A SOCIOPHONETIC STUDY ON TH VARIATION IN EDUCATED NIGERIAN ENGLISH

Folajimi Oyebola, Sin Yu Bonnie Ho, Zeyu Li

University of Münster, Germany
oyebola@uni-muenster.de, zbonnieho@uni-muenster.de, zeyu.li@uni-muenster.de

ABSTRACT

This study examines the realization of the voiceless dental fricative /θ/ and its variation (TH variation) by educated Nigerian English speakers and presents the preliminary results. Previous studies on TH variation (e.g. [17], [19], and [1]) have found that /θ/ is often realized as [t] in Nigerian English. However, there is a lack of systematic review of TH variation and an investigation of its potential correlation with social factors. In the present study, the TH production of 33 speakers (18m15f) were examined. They were selected from the Nigerian component of the International Corpus of English (ICE Nigeria) based on their age, gender, and ethnic group. Identified tokens were analysed using a mixed-effects logistic regression model.

Keywords: Phonology, TH-variation, linguistic variation, Nigerian English

1. INTRODUCTION

There is no uniform accent of English spoken throughout Nigeria. Nigeria, which has close to two hundred million in population, has affiliations to different ethnic groups, which makes Nigeria a multicultural and multilingual society. The constitution of Nigeria recognizes three major languages among the over 500 languages in the country: Hausa, Igbo, and Yoruba. They are spoken by the three major ethnic groups respectively and characterised by distinct phonological systems. These divisions explain why ethnicity is a major divide in Nigeria. Scholars such as [4], [7], [12], [13], and [14] have accorded ethnicity a prominent place in the identification of Nigerians when they communicate in English. This is because Nigerians are often influenced by their native languages when speaking English, especially for sounds that are missing in the indigenous languages ([11], [15], [8]). Previous research, e.g. [8], has demonstrated that Nigerian English is heterogeneous in nature and observed that some English consonants and vowels have different variants in Nigerian English depending on regions and ethnicity. The author also noted that the voiceless dental fricative /θ/ is often realized as [θ] or [s] by a Hausa speaker, whereas in educated Yoruba English, it is realized as [θ] or [t].

Since in general the level of education determines the variety of English used by individuals where English functions as a second language, most of the descriptions of the Nigerian English sub-varieties correlate levels of competence with the speakers' educational background ([5], [18], [9]). This study investigates the sociophonetic variation in Educated Nigerian English, focusing on the realization of voiceless dental fricatives with regard to possible evidence for an emerging, distinctive Standard Nigerian English phonology. While earlier work on Nigerian English (e.g. [17], [19], [3], [1], [2]) revealed that some forms of variability exist in the pronunciation of the dental fricatives /θ/ and /ð/ in Nigerian English, this study examines the linguistic and social constraints influencing this variation in the educated variety of Nigerian English. [19] investigated the general features of spoken English in Nigeria and one of her findings is that /θ/ often changes to [t], who identified the level of education as a major factor for classifying spoken Nigerian English. [1] focused mainly on university graduates covering a smaller range of other constraints on the dental fricatives variation; [2] examined selected English bilingual graduates, representing just one ethnic group (Yoruba). While many of these studies have established the existence of variation in the realization of dental fricatives in Nigerian English, they limited their studies to a small range of subjects (one ethnic group) and social factors (education and gender). The present study, therefore, explores the variability in educated Nigerian English speakers from different backgrounds and controls for a wider range of variables, with the aim of identifying the variants of the word initial voiceless dental fricatives and the conditioning linguistic and social constraints. In addition, this study adopts a variationist approach and examines the non-linguistic constraints such as gender, age, ethnic group.

2. METHODS

2.1. Speakers

Speakers of the present study were 33 educated Nigerian English speakers. They were selected from the ICE Nigeria, which consists of 609,586 words in the spoken data [20]. As this study adopted a 2x3x4 factorial design, namely gender (male, female),

ethnicity (Hausa, Igbo, and Yoruba), and age group (20-29, 30-39, 40-49, and 50 or above), the three factors served as the criteria for the selection of the speakers and their respective audio files in the ICE Nigeria.

In total, there were 729 tokens from 18 male and 15 female speakers. The tokens were factored into the analysis (see the distribution in Table 1).

Table 1. Distribution of tokens (N=729)

Gender	*n*	Age	*n*
Male	385	20-29	234
Female	344	30-39	152
Ethnic	*n*	40-49	138
Hausa	201	≥ 50	205
Igbo	280		
Yoruba	248		

2.2. Data analysis

The transcription of the token was conducted by two of the authors. Each token was transcribed phonetically by listening to it repeatedly. The tokens can be generally categorized into three main phonemes: /θ/, /t/, and /s/. Despite variations noted in the data, all allophonic variations such as aspirated [tʰ], unaspirated [t], and dental [t̪] were coded as the phonemic representation /t/.

All the tokens were transcribed independently in two rounds by the two coders. Comparison was made between the results of the first and second round transcriptions. A 92% inter-rater reliability was achieved for the phonetic transcriptions. If there was an inconsistent transcription of the token, the token would be transcribed by the third author for the final decision. Five tokens from the original data set were excluded for the analysis due to disfluency and the infrequent occurrence of the pronunciation in the dataset such as [g] and [dʒ].

In the first attempt, the 729 tokens were analyzed using a mixed effects multinomial logistic regression model with the MCMCglmm package [10]. The dependent variable, namely the production of TH, was factored into three levels: [θ], [t], and [s]. However, since the number of tokens of the third level [s] were insufficient for modelling, they would only be discussed descriptively in the results. Instead, a mixed effects binomial logistic regression model was adopted for statistical analysis with the two-level factors: [θ] and [t]. It was performed with the lme4 package [6] in R [16].

Regarding the fixed factor, although the aim of the present study was to investigate the effects of the social factors (gender, ethnicity, and age) as well as the linguistics factor (environment) on the production of TH in Educated Nigerian English, the latter was not included in the model as it did not generate significant effects. In terms of the random factors, both the speakers and words were included in the model as this study adopted a repeated-measures design (given the nature of ICE Nigeria).

3. RESULTS

The prevalence of TH variation is first described in Table 2. As can be seen, among the realizations of TH, 47.2% of the tokens were realized as the voiceless dental fricative [θ] and 52.8% of the tokens were pronounced as a variant of the voiceless dental fricative. Within the TH variation, there were 356 (92.5%) tokens of [t] and 29 (7.5%) tokens of [s].

Table 2. Realization of TH (N=729)

	n	%
[θ]	344	47.2
TH variation	385	52.8
[t]	356	92.5
[s]	29	7.5

Table 3. Realization of TH by gender, ethnic group, and age (N=729)

	[θ]	[t]	[s]	*Total n*
Gender				
male	164	193	28	385
female	180	163	1	344
Ethnicity				
Hausa	73	100	28	201
Igbo	121	159	0	280
Yoruba	150	97	1	248
Age				
20-29	108	122	4	234
30-39	41	111	0	152
40-49	84	44	10	138
≥50	111	79	15	205

Table 3 illustrates the realization of TH by gender, ethnicity, and age. A series of two-proportion *z*-tests were computed to compare the results using a 5% alpha level. It is observed that female speakers used more [θ] than [t] (p=.011). Yoruba speakers used significantly more [θ] than Hausa speakers (p<.001), whereas Igbo speakers used significantly more [t] than Yoruba speakers (p=.048). Speakers in their 30s used significantly less [θ] than speakers in other age groups (p<.05). Interestingly, male, Hausa speakers contributed almost all of the tokens of [s].

Table 4. Best-Fit Mixed Effect Regression Model of the Production of [θ] and [t] as Binomial Dependent Variable, with Word and Speaker as Random Factor

Fixed effects	Levels	Coef.	SD	*p*

Intercept		-4.94	2.92	.09
Age	30-39	-3.40	1.63	.036*
	40-49	1.58	1.43	.27
	≥50	1.16	1.34	.39
Gender	male	3.85	2.96	.19
Ethnic	Igbo	17.3	5.65	.97
	Yoruba	5.84	2.78	.036*
Age: Gender	30-39: male	4.9	2.24	.029*
	40-49: male	.25	2.26	.91
	≥50: male	-17.6	5.56	.98
Random effects		Var.	SD	
Word		0.16	.40	
Speaker		1.82	1.35	

*significant at .05 alpha

The descriptive results are further confirmed by our statistical model. As shown in Table 4, the process of model comparisons retained the interaction effect between the social factors age and gender. Male speakers in their 30s significantly favor the TH variant (p=.029). Ethnicity is also a significant predictor conditioning the production of TH, as Yoruba speakers realized [θ] more frequently than Hausa speakers (p=.036). Moreover, speakers in their 30s are shown to disfavor the TH variant generally in comparison with speakers of other age groups (p=.036). The best fit model eliminated all linguistic factors, indicating that the production of the TH variants is not strongly controlled by internal constraints.

4. DISCUSSION AND CONCLUSION

Generally, findings from the study indicate that while there are three major variants of TH realizations in Educated Nigerian English, speakers seem to prefer to articulate the voiceless dental fricative as [t] and [θ]. From the 729 tokens, the analysis indicates that most of the speakers prefer to realize the variable in order of preference as [t] (356 tokens), [θ] (344 tokens), and [s] (29 tokens). Obviously, there is a close margin between the tokens realized as [θ] and [t]. This shows that [θ] has already become an intricate part of the Educated Nigerian English phonology.

To summarize, the results in this study demonstrate that TH variations in Nigerian English are sometimes affected by sociolinguistic factors. Our findings have indicated that female speakers significantly favour [θ] more than [t] (p=.011) while male speakers use more [t] than the female counterparts. This indicates that educated women tend to favour the use of the target like variety than educated men. However, these findings seem to refute the report from the study conducted by [2] that there is no significant gender difference in the speech of educated Nigerians with respect to the realizations of dental fricatives. We are however aware that [2] covered a smaller range of subjects. To enhance the generalisability of these findings, more data should be explored in future studies. Such follow-up studies will provide further insight into TH realization in Nigerian English.

Moreover, our results show that the realization of the TH variable was affected significantly by the speakers' ethnic group. Yoruba speakers used significantly more [θ] than the speakers from the other ethnic groups; whereas Igbo speakers used significantly more [t] than Yoruba speakers and also more than the Hausa speakers. The Hausa speakers (male) seem to be the only ethnic group who occasionally have TH variable realized as [s]. This validates the claims from [8], [2], and [19], though in a more descriptive context, that the ethnic affiliations of Nigerian speakers of English often influence their performance in English usage. The varying TH realizations provide empirical account on language interference often experienced by Nigerians because of the lack of dental fricatives in the phonemic inventories of their first language, forcing them to substitute such realizations with a similar phoneme.

The age factor did not have much impact on the speakers' performance apart from the speakers in their 30s who recorded significantly less [θ] than speakers from other age groups. This is likely an individual linguistic characteristic. This is perhaps the first study to consider age as a possible social conditioning factor in the variable realizations of the dental fricatives in Nigerian English; more studies are therefore needed.

As mentioned earlier, there are no indications that the production of the TH variants is strongly influenced by linguistic factors. It should be noted that our study only examined word initial voiceless dental fricative. For future studies, the word-medial and final position should also be examined.

In addition, the aspirated and unaspirated realizations of /t/ were all coded uniformly as /t/ in the present study. However, it would also be interesting to further examine acoustically if any linguistic and non-linguistic factor may potentially influence the degree of aspiration and the realizations of word-initial /t/. It is preliminarily observed that the TH in *think* was often pronounced with aspiration, whereas TH in *thousand* was not aspirated (see Figures 1 and 2 for visual inspection of the waveforms and wideband spectrograms).

Figure 1: Waveforms of the words *I think* (on the left) and *two thousand* (on the right) demonstrating two varied realizations of /t/.

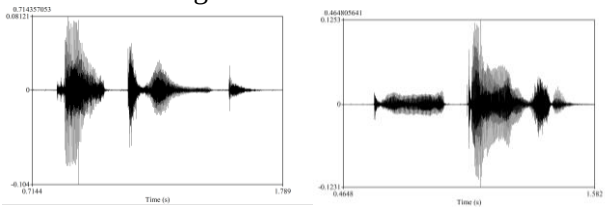
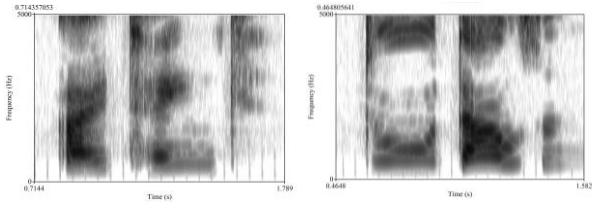


Figure 2: Wideband spectrograms of the words *I think* (on the left) and *two thousand* (on the right) demonstrating two varied realizations of /t/.



In sum, the present study considers additional sociolinguistic factors that have been neglected so far in the investigation of the TH production among speakers of English in Nigeria. The findings have further confirmed that some Nigerian users of English encounter difficulties in the appropriate use of dental fricatives. Moreover, results exhibit inter- and intra-speaker variability in the realizations of the dental fricatives in Educated Nigerian English, which are significantly controlled by both structural and sociological constraints. The unique pattern of TH realizations in Nigerian English may also be interpreted as a phonological characteristic of the Nigerian English variety. To this end, this study has contributed its quota to the mounting thoughts on the increasingly localized features of Nigerian English as an independent variety of world Englishes.

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