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Cognitive Ability As Predictor Of English Language Achievement Of Lower Basic Pupils With Speech Disorder In Nigeria

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ABSTRACT

Speech disorder has been discovered to be one of the reasons for increase in number of out-of-school children in Nigeria. This study assessed cognitive ability as predictor English language achievement of lower basic pupils with speech disorder in North East Nigeria with age and gender of pupils as moderating variables. Simple random sampling was used to draw two local government areas from Jalingo education zone, Taraba, North East, Nigeria. The study which adopted a correlational survey research design, was guided by three objectives, research questions and hypotheses. The population of the study was 207 pupils (150 males and 57 females) identified through Speech Disorder Identification Trait (SDIT), Speech Disorder Classification Checklist(SDCC) and Interview Checklist for Teachers (ICT)from 64 schools. Purposive sampling technique was used to capture 207 lower basic one pupils (150 males and 57 females) with speech disorder. Two instruments were used for data collection, Cognitive Ability Test (CAT) AND English Language Achievement Test (ELAT) were validated by five experts at face and content validity levels. Linear and multiple regression were used to answer research questions, Analysis of Variance (ANOVA) and Hayes Process Macro Statistic were used to test the hypotheses at 0.05 level of significance. Results revealed that cognitive ability has significant predictive power on the English Language achievement of pupils with speech disorder. Age and gender significantly moderated the predictive power of cognitive ability on English language achievement of pupils with speech disorder. The study recommended development of cognitive ability of pupils with speech disorder. Development of cognitive ability of pupils from age seven with particular attention to female pupils was recommended.

Keywords: speech disorder, cognitive ability, age of pupil, gender of pupil.

INTRODUCTION

Communication through speech is crucial to survival of all humans. One principal goal of the lower basic education in Nigeria is to inculcate in the pupil the ability to communicate effectively. There are two types of communication that depend on the norm of human language: these are writing and speech. Written communication is the exchange of information, ideas or messages through scribbling of letters/words on papers or any surface. Speech is the use of articulate sounds to express thoughts and

feelings. Speech is the use of articulate sounds to express thoughts and feelings. It is a primary tool for interaction among peers at the lower basic level and from teacher to pupils. However, there are pupils who are not able to respond appropriately to simple classroom conversation, due to peculiarities in their speech pattern; their utterances differ from those of their peers; this difference is regarded as speech disorder. The occurrence of the term: 'speech disorder' infers that there is 'speech order'. The term 'speech order' refers to speech uttered in relation to acceptable sequence, pattern/arrangement that suits the norm of a language and communicates information intelligibly to another.

Speech disorder is any condition that affects an individuals' ability to produce sounds that create words (Eskie, 2019). Speech disorder is further defined as a communication disorder that can adversely affect a child's educational performance. English language achievement of pupils at this level is closely connected to the ability to recall what has been taught and respond verbally appropriately when questions are asked by the teacher during English language classroom interaction, tests, examinations or by peers in a group activity. The word 'disorder' refers to malfunction or prevalent fault in the mental, physical or psychological processes of a system. The term has been categorised as one of the evidences of specific learning disability (SLD) (Cotrell, 2014). Disorder that is related to speech implies that there is a prevalent fault in the speech production which impedes communication. There are three ways through which speech disorder can be noticed; these are articulation, fluency and voice which are linked to verbal expression. A pupil with speech disorder therefore is one that has problem with expressive skill. A child that lags behind in communication to the point that the shortcoming causes stumbling block to educational advancement and personality, (particularly in comparison with children of same age, class or social group) is negatively exceptional and suffers from speech disorder. Speech disorder, is an impairment caused through the disability noticed in the oral communication of an individual, which can also be called speech impairment.

Cognitive ability is the general mental capability to think and resolve complex problems, concretise abstract concepts, plan and learn through experiences (Ispas & Borman, 2015 & LearningRx, 2021). Cognitive ability is that which enables an individual learner to pay close attention and respond to information, differentiate between concepts and be able to adjust the mind to changed information based on relative factors. Cognitive ability helps the individual to assimilate multiple inputs within a time frame, bring stored up memory to use as the need may arise, organise knowledge according to activities and possess the power of rational prediction (RTMS, 2020; Preckel, & Scherrer, 2025). In the view of Ismailova, Dokhoyan, Kapieva, Oleshko 2017), cognitive ability of learners is related to speech development. Thought comes before speech, in order to contribute intelligently to a conversation, an individual ability to analyse issues on the mind is important. Low cognitive ability in children has been linked to disorders as such children are marked to encounter difficulties in thought, memory, perception and oral speech. Shi and Qi (2022) observed that cognitive ability can have a significant positive effect on academic achievement. The strength of an individual's cognitive ability has been discovered to affect the effectiveness of knowledge acquisition and learning efficiency (Shi,2024) submits. Cognitive ability in the view of Lemos, Guisande, and Almeida, (2025) does not account for achievement in language and mathematics among lower and older adolescents, rather other factors such as age does while Garner, and Robinson (2026) observed that general cognitive ability did not predict academic achievement rather cognitive ability conscientiousness and activity are together capable of predicting academic achievement. Cognitive ability in the view of Liu, Qi and Sun (2025), has significant impact on students' academic performance. It has been discovered that general cognitive ability at the core of students' academic potential (Preckel & Scherrer 2025) therefore there is the need to focus on how cognitive ability of pupils with speech disorder predicts achievement in English language.

Age has been classified as one of the factors that is related to language learning it is assessed as a determining factor for attaining competence and performance in second language learning. There are submissions that support the view that children without speech disorder pick language of the immediate environment easily and can be in possession of almost four or more languages at a time. In the view of Muman (2021) cognitive ability diminishes with advancement in age.

Gender is specifically about being a male or female by birth. Gender is specifically about being a male or female by birth. Gender differences in language appear early in the life of individuals. It has great influence on how people acquire, use and think about language. Research has revealed that the female gender possesses move vocabulary that is emotionally related than the male gender (Steams,2020). The male gender was observed to possess language that describe issues vividly more than the female gender. In the light of this reality, gender can impart how an individual make use of words on daily basis.

Achievement refers to how well pupils perform in any test or assignment given in English language. Achievement is the measurement of the quantity of academic content a pupil has learnt within a particular period. Appropriate and functional use of the English language beyond the classroom by a pupil is considered as evidence of achievement in English language.

Multiple intelligence theory by Howard Gardner (1983) opines that that intelligence does not come by birth. Gardner opined that linguistic intelligence can be nurtured through opportunities given to individuals with linguistic intelligence to create writing activities such as poetry or script writing, formal speaking opportunities, class debates, jokes or humor while Jean Piaget theory of cognitive development posits that changes occur in cognitive development as humans move from infancy to adulthood. The two theories interact to establish relationship between cognitive ability, age and gender.

The study carried out by Nesayan, Amania and Gandomani (2019), on cognitive profile of children and its relationship with academic performance revealed that cognitive abilities are essential for successful learning. The study further revealed that children with different cognitive ability levels are prone to diverse performances. The study of Nalova and Etomes (2019) recorded a significant relationship between age and pupils' achievement in Mathematics and English language.

Statement of the Problem

Achievement in English language at the First School Leaving Certificate Examination in Taraba State has been poor over the years. Pupils with Speech disorder are found in the public schools and are part of the pupils who write the First School Leaving Certificate Examination. Speech disorder has been discovered to be a communication problem that can affect pupils' academic performance. Cognitive ability of leaners is a determining factor for performance through speech while age and gender has been observed to be a causative factor in English language achievement at various levels. The study examined the interrelatedness of these variables on the achievement of pupils with speech disorder in English language.

Objectives of the study

1. Pupils' cognitive ability as predictor of English language achievement of lower basic pupils with speech disorder,
2. Cognitive ability as predictor of English language achievement of lower basic pupils with speech disorder as moderated by age of pupils
3. Cognitive ability as predictor of English language achievement of lower basic pupils with speech disorder as moderated by gender of pupils

Research Questions

The following research questions were raised to guide the study:

1. What is the predictive power of pupils' cognitive ability on English language achievement of lower basic pupils with speech disorder?
2. What is the predictive power of pupils' cognitive ability on English language achievement of lower basic pupils with speech disorder in English language as moderated by pupils' age?
3. What is the predictive power of pupils' cognitive ability on English language achievement of lower basic pupils with speech disorder in English language as moderated by pupils' gender?

Hypothesis

The following hypotheses were formulated and tested at 0.05 level of significance

Ho1. Pupils' cognitive ability has no significant predictive power on English language achievement of lower basic pupils with speech disorder.

Ho2. Pupils' cognitive ability as moderated by age of pupil has no significant predictive power on English language achievement of lower basic pupils with speech disorder.

Ho3. Pupils' cognitive ability as moderated by gender of pupil has no significant predictive power on English language achievement of lower basic pupils with speech disorder.

METHODOLOGY

The study adopted a correlational survey research design. This is a research design that allows investigation of relationship between two or more variables without control or manipulation of any variable (Cherry, 2020, Bhandari, 2021). The population of the study comprised 207 pupils (150 males and 57 females) identified as pupils with speech disorder drawn through multi-stage sampling procedure from 64 schools located in two local government areas where the study was conducted. Speech Disorder Identification Traits (SDIT) to discover lower basic one pupils with speech disorder. SDIT was an adapted identification form generated following the traits of speech disorder as specified by Speech or Language Impairment, Oklahoma State Department of Education, (undated), Minnis (2019), Eskie, (2019) and Arkansas Department of Education on Speech and Language Impairment. The second stage involved the use of Speech Disorder Classification Checklist (SDCC) developed to classify pupils into particular type of speech disorder, while the third stage featured Interview Checklist for Teachers (ICT) developed to authenticate the submissions in SDIT and SDCC. These stages led to the identification of pupils with speech disorder. Purposive sampling technique was used to capture 207 pupils that were involved in the study. Two instruments were used for data collection: Cognitive Ability Test (CAT) and English Language Achievement Test (ELAT), these were validated by five experts. CAT was administered first while ELAT was administered last. Data collected was analysed using linear regression, multiple regression, Analysis of Variance (ANOVA) and Hayes Process Macro statistic score at 0.05 level of significance.

RESULTS

Research Question One: *What is the predictive power of cognitive ability on English language achievement of pupils with speech disorder?*

Table 1: Linear regression analysis of predictive power of cognitive ability on English language achievement of pupils with speech disorder.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Decision
1	.258[a]	.067	.062	9.23757	Low

(R^2) = Coefficient of Determination

The result in Table 1 shows that the correlation coefficient between cognitive ability and English language achievement of pupils with speech disorder is .258. The result implies that there exists a positive low relationship between cognitive ability and English language achievement of pupils with speech disorder. The result also reveals that the coefficient of determination (R^2) associated with the correlation coefficient of .258 was .067. The coefficient of determination (R^2) of .067 indicates that cognitive ability predicts or accounts for up to 6.7% of achievement of pupils with speech disorder in English language. This is an indication that 93.3% of the variation in achievement of pupils with speech disorder in English language is attributed to factors other than cognitive ability.

Hypotheses One: Cognitive ability has no significant predictive power on English language achievement of pupils with speech disorder.

Table 2: Regression analysis of significant predictive power of cognitive ability on English language achievement of pupils with speech disorder.

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1252.209	1	1252.209	14.674	.000[b]
	Residual	17493.192	205	85.333		
	Total	18745.401	206			

The result in Table 2 shows that F-ratio of 14.674 with associated exact probability value of 0.00 was obtained. This probability value of 0.00 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant because 0.00 is less than 0.05. Thus, the null hypothesis of no significant predictive power was rejected. The researcher therefore, concludes that there is a significant predictive power of cognitive ability on English language achievement of pupils with speech disorder.

Research Question Two: *What is the predictive power of cognitive ability on English language achievement of pupils with speech disorder as moderated by age?*

Table 3: Analysis of moderation of age on the predictive power of cognitive ability on English language achievement of pupils with speech disorder.

Age	N	R	R-sq	MSE	F	P
5-6 Years	123	.199	.040	262.164	5.010	.027
7 Years+	84	.205	.042	459.779	3.594	.062
Overall		.320	.103	82.8670	7.7369	.0001

Result in Table 3 shows the analysis of the moderating role of age on the predictive power of cognitive ability on English language achievement of pupils with speech disorder. The result revealed that a correlation coefficient (r) of .320 was obtained. This implies that there is positive low relationship between cognitive ability and English language achievement of pupils with speech disorder as moderated by age. The result further revealed that a coefficient of determination (R^2) associated with the correlation coefficient of .320 was .103. This implies that age moderated 10.3% of the predictive power of cognitive ability on English language achievement of pupils with speech disorder. It can be seen from the table also that the predictive power of cognitive ability on English language achievement of pupils with speech disorder was more with pupils of 7 years old and above (4.2%) than the pupils within the age range of 5-6 years (4.0%).

Hypothesis Two: There is no predictive power of cognitive ability on English language achievement of pupils with speech disorder as moderated by age.

The result in Table 3 was also used to test hypothesis eight. The result in the Table shows that F-ratio of 7.737 with associated exact probability value of .000 was obtained. This probability value of .000 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant. This is because, the probability value of .000 is less than 0.05. Thus, the null hypothesis of no predictive power of cognitive ability on English language achievement of pupils with speech disorder as moderated by age was rejected. The researcher therefore, concludes that age significantly moderates the predictive power of cognitive ability on English language achievement of pupils with speech disorder.

Research Question Three: *What is the predictive power of cognitive ability on English language achievement of pupils with speech disorder as moderated by gender?*

Table 4: Analysis of moderation of gender on the predictive power of cognitive ability on English language achievement of pupils with speech disorder

Gender	N	R	R-sq	MSE	F	P
Male	150	.277	.077	1135.605	12.341	.001
Female	57	.182	.033	129.668	1.891	.175
Overall		.269	.072	85.6724	5.2678	.002

Result in Table 4 shows the analysis of the moderating role of gender on the predictive power of cognitive ability on English language achievement of pupils with speech disorder. The result revealed that a correlation coefficient (r) of .269 was obtained. This implies that there exists a positive low relationship between cognitive ability and English language achievement of pupils with speech disorder as moderated by gender. The analysis further revealed that a coefficient of determination (R^2) associated with the correlation coefficient of .269 was .072. This implies that gender moderated 7.2% of the predictive power of cognitive ability on English language achievement of pupils with speech disorder. It can be seen from the Table that the predictive power of cognitive ability on English language achievement of pupils with speech disorder was more with male pupils (7.7%) than with the female pupils (3.3%).

Hypothesis Three: There is no predictive power of cognitive ability on English language achievement of pupils with speech disorder as moderated by gender.

The result in Table 4 was used to test hypothesis nine. The result in the Table shows that F-ratio of 5.268 with associated exact probability value of .002 was obtained. This probability value was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant since the probability value of .002 is less than 0.05. Thus, the null hypothesis of no predictive power of cognitive ability on English language achievement of pupils with speech disorder as moderated by gender was rejected. The researcher therefore, concludes that gender significantly moderates the predictive power of cognitive ability on English language achievement of pupils with speech disorder.

Findings

The following findings emerged from the study:

1. Cognitive ability significantly predicts or accounts for up to 6.7% of English language achievement of pupils with speech disorder.
2. Pupils' age significantly moderated 10.3% of the predictive power of cognitive ability on English language achievement of pupils with speech disorder in favour of pupils above 7years.
3. Pupils' gender significantly moderated 7.2% of the predictive power of cognitive ability on English language achievement of pupils with speech disorder in favour of male pupils.

RECOMMENDATIONS

The following were recommendations made based on the findings from the study:

1. Cognitive ability of male and female pupils with speech disorder should be developed through activities that will promote verbal comprehension, perceptual reasoning, working memory and processing speed in order to enhance English language achievement.
2. Attention should be given to the development of cognitive ability of pupils with speech disorder who are below 7years of age.
3. Efforts should be made to intensify development of cognitive ability of pupils from age 7 as cognitive ability at this age predicts English language achievement more than lower age.
4. Attention should be given to the development of cognitive ability of female gender among the speech disordered pupils because cognitive ability of male pupils was discovered to predict English language achievement more.
5. Efforts should be made to develop cognitive ability of pupils with speech disorder who are below 7years in order to enhance their achievement in English language
6. Cognitive ability of females with speech disorder should be developed in order to enhance their English language achievement.

CONCLUSION

The study revealed that cognitive ability has a significant relationship with English language achievement of pupils with speech disorder. The study further reveals that cognitive ability as moderated by age and gender has significant relationship with English language achievement of pupils with speech disorder. Teachers are therefore expected to engage in activities that will develop cognitive ability of pupils with speech disorder irrespective of age or gender.

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