THE LINGUISTIC ABILITY AND CHALLENGES OF IGBO CHILDREN WITH DOWN SYNDROME

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Abstract
This study investigates the language abilities of Igbo children with Down syndrome (DS). It addresses the linguistic challenges faced by children with DS in Nigeria, with particular reference to Igbo-speaking children. DS is a genetic disorder caused by an extra copy of chromosome 21, which results in general language difficulties in affected individuals. The study aims to identify specific areas of linguistic difficulty in children with DS and suggest ways to improve their language skills. The research involved four Igbo-speaking children aged between 10 and 15 years, consisting of two typically developing children as the control group (CG) and two children with DS as the experimental group (EG). Data were collected from the children using four structured language tasks: a conversation task (five items), a picture-naming task (five items), a sentence repetition task (five items), and a writing task (one paragraph). The collected data were analysed using a descriptive qualitative approach. The study adopted Jean Piaget's (1952) Cognitive Theory as its theoretical framework. The findings reveal a significant difference in the performance of the control group (CG) and the experimental group (EG), with the children with DS performing lower than their typically developing peers. The study found that children with DS experience difficulties in articulation and expression, while their comprehension remains relatively intact. These deficits negatively affected their performance in the language tasks—conversation, picture naming, sentence repetition, and writing. The study concludes that with improved academic support, including the involvement of professional special-needs teachers, clinical linguists, and speech pathologists, the linguistic abilities of children with DS could be enhanced. This would enable them to communicate more effectively and lead a more linguistically integrated life.

Keywords: *Language ability, Down syndrome, Cognitive theory.*

1. Introduction

Language is an essential feature of human existence, distinguishing humans from other species. It serves as a medium for communication, self-expression, and social interaction. Language acquisition begins early in life and continues as an ongoing process, influenced by biological, social, and environmental factors. In the early stages of life, language development plays a fundamental role in shaping a child's ability to communicate, learn, and interact with their environment. They begin to acquire key abilities—listening, understanding, speaking, reading, and writing— which form the foundation for learning and personal development, and also allows them to express needs, share emotions, and build social connections. Nonetheless, this foundation can be negatively affected if the language ability is not properly developed. A prime example of this lies in the neurodevelopmental profile of individuals with Down syndrome, which inherently impacts language ability. In order to understand these linguistic challenges, we need to elaborate on the nature of Down syndrome itself.

Down syndrome is a congenital disorder first described by an English physician, John Langdon Down, in 1866. It results from an extra copy of human chromosome 21 producing deregulated gene expression in the brain that causes the affected individual to develop subnormal intellectual functioning. The Association of Down Syndrome with Chromosome 21 was established in 1959 by Dr. Jerome Lejeune, a geneticist in Paris, almost 100 years after it was first described. It is the most common chromosomal abnormality or disorder occurring in humans. Since after the discovery, many studies have emerged on the disorder. Some researchers propose different types of Down syndrome. The US Department of Health and Human Sciences (1984) states that there are three forms of Down syndrome: Trisomy 21, Mosaicism, and Translocation. Trisomy 21 is the genetic abnormality that causes the presence of three chromosomes, rather than the normal pair, which could result from an error in cell division. Mosaicism is a very rare form of Down syndrome, appearing in one percent of people with the disorder. The error occurs after fertilization, while some of the chromosomes are normal in number, some have the extra 21 chromosomes. Translocation occurs before fertilization, where an extra copy of chromosome 21 breaks off during cell division and attaches to a different chromosome. According to Bilinguistics Speech and Language Services (2014), Down syndrome occurs in approximately one in every 800 live births. It is not related to race, nationality, religion or socioeconomic status. Identifying people with Down syndrome is not difficult because the individual manifests distinct physical characteristics including stunted growth. For instance, the face exhibits such features as small chin, flat face, slanted eye, slanted neck, poor muscle tone, a flat nasal bridge, and a protruding tongue. Asim, Kumar and Agarwal (2015) claim that Down syndrome is one of the most leading causes of

intellectual disability, as patients face various challenges in learning, memory, language ability and physical development.

Given that the focus of this study is on children, it is important to acknowledge their language development. When a child is born, the expectation is that he reaches each developmental milestone successfully. The child should ordinarily grow physically, emotionally, and intellectually as he develops basic physical, mechanical, and linguistic abilities obtainable at every stage of life. Although language might not be all that makes one human, it is inextricably linked to the human experience, being an essential feature of human existence for communication, self-expression, and social interaction. This explains the definition of language as "a means which human beings have devised for communicating ideas, feelings, emotions, desires, etc. through complex vocal or written symbols" (Anagbogu, Mbah & Eme, 2010:1).

According to Akpan (2004), a normal child at specifically different periods will acquire and demonstrate language abilities. The abnormal child will not do the same. Agbedo (2009) asserts that a child with normal language development is the child who is born without any physical or mental handicap that negatively affects their speech/language. It is, therefore, the normal child that has the normal language development, which permeates all other levels of their development. Any impediment to normal language development usually results in the failure of the affected individual to be able to communicate effectively. Lack of the ability for effective communication is often characterized by speech and communication deficits. These deficits can present in the form of several disorders bordering on language expression and reception, like articulation, voice, fluency, perception and comprehension disorders. The underlying causes of these variations in children's speech development are often rooted in a complex interplay of biological, physiological, neurological, genetic, and environmental factors.

Building on the foregoing, this present study aims to examine the linguistic ability and challenges of Igbo children with Down syndrome, with particular attention to their expressive (speaking and writing) and receptive (listening and understanding) abilities. The study engages a control group comprising the typically developing peers, and an experimental group made up of children with Down syndrome.

2. Literature Review

Hulme, Goetz, Brigstour, Nash, Levar and Snowling's (2012) work aims to discover the relationship in the reading ability of typically developing children and children with Down syndrome (DS) by assessing their reading, non-verbal ability and phonological awareness. The study discovers that the attainment level of learning varies greatly in favour of children without DS. The research shows that in phoneme awareness, the children with DS were poorer in their performance than the normal children. It suggests repeated learning experiences for the DS children in order to increase their learning ability. Their study is similar to this study because they both seek to study children with Down syndrome. Though their study focuses on the reading, non-verbal and phonological abilities of the children with DS, the present study, which uses Igbo-speaking subjects for the research, centres on identifying the areas of linguistic difficulty of the children with DS, and proffering ways for their improvement.

Njoku (2024) presented a psycholinguistic analysis of the communicative patterns of children with DS. The study aims to investigate the causes of DS in children and identify the phonological and morphological disorders they exhibit. The research was conducted at the Special Children's Centre in Aba, Abia State, Nigeria. Data were collected through interactions with two DS children. The study reveals that advanced maternal age, family history, and shared environmental influences significantly contribute to the development of Down syndrome in children. The identified phonological disorders include poor articulation in the form of sound distortion and consonant cluster reduction, initial and final consonant deletion, and what he terms 'vowelisation'. The prevalent morphological disorders are overgeneralization of grammatical rules (such as incorrect pluralisation and verb conjugation), and experiencing difficulties in word formation, particularly in generating compound words. These linguistic challenges hinder the ability of the DS children to communicate effectively, as they impinge on their speech clarity and intelligibility. To better their linguistic ability, the study proposes early intervention support such as parent and caregiver training programmes to educate families with special-needs children, and inclusive education environments to aid DS children learn alongside their typically developing peers. These proposals, when implemented, would foster better language development for the DS children, improve their social interaction, and engender positive relationships. Although Njoku (2024) is similar to the present study, as they have interest on children with Down syndrome, the difference lies in the scope and methodology. While his scope is phonological and morphological disorders and his methodology descriptive, the present study focuses on their language abilities, with the adoption of Cognitive Theory of Jean Piaget (1952), for its theoretical framework.

3. Theoretical Framework

The study adopts the Cognitive Theory (1952) as its theoretical framework. This theory is propounded by a Swiss developmental psychologist Jean Piaget (1896–1980), and is regarded as the developmental stage theory. Piaget's theory of cognitive development is a comprehensive theory about the nature and development of human cognitive ability and how humans gradually come to acquire, construct, and use it. According to Piaget, cognitive

development is more than quantitative change in how much children know; it also involves qualitative change in how children think. During this period, children acquire a mental storehouse of images and symbols, especially spoken and written words. Cognitive ability is the mental skills used for acquiring knowledge, manipulating information, reasoning, and problem-solving eg. memory, attention, language and executive functions. By Piaget thinking that children have great cognitive abilities, he came up with four different cognitive development stages, which he put out into testing. Within those four stages he managed to group them with different ages. They are the Sensorimotor stage (Birth to 2 years), Preoperational stage (2 years to 7 years), Concrete operational stage (7 years to 11 years) and Formal operational stage (12 years to Adulthood). This stages will be explained through the language lens.

In the sensorimotor stage, Piaget states that it "extends from birth to the acquisition of language."Here, infants progressively construct knowledge and understanding of the world by coordinating experiences (such as vision and hearing) from physical interactions with objects (such as grasping, sucking, and stepping). Infants gain knowledge of the world from the physical actions they perform within it. They progress from reflexive, instinctual action at birth to the beginning of symbolic thought toward the end of the stage.

Concerning the Preoperational stage, young children can think about things symbolically. This is the ability to make one thing - a word or an object - stand for something other than itself. During the pre-operational stage of cognitive development, Piaget notes that it starts when the child begins to learn to speak at age two and lasts up until the age of seven, although they do not yet understand concrete logic and cannot mentally manipulate information. Language at this stage is either one word or two words.

Furthermore, in the Concrete Operational Stage, Piaget considered the concrete stage a major turning point in the child's cognitive development because it marks the beginning of logical or operational thought. This means the child can work things out internally in his head. During this stage, a child's thought processes become more mature and "adult-like". They start solving problems in a more logical fashion. In their language and communication aspect, Piaget posits that it is at this stage that a child undergoes a transition where the child learns the cognitive rules to engage in conservations.

Lastly, the final and most advanced stage is known as the Formal Operational Stage. In this stage, Piaget postulates that children develop the capacity for abstract thinking, systematic planning, hypothetical-deductive reasoning, and metacognition. Piaget acknowledges that linguistic ability evolves and is ultimately shaped by the cognitive structures that emerge during this stage. So, in the language aspect of this stage, Piaget notes that this stage supports the adolescents ability to engage in metalinguistic reflection—the ability to think about language as an object of thought. Therefore, where younger children are bound to half baked speech, adolescents and adults begin to master complex grammatical constructions, such as conditional sentences, embedded clauses, and passive voice, which are essential for expressing abstract reasoning and hypothetical possibilities. This is because they can now evaluate language itself as a system. Thus, Piagets theory suggests that linguistic development at this stage is an outward expression of the internal cognitive transformations characteristic of formal operational thinking.

In conclusion, Piaget realized how children managed to develop their cognitive skills in each stage. As he believed that children experience the world through actions, representing things with words, thinking logically, and using reasoning. To Piaget, cognitive development was a progressive reorganization of mental processes resulting from biological maturation and environmental experience. In addition, Piaget affirms that cognitive development is at the center of the human organism, and language is contingent on knowledge and understanding acquired through cognitive development. Therefore, since the study is on the language abilities of Igbo children with Down syndrome, and the investigation foregrounds cognitive ability— specifically, language, the study adopts this theoretical framework to explore the language abilities of this group.

4. Methodology

Qualitative research design and descriptive method of data analysis were adopted for this research. Data were collected from four children who were divided into two groups. The first group comprises two typically developing children serving as control group (CG). The second group consists of two DS children who serve as experimental group (EG). The children that form control group are from Noble Trail Secondary School, Onitsha, Anambra State. The experimental group children are from Day Care and Therapeutic Centre, Abakpa Nike, Enugu State. Data were collected through different tasks such as conversational tasks, picture naming tasks, sentence repetition tasks and writing tasks. The instruments for data collection includes a Samsung Galaxy phone recorder, a jotter and a pen. The recorded data which were repeatedly listened to and orthographically and phonemically transcribed were analyzed using Cognitive Theory of Piaget (1952), as the theoretical framework.

5. Data Presentation and Analysis

The data are presented under a-d comprising a) conversation task b) picture naming task c) sentence repetition task d) writing task. Under each, the data from control group (CG) are in (i) while (ii) contains data from

experimental group (EG). The children's names, though available to the researchers, are not included here for the sake of their privacy. The letters A and B were used instead.

a. Conversation Task

i. Control group

S/N	Questions	Child A	Child B
1.	Kedu ka i mere? *(How are you?)*	Adị m mma. *(I am fine)*	Adị m mma. *(I am fine)*
2.	Gịnị bụ aha gi? *(What is your name?)*	Aha m bụ … *(My name is…)*	Aha m bụ … *(My name is…)*
3.	Afọ ole ka ị dị? *(How old are you?)*	Adị m afọ iri na otu. *(I am eleven years old)*	Adị m afọ iri na otu.
4.	Kedu ebe i bi? *(Where do you live?)*	Ebi m n'Onitsha. *(I live in Onitsha)*	Ebi m n'Onitsha. *(I live in Onitsha)*
5.	Kedu klaasị ị nọ? *(In what class are you?)*	Anọ m klaasị afọ asaa. *(I am in class year seven)*	Anọ m na Junịọ Sekọndịrị nke Mbụ. *(I am in Junior Secondary One)*

ii. Experimental group

S/N	Questions	Child A	Child B
1.	Kedu ka i mere? *(How are you?)*	Á dī̱ má	…… ** Nods in affirmation*
2.	Gịnị bụ aha gi? *(What is your name?)*	*(Mentions his first name and surname)*	*(Mentions only his surname)*
3.	Afọ ole ka ị dị? *(How old are you?)*	Fif-tin *(fifteen)*	Taatin *(thirteen)*
4.	Kedu ebe i bi? *(Where do you live?)*	house *(In my house)*	…… **Points to the door*
5.	Kedu klaasị ị nọ? *(In what class are you?)*	*hesitant… Kláásị̀?	……. *(Demonstrates with finger)*

Analysis

In the conversational task, it is observed that the speech of CG children is more grammatically structured in terms of articulation, phonology, morphology and syntax. They maintain the morphological rule in Igbo during articulation, by including the prefix 'a' to the verb 'dị' to form '*Ádị̀*' and prefix 'e' to the verb 'bi' to form '*Ébì*'. In question no. 5, we observe the different lexical choices both normal children made during their response. As child A uses a direct English borrowing for 'class' combined with a literal Igbo translation for 'year seven' to form 'klaasị afọ asaa', child B uses a borrowed multi-word term from English 'Junior Secondary' combined with the standard Igbo grammar for the ordinal number to form 'Junịọ Sekondịrị nke mbụ'. This is because the school uses year to account for class, though some of the students are still acquainted with using the general Junior Secondary (JS) or Senior Secondary (SS). Overall, the normal children maintained grammatical correctness and clarity in their responses to the conversational task.

Concerning the language of the children in the EG, many observations are made. A primary observation across the dataset of DS children is the use of both verbal and non-verbal responses, specifically by child B who uses nodding and pointing as response. This shows that children with Down syndrome understand language and

respond accordingly even though their response is not as structured as that of the normal children. This supports the claim that the receptive language of children with Down syndrome is largely intact. Judging from earlier study Buckley and Le Prèvost (2002), which postulates that, "children with Down syndrome usually have an uneven profile of social, cognitive and language development – they do not have a profile of equal delay in all areas, they have a profile of strengths and weaknesses. For example, social development and social understanding is typically a strength, while spoken language development is a weakness". In more recent findings, Martin, Klusek, Estigarribia and Roberts (2009) also notes in proposition that, despite considerable individual variability, individuals with Down syndrome have a characteristic profile of language and communication strengths and difficulties. They further note that their receptive language is typically stronger than expressive language, with phonology, syntax, and some aspects of pragmatics presenting particular developmental challenges.

In the data set, there are also instances of code-switching, whereby the researchers asked a question in Igbo and they responded in English 'Kedu ebe i bi*?, 'house'* and '*Afọ ole ka ị dị?, Fif-tin/Taatin'*. This is because being bilinguals and in need to simplify response, they adopt shorter lexical items from their second language, English. This supports the claim that DS bilinguals adopt shorter and simpler lexical items from their second language (Ward 2020). Also, in the speech of child A, there is an instance of immediate or delayed repetition of the speech of another person, referred to by Robert (2024) as echolalia. Child A responds to '*Kedu klaasị ị nọ*?' with the repetition of '*Klaasị*'. The strategy of repetition of word or question is often to gain extra time for utterance processing. However, this particular case of repetition could be a way of seeking clarification, since their school does not officially use the term 'class'. There is also an instance of syllable reduction at the word initial position, whereby child A produces '*mma'* as '*ma'*, in addition to dropping the first person singular pronoun 'm' preceding '*mma*'. This causes morphological and semantic adjustments, where 'A' in 'Adị m mma' changes from being a verbal prefix to becoming an impersonal pronoun, hence '*A dị ma.*' The utterance could be seen as distorted since the person being referred to as being fine is not specified.

b. Picture Naming Task

In picture naming task, the researchers provided both groups with five images showing the following objects: ázụ̀ 'fish , ńkı́tā 'dog', éwú 'goat', bǫ́ǫ̀lụ̀ 'ball', ụ́gbǫ́àlà 'car'.

i. Control group

S/N	Questions	Child A	Child B
1.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of fish* - ázụ̀	ázụ̀	ázụ̀
2.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of dog* - ńkı́tā	ńkı́tā	ńkı́tā
3.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of goat* - éwú	éwú	éwú
4.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of ball* - bǫ́ǫ̀lụ̀	bǫ́ǫ̀lụ̀	bǫ́ǫ̀lụ̀
5.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of car* - ụ́gbǫ́àlà	ụ́gbǫ́àlà	ụ́gbǫ́àlà

ii. Experimental Group

S/N	Questions	Child A	Child B
1.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of fish* - ázụ̀	*hesitant… ázụ̀	*hesitant… ázụ̀ míī
2.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of dog* - ńkı́tā	*hesitant… kı́tā	*hesitant… kı́tā Kosi
3.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of goat* - éwú	*hesitant… éwú	*hesitant… éwú úú * *Proceeds to make the goat sound.*

4.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of ball* - bọ́ọ̀lụ̀	*hesitant… bọ́ọ̀	*hesitant… fú-bọ́ọ̀ ọ̀ọ̀ * *Claps and screams in excitement.*
5.	Kedụ ihe bụ ihe a? *(What is this?)* * *Points to a picture of car* - ụ́gbọ́àlà	*hesitant… mótò	*hesitant… mótò òò * *Proceeds to mimic the car sound.*

Analysis

The typically developing children performed better than the DS children in both articulation and quick lexical retrieval. Although DS children were relatively slow in lexical retrieval, they eventually responded. In speaking, there are noticeable articulation differences, as seen in child B, producing '*Ázụ̀* míī' instead of *Ázụ̀*. It is assumed that the inclusion of *'mii'*, that is, 'ḿmírī' is for clarification, to indicate that the fish is not dried fish. This supports Angulo-Chavira, Castellón-Flores, et. al (2022) study on word prediction using closely and moderately related verbs in down syndrome, which asserts that DS individuals would often include sematic related lexical items (noun or verbs) to an object that is closely associated. In this case, fish is associated with water. Another instance of semantic-associative approach to naming is seen in the production of 'fú-bọ́ọ̀ ọ̀ọ̀' by child B, where 'fú' is 'foot'. He associates the type of ball in the picture to 'football'; hence, he calls it 'fú-bọ́ọ̀ ọ̀ọ̀'. The shortening of '*ḿmírī*' to '*ḿíī'*, shows phonological reduction in order to simplify articulation by dropping the bilabial nasal /m/ and alveolar roll /r/. Deletion of nasal by DS children is seen again in their pronunciation of dog '*ńkı́tā*', where the word-initial nasal was deleted to realize the word 'kı́tā'. Both child A and B in the EG deleted the final syllable of ball [lʊ] in order to realize 'bọ́ọ̀' and 'fú-bọ́ọ̀ ọ̀ọ̀'. Sound or syllable deletion of this nature may affect intelligibility, especially when dialectal differences are considered.

The inclusion of someone's name, Kosi, by child B still supports semantic-associative approach to naming. Maybe the said Kosi has a dog and, therefore, every dog he sees must be associated with Kosi. In producing *goat '*éwú' and *ball* 'bọ́ọ̀lụ̀', child B realizes them as 'éwú úú' and 'fú-bọ́ọ̀ ọ̀ọ̀' respectively. The lengthening of the final vowels /u/ and /ɔ/ could have been influenced by excitement, as he proceeds to mimic the bleating of goat while clapping and screaming in excitement on producing 'ball'.

c. Sentence Repetition Task

For sentence repetition task, the researchers presented the sentences to the children moving from simple sentence to complex sentence. Theodorou, Kambanaros & Grohmann (2017) aver that sentence repetition, also referred to as sentence recall or sentence imitation, taps into an individual's ability to repeat the exact wording of what was just heard. This task has been used for decades as a tool for investigating language ability and is widely recognized as a means for identifying children with language impairment and as useful measures of individual differences in receptive language and working memory (Vinther, 2002).

i. Control group

S/N	Sentences	Child A	Child B
1.	Ázụ̀ bì n'ı́mé ḿmīrī. *(Fish lives in the water)*	Ázụ̀ bì n'ı́mé ḿmīrī. *(Fish lives in the water)*	Ázụ̀ bì n'ı́mé ḿmīrī. *(Fish lives in the water)*
2.	Ógè èrúgó élékéré īrī. *(The time is 10 o'clock)*	Ógè èlúgó élékéré īrī. *(The time is 10 o'clock)*	Ógè èrúgó élékéré īrī. *(The time is 10 o'clock)*
3.	Ákwụ́kwọ́ édémédé màrà ḿmā. *(The novel is beautiful)*	Ákwụ́kwọ́ édémédé à màrà ḿmā. (This novel is beautiful)	Ákwụ́kwọ́ édémédé màrà ḿmā.
4.	Ákwụ́kwọ́ à bụ̀ ǹkè ḿ, ọ́ nà-àtọ́ m̄ ụ́tọ́ ídē íhé. *(This book is mine and I like to write)*	Ákwụ́kwọ́ à bụ̀ ǹkè ḿ, ọ́ nà-àtọ́ m̄ ụ́tọ́ *…pause...* ídē ífé	Ákwụ́kwọ́ à bụ̀ ǹkè ḿ, ọ́ nà-àtọ́ m̄ ụ́tọ́ ídē íhé.
5.	N'ímé íhé níīlē Chúkwú kèrè, ọ́ bụ̀ náānı̄ ḿmádụ̀ nà-àsụ́ ásụ̀sụ́. *(In all the things God created, it is only humans that speak language)*	N'ímé íhé níīlē Chúkwú kèrè, ọ́ bụ̀ náānı̄ *...pause…* ḿmádụ̀ nà-àsụ́ *...pause…* ásụ̀sụ́.	N'ímé íhé níīlē Chúkwú kèrè, ọ́ bụ̀ náānı̄ ńdı́ m̄mádụ̀ nà-àsụ́ ásụ̀sụ́.

ii. Experimental Group

S/N	Sentences	Child A	Child B
1.	Ázụ̀ bì n'ḭ́mé ḿmīrī. *(Fish lives in the water)*	Azụ̀ bị me mịlị.	Azụ̀ me mịị.
2.	Ógè èrúgó élékéré īrī. *(The time is 10 o'clock)*	Ógo lugo eleeele rwị.	Ógo eyeye yii.
3.	Ákwụ́kwọ́ édémédé màrà ḿmā. *(The novel is beautiful)*	Ákwụwọ édéédé mala ma.	Áwụwuwọ éwéwé maa.
4.	Ákwụ́kwọ́ à bụ̀ ǹkè ḿ, ọ́ nà-àtọ́ m̄ ụ́tọ́ ídē íhé. *(This book is mine and I like to write)*	Ákwụwọ ọ bụ ke mụ, ọ́ a-átọ́ de ye	Áwụwuwọ ke mụo.. *(unintelligible vocalizations)…. *stops*
5.	N'ímé íhé níīlē Chúkwú kèrè, ọ́ bụ̀ náānḭ̄ ḿmádụ̀ nà-àsụ́ ásụ̀sụ́. *(In all the things God created, it is only humans that speak language)*	Me lee Chúkù kele, ọ bụ ……maadụ a-asụsụ	Méyee Chúkù ……. **stops*

Analysis

Despite the CG children's strong repetition ability and greater capacity to manage increased linguistic load, they still encountered errors, though minor. For example, phonological variations made by child A by substituting 'èlúgó' for 'èrúgó' in 2 and 'ífé' for 'íhé' in 4. However, the substitution in 4 may suggest a potential difficulty in processing or retaining the precise lexical item, possibly indicating limitations in working memory capacity or processing speed because it is the last item in the long compound sentence. Moreover, both CG children encounter a little challenge in 5 because of the higher cognitive load it required for processing and producing the utterance. While child A uses pauses, child B manages to repeat the sentence without significant pauses, but with grammatical substitution; using *ńdị́ m̄mádụ̀* (people) instead of *ḿmádụ̀* (human/person). In essence, the sentence repetition task reveals that both children demonstrate a strong foundation in language comprehension and production, even though subtle errors and hesitations were observed, particularly with increasing sentence length and complexity. This could be indicative of the ongoing developmental processes within their linguistic systems and aligns with Piaget's Cognitive Theory which posits that language acquisition is deeply intertwined with underlying cognitive growth, with children's linguistic abilities reflecting their stage of cognitive development.

In the case of the DS children, certain major differences are glaring. For instance, at the phonological level, they exhibit difficulty in speech sound articulation such as consonant deletion, for example, deletion of a bilabial nasal /m/ in 'mmadụ' to realise a single /m/ in 'madụ'. The labialized velar plosive /kw/ in '*Chúkwú'* and '*Ákwụ́kwọ́'* is reduced to either /k/ or /w/. Also, there are instances of consonant substitution. For example, from alveolar roll /r/ to alveolar lateral /l/, voiceless velar plosive /k/ to alveolar lateral /l/, and voiced alveolar plosive /d/ to labiovelar approximant /w/. For '*édémédé',* the voiced alveolar plosive /d/ is substituted with the palatal approximant to realise '*éwéwé'*. There are also instances of deletion of initial sound. For example, /n/ in '*nke'* is deleted to become '*ke'* and /i/ in '*iri*' to '*rwi'*. There is also an instance of insertion by child B who produced '*Áwụwuwọ'* instead of producing *'Ákwụkwọ'*; thus inserting a syllable */wu/.*

All these maneuvres by EG children in their speech production might be a way to simplify the articulation process through the bypass of any sound or syllable that could constitute articulation difficulty. Bypassing the sound could be achieved by many means, especially deletion and substitution.

In the area of morphology, DS children show tendencies in simplifying word structures and omitting grammatical markers. They both omitted the preposition /n/ in '*N'ihe*'. Also, while core morphemes are often attempted, they were frequently distorted phonologically by changing their meaning or making them unintelligible, making their identification challenging. For example, from essay '*édémédé'* to '*éwéwé'*, clock '*elekere'* to *'eyeye'* and all things *'niile'* to '*leee*'. Also, there is an observed difficulty in the production of affixes, specifically, interfixes. According to Anagbogu, Mbah & Eme (2010:144), an interfix is an affix which occurs in the middle of a word in such a way that on both sides of it, there are identical morphemes. We can observe difficulty in the production of the word '*édémédé'*, whereby child A in the experimental group omits the bilabial nasal /m/.

Regarding syntax, EG children exhibit more challenges with sentence complexity, though child A attempts to reproduce the basic syntactic framework of the target sentences (subject-verb-object/complement structure) but often simplifies them by omitting function words or grammatical markers. They omitted the preposition /n/ in '*N'ihe*', article /a/ in *this book* '*Ákwụkwọ a*' or aspect markers, and reducing the complexity of noun and verb phrases, such as '*átọ́ m ụtọ*' to *'ọ́ a-átọ́*', '*mmadụ na-asụ asụsụ'* to '*maadụ a-asụsụ*' and *'ide ihe*' to '*de ye*'. Child B demonstrates more profound syntactic difficulties, as his sentences are often severely truncated or replaced by sequences of sounds that do not form grammatical constituents in Igbo. In several instances, the attempt to produce a sentence breaks down entirely after producing only a fraction of the sentence (as seen in questions 4 and 5), indicating a significant challenge in planning and executing complex sentence structures. Perhaps, this may suggest that the demands of the sentence repetition task (specifically the amount of information that needs to be held and processed in working memory) are beyond child B's working memory capacity.

d. Writing Task

"Ikele Ekele: Ụmụaka kwesịrị ịna-ekele ndị mụrụ ha ekele ụtụtụ nakwa ma ha richaa nri." (This text is culled from Emenanjọ, N. E., Ekwe, B. U., Okolie, O. O. & Kanụ, N. (2008: 67) *Igbo Maka Junịọ Sekọndịrị*).

i. Control Group

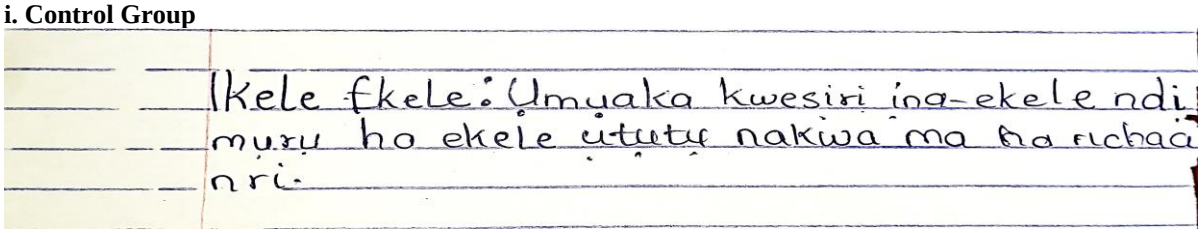
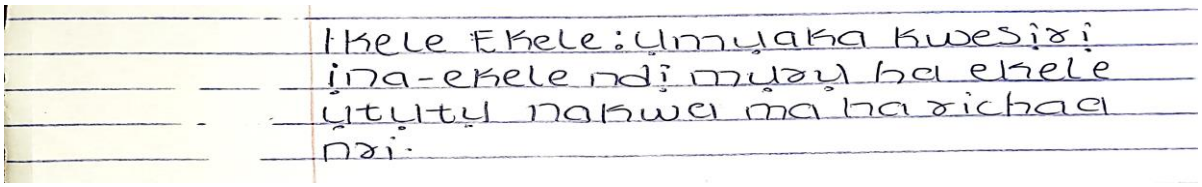
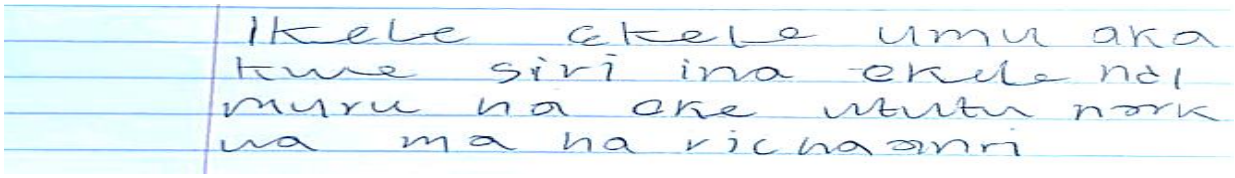


Fig. 1: Writing of the typically developing child A



Fig, 2: Writing of the typically developing child B

ii. Experimental Group



Fig, 3: Writing of the Down syndrome child A

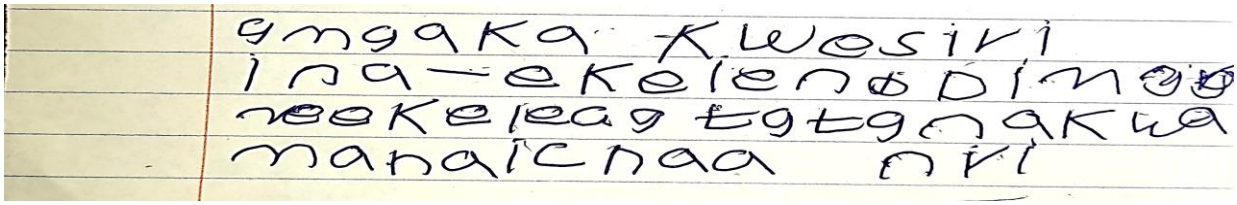


Fig. 4: Writing of Down syndrome child B

Analysis

In the writing task, the handwriting of the typically developing children is more organised and clear to read. Also, they observed the use of diacritics and punctuation marks such as full stop and colon. On the handwriting of the children with Down syndrome, the content is less readable. For instance, the spacing between letters and words is erratic, making it difficult to distinguish individual words e.g "kwe" and "sịrị" is supposed to be written together as "*kwesiri*", "umu" and "aka" as "*umuaka*". Also, they did not observe the use of diacritics and punctuation marks, the letters are frequently misaligned, some characters appear distorted or reversed, and there are clear instances of letter substitutions, spelling omissions, and grammatical errors, rendering the intended message largely incomprehensible. The handwriting of the children with downsyndrome reflects significant

challenges in both motor control and orthographic awareness. Although the typically developing children (TDC) outperformed the children with Down syndrome (DS) in writing tasks overall, a noticeable variation was observed within the DS group. Specifically, DS child A, who is fifteen years old, demonstrated significantly better writing skills than DS child B, who is thirteen years old. This intra-group difference may be attributed to DS child A's more advanced age and also to their longer exposure to educational training, having been enrolled in the therapeutic center prior to child B. Therefore, while group-level disparities exist between TDC and DS children, writing ability among children with Down syndrome may reflect an interplay between developmental variables, like age, and environmental factors, particularly the duration, consistency, educational training and writing practice received at the therapeutic center. Ultimately, although both DS child A and B made a visible effort in producing their writing, their outputs still lacked the legibility, letter formation, spacing, alignment, and spelling accuracy demonstrated by their typically developing peers.

Overall, in the analysis, from the conversational task Down to the writing task, it is observed that in both groups of Igbo children, the language ability in the typically developing children is more organised and structured than that of the children with Down syndrome. This is because children with Down syndrome experience difficulties in expression—speaking and writing, though they are able to understand and comprehend language. In terms of speaking, it could be as a result of dysarthria, a speech disorder that involves weakness, paralysis, or incoordination of the muscles involved in speech production, leading to difficulties with articulation, voice, and rate of speech. This is a motor speech disorder that is caused by generalized weakness to the oral musculature that occurs as a result of damage to the central nervous system, J. Duffy (1995). In oral musculature weakness, the speech of individuals with dysarthria is slow and labored and their articulation is imprecise (Freed, 2000). Hence, in this case, their difficulty in it can be interpreted incoordination of the muscles involved in speech production as a result of macroglossia (enlargement and protruding of the tongue), dentofacial and cranial changes. While in terms of writing, it could be as a result of muscle hypotonia (MH), a condition of low muscle tone and strength. According to Dey et al (2013), almost all children with DS suffer from muscle hypotonia. Therefore, due to the low muscle tone in the fingers, these children are likely unable to grip their pen or pencil, leading to disorganized writing.

When the study data are examined in terms of language development in typically developing children (CG) and children with Down syndrome (EG) through the lens of Jean Piaget's stages of cognitive development comprising, Sensorimotor Stage (Birth to 2 years), Preoperational Stage (2 to 7 years), Concrete Operational Stage (7 to 11 years), and Formal Operational Stage (12 and extends into adulthood, though not everyone fully reaches or consistently uses this stage), it is observed that CG children, aged 11 years, are squarely in Concrete Operational Stage. Their language performance aligns well with the characteristics of this stage. Their mastery of grammatical structures and rules, efficient lexical retrieval, ability to handle the processing load of complex sentences, and organized written output all reflect the logical thinking, rule-based understanding, and developed symbolic manipulation capacities characteristic of children at this cognitive level. They demonstrate the ability to manipulate the symbolic system of language according to established conventions.

However, EG children, aged 13 and 15 years, exhibit significant limitations in their cognitive processing capacity, despite their chronological age that potentially places them in Formal Operational Stage. Their performance suggests cognitive and, consequently, linguistic functioning that exhibits characteristics associated with earlier Piagetian stages. Their use of simpler expressive language, reliance on non-verbal cues, and instances of echolalia are suggestive of difficulties in formulating complex linguistic output. This is an indication of less developed cognitive structures required for organizing and executing intricate speech. Difficulties with complex sentence repetition, writing tasks, and observed phonological/morphological simplifications point to limitations in working memory and the cognitive capacity needed to process and reproduce complex, rule-governed linguistic information, aligning more with the challenges faced by children in earlier developmental phases like the Preoperational stage.

6. Summary and Conclusion

This study compared the language abilities of Igbo children with Down syndrome to those of typically developing children. Using a descriptive qualitative approach with four children aged 11-15 years, the study analysed data from conversation, picture naming, sentence repetition, and writing tasks. The findings reveal significant differences, with children with Down syndrome showing difficulties in expressive language (speaking and writing), specifically in phonology, morphology, and syntax. These challenges are potentially linked to dysarthria affecting speech articulation and hypotonia impacting writing. Typically developing children demonstrated more structured and clear language across tasks, while children with Down syndrome exhibited slower lexical retrieval, articulation differences, echolalia, and difficulties with sentence complexity and legible writing.

The data from both groups collectively support Piaget's fundamental idea that cognitive development underpins language abilities. The typically developing children's language skills are consistent with the cognitive capacities of the concrete operational stage, while the children with Down syndrome demonstrate linguistic

patterns that suggest their underlying cognitive structures and processes are operating at an earlier developmental level, impacting their capacity for complex language use in a manner consistent with a developmental delay in the cognitive skills Piaget deemed crucial for advanced language.

However, scholars such as Buckley and Le Prèvost (2002), as well as Hulme, Goetz, Brigstocke, et al. (2012), acknowledge that with a better academic environment involving special-needs professionals, the language performance of children with Down syndrome can improve, enabling them to communicate effectively and lead a more linguistically integrated life. To achieve this among Igbo children with Down syndrome, caregivers should adopt the therapy plans proposed by Buckley and Le Prèvost (2002), which include setting clear targets in four areas: speech, vocabulary, grammar, and communication skills, while maintaining detailed records of progress. For vocabulary and grammar, separate targets should be set for comprehension and production, as comprehension in both areas is typically significantly ahead of production. For speech work, the focus should be on articulation, phonology, and intelligibility (including pacing, voice, etc.). Communication skills—particularly in conversation and dialogue—should also be addressed if necessary, as 3–5% of children with Down syndrome may have autism spectrum difficulties.

Finally, all targets should be shared with parents, teachers, and support staff to foster a supportive communication environment at both home and school. It is essential that all involved—parents, teachers, and learning support assistants—understand the speech and language needs of these children and how their language develops.

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