڑ دیا	مریض کا دیا ہوا جواب	+	–	0	(494)
	صحیح کیا ہوا جملہ	+	–	0	(495)
496 لیلا نے دیکھا انہیں ۔	مریض کا دیا ہوا جواب	+	–	0	(496)
	صحیح کیا ہوا جملہ	+	–	0	(497)

***In this section the patient must indicate whether a sentence which is read to him is a correct English sentence or not. If the patient judges the sentence to be ungrammatical, he is asked to make it right. For the patient's judgment, circle "+" if the patient considers the sentence to be correct, irrespective of whether the patient is right or wrong, "–" if the patient considers the sentence to be incorrect, and "0" if the patient gives no answer. Then score the corrected sentence as "+" if acceptable" if unacceptable, and "0" if the patient declares he is unable to make it right, or has wrongly declared an incorrect sentence as "correct", in which case there is no point in trying to make it right, or if the patient says nothing. When a correct sentence (500, 504) is declared incorrect and subsequently made wrong, score "–" for both judgment and correction. If the patient makes some change to the sentence which does not make it incorrect, then score "+" for the correction.

***Start reading aloud here

I am going to give you some sentences in English. Tell me if they are correct English sentences. If they are not, I will ask you to make them right. For example, if I say "he a hat bought", you say "incorrect" and you correct it "he bought a hat". Ready?

498 Kazim will jump when Akbar will shout	judgment	+	–	0	(498)
	sentence corrected	+	–	0	(499)
500. Kabir was shown the pictures	judgment	+	–	0	(500)
	sentence corrected	+	–	0	(501)
502 Asma went in a wedding	judgment	+	–	0	(502)
	sentence corrected	+	–	0	(503)
504 The parcel arrived late	judgment	+	–	0	(504)
	sentence corrected	+	–	0	(505)
506 He came without money bringing	judgment	+	–	0	(506)
	sentence corrected	+	–	0	(507)
508 Rafi what was singing?	judgment	+	–	0	(508)
	sentence corrected	+	–	0	(509)
510 Ahmer finished to eat.	judgment	+	–	0	(510)
	sentence corrected	+	–	0	(511)
512 Samina it took	judgment	+	–	0	(512)
	sentence corrected	+	–	0	(513)

Additional remarks concerning any aspect of the patient's performance not covered by the standardized questions

مریض کی کارکردگی کے کسی بھی پہلو کے متعلق مزید تشریحات جو ان معیاری سوالات میں داخل نہ ہوتی ہوں یہاں درج کریں۔

1. apple	درخت
2. rain	بارش
3. lightning	کھڑکی
4. hammer	ہتھوڑی
5. door	مچھلی
6. fish	
7. window	
8. pliers	
9. tree	
10. sheep	

1. کرسی	milk
2. دودھ	horse
3. قمیض	shirt
4. میز	flower
5. پھول	chair
6. پانی	
7. ٹوپی	
8. گھوڑا	
9. کاغذ	
10. گدھا	