International Journal of Research in Humanities and Social Studies
Volume 2, Issue 7, July 2015, PP 25-33
ISSN 2394-6288 (Print) & ISSN 2394-6296 (Online)

Primary School Deaf Childrens' Competence in Kenyan Sign Language in Kenya: An Investigation

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ABSTRACT

This study examined the level of competence of deaf primary children in Kenyan Sign Language and showed the achievements on performance in production and comprehension skills. The study also analyzed the effects of variables such as age of children, signing experience, contacts with skilled signers, class level, age at onset of deafness, on the general performance. While vocabulary knowledge elicited better scores across the instruments in all children, difficulties were experienced in the articulation of the expected target verbs and their use syntactically in space. Many factors appeared to influenced their language complexity, the strongest being parental language, signing experience, age, the amount of contact with deaf peers and the use of deaf role models at an early age. Clear evidence of difficulties in production part of the tasks compared with comprehension was noted and competence in spatial grammar was reached fairly late as compared with hearing counterparts of the same age. This situation calls for early intervention and exposure to KSL on the part of the deaf child. The deaf school child should be taught KSL in line with other policies on other languages being taught in schools. Otherwise the assumption that KSL should be used as a language of instruction because deaf children know KSL would be misplaced.

Keywords: Kenyan sign language, deaf children, language competence, performance, language comprehension, language production,

INTRODUCTION

General Language Acquisition Process

According to McAnnaly, Rose and Quigley 1987, no theory has yet been able to account for the development of language behaviors in all areas of language. It is argued that a theory of language must account for language behaviors at any point in development and for the process that allow language growth. They also stress that language theory that is sufficient must explain why children say what they do when they are developing language and why they eventually speak like adults. Currently there are four major perspectives on language acquisition as follows:

The behavioral theory (Skinner 1957), which stresses the influence of environment in the language learning process in which the child is a passive learner who responds to stimulus in the environment. Chomsky 1965 theory however assumes that language has a structure or grammar that is independent of language use and that all native speakers know these rules.

The third Theory, semantic theory (Piaget 1971) believes that, cognitive development is a prerequisite for grammatical and lexical development. The forth Theory, Socio-cultural theory (Lucas 1980) emphasizes that the development of language is attributed to a child's interaction with other members of the society which includes the view of pragmatics as a component of linguistics that deals with logical and pragmatic presuppositions. Deaf children of deaf parents who have been exposed to sign language learn sign language in stages parallel to language acquisition by hearing children learning oral language (Volterra and Casseli, 1985). Deaf children living in situations in which sign language is the linguistic vehicle explore the visual structure quite well. They acquire sign language in essentially similar ways and through similar mental strategies as hearing children acquire spoken languages. Marchaks 1993 has however pointed out that about (90%) of deaf are at risk because they

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can not hear the spoken language of their parents and secondly, beyond the direct consequences of those problems are chances of both pre-natal and post-natal concomitants of deafness that influences the beginnings of social and cognitive interactions. These have ever-widening consequences for social, linguistic and cognitive development over the first years of the child's life and thus affect the linguistic input and language, whether signed or spoken.

THE ISSUE

Throughout the world there has been a debate about deaf education in response to a need for a more appropriate means of educating deaf children. An increasing dissatisfaction with the outcomes of education for the deaf has led to wide ranging arguments on the methodology in Kenya. While all seems to be pointing to the need for competence in sign language on the part of the teacher, and the subsequent use of the same in the classroom, hardly has any research been carried out to ascertain the competence of deaf children themselves on Kenyan Sign Language as they also need it for curriculum access and examination. The central question therefore is; what is the level of competence of deaf school children in Kenyan sign language and what influences this competence?

This study evolved from an examination of the level of performance of deaf primary school children in Kenyan Sign Language skills. Effects of variables such as age of the children, degree of hearing loss, onset of deafness, linguistic interaction, parental status- (whether deaf or hearing) contact with skilled signers on different levels of sign competence were tested. The purpose of the study was to examine and explore the level of performance of deaf primary children in Kenyan Sign Language and to show the performance levels in production and comprehension skills using instruments involving sign order, picture description, placement features and interview schedule across variables such as age, parental status, signing experience, hearing loss level, date at onset of deafness.

RESEARCH DESIGN

This study used an Experimental design to examine and explore the performance levels of deaf primary school children in Kenyan Sign Language. The experiments involved the use of four receptive and expressive Kenyan sign language instruments on Interview schedules, Sign Order, Placement and Picture Description. These tools basically measured sign production and reception.

General Information

The study was conducted in a School for the Deaf, in western Kenya. This school was established in 1975. The school had twenty one hearing teaching staff members. Thirteen were female (61.9%) 8 were males (38.8%). Ten (47.6%) Teachers had received special training, though only two (9.52%) could sign competently according to their colleagues. The school advocated the use of Kenya Sign Language as the language of instruction as well as for social interaction. All the academic subjects were being taught. There were five deaf staff members. Of the five, four were females and one was a male. Two were house parents one was a typist/assistant librarian. The remaining two were classroom assistants. They interacted with the learners at various times and levels. The house parents had contact with the deaf children every evening after classes for 4 hours and for three hours in the morning before classes. They also came into contact with learners during the weekends for 24 hours. Out of the 184 parents, only one (0.1%) was deaf. The rest (183 or 99.7%), were hearing. They had challenges in communicating with their deaf children at home.. The seven settings from which the respondents were drawn differed in a number of key dimensions. Class 4 had been taught for 5 years by a teacher with sign interpreter skills and had a child from a deaf parent, Class 6 had two children from the same family. Children in the Infant class and class 1 had only a few years in the school, i.e. 2 and 3 respectively. The older children had more years in the school and had been exposed to signing longer period. They had even more contact with other deaf adults.

Sample and Sampling Technique

Purposive sampling technique was used in this study. From a population of 184 deaf children, 48 deaf children, four from each class were purposively sampled and took part in the study. The four children were believed to be good in KSL. It was ensured that they did not have any additional handicaps. Each child was tested individually across variables. All the task demonstrations and instructions were carried out by two deaf classroom assistants with the assistance of two hearing teacher coders. Each test took between 15 to 20 minutes. Children's better ear average hearing loss ranged between 65db to

110db, an average of 80.75db. They had been in school for between 2-8 years and had access to sign language for the same number of years except the child who had a deaf parent and the other two who were born of the same family. Causes of deafness varied from genetic family history, otitis media, hereditary, measles, and meningitis to unknown causes. By far the largest was "unknown causes". Figures on onset of deafness were as follows: 28 pupils went deaf between the ages of 0-12 months, 13 children between 13-24 moths, 4 between 25-36 months and 3 between 37 and 60 months. Almost 27% of the children used hearing aids. Children's ages ranged from 5 years to 15 years 2 months.

Instruments for Data Collection

Interview Schedule

The task involving interviews was designed to put a child in a relaxed mood and to encourage conversation. The child was asked a number of questions by a familiar adult about him/herself, the school, the classroom and the family at home. Responses were analyzed in terms of appropriateness, correctness and the general conversational ability. The use of facial expressions and turn taking was also considered. Ten questions were asked in KS and each correct answer carried one mark and the maximum score was 10.

Sign Order

This instrument had simple action pictures to examine KSL sign order. There were two parts to the section, comprehension and production. Each child was shown base pictures with the subjects' location changed and asked to select the correct pictures for the correct sentence signed by the examiner. There were four base pictures with different sequences. Each correct selection carried one mark. Chance score was 2.

Sign Order Comprehension

Here, the child first watched a deaf adult sign a sentence, for instance **MAN**(a) **Woman**(b) **FOLLOW** (ab) [in this sentence the superscripts refer to the location]. The man was placed at a point (a) in space, the woman at point (b), the sign FOLLOW then moved through space from (a) to (b) implying the man followed the woman. The child was then shown pairs of the base pictures with the locations of the subjects changed. (So one picture had a woman following a man and another had a man following a woman). The child had to select the correct picture for the sentence signed by the examiner.

Sign Order Production

The production part of the sign order involved the identification, production of the vocabulary item. Using an appropriate verb, putting the items in the correct spatial arrangements and using the inflected form of the verb. The child was given a picture to examine before the deaf assessor signed to the child particular ordering indicating the spatial arrangement of the picture. The picture portrayed a woman giving a letter to a man. In this sentence the woman was signed and placed at point (a) in space, the man at point (b) showing the use of the directional verb 'give' which showed that the woman gave the letter to the man. The child was asked to sign a selection of pictures him/herself to indicate how well he could produce sign order. A mark was only awarded for production of subject, object, vocabulary item and the directional verb.

Placement

This task required the accurate setting up of objects in space in relation to the signer and to each other (objects). The task showed a picture of a man seated at a table. On the table were items placed at three different locations in relation to the man in the picture, e.g. a book on the left side of the table, a pen at the centre of the table and a ruler on the right. The child was allowed to examine this arrangement before the examiner signed the spatial arrangements while the child observed. The child was then required to indicate the appropriate picture which corresponded with the spatial locations signed by the assessor. In the next part of the production, the child was shown the base pictures and asked to produce the spatial arrangement in relation to himself.

Picture description

This section elicited a text describing a picture. Using a picture of school children playing, the child was asked to describe what was happening. The concern here was the KSL production, the extent and

use of verb targets, the use of facial expression, placement and the overall quality of the child's production.

RESULTS

The Interview

Of significant interest from children here was elicitation of appropriate turn taking, the degree of correctness of the answers and the general conversational ability. The use of non-manual features, e.g. facial expressions and mouth patterns were also of concern. The following TEN questions were asked. Each correct answer had ONE mark and the maximum score was TEN

_____wh_q
1) NAME WHO
_____q
2) TEACHER CLASSES YOU WHO
_____q
3) HOUSE YOUR BIG
_____q
4) FATHER WHERE
_____q
5) SISTER YOU HOW MANY
_____q
6) MEAT LIKE YOU
_____q
7) HOUSE MOTHER YOU WHO
_____q
8) BOY BAD WHO
_____q
9) CLASS ALTOGETHER – HOW MANY
_____q
10) CLASS YOU – HOW MANY

Children aged 5-8 years were only able to display single signs. In circumstances where they did not understand the question, younger children simply nodded their heads or smiled or better still, shrugged their shoulders, a characteristic which is also common with their hearing counterparts of the same age. At other moments they simply looked down and the assessor had to obtain eye contact again. Although a measure of MLU (mean length of utterances) was not taken, it was evident that older children aged 12 to 15 years produced longer KSL utterances, understood questions with ease or little clarification though this was still below what was expected and attempted to give relevant answers.

The general performance indicated improvement by class as reflected on table1.. There was also a noticeable better performance by class 4, mean score 8.3, SD = 0.63 compared to other classes given their mean age. This was apparently due to the class having been taught by a teacher with good signing skills and experience. In this class too was a child with a deaf parent. It was noted that chronological age was a predictor of signing skills).

Table1:1. *Interview scores by children according to grade level*

Class	Number of Children	Mean Score	SD
Infant	4	3.0	1.0
Class 1	8	3.6	1.21
Class 2	8	5.1	1.89
Class 3	8	3.1	1.53
Class 4	8	8.3	0.63
Class 5	8	7.0	1.00
Class 6	4	8.7	0.43

Result also suggested better performance by age 11-12 years where most of the Class 4 children were. This category had an even better performance than year 13-14. This result showed that older children were better in signing. However it was clear that within many classes were variation in standards.

Degree of hearing loss too had an effect on the comprehension and production of conversation. Results suggested better performance by those with the greatest hearing loss 86 db and above, mean score 4.5, SD = 1.83. Deaf children of deaf parents (DCDP) elicited good comprehension of the questions, good sign production and produced relevant answers thus performing much better than the DCHP in this task. There were some difficulties in this interaction with some groups because to some extent the questions were misunderstood. Most of the communication was single signs. Findings seem to suggest that comprehension of the spatial grammar was not understood by children up to age 10. Only by age 12 was the main feature of the grammar in respect of location and directional verb beginning to be elicited. Children did not seem to understand who did what to whom. Degree of hearing loss did not seem to be a strong determinant of sign order skills, however children with the greatest degree of hearing loss showed slightly better performance.

It was concluded that years in school had an effect on performance. Those with more years in school did well, however age at onset of deafness did not indicate effect. Performance of sign order by gender did not show a significant relation though there was a slightly better performance in favor of boys. Neither difference reached statistical significant. An examination of the three deaf children with deaf families showed better performance in sign order comprehension than the rest as they were able to interpret the subject and objects and they inflected the verbs correctly. This showed the effect of early sign input in the deaf children with deaf families.

Sign Order

In this task children were shown pictures and asked to sign in a way which reflected the arrangements of the participants in the paper. They had to provide the grammatically correct and spatially related utterances. They scored marks for correct production of subject, object and verb. Results showed some difficulties in the production part. First it appeared to be a task similar to one with which deaf children were familiar, i.e **"Name the object"** and secondly, children may not have felt the need to differentiate the relationships of the objects and people in the pictures. According to Kyle (1990), deaf children are often used to naming items. It was evidently easier for the children to name the vocabulary items. The number of verbs inflected was fewer compared with naming of the vocabulary items. There was better performance in the older children as shown in table 2, Mean 3.0, SD 0.0

Table2. *Spatial grammar scores according to age*

Age (years/months)	Number of Children	Mean Score	SD
5yrs – 6yrs 3mths	12	2.25	0.4
7yrs – 8yrs 3mths	12	2.33	0.4
9yrs – 10yrs 3mths	6	2.5	0.5
11yrs – 12yrs 2mths	11	2.81	0.5
13yrs – 14yrs 6mths	5	2.4	0.4
15yrs – 15yrs 2mths	2	3.0	0.0

The major problems here were the grammatical features which the test was designed to highlight as they tended to name the vocabulary and not to comment on them. Performance by the age 5-9 years level was single sign naming. From the age of 10 years onwards, the responses were a bit complex and involved a few sign constructions. The standard response to identifying elements of a picture did not naturally lead to fully grammatical utterances with appropriate verb inflections. The sign order performance showed that deaf children rarely had the production skills. The results also suggested that comprehension was better performed than the production part.

Picture Description

Of concern in this task was correct KSL production, the extent and use of the verbs, the use of appropriate facial expressions and the overall quality of the child's sign production. In general the task did not elicit much proficient sign language production skills in almost all the children. Ten verb target were expected to be elicited through the descriptions but were not in two thirds of the population. The target verbs expected included **WALL, PLAY, PULL, LOOK, CLIMB, WRITE, CARRY, CUT, BRING AND SIT**. The results were not as was expected from the young children, ages 5-7 years as the children kept pointing at the items and people in the picture and signing the names without commenting on them. A few older children, ages 9 and above, did fairly well and produced a few target verbs within their description. Sometimes children went out of their way and

started to act out stories by copying the posture and imitating the actions instead of actually describing the picture using sign language.

Table2.9. *An excerpt of Transcription of picture description of a child aged 14yrs 2mths*

Examiner	**Child**
Got eye contact and asks the child	CHILDREN, MANY PLAY//
_____q	
TELL ME, CHILDREN DO WHAT	HOUSE BUILD//
	Looked at examiner
SIGN MORE//	BOY CARRY WOOD BOY // CLIMB UP BIG TREE//
YOU FAST// SLOWLY/ SLOWLY//	DOG HARSH/ BOY RUN/
	AFRAID//
_____q	_____q
WHO WRITE	BOY WRITE/PAINT
	Read with deaf voice "Our" but
	Finger spell D-E-N
	BOY CARRY WOOD//
	Points at boy and sign BOY//
	REST, WORK NOTHING/
	LAZY//
	SQUIRREL HAPPY BOY
	PLAY//
	TWO BOY AND BOY AND GIRL BUILD ROOFY// BOY TIE TREEGIRL BUILD ROOF//
THANK YOU//	FINISH//

Older children age 8 to 15 years produced more verbs and tried to use them in simple description than did the young ones, who simply pointed at the pictures and signed the names. Average performance by degree of hearing loss however indicated better performance by those with greater degree of hearing loss. Performance by signing experience had evidence of children with more experience performing better. This also concurred with the results from the children from deaf families though this constituted only 6.25% of the total population in the study. When scores were analyzed in relation to class level, similar result was obtained. However the analysis of the picture description in relation to gender did not show any difference between the boys and girls. Picture description tasks did not elicit rich sign language production skills because the children's signing in most cases were unclear and incomprehensible. This made this assessment very difficult. There was improvement by age 14. There were meaningful utterances here which related to the picture description. Quite a number of target verbs were elicited with less hesitation. A close analysis of the results however still revealed that they were less fluent than hearing counterparts of the same age were using speech.

Placement

The concern here was to asses the understanding of spatial locations in relation to each other. On the production part, a mark was scored on correct production of the three vocabulary items and their correct spatial location in relation to each other. Results indicated that children aged 5-8 years did not seem to understand the spatial relations. Some understanding of the locations was evident from age 9 though even at this age they still kept on confusing the directions.

After signing the vocabulary item, a brief pause for thinking was evident during the production and on many occasions, the positions of the items were not clearly marked, resulting in placing them at the same location or in opposite locations. Performance by gender did not show any relation. This was also true of age and onset of deafness. Number of years in school and degree of hearing loss however showed effects. There was evidence suggesting that the longer pupils stayed in school gathering experience, the more skills they acquired to display spatial locations. Better performance was also realized in the deaf children with deaf families.

Average spatial location performance by type of family (Deaf or Hearing)

Families	Number of Score	Mean	SD
Hearing	3	2.66	0.47
Deaf	45	1.31	1.11

Analysis of performance scores by causes of hearing loss did not show any effect. The production part of the tasks in placement was more difficult for the deaf children than the comprehension part. This was more evident in the picture description and sign order production tasks.

DISCUSSIONS

Findings suggest that most of the children in the study had difficulties in sign language and in particular, spatial grammar. Production tasks proved to be more difficult than comprehension. In the majority of the assessment tasks, there were clear indications of age effects family background – whether deaf or hearing – and the amount of contact children experienced with skilled signers. This concurs with Skinner 1957, Lucas 1980 assertions that environment influences language learning process.

In the interview situation, children tended to answer the questions with very short responses. Longer utterances were not reached until children were about 10 years old. Simple questions were misunderstood and irrelevant answers given.

Deaf Children of Deaf Parents showed evidence of better conversational ability. This was also cited by Meadow (1980) who noted that the interaction communication of DCDP is usually very cordial as opposed to those of DCHP. According to her, DCDP interaction shows characteristics of extended and enjoyable communication. That they are able to sustain interaction for longer periods of time, able to elaborate on ideas in a reciprocal fashion., and, in general, their conversation reflects a mature conversational style, as opposed to those from hearing parents who are found to be more intrusive and directive in their communication. Perhaps it is these areas of interactional need which made the qualitative difference between DCDP and DCHP According to Kyle, 1990,

> "It is not simply the content of the hearing adult's utterance in sign that is important, but the way in which this is delivered and the way in which it takes into account the unique interactractional style necessary in a visual world". P.54

Although DCDP may sign better than DCHP, Kyle (1990) reports that one of the most disadvantageous elements they face is that the teachers and other adults with whom they interact are predominantly second language learners in sign and, as a result, are not fluent signers. A survey carried out in this school sometimes back (Adoyo, 1995) showed that out of 21 teachers, only two were able to sign competently. Although the use of sign language is advocated in the school, teachers used sign supported speech (SSS). This kind of situation is not ideal for the deaf children's sign acquisition even if the child had initial input.

In general, the picture description did not elicit proficient signing in children as was expected. Not many children were able to produce the expected target verbs. The description tasks, however, showed older children, from the age 10 years, starting to produce expected verbs and using then in simple and short sentences. This suggested both developmental and conceptual growth. The younger children aged 5-7 years, simply pointed at the pictures and signed their names. This task was not easy to assess due to some children's incomprehensibility in production. The omission (ellipsis) of the subjects and sometimes objects in their description made it impossible to determine" who did what to who". This incompressibility regularly resulted from several phenomena occurring at the same time. For instance, it was not easy to analyze a sentence like this;

CLIMB UP ……BUILD ROOF …….. AFRAID

Because the description did not start with an introduction of the protagonist, it was not clear who was climbing up, who was building the roof, and who was afraid and what she was afraid of. The sequence of null-subject made the description quite difficult to understand. The ambiguity of the child's signing seemed to be caused by too frequent use of null-subjects/objects and by not lexically or pronominally introducing and reintroducing a protagonist combined with the application of un-established locations in the syntactic signing place.

In Sign Order performance, children up to age 10-11 years did not seem to understand the spatial grammar reliably. This test worked best in its receptive version but varied in both vocabulary and grammar. Children tended to name the elements of the picture, but to choose the wrong verb. According to Kyle (1990) deaf children are often used to tasks asking them to 'name the object. Perhaps this explains why they were only able to name and not explain. The Vocabulary knowledge in the sign order tasks, which was analyzed separately, elicited better scores than the use of verbs, though this is only a small part of linguistic development which, Kyle (1990) notes does not actually take into account the interaction and construction of language by the child. In the Spatial Location task, the vocabulary items were well produced by most of the children in the study. The spatial locations in the syntactic signing space in relation to each other however caused some difficulties for many children. Children found it difficult to sign the spatial locations of the objects in relation to each other. Literature tells us that 95% of deaf children born of hearing parents acquire language in the most unfavorable way, that is, in the absence of good sign language models (Kyle, 1994). The situation in this study was not unique. Most children enter school without a firm language base and the actual socialization in sign language is only received from peers (Schmalling 2002). The teachers they meet at school are not proficient signers. This condition is not favorable for effective sign acquisition and development on the part of the deaf children with hearing parents as was seen in this study.

CONCLUSION

This study examined and explored the level of performance of deaf primary school children in Kenyan Sign Language and showed the achievements on levels of performance in production and comprehension skills. The study also attempted to determine the effects of variables such as age of children, signing experience, contacts with skilled signers, class level, age at onset of deafness, on the general performance. While vocabulary knowledge elicited better scores across the levels of the instruments difficulties were experienced in the articulation of the expected target verbs and their use syntactically in space, This situation calls for early intervention and exposure to KSL on the part of the deaf child some remedial help in sign acquisition and learning are also necessary. There is need for input from society, parents, teachers, and children themselves to ensure successful performance in KSL. One way of dealing with this situation would be to carry out early diagnosis of deafness, institute early intervention such as access to language models that is the native or experienced signers, from an early age. Although this would be difficult because the deaf role models would not always be the parent, an effort should be made by schools to arrange for their visits. Johnson et al (1989) provide a model which calls for the use of deaf role models in the early years of the deaf child. According to Kyle (1990) this kind of programme would provide adequate acquisition of KSL. The ministry should also come up with sign language policy on education as cited by Okombo (1994).

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