Phonemic and Lexical Use in Igbo–English Bilingual Aphasics

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ABSTRACT

This study investigates phonological and lexical impairments in the speech of Igbo/English bilingual aphasics, with a focus on how aphasia affects the realization of phonemes and the use of lexical items across the two languages. Aphasia is an acquired language disorder resulting from brain damage, most commonly caused by stroke, and it may impair language production and comprehension at various linguistic levels. Given Nigeria's multilingual context and the widespread use of English alongside indigenous languages such as Igbo, bilingual aphasia presents a complex linguistic phenomenon that requires systematic investigation. The study adopts a descriptive research design and is grounded in the theoretical frameworks of structuralism and socio-communicative theory. Data were collected from three Igbo/English bilingual aphasic participants receiving medical care at the University of Port Harcourt Teaching Hospital. Speech samples were elicited through spontaneous conversation, question-and-answer sessions, and object/picture naming tasks. Phonetic transcription using the International Phonetic Alphabet (IPA) was employed for detailed phonological analysis, while lexical performance was assessed through word retrieval tasks in both languages. Findings reveal marked phonological impairments characterized by sound substitutions, deletions, and distortions in both Igbo and English. Notably, phonemes that are structurally complex or absent in one language were more vulnerable to impairment. Lexical analysis shows significant word-finding difficulties in both languages, with greater impairment observed in English (L2) than in Igbo (L1). The aphasics demonstrated slower lexical retrieval, use of inappropriate lexical items, and circumlocution, especially in L2. Overall, the study establishes that while both languages are affected by aphasia, the first language exhibits relative resilience. These findings have important implications for bilingual aphasia assessment and rehabilitation in multilingual contexts.

Keywords: Aphasia, Bilingualism, Phonological Impairment, Lexical Access, Igbo-English Language Use

INTRODUCTION

Damage to the brain is one of the major causes of language impairment, which is referred to as a disorder that interferes with an individual's ability to use language effectively, thereby disrupting communication, which may occur at various levels of linguistic organization, including the phonological, morphological, lexical, and grammatical levels, as well as in broader language domains such as comprehension. In general, language impairments may affect expressive abilities, receptive abilities, or both (Ryan, Gibbon, and O'shea, 2016), and one prominent language impairment resulting from brain damage is aphasia.

Aphasia is clinically defined as a disorder caused by damage to the areas of the brain responsible for language production and processing (Code, 2021; Clark and Cummings, 2003; Benson and Ardila, 1996). According to Müller (2025), aphasia results from injury to the language-dominant regions of the brain and leads to difficulties in speaking, understanding, reading, and writing. Similarly, Damasio and Damasio (2000) described aphasia as the loss or impairment of the ability to produce and/or comprehend language arising from focal damage to specific brain regions, particularly within the left cerebral hemisphere, which plays a central role in language functions. In line with this, the American Speech-Language-Hearing Association (ASHA, 2021) characterizes aphasia as an acquired neurogenic language disorder typically resulting from damage to the left hemisphere of the brain. Aphasia is therefore neither a genetic nor a congenital disorder; rather, it

affects individuals who were previously competent speakers of their language or languages before the onset of brain injury (Coppens, 2016).

The severity of aphasia and the extent of language impairment vary depending on the nature and magnitude of the brain damage. The impairment may be partial or total, and it may affect one or multiple aspects of communication, including speech production, comprehension, reading, and writing (Schwartz, 2017), where in some cases, only one communicative ability may be impaired, but it is more common for aphasics to experience difficulties across several language domains. In extreme cases, where both language production and comprehension are severely compromised, the individual is said to have global aphasia, also referred to as a non-reversible aphasic syndrome (Mrkonjić, Begić, and Smajlović, 2019).

Aphasia typically occurs suddenly following a stroke or head injury (Sinanović et al., 2011). Stroke occurs when blood flow to the brain is interrupted by a blocked or ruptured artery, depriving brain cells of oxygen and nutrients and leading to cell death (Caplan, Simon, and Hassani, 2023; Venkat, Chopp, and Chen, 2017). The severity of aphasia and the specific language abilities affected depend on several factors, including the location and extent of the brain damage. In addition to stroke and traumatic brain injury, aphasia may also develop gradually as a result of slow-growing brain tumors or neurodegenerative diseases that cause progressive and permanent damage to the brain (Hegde, 2022).

Aphasia is often classified clinically into fluent and non-fluent types based on the characteristics of speech production (Clough and Gordon, 2020), where the non-fluent aphasia typically results from damage to the frontal lobe of the brain, with Broca's aphasia being the most common form (Rashed Chitgar et al., 2022). Individuals with Broca's aphasia generally have relatively preserved comprehension but experience significant difficulty in language expression, often characterized by halting, effortful speech and reduced grammatical complexity (Elleuch, 2024; Hasan et al., 2024), while fluent aphasia, on the other hand, is usually associated with damage to the temporal lobe of the brain, with Wernicke's aphasia being the most common type (Fridriksson et al., 2015). Individuals with Wernicke's aphasia produce fluent but often meaningless speech and experience marked difficulty in language comprehension (Mesulam et al., 2015).

Aphasia may affect individuals who speak one language, two languages, or more than two languages, and when it affects a monolingual individual, the person is referred to as a monolingual aphasic, while an individual who used two languages before brain damage is described as a bilingual aphasic (Lahiri et al., 2021; Hope et al., 2015). Similarly, individuals who spoke more than two languages before the onset of aphasia are referred to as multilingual aphasics (Goral and Hejazi, 2021). Thus, bilingual aphasics are individuals who were bilingual premorbidly but whose language abilities in one or both languages have been impaired as a result of brain damage (Kuzmina et al., 2019); meanwhile, the ability to use one, two, or more than two languages is respectively referred to as monolingualism, bilingualism, and multilingualism.

According to Wei (2020), bilingualism is defined as the ability of an individual or a community to use two languages effectively; Wei also noted that more than half of the world's population is bilingual or multilingual. Baghirova (2018) further observed that approximately two-thirds of the world's children grow up in bilingual environments, that is, of the estimated 570 million English speakers worldwide, over 41 percent, about 235 million people, are bilingual in English and another language. In multilingual societies, bilingualism is not only common but often functionally motivated by social, educational, and economic factors.

In Nigeria, scholars such as Udoh and Emmanuel (2020) observed that Nigeria has over 400 indigenous languages, with English and French serving as official languages and Hausa, Yoruba, and Igbo functioning as major indigenous languages with official recognition. According to Sunday (2013), Nigeria's language policy promotes societal bilingualism, requiring citizens to be literate in English and/or French, an indigenous language, and preferably one other major Nigerian language. Consequently, the average Nigerian tends toward bilingualism or multilingualism, where within such a linguistic environment, the likelihood of encountering bilingual aphasics, particularly individuals who speak an indigenous language alongside English, is relatively high (Ndiribe and Aboh, 2022).

Against this background, the present study focuses on Igbo/English bilingual aphasics whose first language (L1) is Igbo and whose second language (L2) is English. The researcher's interaction with bilingual aphasic patients in hospital settings inspired this investigation into how aphasia affects language use across the two languages. Specifically, the study seeks to examine how Igbo and English phonemes are realized by Igbo/English bilingual aphasics and to explore the manner in which lexical items are used in both languages. By describing language production impairments at the phonological and lexical levels, the study aims to determine whether one language is more affected than the other and how bilingual aphasics manage their linguistic resources following brain damage.

The findings of this study are expected to contribute valuable insights to the fields of linguistics, neurolinguistics, and speech-language pathology, particularly in multilingual contexts. The information generated will be useful to speech therapists and clinicians involved in the rehabilitation of bilingual aphasics, as it will provide empirical evidence on patterns of impairment across languages. To achieve a comprehensive analysis, the study adopts structuralism and socio-communicative theories as its theoretical framework. Structuralism views language as a system composed of interrelated units whose meanings and functions are determined by their positions within the system. The socio-communicative theory, on the other hand, emphasizes language use as a means of fulfilling communicative needs within social contexts. Together, these theoretical perspectives provide a robust framework for analyzing the phonemic and lexical patterns in the speech of Igbo/English bilingual aphasics and for understanding how these individuals negotiate meaning despite their linguistic impairments.

LITERATURE REVIEW

Conceptualization of Aphasia

Aphasia is widely recognized as a language disorder resulting from brain damage, particularly to areas specialized for language processing. Clark and Cummings (2003) define aphasia as the disturbance of some or all skills and habits associated with spoken or written language caused by injury to specific brain regions, predominantly within the left cerebral hemisphere. However, the definition of aphasia by Clark and Cummings underscores aphasia as a disorder that affects multiple dimensions of language rather than a single linguistic component. Similarly, Coppens (2016) describes aphasia as a disorder of language use, production, and comprehension resulting from lesions to the left cerebral hemisphere, emphasizing its neurogenic origin.

Aphasia typically arises suddenly following a stroke or traumatic brain injury, although it may also develop gradually as a result of brain tumors or neurodegenerative diseases (Hegde, 2022; Chauhan, 2014); the severity and manifestation of aphasia depend largely on the location and extent of brain damage (Døli et al., 2021). Language impairment associated with aphasia often affects an individual's ability to speak, understand, read, and write, thereby significantly disrupting communication and quality of life (Filipska-Blejder et al., 2023; Bullier et al., 2020).

Diagnosis of aphasia usually begins with medical imaging techniques such as magnetic resonance imaging (MRI) or computed tomography (CT) scans to identify the location of brain damage. Subsequent language assessment is conducted by speech-language pathologists who evaluate the patient's expressive and receptive language abilities, including speech production, comprehension, reading, and writing (Shipley and McAfee, 2023; McIntyre et al., 2017). Although spontaneous recovery often occurs within the first few months after brain injury, many individuals continue to experience residual aphasia, necessitating speech-language therapy.

Classification of Aphasia

Aphasia is broadly classified based on the nature of speech output, comprehension ability, repetition, and naming skills. Traditionally, aphasia is grouped into fluent and non-fluent types, with additional categories such as global and anomic aphasia, and this classification helps clinicians and researchers understand the linguistic deficits associated with specific brain regions and guides diagnosis and intervention.

Non-fluent aphasia is characterized by slow, effortful, and halting speech. Individuals with this type of aphasia typically produce short utterances with reduced grammatical structure, while comprehension is relatively preserved (Newcombe, 2024). The most common form of non-fluent aphasia is Broca's aphasia, which results

from damage to the posterior inferior frontal gyrus of the left hemisphere (Rashed Chitgar et al., 2022). Speech in Broca's aphasia is marked by agrammatism, omission of function words, and impaired phonological encoding, though comprehension of simple sentences often remains intact. Another non-fluent type is transcortical motor aphasia, which resembles Broca's aphasia but is distinguished by preserved repetition ability.

Fluent aphasia, in contrast, involves effortless and well-articulated speech that lacks meaningful content. Individuals speak in long, grammatically structured sentences; however, their speech is often filled with phonemic and semantic paraphasias (Newcombe, 2024). Wernicke's aphasia is the most notable fluent aphasia and is associated with damage to the posterior superior temporal gyrus of the left hemisphere (Binder, 2017). Affected individuals exhibit severe auditory comprehension deficits and impaired self-monitoring, which leads to incoherent speech. Another fluent type is transcortical sensory aphasia, which shares similarities with Wernicke's aphasia but retains intact repetition.

Phonological and Lexical Impairments in Aphasia

Aphasia significantly affects language processing at multiple levels, particularly at the phonological and lexical levels, which are central to spoken language production and comprehension. Phonological impairment refers to difficulties in the selection, organization, and realization of speech sounds, while lexical impairment involves problems with word retrieval, selection, and use. These impairments vary across aphasia types and are influenced by the site and extent of brain damage.

Phonological impairments in aphasia are commonly manifested through errors in speech sound production, known as phonemic paraphasias, which include sound substitutions, omissions, additions, and transpositions, or rearranging sounds within a word (Denes, Semenza, and Caldognetto, 2020). However, such errors reflect disruptions in phonological encoding rather than motor articulation. Individuals with non-fluent aphasia, particularly Broca's aphasia, often exhibit reduced phonemic inventories, distorted phoneme realization, and difficulty producing complex syllable structures. Speech is typically slow and effortful, with frequent pauses as speakers struggle to assemble phonological forms (Lundholm Fors, 2015). In fluent aphasia, phonological errors may be less obvious but still frequent, occurring within otherwise smooth speech and contributing to reduced intelligibility (Hodson and Paden, 1981), where these impairments indicate a breakdown in the mapping between abstract phonological representations and surface speech forms.

Lexical impairments are among the most prominent features of aphasia and are evident in both expressive and receptive language. A key lexical deficit is anomia, the inability to retrieve appropriate words during speech, and the individuals may resort to circumlocution, use semantically related words, or produce neologisms. Lexical errors often take the form of semantic paraphasias, where a target word is replaced with another of related meaning (Caramazza and Hillis, 1990). Lexical impairments are particularly severe in Wernicke's aphasia, where word selection is poorly constrained by meaning, leading to fluent but content-deficient speech.

In bilingual aphasia, such as in Igbo/English bilingual aphasics, phonological and lexical impairments may affect the two languages differently. Cross-linguistic interference, code-mixing, and uneven language recovery are common, reflecting differences in phonological systems and lexical organization between the languages. For instance, phonemes unique to one language may be more vulnerable to impairment, while lexical retrieval may be more preserved in the dominant or more frequently used language.

Bilingualism and Aphasia

Bilingualism refers to the ability of an individual to use two languages with varying degrees of proficiency (Wei, 2020). In multilingual societies such as Nigeria, bilingualism is a common linguistic experience, with many individuals acquiring an indigenous language as a first language (L1) and English as a second language (L2). When brain damage occurs in bilingual individuals, the resulting language impairment, known as bilingual aphasia, presents complex patterns of language breakdown and recovery that differ from those observed in monolingual aphasia. These patterns are shaped by factors such as age of language acquisition, language dominance, frequency of use, and sociolinguistic context.

Aphasia in bilingual individuals can affect one or both languages, and the degree of impairment may not be equal across languages. Some bilingual aphasics show parallel impairment, where both languages are similarly affected, while others exhibit differential impairment, with one language being more severely disrupted than the other (Kuzmina et al., 2019). In some cases, recovery follows a parallel pattern, whereas in others it is non-parallel, with one language recovering faster or more fully, but there are also instances of selective aphasia, where only one language is impaired, and successive recovery, where improvement in one language precedes or inhibits recovery in the other.

Bilingual aphasia often reveals unique linguistic behaviours, including code-switching, language mixing, and language interference (Mooijman et al., 2025; Hameau, Dmowski, and Nickels, 2023). While code-switching is a normal strategy in healthy bilingual speech, in aphasia, it may occur involuntarily and reflect impaired language control rather than communicative intent. Lexical retrieval difficulties may prompt bilingual aphasics to substitute words from one language when the target word in the other language cannot be accessed (Gollan and Kroll, 2015), while phonological interference may also occur, leading to the transfer of phonemic patterns from one language to another during speech production (Hambly et al., 2013).

Patterns of Language Impairment in Bilingual Aphasics

Several studies have documented parallel impairment in bilingual aphasics. Kuzmina et al. (2019) reports that 65% of bilingual aphasics in their study exhibited comparable impairments across both languages. Similarly, Calabria et al. (2018) found parallel impairment in long-term bilinguals, attributing this pattern to shared control mechanisms governing language use.

Conversely, studies by Derakhshan and Karimi (2015), Sabourin and Stowe (2008), and Montrul (2005) reveal cases where either the first language (L1) or second language (L2) is more severely affected. Again, factors such as age of acquisition, language proficiency, frequency of use, and structural differences between languages have been identified as possible determinants of these patterns (Foote, 2010; Bialystok and Hakuta, 1999).

Kuzmina et al. (2019), in their review of multilingual aphasia cases, found no dominant pattern of impairment, suggesting that bilingual aphasia is a complex phenomenon influenced by multiple interacting variables. These findings highlight the need for language-specific investigations that consider the structural properties of the languages involved.

Despite extensive research on aphasia, most studies have focused on Indo-European languages, resulting in a significant imbalance in aphasia research across languages. Nigerian languages, including Igbo, have received limited attention. Sunday (2013) examined the segmental phonology of Nigerian bilingual Wernicke's aphasics and identified deletion, substitution, and epenthesis as dominant phonological deviations. However, his study did not foreground any specific Nigerian language, thereby limiting insights into language-specific phonemic patterns.

Similarly, Akínmúrelé (2019) investigated sentence production in a Yoruba–English bilingual aphasic and concluded that the acquired language (English) was more vulnerable to brain damage than the native language (Yoruba). While this study contributes valuable insights, it focuses primarily on syntax rather than phonology or lexicon.

Notably, no known study has systematically examined phonemic realization and lexical use in Igbo–English bilingual aphasics. Given the phonological and lexical differences between Igbo and English, there is a clear need for language-specific research that explores how aphasia manifests across these two linguistic systems.

THEORETICAL FRAMEWORK

This study is anchored on structuralism and socio-communicative theory, both of which provide a suitable theoretical framework for analysing the phonological and lexical behaviour of Igbo/English bilingual aphasics. These theories complement each other by focusing respectively on the internal structure of language and the

functional use of language in communication, which are central to understanding aphasic language impairment.

Structuralism views language as an organized system made up of interrelated units such as phonemes, morphemes, words, and sentences (Al Umman, 2015; Bybee, 2003). According to structural linguists, particularly Ferdinand de Saussure, the meaning and function of each linguistic unit are determined by its relationship with other units within the language system, and in this perspective, language impairment can be understood as a disruption in the structural organization of these units. When structuralism is applied to aphasia, it allows the researcher to examine how damage to the brain affects the arrangement and realization of phonological and lexical units (Díaz Gutiérrez, 2024). For instance, phonemic substitutions, omissions, and distortions observed in aphasic speech reflect a breakdown in the phonological system, while word-finding difficulties and inappropriate lexical choices point to disruptions in the lexical system (Pummill, 2019). In the context of Igbo/English bilingual aphasics, structuralism provides a framework for analysing how the phonemic inventories and lexical structures of Igbo and English are differentially affected by aphasia, considering that the two languages possess distinct sound systems and lexical organization.

On the other hand, socio-communicative theory emphasizes language as a tool for social interaction and communication, which focuses on how individuals use language to express intentions, convey meaning, and participate in social contexts (Hughes and Leekam, 2004). From a socio-communicative perspective, language impairment is not only a structural deficit but also a limitation in the individual's ability to meet communicative demands, and even when linguistic forms are impaired, speakers may attempt to compensate through alternative strategies such as circumlocution, gesture, code-switching, or reliance on the more accessible language in bilingual contexts (Neumann, Walters, and Altman, 2017). For bilingual aphasics, these strategies are shaped by sociolinguistic factors such as language dominance, familiarity, and the communicative environment.

In this study, the socio-communicative theory is particularly relevant in interpreting how Igbo/English bilingual aphasics use their languages in real communicative situations. It allows the researcher to assess not only what linguistic structures are impaired but also how aphasics attempt to communicate meaning despite these impairments. By integrating structuralism and socio-communicative theory, this study achieves a comprehensive analysis of aphasic language, accounting for both the internal linguistic breakdown and the functional use of language in bilingual aphasia.

METHODOLOGY

This study employed the descriptive research design because it provides the opportunity for a detailed examination and explanation of the languages of bilingual aphasics. The study adopted the phonetic transcription and used the International Phonetic Alphabet (IPA) to represent the speech sounds in written form. This study involved respondents residing in Port Harcourt and attending the University of Port Harcourt Teaching Hospital (UPTH).

Data Description

The data for this study were obtained from Igbo/English bilingual aphasic participants receiving medical care at the University of Port Harcourt Teaching Hospital (UPTH) in Port Harcourt, Rivers State. The three participants who were involved in this study were selected through purposive sampling based on the following criteria: (i) premorbid bilingual competence in Igbo (L1) and English (L2), (ii) clinical diagnosis of aphasia resulting from cerebrovascular accident (stroke), and (iii) willingness to participate in conversational and question–answer sessions. For ethical reasons, the identities of the participants are anonymised and presented as cases.

Case 1 is a 68-year-old male native of Igboukwu in Anambra State. He was born and raised in an Igbo-speaking environment and completed his education up to the West African Senior School Certificate Examination (WASSCE) level in his hometown. Igbo is his first language, while English serves as his second language, both of which he spoke fluently prior to the onset of aphasia. In early adulthood, he relocated to Port Harcourt, where he worked as a professional vulcanizer and has resided ever since.

Medical records indicate a long history of diabetes (over 15 years) and hypertension (over 10 years). He suffered a cerebrovascular accident approximately eight years prior to this study. At the onset, he presented with left-sided weakness, paralysis, sensory impairment, and left visual field deficit, suggesting right-hemisphere damage. Linguistically, his condition is consistent with fluent (Wernicke's) aphasia. Although speech production is fluent, his utterances are lengthy, poorly structured, and semantically incoherent. He demonstrates marked impairment in auditory comprehension, as evidenced by inappropriate and irrelevant responses to questions. Data were elicited through spontaneous conversation and structured question-and-answer interactions.

Case 2 is a 61-year-old male from Ezinihite Mbaise, Imo State. He attained his education up to the university level in Imo State before relocating to Port Harcourt, where he worked as a clearing and forwarding agent at the Port Harcourt Airport. Prior to his stroke, he was a fluent speaker of Igbo (L1) and had good proficiency in English (L2).

According to his caregiver, he had a prolonged history of diabetes and hypertension and was under continuous medical management. He suffered a stroke in March 2021, resulting in right-hemisphere damage. Initial symptoms included left-sided paralysis, sensory loss, and left visual field impairment, some of which have improved with treatment. However, his language comprehension remains significantly impaired. His speech is fluent with intact articulation, but his utterances are verbose, disorganized, and lack contextual relevance. This linguistic profile aligns with Wernicke's aphasia.

Case 3 is a 61-year-old female widow from Ngor-Okpala Local Government Area, Imo State. She obtained a university degree and was actively engaged in business before the onset of aphasia. Her medical history includes long-term hypertension, exacerbated by emotional trauma following the death of her husband. She later relocated to Port Harcourt for better access to healthcare.

She was diagnosed with a stroke in late 2020, which initially resulted in total loss of language. Although there has been partial recovery following medical and physiotherapeutic intervention, her speech remains impaired. Her language is characterized by slow, effortful production, frequent hesitations, and reduced fluency. This pattern is consistent with non-fluent (Broca's) aphasia, indicating left-hemisphere damage. Speech samples were collected through guided conversation and elicitation tasks for phonological and lexical analysis.

Data Analysis

The data was analyzed based on the tenets of structuralism and socio-communicative theories. In other words, the various units of the languages of the bilingual aphasics were broken down to their smallest units to account for the impairment and manifestation of aphasia in their language use.

At the phonological level, the target pronunciation of the sounds of the words in both languages that were given to the participants was placed alongside the participants' pronunciation to determine if there is any difference in their pronunciation and that of Nigerian standard English, and then identified and analyzed the phonological processes involved in the participants' pronunciation.

At the lexical level of analysis, their responses in both languages in the picture/object naming task were presented alongside the name of the object presented. This was done to measure their level of success in word retrieval in both languages. This was analyzed afterward.

At the morphological level, their use and application of inflectional and derivational morphemes in words of the two languages were presented and examined to identify basic morphological errors in their utterances.

Similarly, at the syntactic level, their responses to questions in both languages were placed alongside the questions. This is to properly identify and examine the sentence structure used by the aphasics and to determine if their structure conforms to the ideal sentence structure of the two languages under study. However, their general performance in all the various units of language study in both languages was examined and compared to determine if either language is more prone to aphasia than the other.

DATA ANALYSIS AND DISCUSSION

The data obtained for this study are presented in two sets: the first set represents the extraction of English conversation, and the second set deals with the extraction of Igbo conversation.

Extracts of English Conversation

Table 1. Pronunciations of Cases and Target Pronunciations in English (L2)

S/N	Target Pronunciation	Case 1 (Igboukwu Man) Pronunciation	Case 2 (Ezinihite Man) Pronunciation	Case 3 (Owerri Woman) Pronunciation	Gloss
1	ʃu:	ʧu:	ʧu:	ʧu:	Shoe
2	elifənt	elifənt	Elifæ	efənt	Elephant
3	ɒktəbə	əktəubæ	ətəubæ	ətəubæ	October
4	Slaid	Slaid	slaid	lide	Slide
5	puʃ	puʧ	puʃ	-	Push
6	klɒk	-	kɒ	-	clock
7	entə	-	-	-	enter
8	Briŋ	Bin	-	-	bring
9	ki:	ti:	ti:	-	Key
10	Θæŋk	Tæn	tæn	tæn	thank
11	Bred	bəredi	-	-	bread
12	Driŋk	-	-	-	drink
13	Red	Ree	ret	-	Red
14	pɪləu	pu:jəu	-	-	pillow
15	Bæg	Bædi	bæti	-	Bag
16	Kreit	kəreti	-	kəreti	Crate
17	dɒg	Doodi	doodu	doodi	Dog
18	Hed	Edi	-	-	head
19	smɔ:l	-	mɔɔlu	-	small
20	pɒd	-	-	pɒtə	Pod
21	ʃɪp	ʧɪp	-	-	ship
22	bəna:nə	na:na	-	-	banana
23	su:p	su:bə	-	-	soup
24	Haus	ausə	ausə	-	house
25	septembə	Setebæ	-	-	september
26	səup	-	-	-	soap
27	Plæt	pætə	-	pætə	plait
28	sænd	Sæn	-	-	sand
29	Buk	Buutu	buu	buut	book
30	graind	guraindi	-	guraindi	grind
31	sta:	-	sita:	-	star
32	Stik	-	tiiki	-	stick
33	Desk	Desi	deeki	-	desk
34	frəm	-	-	-	from
35	Kæp	-	-	-	Cap
36	əktəpəs	-	-	-	octopus
37	Keik	Keeti	-	keiti	cake
38	Kæri	Kæji	kæji	kæji	carry
39	brʌʃ	buwɔ:	-	-	brush
40	stɒp	-	sitɒp	-	stop

41	Milk	Mik	mik	mik	milk
42	bəut	bəu	bəu	bəu	boat
43	grəu	-	-	-	grow
44	bɪg	biidi	biidi	Biiti	Big
45	wɒʃ	-	-	-	wash
46	Mæd	mæti	-	-	mad

In Table 1, the observed difficulties in the utterances of Case 1 are as follows: The voiceless post-alveolar fricative /ʃ/ was replaced with the voiceless post-alveolar affricate /ʧ/ in numbers 1, 5, and 21. The voiceless velar plosive was replaced with the voiceless alveolar plosive in numbers 9, 29, and 37. The voiceless dental fricative /θ/ was replaced with the voiceless alveolar plosive /t/ in number 10. The voiced alveolar lateral approximant /l/ was replaced with the voiced palatal approximant /j/ in number 14. The voiced velar plosive /g/ was replaced with the voiced alveolar plosive /d/ in numbers 15, 17, and 44. The voiceless bilabial plosive /p/ was replaced with its voiced counterpart /b/ in number 23. The voiced alveolar plosive /d/ was replaced with its voiceless counterpart /t/ in number 46. The voiced alveolar approximant /r/ was replaced with the voiced palatal approximant /j/ in number 38. Furthermore, some sounds were deleted in the data presented. The identified sounds that were deleted are glottal fricative /h/ in numbers 18 and 24, voiced bilabial nasal /m/ in number 25, alveolar lateral approximant /l/ in numbers 27 and 41, voiced alveolar plosive /d/ in number 28, and voiceless alveolar plosive /t/ in number 42.

For Case 2, the voiceless post-alveolar fricative was substituted with a voiceless post-alveolar affricate /ʧ/ in number 1. The voiceless velar plosive /k/ was replaced with the voiceless alveolar plosive /t/ in number 9. The voiceless dental fricative /θ/ in number 10 and a voiced alveolar plosive /d/ in number 13 were both replaced with the voiceless alveolar plosive /t/. The voiced alveolar approximant /r/ in number 38 was replaced with a voiced palatal approximant /j/. The voiced velar plosive /g/ was replaced with the voiced alveolar plosive /d/ in numbers 17 and 44, and then replaced with a voiceless alveolar plosive /t/ in number 15. The deleted sounds are voiceless velar plosive /k/ in numbers 3 and 29, the alveolar lateral approximant /l/ in numbers 6 and 41, the voiceless alveolar fricative /s/ in numbers 19, 32, and 33, the glottal fricative in number 24, and the voiceless alveolar plosive in number 42.

There are obvious cases of pronunciation difficulties in the utterances of Case 3. The voiceless post-alveolar fricative /ʃ/ was replaced with the voiceless post-alveolar affricate /ʧ/. The voiceless dental fricative /θ/ in number 10, the voiced velar plosive /g/ in number 44, the voiced alveolar plosive /d/ in number 20, and the voiceless velar plosive in 29 and 37 were all replaced with the voiceless alveolar plosive /t/. Furthermore, the deleted sounds are the voiceless velar fricative /k/ in number 3, the voiceless alveolar fricative /s/ in number 4, the alveolar lateral approximant in numbers 27 and 41, and the voiceless alveolar plosive /t/ in number 42.

Extracts of Igbo Conversation

Table 2. Pronunciations of Cases and Target Pronunciations in Igbo (L1) for Case 1 and 2

S/N	Target	Case 1 (Igboukwu Man) Pronunciation	Case 2 (Ezinihite Man) Pronunciation	Gloss
1	ńwátà	wátà	Ńwátà	Child
2	ùgègbè	[ńgègè]	Ùgèbè	Mirror
3	àkpà	àpà	Àpà	Bag
4	áká	átá	Áká	Hand
5	átú	átú	Átú	chewing stick
6	kpà	kpà	Kpà	Plait
7	túfùó	lúfùó	Túfùó	throw away
8	gábá	gábá	Gábá	Go
9	ḿkpē	ḿpē	ḿpē	Widowhood
10	ékpè	ḿpè	Ìbà	mud fence

11	úkpà	úpà	ḿpà	wall nut
12	ḿgbá	ḿbá	-	Wrestle
13	úgbō	úbō	ḿbō	Farm
14	ìgbà	-	ḿpè	Drum
15	úgbó	úbó	-	Boat
16	gbòʧī	bòʧī	bòʧī	Prevent
17	ènwè	-	-	Monkey
18	ògbó	òbó	ḿbó	Sponge
19	áfó	áfó	Áfó	Stomach
20	èzì	èdì	-	Pig
21	ánú	ánú	-	Meat
22	gbá	bá	-	Kick
23	àgbà	àbà	Àbà	Jaw
24	gbùchíé	bùchíé	-	Cover
25	gbùté	bùté	-	Cut
26	òkpò	òpò	Òpò	intestinal worm
27	làchá	làchá	Làchá	Lick
28	ùdé	ùdé	Ùdé	Cream
29	ásùsù	ásùsù	-	Language
30	úgú	úgú	Úgú	Pumpkin
31	ùtàlì	ùtàyì	-	Cane
32	nyé	yé	Nyé	Give
33	gbúbiè	-	-	Break
34	bìàbá	-	Bìàbá	Come
35	bàtá	Bàtá	Bàsá	Enter
36	sùbá	Sùbá	Sùbá	Wash
37	úgbènè	ḿbènè	-	Feathers

In Table 2, there are observed pronunciation difficulties in the utterance of Case 4 presented above. These difficulties are presented as thus: the labialized velar nasal /nw/ was replaced with a voiced labialized velar approximant /w/ in number 1. The voiced labial velar plosive /gb/ was replaced with voiced bilabial plosive /b/ in numbers 2, 12, 13, 15, 16, 18, 22, 23, 24, 25, and 37. The voiceless labial velar plosive /kp/ was replaced with voiceless bilabial plosive /p/ in numbers 3, 9, 10, 1, and 26. The voiceless velar plosive /k/ was substituted with voiceless alveolar plosive /t/ in number 4. The voiceless alveolar plosive /t/ was replaced with an alveolar lateral approximant /l/ in number 7. The voiced alveolar fricative /z/ was replaced with the voiced alveolar plosive /d/ in number 20. The alveolar lateral approximant /l/ in number 31 and a palatal nasal /ny/ in number 32 were both substituted with the voiced palatal approximant /j/.

For case 2, there are observed difficulties in the pronunciation. The voiced labial velar plosive /gb/was replaced with the voiced bilabial plosive /b/ in numbers 2, 10, 13, 16, 18, and 23. The voiceless labial velar plosive /kp/ was substituted with voiceless bilabial plosive /p/ in numbers 3, 9, 11, 14, and 26. The voiceless alveolar plosive /t/ was replaced with the voiceless alveolar fricative /s/ in number 35.

Table 3. Pronunciations of Cases and Target Pronunciations in Igbo (L1) for Case 3

S/N	Target	Case 3 (Owerri Woman) Pronunciation	Gloss
1	ńwátà	Wátà	Child
2	ényò	Nyò	Mirror
3	àkpà	Àpà	Bag
4	áká	Áká	Hand
5	átú	Átú	chewing stick
6	íbù	Íbù	Fat

7	kpà	kpà	Plait
8	túfùó	túfùù	throw away
9	gáwá	gáwá	Go
10	ḿkpē	ḿpē	Widowhood
11	ékpè	ḿpè	mud fence
12	òkpà	ṅpà	wall nut
13	ḿgbá	ḿgbá	Wrestle
14	úgbō	úbō	Farm
15	ògbó	òbó	Sponge
16	úgbó	úgbó	Boat
17	gbòʧī	bòʧī	Prevent
18	ènwè	èwè	Monkey
19	òkpò	òpò	intestinal worm
20	áfó	áfó	stomach
21	èzʰì	-	Pig
22	ánú	ánú	Meat
23	gbá	gbá	Kick
24	àgbà	àbà	Jaw
25	méchíé	méchíé	cover
26	gbùbíē	bùté	Cut
27	ìgbà	-	Drum
28	ràá	ràá	Lick
29	ùdé	ùdé	cream
30	ásùsù	-	language
31	úgú	-	pumpkin
32	ùtàlì	-	Cane
33	nyé	nyé	Give
34	gbúbìè	-	break
35	bìà	bìà	come
36	bàtá	bàtá	enter
37	sáà		wash
38	ṅkù	-	feathers

In Table 3, the labialized velar nasal /nw/ was replaced with a voiced labialized velar approximant in numbers 1 and 18. The voiceless labial velar plosive /kp/ was replaced with voiceless bilabial plosive /p/ in numbers 3, 11, 12, and 19, and the voiced labial velar plosive /gb/ was replaced with voiced bilabial plosive /b/ in numbers 14, 15, 17, and 24.

Use of Lexical Items by the Bilingual Aphasics

Impairments at the lexical level of language analysis are reflected in the object naming task they were engaged in. It was observed that across the aphasics studied, they experienced difficulty in the word selection and recovery process in both languages during the object naming task. Examples drawn from their responses in the object naming exercise are shown in Tables 4 and 5.

Table 4. Object Naming in English (L2)

S/N	Object	Pronunciation	Case 1	Case 2	Case 3
1	Head	/hed/	Eedi		
2	Banana	/bəna:nə/	na:na		
3	Cap	/kæp/			
4	Dog	/dɒg/			
5	Ship	/ʃɪp/	ʧɪp		

6	Stick	/stɪk/			
7	Desk	/desk/	Desi		
8	Soap	/səup/			
9	Sand	/sænd/	Sæn		

Table 5. Object Naming in Igbo (L1)

S/N	Object	Pronunciation	Case 1	Case 2	Case 3
1	Head	Ísí	Ísí	ísí	Ísí
2	Banana	Ùnèlè	Ùnèlè	ùnè	
3	Cap	Òkpù	-	òkpù	òkpù
4	Dog	Ńkítà	Ńkítà	ńkítà	-
5	Ship	Úgbó	Úgbó	-	úgbó
6	Stick	Ósísí	-	ósísí	ósísí
7	Desk	Óché	óché	óché	óché
8	Soap	Ńchà	ńchà	ńchà	ńchà
9	Sand	Ájá	ájá	ájá	ájá

In Table 4, it is obvious that it took the participant a longer time and an attempt to make an accurate lexical selection to express the content of the picture in L2 (Participant's acquired language). Some of the participants could not find the appropriate lexical items for the object in the picture. There were obvious cases of insertions of inappropriate lexical items in the struggle to name an object. This could be cited in numbers 3, 4, 6, and 8 for Case 1, and all for Cases 2 and 3, in English data, for example, 'cap' is pronounced as /kæka:bu/ instead of /kæp/.

Nonetheless, in Table 5, the provision of accurate lexical items seems to be less difficult in L1 (Participant's first language) as judged from the data provided, where Case 3 had an issue with the appropriate lexical item cited in number 2.

Morphological Analysis of the Language of the Bilingual Aphasics

This section analyses the structure of words and parts of words like stems, root words, prefixes, and suffixes as used by bilingual aphasics. From observation, some of the words of the bilingual aphasics are not well structured and formed. Their utterances are characterized by inappropriate use of inflectional markers like the plural and tense markers. Some examples drawn from their expressions are presented as follows:

The past tense forms of the words 'Come and eat' were not marked in their utterances. The presented forms of the words were retained as thus, 'come and eat'.

The semivowel /n/ was also used in place of the vowel prefix /i/ to form an infinitive. For example, 'nrinri' was used in place of 'irinri'

There was a total omission of a present continuous tense in their sentences. This is evident where one of the participants was supposed to use 'eating' but retained the present form of the verb 'eat'. It was also seen when the participant was expected to use 'going' but used 'go' instead.

There was an insertion of a lexical item 'aa' in trying to retrieve words during the object naming.

In Igbo, it was observed that some derivational suffixes were retained across the aphasics irrespective of the dialect of the participant. Some examples extracted from their utterances are as follows: lacha, gaba, laba, banye, etc.

CONCLUSION

This study examined the phonological and lexical manifestations of aphasia in Igbo/English bilingual speakers, with the aim of determining how aphasia affects language use across the two languages. Drawing on data from three bilingual aphasics diagnosed with Broca's and Wernicke's aphasia, the study revealed that aphasia disrupts language at multiple linguistic levels, particularly phonology and lexis, irrespective of the type of aphasia. However, the degree and pattern of impairment vary across languages and individuals.

At the phonological level, the study identified recurrent sound substitutions, deletions, and simplifications in both Igbo and English. In English, there was a high frequency of substitutions involving fricatives, plosives, and approximants, while in Igbo, complex consonants such as labial-velar plosives and palatal nasals were often simplified. These patterns reflect structural breakdowns in the phonological systems of both languages, supporting the structuralist view of aphasia as a disruption of linguistic organization.

Lexically, the aphasics demonstrated pronounced word-retrieval difficulties in both languages, manifested through delayed responses, incorrect lexical selections, insertions, and circumlocution. However, lexical retrieval was generally more successful in Igbo (L1) than in English (L2), indicating relative preservation of the first language. This finding aligns with socio-communicative theory, which explains language choice and performance in terms of accessibility, familiarity, and communicative efficiency.

However, the study establishes that aphasia affects both languages of bilingual aphasics but does not do so uniformly. The first language tends to be more resilient than the second. These findings provide valuable insights for clinicians and speech therapists, emphasizing the need for bilingual-sensitive assessment and rehabilitation strategies in multilingual societies such as Nigeria.

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