

Effect of Manual Method of Instruction on Grammatical Skills of Pupils with Profound Pre-lingual Hearing Impairment

Iheme Maryann Ugochi, Ph.D.

Department of Special Needs Education
Alvan Ikoku Federal College of Education
Owerri, Imo State
Ugochiiheme1@gmail.com

and

Chibuzor Chile Nwobueze, Ph.D.

Faculty of Humanities
Ignatius Ajuru University of Education
Porthacourt, Rivers State
chibuzornwobueze@yahoo.com

Abstract

This study investigated the effect of manual method of instruction on grammatical skills of pupils with profound pre-lingual hearing impairment in Ibadan, Oyo State. Two hypotheses were formulated for the study while the pretest-posttest, control group quasi-experimental research design was adopted for the study. The treatment (manual method) was cross-examined with gender and socio-economic status of pupils with profound pre-lingual hearing impairment (PPHI) for a period of 8 weeks. The Test of Written Language in English ($\alpha = 0.88$) and Socio-economic Status Scale was used for data collection. Data generated were analysed with t-test and Analysis of Covariance (ANCOVA) at $p < 0.05$. Results revealed no significant effects of parents' socio-economic status on English grammatical skills of PPHI. Also no significant effect of treatment and gender ($F_{(1,16)} = 2.870, p > 0.05$, eta square = 0.74) was observed on English grammatical skills of the participants. The study concluded that neither gender nor parental socio-economic status has significant effect on English grammatical skills construction of the pupils with profound hearing impairment. Hence, this study recommends that irrespective of family socio-economic status, children with profound prelingual hearing impairment should be exposed to early language environment through manual communication.

Keywords: *Manual method of instruction, Grammar skills, Pupils, Hearing impairment*

Introduction

Hearing impairment could exist either prelingually (impairment of hearing prior to acquisition of language) or postlingually (occurrence of hearing impairment after the acquisition of spoken language). In other words, individual affected by the former condition cannot naturally acquire speech as usually as the hearing people do while those with the latter condition however, having developed speech before sustaining hearing impairment can use speech subsequently for learning and social purposes (Mba, 1995). Unfortunately, children with profound pre-lingual hearing impairment experience worse language learning outcomes due to early language deprivation. The greatest devastation of children with profound pre-lingual hearing impairment (CPHI) is not only failure to acquire speech and language but also failure to use speech and language adequately in their academic endeavour and social interactions. In other words, profound pre-lingual hearing impairment has a detrimental effect on the academic achievement. Invariably, these individuals struggle to cope with the complexity of grammatical skills, vocabulary development, and further experience difficulties in interpreting indirect sentences that require inferences.

Children with profound prelingual hearing impairment typically lag behind in the development of their syntactic skills. More specifically, they use fewer cohesive markers or fewer different lexical devices to signal cohesion (Antia, Reed and Kreimeyer, 2015) while many of them tend to consistently show an introduction of ideas, but fail to fully develop or establish said ideas due to a lack of semantic and syntactic skills. Not only is the production of the writing itself not strong but children with profound hearing impairment are not able to produce complex sentences or have complete sentence length problems. Over the years, researchers have noted that students with hearing impairment made errors of addition, omissions, substitution, and word-order deviations. Although, the attention brought to these errors was significant, there was no conversation about the significance of the errors vis-à-vis simple and complex sentence constructions themselves especially among children with profound hearing impairment. In written and oral communication, sentences come in a variety of styles and proportions such as simple sentences, compound sentences, complex sentences, and compound-complex sentences. Based on the foregoing, Adigun and Ajayi (2015) stressed that the unique component of language is governed by rules expressed in reading, writing and speaking. These aforementioned rules are used to facilitate effective social interaction and indeed functional literacy. While simple sentence contains just a subject and a verb, other variants of sentence structure such as the compound sentence is made up of two or more simple sentences joined by a coordinating conjunction.

For CPHI, absence of such auditory-verbal ability renders communication meaningless or relatively impossible. Thus, they resort to the use of manual communication as a means of communication. The term 'manual communication' refers to the systematic use of manually produced symbols and signs to convey and receive information. This system of manual impairment. Users of sign language often fail to follow the rules of grammar by

omission of word endings, irregular use of tenses and so on. Unfortunately, the linguistic difficulties among manual communicators often manifest in written work, where mistakes may be found with sentence structure, verb tenses and word omissions among others.

In a Kenyan study, Yule (1995) noted that the grammatical pattern of Kenyan Sign Language (KSL) distorted the grammatical patterns of English. The challenge was that in manual method, English grammatical structure, context and principles are not embedded in English grammar patterns. Wamae (2003) also pointed out that sign language had grammatical flow with sentence structure different from English. He further argued that manual method particularly sign language sentence structure was written in capital letters and ignored axillaries that form the basis of writing in English language grammar pattern. For instance;

Sign Language: PEOPLE GREET HOW?

ENGLISH: How do people greet? (Subject + Object + Verb)

Sign Language: MILK CAT DRINK (S + O + V),

ENGLISH: A cat drank the milk

Based on Wamses' description of grammatical skills of the deaf, it can be concluded that writing grammatical skills of the deaf is grossly affected by their lack of opportunity to perfectly engage their sense of hearing. Hence, Manual method as a component of manual communication, has three components of language: form, content and use. Form is the appearance of language in relation to the structure, content refers to the meaning of language and use refers to the workability of language. Although, based on the potency of manual communication, Moss (1995) posited that the early and consistent use of a system of manual communication serves as a springboard for intellectual development and subsequent academic achievement. However, the effect of manual communication and how it affects English grammatical skills of CPHI is still a mirage and needs to be further studied. The foregoing therefore forms the basis why this study is aimed at examining the effect of manual communication on English grammatical skills of CPHI in Ibadan.

This study also aimed at examining the effect of gender and socio-economic status as a moderating variables on the language use of students with hearing impairment. First, various biological differences which are inherent in male and female children may be responsible for some disparities in language use since it was argued that no two human beings are the same in physical and intellectual attributes, one should not expect both male and female CPHI to perform uniformly in learning grammatical skills. A number of studies investigated the influence of gender on students with hearing impairment performance in English language. For example, Abiodun (2006) reported that female children with hearing impairment always develop verbal skills faster and better than male counterparts. It was reported by the researcher that gender has no significant influence hearing impaired

students' performance in English. The result indicated that no significant two-way interaction effects existed between the treatment and gender on performance of children with hearing impairment in English.

Secondly, a significant number of CPHI are from poor families and live in developing countries like Nigeria. According to the Excellence and Education Network (2011), Nigeria had about 93 schools available for children with disability among which 18 schools were for CPHI. Interestingly, many among the special schools in Ibadan, reportedly lacked human and material resources for effective implementation of their curricula, thus, students from these schools had been found to be struggling in their academic activities especially in English grammatical skills. There has been consensus that poverty accounts for differences in academic achievement throughout rural, sub-urban and urban regions. This implies that CPHI who are from families with high socio-economic status (SES) learn and use grammatical skills better than their peers from families with low socioeconomic status. SES differences in language input seem to relate not only to children's vocabulary, but also to their grammar (Hoff, 2013). Studies of Vasilyeva, Waterfall and Huttenlocher (2008) as well as Luo *et al.*, (2016) revealed an association between family socioeconomic status and variability in sentence production of children in their early stages. In Snow's (1999) study, remarked that there is a great difference in the grammatical abilities of children based on families SES. SES-related differences in language input and learning are not limited to families beneath the poverty line, as family income is just one way to measure SES, and other variables may combine with income in influencing children's language environments. According to Hoff (2013), the most relevant component of SES for children's language development may be maternal education, rather than household income per se, but the effect of SES on early language development is robust across a variety of measurement approaches (Schwab and Lew-Williams, 2016). This present study presents gender and socio-economic status as variables likely to influence the grammatical skills of PPHI.

Theoretical framework

This study is hinged on neurolinguistic development theory propounded by John Locke in 1997 which focuses on emergence of language within social context and children developmental process. As an interdisciplinary field, neurolinguistics draws methods and theories from fields such as neuroscience, linguistics, cognitive, neuropsychology and communication science. This theory is also relevant to this present study because it focuses on pupils in their early years of English development state at the primary school level. The neurolinguistic development theory is used to understand how pupils with profound pre-lingual hearing impairment performs in English grammatical skills.

Pupils with profound pre-lingual hearing impairment have very serious difficulties in hearing their teachers who use oral means of communication alone. Irrespective of gender, children with profound pre-lingual hearing impairment find it difficult to understand and write complex English grammar and teachers even struggle to explain complex grammatical

issues to their pupils. This is perhaps because they have already resorted to the use of manual communication. In Nigeria, some children with profound pre-lingual hearing impairment lack access to amplification devices primarily due to poor parental socio-economic status to afford such devices to enhance their children's learning ability as well as perfect grammatical skills as evident in their writing skills. Hence this study is designed to determine the effect of manual method of instruction on grammatical skills (simple and complex sentence) of pupils with profound pre-lingual hearing impairment.

Hypotheses

There is no significant effect of parent socio-economic status on pupils with profound pre-lingual hearing impairment in simple and compound sentences in English grammatical skills construction.

There is no significant interaction effect of treatment and gender on the written English grammatical skills mean scores of pupils with profound pre-lingual hearing impairment exposed to Manual Method.

Methods and Material

Research design

The study adopted a pretest, posttest experimental and control group quasi-experimental research design. A $2 \times 2 \times 3$ factorial matrix was employed with treatment using manual method on the experimental group and control group using the oral method of communication. This research design was used to examine the effect of the treatment with parent socio-economic status and gender of students with profound pre-lingual hearing impairment who are primary five pupils.

Population and sample

The population of this study includes all 240 Primary five pupils with profound pre-lingual hearing impairment in special schools in Ibadan, Oyo State, Nigeria who have difficulties in English grammatical skill especially in simple and compound sentences. The study purposively sampled 40 Primary five pupils with profound pre-lingual hearing impairment from special and integrated schools in Ibadan, Oyo State, Nigeria. Two intact classes of primary five pupils were used for experimental (20 participants) and control groups (20 participants). The participants were those who solely depend on the manual communication method of communication (a communication mode that essentially made use of the sign language, gesture, pantomime as well as dramatisation).

Instruments

Data were collected through the Test of Written Language in English (TWLE) and a Parents' Socio-economic Status Scale. The test of written language in English grammatical skills designed by the researchers is subdivided into a three different sections for the participants to attempt. Section A is designed to acquire demographic information of the respondents, Section B is designed to assess the participants on simple sentences of subjects and verb; subject, verb and object as well as construction of simple sentences while Section C is designed to assess the participants on construction of compound sentences. The simple sentences require the participants to answer four (4) questions on subjects and verbs, six (6) questions of simple sentences on subject, verb and objects as well as three (3) questions for the participants on re-arrangement of simple sentences. Also, ten (10) questions were designed to assess the participants' knowledge about construction of compound sentences and four (4) questions of re-arrangement of compound sentences. Above all, each of the responses were assigned three (3) marks each for a correct answer.

More importantly, emphasis was laid on correct spelling from the participants. The parents' socioeconomic scale is an instrument developed by the researcher for the purpose of eliciting data on parental socioeconomic status of the participants of the study. This is measured by eliciting data on the educational, income and occupational levels of the parents of the participants of the study. Education can be measured using continuous variables (for example, highest level of education or schooling attained) or categorical variables (for example, 1-6 scale indicating the highest grade completed). Higher levels of education are often associated with better socioeconomic outcomes, as well as the expansion of social resources. This scale employs the use of categorical variables in eliciting data of parental level of education. The Parental Socioeconomic Status Scale comprises of 15 items: 5 each on pooled monthly income of parents, highest education attained by parents and occupation of parents. After a pilot test, the instrument was found to have a reliability value of 0.88.

Data analysis

Data collected were analysed with t-test and Analysis of Covariance (ANCOVA) at 0.05 level of significance. All data collected were computed and analysed with the version 23 of the Statistical Package of the Social Sciences (SPSS).

Results

Hypothesis 1: There is no significant effect of parent socio-economic status on pupils with profound pre-lingual hearing impairment in simple and compound sentences in English grammatical skills construction.

Table 1: Summary of two-way Analysis of Variance (ANOVA) of Parent Socio-Economic Status on Pupils with Profound Pre-Lingual Hearing Impairment in Simple and Compound Sentences in English Grammatical Skills Construction.

Grammatical Skills	Parent Socio-Economic Status	N	??	SD	Df	F _{cal}	p-value	Eta Squared
		6	38.67	2.34				
Simple Sentences	High	6	38.67	2.34				
	Moderate	5	42.60	4.34	1, 17	1.76	.202	.172
	Low	9	40.67	3.57				
Compound Sentences	High	6	15.50	1.22				
	Moderate	5	17.00	1.58	1, 17	1.49	0.25	.149
	Low	9	16.22	1.48				

Table 2 reveals the Summary of Analysis of Covariance (ANCOVA) of Interactive Effect of Treatment and gender on the post-test written English grammatical skills Mean scores of pupils with profound pre-lingual hearing impairment exposed to Manual Method. The table 2 indicates that there is no significant effect of treatment and gender ($F_{(1,16)} = 2.870$, $p > 0.05$, Beta square = 0.74) on English grammatical skills of the participants. This implies that even teaching the participants with manual communication, gender difference has no implication in written English grammatical skills of pupils with profound pre-lingual hearing impairment. Hence, the null hypothesis is accepted.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	20041.995 ^a	3	6680.665	247.488	.000	.954
Intercept	43802.508	1	43802.508	1622.682	.000	.978
TEST	17437.662	1	17437.662	645.985	.000	.947
GENDER	28.308	1	28.308	1.049	.313	.028
TEST * GENDER	77.462	1	77.462	2.870	.099	.074
Error	971.780	16	26.994			
Total	68417.000	20				
Corrected Total	21013.775	19				

* R Squared = .954 (Adjusted R Squared = .950)

Discussion

Based on the result of hypothesis 1, parental socio-economic status does not have significant effect on simple and compound sentences in English grammatical skills construction of the participants. This result finding is in agreement with Jones and Colleagues (2016) that structured analysis of written language which is similar to manual method of instruction was effective on pupils with profound prelingual hearing impairment in the construction of correct simple and compound sentences. The finding of this study negates Luo, Pace, Masek, Hirsh-Pasek and Golinkoff (2016) who found a link between family socioeconomic status and children's grammatical skills. In like manner, Huttenlocher, Waterfall, Vasilyeva, Vevea and Hedges (2010) noted that complexity of speech vis-à-vis the use of prepositional, adverbs or adjunct clauses by parents have the potential to predict children's subsequent language growth. Unlike the result of this study, studies of Vasilyeva, Waterfall and Huttenlocher (2008) as well as Luo *et al.*, (2016) revealed that children's socioeconomic background and interaction with their parents have systematic variability on the sentence production even at early stages. In Snow's (1999) study, children aged 4 from low-SES families had an average mean utterance length similar to that of children from middle-SES. At age 5 or 6, the SES-related gap had become 2.5 years. A more recent work documented two years gap in children's grammatical skills (e.g., understanding of wh-questions and embedded clauses) between preschoolers from low- and middle-SES families (Suskind, Suskind and Lewinter-Suskind, 2015; Pace, Luo, Hirsh-Pasek and Golinkoff, 2017). Other researchers suggest that socioeconomic circumstances may have a more nuanced effect on verbal ability (Mol and Neuman, 2014; Noble, *et al.*, 2015) and that there is wide variability even within socioeconomic strata (Hirsh-Pasek, *et al.*, 2015). Contemporary theorists of language socialization have also voiced legitimate concerns about scholarly emphasis on the verbal limitations of children from low-income families (Johnson 2015, Sperry *et al.*, 2015).

Results of hypothesis 2 found that even with teaching the participant with manual communication, gender difference has no implication in written English grammatical skills

of pupils with profound pre-lingual hearing impairment. Although, this study has shown that gender has no implication on grammatical skills despite intervention. This means that irrespective of intervention, the impact of profound hearing impairment on either male or female remains the same. Hence, there seems not to be any significant difference in the grammatical skills of children with profound hearing impairment. This finding is not in tandem with previous studies of Tse, Kwong, Chan, and Li (2002); Eriksson et al. (2012); Babayigit (2015) and Pargulski and Reynolds (2017) who all found gender differences in language and grammatical abilities of young children. For instance, in a vast study of over 13,000 children in ten different language communities, Eriksson et al. (2012) found girls to be more advanced than boys in language abilities in each language community. Specifically, results showed girls to be ahead of boys in early communicative gestures, in productive vocabulary, and in combining words. Although there existed great variation between the children's language abilities from community to community, the female advantage persisted throughout. In a similar study, Tse, Kwong, Chan and Li (2002) set out to determine sex differences in language ability among Cantonese-speaking children.

Conclusion and recommendations

This study determines the effect of manual method of instruction on grammatical skills of pupils with profound pre-lingual hearing impairment. Based on the findings, the present study concludes that parental socio-economic status does not have significant effect simple and compound sentences in English grammatical skills construction of the participants and that gender has no implication on grammatical skills despite intervention. Hence, it is recommended that children with profound hearing impairment should be exposed to early language environment. Irrespective of family socioeconomic status, parents of children with profound prelingual hearing impairment should ensure that in addition to manual communication, children with profound prelingual hearing impairment should be exposed to writing and reading in the language of the immediate environment and particularly in English Language.

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