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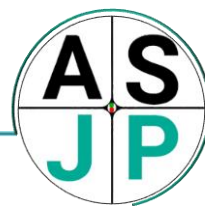
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Phonological interference and secondary school students' achievement in english language reading comprehension

Interférence phonologique et réussite des élèves du secondaire en compréhension de la lecture en anglais

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Abstract

This study employs survey and correlation research designs to investigate the extent of phonological interference and its impact on students' achievement in English language in Imo State, Nigeria. The study is anchored in Contrastive Analysis Hypothesis (CAH) and Interlanguage Theory, which explain how first-language phonological systems influence second-language acquisition and performance. Two research questions and two hypotheses guided the study. The population comprises 82,734 senior secondary school students from 284 Government-owned Secondary Schools in the 2020/2021 academic session. A sample of 400 students from ten selected Government-owned Secondary Schools was determined using the Taro Yamane formula, employing purposive, cluster, and simple random sampling techniques. The Phonological Interference Assessment Test (PIA) and Reading Comprehension Test (RCT) were used for data collection. The instruments were validated by experts, while the PIA yielded a reliability coefficient of 0.85 using the Kuder-Richardson Formula 20 (KR-20). Data were analysed using mean, standard deviation, Pearson Product Moment Correlation (PPMC), χ^2 -test, and t-test statistics at the 0.05 level of significance. The findings reveal a significant relationship between

phonological interference and students' achievement in English language reading comprehension, emphasizing the need for targeted interventions in language instruction to enhance students' language proficiency and reading comprehension.

Keywords: Phonological interference, English language, Achievement, Reading comprehension, language intervention

1. Introduction

Language is a fundamental medium of human communication and social interaction. It is social in nature. It is the major tool of communication in human society. One of the major characteristics of man, according to Mgbodile (2009), is his ability to use language to send messages about objects, events and situations around him. Speech is what distinguishes man from other animals.

In line with this, Obasi and Oku (2010) opined that language is man's most valuable weapon as he uses it as the medium of communication. Speech is paramount to any language and knowledge of the English Language cannot be appreciably good without effective manipulation of the speech sounds and speech is based mainly on oracy. So, the mastery of English language is highly connected to the mastery of the spoken form of it.

Learning to speak a second language or foreign language usually involves some rigours and challenges because the learner has to learn the sound system and the prosodic features of the second language against the already firmly consolidated first language in the learner's mind. This, according to Otagburuagu and Okorji (2007), is because languages have their individual peculiar phonological and grammatical features which must be mastered and used by the learner for mutual intelligibility with the native speakers and other users of the language. The reason is that some languages are tonal and syllable-timed and others are stress-timed and various speech sounds have distinctive acoustic properties.

This study is grounded in the Contrastive Analysis Hypothesis (Lado, 1957), which posits that similarities and differences between first and second languages predict learning difficulties. It is further supported by Selinker's (1972) Interlanguage Theory, which explains learner errors as systematic and developmental rather than

random. Additionally, Flege's Speech Learning Model (1995) and Best's Perceptual Assimilation Model (1995) provide insight into how learners perceive and reproduce non-native phonological contrasts. These frameworks collectively explain the persistence of phonological interference among second language learners.

The adjustment to these differences may lead to confusion and may consequently lead the learner to produce sounds that cannot be understood by other users of the same language. Onuigbo (2015) asserts that learning to speak a second language is psychologically demanding because the learner has already internalized the phonological system of his native language. A person who has been using only one language since early childhood has habits and thoughts which are closely tied to his habits of language, and that language is part of his experience. The author concludes that in learning a second language, the learner has to adjust his speech habits to accommodate those of the target language of which he is conscious of learning.

Apparently, Nigeria adopted English language as a second language for socio-cultural and geo-political day-to-day activities. According to Ogbuchi (2012), the importance of English language as a second language cannot be over emphasized. He submitted thus:

English has become an alternative to the mother tongue in Nigeria. It is now serving as a language of administration, education, law, mass media, international commerce, and diplomacy and in all other official situations. In the Nigerian situation, English language is acquired as a second language (L2). It is a language for specialized education. English language is used as the medium of instruction from elementary to the university level. This means that the Nigerian learner's access to the cultural and scientific knowledge of the world is largely through English language, (p.37). English occupies the highest position in language status in Nigeria. In the opinion of Dada (2010), English is compulsory for every Nigerian, being the Facto official language in the bureaucracy and all tiers of formal education in Nigeria and as an international language for that matter. This indicates that the utilitarian value of the English Language over the Indigenous Languages in Nigeria today makes even mother tongue learning a perfunctory exercise.

Furthermore, English has become the bedrock and a pre-requisite for admission into the Nigerian universities. In fact, it is a language, which, for the effectiveness of its functions, requires the learner's/user's knowledge of all the four basic skills of listening, speaking, reading and writing.

The implication is that many learners of a second language find it difficult to make this adjustment successfully. They approximate the phonological features of the second or target language with those of their mother tongue. The students also tend to replicate and duplicate some of the rules. The learners have limited vocabularies as well as poor command of grammar. In other words, they allow the speech habits of their mother tongue or their first language to interfere with the speech habits of the target language. This phenomenon, according to Akindele and Adegbite (2009), is known in the language register as phonological interference or mother tongue interference.

Mother tongue is the first language one learns from infancy. It is the language handed down to a child by the parents and does not necessarily refer to a child's strong language. This implies that mother tongue is the child's environment and it becomes the natural basis onto which verbal skills can be built. On this note, Oyewole (2017), stresses that the L1 or MT is the first language a person picks up in his/her childhood that cannot be learnt but acquired. He maintains that, it is a language that a person speaks best, and so, it's often the basic for mother tongue identity fully identified with multilingual person to conduct everyday activities. This notwithstanding, the importance of English language acquisition as a stepping stone for proficiency in other school subjects cannot be overemphasized. However, one of the current educational problems that strike public interest in Nigeria is that of poor level of students' achievement especially in public examinations. This problem has persisted in many subject areas such as English, Mathematics and Science. Since there is no local variety of the target language and students are generally made to acquire the standard form of the language used by native speakers. Certain features of the learner's local language have been institutionalized and these features of a Learner's speech deviate from the normal English standard.

One major problem which many are quick to point out according to Onike (2009), is the problem of interference. Interference is a linguistic phenomenon whereby one language influences the other which is the case in second language learning. This arises when the student's understanding of one language has an impact on his/her understanding of another language, then such an individual can be said to be experiencing linguistics interference or language transfer. Onike (2009) posits that interference is a linguistics concept which is a reality in language learning. This is an indication that common errors in a second language learning is partly attributed to interference. This kind of situation exists in a bilingual/multilingual society.

In a related development, interference based on Baldeh (2010), is the major obstacle in the teaching and learning of the English Language and it constitutes a great problem to the learning of a second language for it can hinder mutual understanding and intelligibility and consequently affects performance in target language. This has resulted in having another variety of English Language in Nigeria called "Nigerian English" (Baldeh, 2010). Mgbodile (2009) is of the view that mother tongue interference is a great problem to learners of English language. The Nigerian child ought to be taught to perceive and produce correct pronunciation, stress and intonation, speak standard English, use words appropriately in the target language, which in Nigeria is the English Language.

The teaching and learning of correct pronunciation, stress, and intonation in English language to Nigerian children may be difficult as Nigeria is a multilingual country. Nkamigbo (2010) observes that teaching English Language to students who have different phonological features other than English Language is complicated and difficult, and worse still when the learning environment is multilingual. This problem is compounded by the fact that, for many students, English is not really their second language but their third or even fourth language.

Teaching correct pronunciation, stress and intonation becomes more complex when in a class, for instance, Student "A" may have a problem of distinguishing the /l/ from /r/ sounds, but this may not be the problem of Student "B" whose speech difficulty is with

the pronunciation of words like “live” and “leave” so that they sound differently. Student “C”’s own difficulty may be that he cannot help inserting a vowel sound in a consonant cluster. From the spoken English Language of many Nigerians, one can easily identify the area they come from. This is because different speech communities have different phonological, grammatical and other interference problems. Ogbuehi (2003) points out that today, there are many “Shibboleths (speech signs) for identifying people from different areas of Nigeria.

Interference is of two parts: proactive interference and negative transfer as highlighted by Nitdike, Kidd and Serratrice (2019). The source further opined that proactive interference is a situation where the prior experience of old memories makes it harder to recall new memories. Negative transfer is about how the detrimental effect of prior experience affects the language of a new task. Although interference manifests across linguistic levels (phonological, morphological, syntactic), this study specifically focuses on phonological interference and its measurable impact on reading comprehension, thereby maintaining conceptual clarity.

Phonological interference is a term which refers to a linguistic occurrence in which two different languages interfere and the linguistic system of one of the languages is transferred into the other in a process of producing the latter which is the target language. It is a well-known fact that segmental phonemes, made up of the vowel and consonant sound segments may however differ from language to language in their composition and distribution. Since no two phonological systems of any language is the same, in order to abridge difficulties, learners tend to substitute some elements of the phonological features of the second language with those of the first language. This phenomenon may impede meaning because in the face of such phonological conflicts, the native speaker may find certain utterances made by the second language learner unintelligible.

Language transfer theorists believe that the lexis, grammar and phonology of the learner’s first language impose themselves on the second language habit, thereby resulting in interference problems. Quirk, Greenbaum, Leech and Svartvik (2014:26) observe that “we tend to impose our native phonological pattern on any foreign

language we learn.” Based on this linguistic principle, the researcher is convinced that the possibility of Imo State learners of English language being influenced by the mother tongue interferences cannot be disputed.

1.1 Purpose of the Study

The general purpose of this study is to find out the extent of phonological interferences on Igbo secondary school students’ achievement in English language. Specifically, the study set out to:

1. ascertain the extent of phonological interference among Igbo Senior Secondary School Students in English Language in Imo State.
2. find the coefficient of the relationship between extent of phonological interference and Igbo Senior Secondary School Students’ achievement in English Language reading comprehension in Imo State.

1.2 Research Questions

The following research questions guided the study:

1. What is the extent of English Language phonological interference among Igbo senior Secondary School Students in Imo State?
2. What is the coefficient of the relationship between extent of phonological interference and Igbo Senior Secondary School Students’ achievement in English Language reading comprehension?

1.3 Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. The extent of phonological interference among Igbo Secondary School Students is significantly greater than the expected average level of 10.00.
2. The coefficient of the relationship between students’ levels of phonological interference and their achievement in English Language reading comprehension is not significant.

2. Methods

The researcher employed both survey and correlation research designs because the researcher sought to ascertain the extent of phonological interference and its influence on students’ achievement in English language. Area of this study is Imo State of Nigeria. The population of the study comprised of the 82,734

senior secondary school students (consisting of 41,898 males and 40,836 females) in the 2020/2021 academic session from the 284 Government owned Secondary Schools in Imo State. The sample size for the study is 400 students from the ten sampled Government owned Secondary Schools in Imo State. Using Taro Yemen formula, the researcher computed a sample size of 400 (rounded up to the nearest hundred). The sampling technique employed is a purposive, cluster and simple random sampling techniques. Specifically, purposive sampling was used to select schools with diverse linguistic backgrounds, cluster sampling grouped schools geographically, and simple random sampling ensured equal representation of students within selected schools. Two test instruments were used for data collection namely Phonological Interference Assessment Test (MTIAT) and Reading Comprehension Test (RCT). To ascertain the validity of the instruments, the researcher gave them to three specialists in Language Education and two specialists in Measurement and Evaluation for content and face validation. Reliability coefficient of 0.85 was obtained for the PIA using Kuder-Richardson formula twenty, (KR_{20}). The research questions were answered using means and standard deviations, and Pearson Product Moment Correlation (PPMC). Also, the hypotheses were tested using z-test and t-test statistics at 0.05 level of significance. The use of Pearson Product Moment Correlation (PPMC) is appropriate for determining linear relationships between continuous variables. The z-test was employed due to the relatively large sample size ($n = 400$), while the t-test was used to test the significance of correlation coefficients, ensuring statistical robustness.

3. Results

Research Question One: What is the extent of phonological interference among Igbo Secondary School Students’ achievement in English Language in Imo State?

N	$\bar{X}$	S	μ
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400 7.16 5.64 10.00

Table 1: The Mean Achievement Score of Igbo Secondary School Students on Phonology

Table 1 contains the mean achievement score of Igbo secondary school students on phonology. The mean achievement score of the students on phonology is 7.16, while the standard deviation of the scores is 5.64. Also, the expected mean achievement score is 10.00. The obtained mean achievement score is less than the expected mean achievement score. This difference suggests not only the presence of phonological interference but also indicates a systematic deviation from expected phonological competence, which may hinder decoding processes required for reading comprehension.

Hypothesis One: The mean achievement score of Igbo Secondary School Students on phonology is not significantly greater than the average score of 10.00.

<i>Z_{cal}</i>	<i>df</i>	<i>Z_{crit}</i>	<i>Decision</i>
-10.071	398	1.645	H ₀₁ is accepted

Table 2: Summary z-values for Testing Hypothesis One

Table 2 shows that the calculated z-value for testing hypothesis one is -10.071. Cross checking with the tabulated z-statistics with 398 degree of freedom shows that the calculated z-statistics of the mean achievement score of Igbo students is not significant beyond 0.05 level. In the light of this, the null hypothesis that it is not significantly greater than the expected mean achievement score of 10.00 is upheld. Therefore, the mean achievement score of Igbo Secondary School Students on phonology is not significantly greater than the average score of 10.00.

Research Question Two: What is the coefficient of the relationship between extent of Phonological Interference and

Student’s Achievement in English language Reading Comprehension?

<i>N</i>	<i>r</i>	<i>r</i> ²	<i>t</i> _{cal}	<i>p</i>	<i>df</i>	<i>t</i> _{crit}	<i>Decision</i>
400	0.843	0.711	31.265	0.000	398	1.960	H ₀₄ is rejected

Table 3: The Coefficient of Correlation between Phonology and Student’s Achievement in English language Reading Comprehension

To answer the research question, Table 3 shows that the coefficient of relationship between phonology and achievement of students in English language reading comprehension is 0.843. The calculated coefficient is within the range 0.81 – 1.00, for very high extent of relationship. This shows that there is a very high extent of relationship between Igbo students’ achievement in phonology and their achievement in English language reading comprehension. The coefficient of determination of 0.711 indicates that 71.10% of the variations in students’ achievement in English language reading comprehension is explained by their achievement in phonology.

Hypothesis Two: The coefficient of the relationship between students’ achievement in phonology and their achievement in English language reading comprehension is not significant.

Table 3 shows that by means t-test for testing the significance of Pearson correlation coefficient, the calculated t-value of 31.265 was obtained. The tabulated t-value of 1.960 at 0.05 level of significance was obtained from statistical tables. From the above it followed that the coefficient of relationship between students’ achievement in phonology and their achievement in English language reading comprehension is significant beyond 0.05 level of significance.

4. Discussion

The study indicates a moderate extent of phonological interference among Igbo senior secondary school students, with statistical tests revealing its significance. Students with mean scores in the range of 6-10 are classified as experiencing moderate interference, while scores in the range of 0-5 indicate high interference. This suggests

a significant experience of phonological interference among the students. The findings highlight the substantial influence of native languages on the students' use of English. The significant phonological interference may be attributed to differences between the English language sound system and that of the students' native language (MT). This difference leads learners to either approximate the sound features to the closest in their native language or pronounce words literally based on letter representation. The conclusion aligns with previous studies by Igboanisi (2002), Okafor (2008), and Anuforo (2012), asserting that differences in vowels, consonants, and supra-segmental elements between English and Igbo contribute to pronunciation interference. Similar findings by Ebi (2011) for English speakers of Ibibio extraction indicate that differences in segmental phonemes' composition and distribution account for pronunciation difficulties. These conclusions emphasize the impact of native language interference on English pronunciation, particularly in the absence of meaningful exposure to pronunciation variations and the lack of proper pronunciation models and exercises in teaching. Improving pronunciation skills is crucial for enhancing students' speaking, listening, and reading abilities.

The findings can be interpreted within the framework of Contrastive Analysis, which predicts that structural differences between Igbo and English phonological systems result in negative transfer. The high level of interference observed supports this prediction. Furthermore, from an Interlanguage perspective, these phonological deviations are not merely errors but represent systematic learner strategies.

The calculated coefficient of relationship reveals a very high correlation between phonology and students' achievement in English language reading comprehension, with a value of 0.843. However, the exceptionally high correlation coefficient ($r = 0.843$) warrants cautious interpretation. Such a strong relationship may indicate potential overlap in measurement constructs, shared cognitive processes (e.g., phonological decoding), or possible test dependency effects. This suggests that phonological competence may function as a foundational predictor of reading comprehension performance. From a psycholinguistic perspective,

phonological processing is central to decoding written text; thus, deficits in phonological awareness directly constrain reading comprehension efficiency.

The statistical test confirms a significantly strong relationship between Igbo students' phonology and their performance in English language reading comprehension. Students with low phonological interference (high scores in phonology tests) tend to excel in English language reading comprehension, while those with high phonological interference (low scores in phonology tests) show comparatively lower achievement in reading comprehension. The specific reasons for this correlation remain unknown. Possible factors include the teaching methods employed by Igbo-origin teachers in pronunciation instruction or the students' lack of practice in pronouncing English words. Regardless of the cause, the study emphasizes the crucial role of phonology, given its high and significant influence on students' achievement in English language reading comprehension. Additionally, the research discovers that reading activities in the school are at the discretion of the students. This finding aligns with Abdul and Remia's (2013) study, which also identified a significant and positive relationship between phonology and students' achievement in English language reading comprehension. Their findings support the hypothesis that phonology plays a vital role in developing reading comprehension abilities.

5. Recommendations

Based on the findings of the study, several recommendations can be made to enhance the teaching and learning of English language reading comprehension, particularly in the context of phonological interference among Igbo senior secondary school students.

1. Develop structured phonology-focused training modules incorporating minimal pair drills, phonemic awareness exercises, and technology-assisted pronunciation tools for English language teachers, with a specific focus on addressing phonological interference. Teachers should be equipped with effective strategies for teaching pronunciation and mitigating interference issues.
2. Integrate regular and structured pronunciation practice into English language classes. This can include exercises,

drills, and activities that focus on the specific phonological features causing interference.

3. Introduce diagnostic phonological screening assessments at early secondary levels to identify learners at risk.

6. Conclusion

In conclusion, this study has shed light on the significant relationship between phonology and students' achievement in English language reading comprehension among Igbo senior secondary school students. The findings underscore the importance of addressing phonological interference to enhance overall language proficiency. The calculated coefficient of relationship, with a remarkably high value of 0.843, indicates a strong correlation between phonology and reading comprehension. Students with low levels of phonological interference demonstrated higher achievement in English language reading comprehension, emphasizing the pivotal role of effective pronunciation skills. While the specific reasons for this correlation remain unclear, potential factors such as teaching methods and the students' practice of pronunciation have been identified as areas for further exploration. The study highlights the need for targeted teacher training, incorporating pronunciation practice into classroom activities, and leveraging native language support to bridge the gap between English and Igbo phonology. Future studies should explore causal relationships using experimental or longitudinal designs to determine whether improving phonological skills directly enhances reading comprehension outcomes.

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