European Journal of Applied Linguistics Studies
ISSN: 2602 - 0254
ISSN-L: 2602 - 0254
Available on-line at: http://www.oapub.org/lit

DOI: 10.46827/ejals.v4i1.288 Volume 4 | Issue 1 | 2021

PHONOLOGICAL PROCESSES AMONG GHANAIAN PRESCHOOL CHILDREN: A CASE STUDY OF NEW ELITE INTERNATIONAL SCHOOL

Isaac Kwabena Adubofour[1i],
Daniel Afrifa-Yamoah[2],
Yaa Amponsah Owusu-Afriyie[3]
[1]Assistant Lecturer,
Faculty of Communication and Cultural Studies,
University of Development Studies,
Ghana
[2]Assistant Lecturer,
Department of Interdisciplinary Studies,
Akenten Appiah-Menka University of
Skill Training and Entrepreneurial Development,
Ghana
[3]Forces Senior High Technical School,
P.O. Box BC 299,
Burma Camp, Accra,
Ghana

Abstract:
The study focused on ascertaining the phonological processes that characterize the speech patterns of some selected preschool children. Data was collected from a sample of ten (10) pupils from ages 1-5 spanning the accepted age range for pupils to be in preschool in Ghana. Productions of the participants on words were recorded and later analyzed to determine the phonological processes present. It was found that the phonological processes that characterized the speech of the sample are syllable structure processes (e.g. cluster reduction); substitutions; and insertions. Further, it was found that age has a role to play in the presence of phonological processes in the speech of an individual. It was found however that some of the pupils were able to correctly articulate sounds when they were repeated to them. The study recommends that this study be extended to other school children in the country as well as teachers and other stakeholders towards ensuring the school-going children learn English pronunciation the right way.

Keywords: phonological process, language acquisition, second language learning, bilingualism

[i] Correspondence: email ikeadu2009@yahoo.com, yaaamponsah2007@gmail.com

1. Introduction

Language acquisition, as illustrated in the generativist works of Chomsky (1972) and Radford (1997), represents an interesting field of linguistic research. One phenomenon that aids explanation of language acquisition process among children is the operation of ***phonological processes***; it is used typically by children to make speech simple as part of learning how to talk (Bleile, 1995; Hedge, 2001; Bowen, 2011). Although phonological processes are deemed natural to the acquisition process, it is reported that simplification through the application of phonological processes may be considered a disorder when it persists beyond certain age limits or when the processes used differ much from what is expected (Pena-Brooks, 2007). Children in their early education years are admitted at a stage in their development when their language use is characterized greatly by phonological processes, and, in the Ghanaian context, the children learn English as a second language in addition to their native languages. It is therefore necessary to investigate the nature of phonological processes among such children in a second language context such as that of Ghana especially when they are taught English pronunciation by teachers who are non-native speakers.

Especially when previous researchers such as Sey (1973) have expressed concern about deviations in pronunciations in Ghanaian English (GhE), investigations of this nature make it possible to scrutinize the issue from the roots. In fact, a recent study by Afrifa-Yamoah *et al.* (2021) confirmed that students in Ghanaian senior high schools are faced by challenges in learning English pronunciation. Since phonological processes have the potential of being carried into later years, studying them as they manifest among Ghanaian children may help extending the study among adults too.

The study, among many other factors, will prove beneficial to research on phonological processes among Ghanaian preschool children. Beyond that, certain elements in the literature on phonological processes among children have suggested that teaching methods for children at this level of language acquisition should be geared toward handling the points where there are difficulties but not to adopt a general approach to instruction in this regard. Thus, this study will be helpful to teachers and school administrators to understand the phenomenon in order to find proper methods at dealing with them in the teaching and learning spaces.

2. Research Questions

The following questions drove the methodology of the present study:

a. What phonological processes are common in the speech of Ghanaian preschool children?
b. Does the age of children contribute to the presence and nature of these phonological processes in their speech?

3. Literature Review

Carroll, Snowling, Hulme & Stevenson (2003) conducted a short-term longitudinal study on a group of 67 preschool children. The participants were observed three times over a 12-month period. They were given tests which measured their syllable, rime, and phoneme awareness, speech and language skills, and letter knowledge. It was found that the children's rime skills developed quite earlier than their phoneme skills.

Generally, the literature related to the current study help in determining the kinds of phonological processes that exist and they indicate a potential for the unravelling of others. Leung and Brice (2012) have a study on phonological processes evident in Spoken English of Hong Kong Primary Pre-service Teachers. First, this study is relevant for how it hints at a potential of teachers in influencing the phonological processes a child may use. Already, due to the stage the child is in, properly articulating speech sounds is a difficulty. We can only imagine the extent it will take when the instructor of a child in a second language may be affected by a teacher whose speech pattern is characterized by the application of certain non-standard phonological processes. Their study investigated the English phonological processes and speech articulation of adult Cantonese-English speakers residing in Hong Kong. The Phonology Test for Cantonese Speakers of English (PTCSE) was used to assess English articulation and phonological processes of native speakers of Cantonese. 37 adult participants formed the respondents for the study and after a descriptive analysis of the data, 466 phonological process deviations were found wherein two syllable words presented the most difficulty, followed by three and single syllable words; in fact, the study reports that some of their articulatory patterns were not found in the existing literature on the subject and the phonological processes that were identified in the study included stopping, fronting, deaffrication, gliding, devoicing, lip rounding, backing, affrication voicing, pre-vocalic singleton, omission; post-vocalic singleton omission, consonant sequence reduction; vowel deviations; and vowel additions. Their study confirms that studies of this nature should be conducted on all stakeholders in the educational system.

When it comes to studies on phonological processes among children, Queiroga *et al.* (2015) deserve a mention for their investigation into the phonological development of speakers of non-standard Portuguese in the metropolitan region of Recife based on the model of phonological processes. After analyzing data from 202 children of both sexes enrolled in kindergartens and public schools, the study showed that the most common phonological processes used by the students to simplify their production of Portuguese were consonant cluster simplification, simplification of net, reduction and simplification of syllable final consonant. The study observed syllable reduction, consonant harmony, plosivation of fricatives, and velar fricative simplification among other factors. Another finding was that the population for the study simplified consonants and this finding was mainly blamed on the possible influence of language variety on acquisition. They concluded that the different phonological processes in the sample could be explained by the linguistic influence of their native Portuguese and recommended that further studies

be conducted in other parts of Portugal. The study makes it clear that phonological process may be influenced by factors beyond biological causes as in the case of children for which reason further studies should be conducted to determine the varying patterns of phonological process among different groups. However, their conclusion that L1 influence was the sole cause of the different phonological processes in their sample may not have been completely sound. There may be other potential factors that could have caused the deviations especially when the sample was taken from a metropolitan area.

Another study which by virtue of its setting in Ghana makes it relevant to the present study is that of Bodua-Mango (2015). In her study, she investigated the language of three-year-old Safaliba-speaking children from a phonological perspective. Thus, building from the phonological inventory of the participants, the research determined the differences, similarities and strategies that three-year-old Safaliba-speakers use in their quest to speak the language. In the end, it was found that the participants were able to distinguish between vowels in terms of their orality-nasality and their length qualities, but out of the twenty-five consonants in the language, the three year olds were able to produce sixteen of them. Fricatives were more difficult for them to produce as compared to stops, nasals, semivowels and laterals. The main strategy used by three-year old Safaliba-speakers was substitution and this finding is explained by universals and unmarked patterns in languages all over the world. One aspect of the relevance of that study to the current study is its identification of the phonological process used for simplification in the speech of the children. Its limitation to children from Safaliba however calls for further studies in this regard in a bid to document and explain similar phenomena in the entire country.

Simon *et al.* (2015) focused on comparing the phonological processes across urban and rural Malayalam-speaking children in India. Thirty children formed the sample of the study with ages ranging from 3 to 4. Speech samples were recorded from the children recorded using PRAAT software. The result of the study was that rural children exhibit more phonological processes than urban group probably because of the vast socio-economic facilities into which the groups of children under investigation in the study are born.

4. Material and Methods

The research, from the onset, exhibited features that made it tend toward analysis both quantitatively and qualitatively. Hence, the mixed method approach was adopted as it allows the researcher to properly collect and analyze data that encompasses numerical and qualitative details. The advantage of this approach to this study is how it empowers the researcher to meet every problem with a tool that suits the situation (Jick, 1979; Rossman and Wilson, 1985; Creswell, 2003).

When it comes to sampling, certain factors needed to be considered – sampling method, sample size, and how to even acquire the sample especially when it involved children who are far below the age of giving their own consent. The population from

which the sample was selected comprised children aged 1 – 5 in New Elite International School. Records from the school showed that such pupils numbered 103.

Further from the sampling considerations above, the researchers decided to use a sample size of ten (10) participants. This gave room for representation for all ages in the category of preschoolers. Thus, there were participants for ages 2, 3, 4, and 5.

The data collection methods of this work were largely based on primary data collected from the field. Primary data was collected by means of interactions with teachers and recordings of pronunciations of selected words by the pupils on an audio sound recorder. As has already been indicated, the participants, because of their ages, were not removed from the natural environment of study – the school or classroom. Recordings of their voices were done in the school and in their classes.

Table 1: Information on pupils

Participants	Age	Class
1	4	KG1
2	5	KG2
3	3	Nursery 2
4	3	Nursery 2
5	2	Nursery 1
6	2	Nursery 1
7	4	KG1
8	4	KG1
9	5	KG2
10	5	KG2

From Table 1 above, out of the ten (10) pupils that were sampled randomly from their respective classes, three (3) were 5 years old and in Kindergarten 2; three (3) from Kindergarten 2; two (2) from Nursery 2; and two (2) from Nursery 1.

Since pupils at this stage are not so conversant with calling out words on their own, the words were called for them so that the participants repeated them. There were five (5) words that were used for the study – ASKS, FOX, TOMATOES, DONKEY, and MOTHER – and the choice of that list was informed by factors of consonant clusters, vowel and consonant qualities, and syllable structure. For each word, each participant was instructed to call it out for five times to determine mean performance.

The recordings were done on a SAMSUNG SIII since the recordings had to be done in their natural setting, and the recordings were later transferred onto a laptop for analysis with the help of PRAAT, a speech analysis software.

To begin with, the researchers decided to use purposive sampling with a touch of randomness so that, out of the pool of pupils in New Elite International School who fulfilled the characteristics (i.e., participants from classes within the preschool range) the researchers looked for, individuals had to be selected randomly. Purposive sampling is the sampling method which allows the researcher to select members into the sample based on how they satisfy certain characteristics the researcher looks out for (Parahoo, 1997). Since the study was interested in pre-school children, it was expected that every

participant would be below the age of 6 since that is the average age assigned by the Ghana Education Service for every child to be in Class 1. Thus, the first criterion for qualifying a participant for the sample was that the pupil should be aged 1 – 5 which correspond with classes Crèche, Nursery to Kindergarten. After the purposive sampling, selection was randomized by labelling the pupils in the various classes with numbers that were mixed so that the pupil whose number was picked out of the lot was admitted into the sample.

Regarding the sampling for respondents of the study, a pre-school (New Elite International School, Ayeduase-Kumasi) was identified, and the head teacher was informed of the researchers' intent to use the school and some of the pupils in this research. First, the research and its purpose were explained to the head teacher. The researchers further ensured that the pupils that were selected for the final sample were not removed from the natural environment – the classroom. Thus, those who were below age three (3 years) who were not expected to do well with strangers were left with their teachers to administer the instrument on the pupils. The pupils who were three years and above and could do well with strangers were handled by the researchers in their natural environment in order not to affect the data. Most importantly, the anonymity of the respondents was very much ensured by the researcher.

5. Results

The section immediately below summarizes the findings of the study. The analysis here was done based on the phonological processes that featured predominantly in the recordings of the pronunciations of the children of the selected words - ASKS, FOX, TOMATOES, DONKEY, and MOTHER. The second part of the analysis is on the role of age.

Table 2: Performance of pupils

Words	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
ASKS	*	*	*	*	*	*	*	*	*	*
DONKEY	+	+	+	+	*	+	+	+	+	+
FOX	+	+	*	*	*	*	*	+	+	+
MOTHER	*	*	*	*	*	*	*	*	+	+
TOMATOES	*	*	*	+	*	*	*	*	+	+

The table above presents the performance of the pupils in pronouncing the words that were selected for the study particularly for their articulation of the phonemes in each word. Correct performance is indicated by **+** while wrong performance is indicated by asterisks (*). The table shows that ***Participant 1*** could articulate two of the words correctly; ***Participant 2*** could articulate two words correctly; ***Participant 3*** could articulate only one word correctly; ***Participant 4*** could articulate two words correctly; ***Participant 5*** could not articulate any word correctly; ***Participant 6*** could articulate only one word correctly; ***Participant 7*** could articulate only one word correctly; ***Participant 8***

could articulate two words correctly; ***Participant 9*** could articulate four words correctly; and ***Participant 10*** could articulate four words correctly.

The table further shows that DONKEY was the word that received the highest number of correct pronunciations while ASKS recorded the lowest.

5.1.1 Phonological Process in the Pronunciations of the Children

The data showed that two phonological processes mainly featured in the pronunciations of the children – syllable structure phonological processes and substitution. Each of the selected words will be assessed below.

5.1.1.1 ASKS [a:sks]

All the children in the study could not correctly articulate the word. The main challenge that was found was such that each child made adjustments to the structure of the syllable. The table below summarizes the performances of the children in this regard.

Table 3: Performance of Pupils for ASKS

Participants	Performance
1	*[aks]*
2	*[aks]*
3	*[æs]*
4	*[ak]*
5	*[æt]*
6	*[as]*
7	*[aksd]*
8	*[aks]*
9	*[aks]*
10	*[aks]*

From the table above, it is clear that all the participants pronounced ASKS with varying degrees and shapes of alterations to the syllable structure of the word. Interestingly, five (5) of them made the same pronunciation though in error.

5.1.1.2 DONKEY [dɔŋkɪ]

In this case of this word, all participants articulated it correctly except ***Participant 5*** who realized it as ***[dɛŋkɪ].*** Interestingly, this participant was a two-year-old child, and yet, the phonological process was one of adjustment to the structure of the syllable.

5.1.1.3 FOX [fɔks]

The table below summarizes the performances of the participants for the word, FOX.

Table 4: Performance of Pupils for FOX

Participants	Performance
1	*[fɔks]*
2	*[fɔks]*
3	*[fɔs]*
4	*[fɔʃ]*
5	*[fɔt]*
6	*[fɔs]*
7	*[fɔsk]*
8	*[fɔks]*
9	*[fɔks]*
10	*[fɔks]*

Table 4 above shows that participants 1, 2, 8, 9, and 10 all pronounced the word correctly. Participants 3, 4, 5, 6, and 7 could not. Except for 7 whose error was in connection with syllable structure, the remainder were of a substitution kind.

5.1.1.4 MOTHER [mʌðə]

For MOTHER, only participants 9 and 10 could correctly articulate it; the rest could not. The table below shows the results for this word.

Table 5: Performance of Pupils for MOTHER

Participants	Performance
1	*[mada]*
2	*[mɔda]*
3	*[mɔdə]*
4	*[mɔðə]*
5	*[bæda]*
6	*[mada]*
7	*[madə]*
8	*[madə]*
9	*[mʌðə]*
10	*[mʌðə]*

It is clear from the table above that the phonological process common to all participants who could not pronounce the word correctly is that of substitution.

5.1.1.5 TOMATOES [təma:toʊs]

For TOMATOES, participants 4, 9, and 10 were those who could pronounce the word correctly. For the rest who could not pronounce the word correctly, the phonological process that characterized their pronunciation was related to syllable structure alterations. The table below summarizes the results.

Table 6: Performance of Pupils for TOMATOES

Participants	Performance
1	*[tɔmantoʊ]*
2	*[tɔmantoʊs]*
3	*[tɔmantoʊ]*
4	*[təma:toʊs]*
5	*[tomotos]*
6	*[tɔmotos]*
7	*[tɔmantoʊs]*
8	*[tɔmantoʊs]*
9	*[təma:toʊs]*
10	*[təma:toʊs]*

5.1.2 Phonological Process and Age

Information from Table 1 and Table 2 show that, relatively, as the ages of the participants increase, the number of words they pronounce correctly increases. Thus, those in Nursery 1 (who were two-year-olds) had the worst performance; followed by those in Nursery 2 (who were three-year-olds); next were those in KG 1 (who were four-year-olds); and finally, those in KG 2 (who were five-year-olds).

6. Discussion, Conclusions and Recommendations

The discussion here is guided by the two research questions that initiated the study. The first was to determine the forms of phonological processes that characterize the speech of preschool children in Ghana, and the second was to check whether age mattered when phonological processes are concerned.

6.1 Phonological Processes in the Pronunciation of Pre-School Children

From the analysis of the data above, it was clear that the participants mainly exhibited manifestations of phonological processes such as syllable structure processes (e.g. cluster reduction from Participant 1's production of [**aks**]); insertions (e.g.); substitutions (e.g. from participant 3 production of [**mɔdə**] and participant 5 production of [**bæda**]); insertions (e.g. from participants 2 and 4 productions of [**tɔmantoʊs**] and [***fɔʃ***] respectively).

Moreover, it is clear that the children were able to properly produce DONKEY with nine of them properly producing it with the exception of Participant 5. FOX was properly produced by Participants 1 and 2 while the rest could not properly produce it. TOMATOES could only be properly produced by Participant 3; however, ASKS and MOTHER were not properly produced by any of the participants. And as has been indicated already, in the case of FOX, the processes that caused the improper productions were consonant cluster reduction and substitution; for DONKEY, it was a matter of substitution; for ASKS, it was mainly a matter of consonant cluster reduction; for TOMATOES, it was also as a result of insertions; and for MOTHER, it was a matter of substitution and insertion.

The findings above confirm the phonological processes already mentioned in the literature and this suggests that, based on the sample for this study, there is quite little variation from the generally recognized phonological processes (Bleile, 1995; Hedge, 2001; Bowen, 2011). This, however, is not very conclusive. Considering the size of the sample, it makes it difficult to make certain generalizations. Thus, it is advised that further studies on the phenomenon should be conducted in order to better appreciate the possible varieties on the phenomenon.

6.2 The Role of Age

Another finding which went toward answering the second question of this study has to do with the role of age when it comes to the presence of phonological processes in speech. From the data, it was found that older participants exhibited quite lesser phonological processes than the younger ones. For instance, Participants 9 and 10 who were both 5years produced the same performance; they could both properly pronounce all the works except ASKS which was actually a problem for all the participants. Meanwhile, Participant 5 who was a 2year old pupil could not correctly produce any of the words; and Participant 3 could correctly produce only DONKEY. Significantly, this finding goes to support the literature to the effect that, as individuals grow, the presence of phonological processes in their speeches reduces (Hedge, 2001; Bowen, 2011).

Further, these findings suggest that instructors for these preschool children should do more in determining what strategies can be devised in targeting and handling the problems phonological processes in the speeches of the children may cause.

6.3 Recommendations

Further researchers could look into the influence of gender on the subject of phonological processes. It could be extended to investigate the presence of phonological processes among main stakeholders such as instructors and parents. Finally, during the study, it was found that, even when the initial efforts of the participants were faulty in pronouncing the words, when the words were repeated to them, they seemed to modify their pronunciation towards the correct form. This may be a future endeavor to determine the need for repetitive exercises in teaching children pronunciation.

Conflict of Interest Statement

The authors of this paper certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

About the Authors

Isaac Kwabena Adubofour is currently an assistant lecturer with the Faculty of Communication and Cultural Studies in the University for Development Studies in Ghana. He holds a Master of Philosophy in English, and his research interests are in the fields of phonetics, phonology, and applied linguistics.

Daniel Afrifa-Yamoah is an assistant lecturer in the Department of Interdisciplinary Studies at Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development. His research interests are in pronunciation, second language learning, teaching English as a second language, intonation, and discourse analysis. He is currently a PhD in English candidate at the University of Ghana, Legon, Ghana.

Yaa Amponsah Owusu-Afriyie is an English language teacher at Forces Senior High Technical School, Burma Camp in Accra, Ghana. Her research interests are in applied linguistics, and she specializes in discourse analysis. She is a graduate from the Master of Philosophy in English at the University of Ghana, Legon, Ghana.

References

Afrifa-Yamoah, D., Adubofour, I. K., Kyei, E. & Sarpong, F. (2021). Challenges of Study Pronunciation at the Senior High: A Cases study of Osei Kyeretwie Senior High, Kumasi. *East African Journal of Education and Social Science.* 3(134-146)

Bleile, K. M. (1995). *Manual of Articulation and Phonological Disorders*. San Diego, CA: Singular Publishing Group, Inc.

Bodua-Mango, R. K. (2015). *The Phonology of a Three Year Old Safaliba-Speaking Child*. Unpublished Thesis Submitted to the University of Ghana.

Bowen, C. (2011). *Elimination of Phonological Processes in Typical Development*.

Carroll, J. M., Margaret J. Snowling, Charles Hulme & Jim Stevenson (2003). The Development of Phonological Awareness in Preschool Children. *Developmental Psychology*, Vol. 39, No. 5, 913–923.

Creswell, John W. (2003). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (2nd ed.). Sage Publications: USA.

Hedge, M. N. (2001). *Pocket Guide to Assessment in Speech-Language Pathology* (2nd Edition). San Diego, CA:

Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in Action. Administrative Science Quarterly Vol. 24, No. 4, pp. 602-611.

Leung, C. B., & Brice, A. E. (2012). An analysis of phonological processes involved in spoken English of Hong Kong primary pre-service teachers. *Language Testing in Asia*, *2*(2), 42.

Linguisystems, (2008). *Phonological Pattern Suppression by Age*. http://www.linguisystems.com

Pena-Brooks, A., & Hedge, M. N. (2007). *Assessment and treatment of articulation and phonological disorders in children* (2nd Edition). Austin, TX: PRO-ED.

Queiroga, B. A. M., Rosal A. G. C., Silva, A. C. F., Cordeiro, A. A. A. (2015). Analysis of Phonological Processes in Children from the Metropolitan Region of Recife. *SCIELO*, 17 (5). http://dx.doi.org/10.1590/1982-0216201517519514.

Radford, A. (1997). *Syntax: A minimalist introduction*. Cambridge University Press.

Rossman, G. B. & Wilson, B. L. (1985). Numbers and Words: Combining Quantitative and Qualitative Methods in a Single Large-Scale Evaluation Study. Evaluation Review, 9(5), 627-643.

Sey, K. A. (1973). *Ghanaian English*. London, UK: Macmillan.

Simon A., Shruthi L. Rajalekshmi S. & Jenny Mevis D'Souza Satish Kumaraswamy (2015). Phonological Processes in Malayalam Speaking 3-4 Year Old Urban and Rural Children. *Language in India*, 15:5.

United Nations Development Programme, Ghana. (2007). *The Ghana Human Development Report*. Accra: UNDP.