Perception of Focus Prosody in the English speech of Bangou speakers

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Abstract

This paper presents a comparison of the recognition by Southern Standard British English (SSBE) listeners of four conditions of focus in the English, Pidgin and Bamileke Bangou speech of multilinguals from Cameroon living in London. The aim is to examine the influence of the first language (L1) systems on the acquisition of English focus prosody. While the SSBE listeners could identify the focus conditions intended by the SSBE speakers, they could not do so for the Cameroon speakers.

The investigation utilised recordings from a set of materials using football team names, developed to maintain lexical consistency across languages, as part of a wider examination of acoustic cues used by Cameroon speakers for focus signaling in their English, Pidgin and Bangou speech.

This contributes to the discussion of how acquisition of prosodic features in a second language (L2) relates to the role of the feature in the L1.

Index Terms: focus prosody, language contact, cross linguistic perception, feature hypothesis.

1. Introduction

The L2 acquisition speech learning model established by Flege hypothesises that L2 speakers have difficulty perceiving and producing L2 features not used to signal phonological contrast in their L1s [1]. It is not yet clear what aspects of the L1 are transferred at the prosodic level, nor whether adults can acquire sensitivity to a feature not exploited in their L1s.

In order to examine the acquisition of English focus prosody, this study uses recordings of the speakers of an African L1 tone language from the Benue-Congo Grasslands Bantu Bamileke family. The phonological status of the features of duration and pitch in Bangou means that they are not available for use in signaling focus as they are in SSBE. An additional significant L1 for these speakers is Cameroon Pidgin, also called Kamtok which may also be influencing L2 prosody.

The question for this investigation is whether, to what degree and how like a native speaker that tone language speakers can acquire intonational language features in an L2.

The hypothesis is that SSBE listeners will recognise the focus condition intended by the speaker in the speech of SSBE speakers, but not in the speech of the Cameroon speakers. To minimise the impact of aspects such as segmental content and vowel quality on the perception of duration, stimuli with the standardised lexical content of football team names are used. This does mean that the football team names are loan words in both Pidgin and Bangou, but also means that the description of the match result is readily elicited and understood.

2. Bamileke Bangou and Kamtok Pidgin

Bamileke is the collective name for a group of around ten Eastern Grassfields Bantu languages spoken in the south and south west of Cameroon by over a million people. They are tone languages and there is published work on a number of them for example [2] [3].

While the languages of government and education in Cameroon are officially French and English, over 250 languages are spoken, and the Bamileke language Ghomala, to which Bangou is related [4], is actively taught in schools and used in radio broadcasts as one of nine 'wider communication languages' [5]. Pidgin is widely used, especially by young people moving to the cities, though it is officially disregarded. [6]. Pidgin as well as Bangou is a significant influence for the Cameroon speakers, as well as the prosody of Cameroon English [7] [8], and both of these languages might influence their L2 prosody in English.

This study focuses on speakers of the Bangou language which has around 12,000 speakers in the west Francophone region, and many more in the cities such as Limbe in an Anglophone area, the capital Yaoundé and main port and largest city, Douala. A small community from Limbe, fluctuating between 10 and 30 people in London, who originally came from one village, have been recorded for this investigation.

3. Background of the wider investigation

The perception of spoken West African English by SSBE listeners is of equal weight being given to each syllable, as if English is being spoken as a syllable timed language rather than with the customary stress timing. West African English, including Cameroon English, does not generally employ weak syllable forms, nor use duration in the manner of SSBE speakers to signal focus.

The recording used in this investigation, were made to examine the focus prosody in the English speech of multilingual Cameroon speakers in London, which is expected to show the impact of their L1s, in contrast to focus prosody in SSBE speech. In addition, contrasting the status and use of acoustic cues for focus in both Bangou and Pidgin will inform the discussion of how the adult L2 speaker processes and produces focus prosody in English. Firstly, investigation of the perception of the recorded materials by SSBE listeners has been undertaken. As well as providing information about prosodic marking in a contact variety of English, this investigation will throw light on whether acquiring an L2 prosodic distinction relates to the role of the features in the L1s on which the L2 category is based.

4. Investigation

4.1 Method

4.1.1. Subjects

Recordings made of five speakers from Cameroon and five Southern Standard English speakers were used. The Cameroon speakers were recorded in English, Pidgin and Bangou.

Table 1. Subjects recorded in the investigation.

Code	Age	Gender	Languages		
			English	Pidgin	Bangou
Cameroon Speakers					
CB	30-40	F	Yes	Yes	Yes
CC	30-40	M	Yes	Yes	Yes
CD	20-30	F	Yes	Yes	Yes
CE	30-40	M	Yes	Yes	Yes
CF	20-30	M	Yes	Yes	Yes
Standard English Speakers					
EA	20-30	F	Yes	X	X
EB	20-30	F	Yes	X	X
EC	30-40	F	Yes	X	X
ED	20-30	M	Yes	X	X
EE	30-40	M	Yes	X	X

4.1.2 The Listeners

There were thirteen SSBE listeners who carried out the main listening test, ten who participated in the pilot. They were given a presentation on focus and a description of the football materials before taking the test. They were not trained in phonetics, but received an explanation of focus. They recorded their responses on a grid, and were able to explain that they were listening for the premier league football team name that was "stressed".

Table 2. SSBE listeners for the investigation.

Pilot Listening Test			Main Listening Test		
Code	Age	Gender	Code	Age	Gender
LA	20-30	F	LK	40-50	F
LB	20-30	F	LL	40-50	M
LC	20-30	F	LM	40-50	F
LD	20-30	F	LN	40-50	F
LE	20-30	M	LO	20-30	M
LF	20-30	M	LP	20-30	M
LG	30-40	M	LQ	20-30	M
LH	30-40	M	LR	20-30	F
LI	20-30	M	LS	30-40	M
LJ	20-30	M	LT	30-40	F
			LU	20-30	M
			LV	40-50	M
			LW	40-50	F

4.1.3. Stimuli

The stimuli were based on premier league football matches in the 2010/11 season, using the names of the teams as the content of the target sentences. Prompt cards were prepared setting out the match result. Speakers were coached in producing the target sentences, in order to elicit the sentences without reading or prompt questions, and for the same prompts to be used in all three languages. This did result in some variation in lexical items and word order, particularly in respect of the location. which made comparison between speakers more difficult, and did not allow for multiple instances of the same utterances.

A further set of stimuli was developed, still using football results, but with a single standardised target sentence with the same lexical items and word order. The focus condition was varied with prompt questions, and ten instances of each were elicited. The four conditions were the three narrow foci of initial, medial and final, and a neutral broad version. A randomised ordering of these 40 sentences was recorded for each language and speaker.

> *English: Arsenal beat Chelsea at Arsenal.*
> *Pidgin: Arsenal be beat Chelsea for Arsenal.*
> *Bangou: Arsenal lazap Chelsea Arsenal.*

4.1.4. Recording Procedure

Each speaker first practised responding to a prompt card, until they produced the standardised sentences, and were then asked to continue to produce the same sentence in answer to these prompt questions which were to vary the focus:

Broad Focus Neutral Focus: "Tell me about the match."
Narrow focus:
Initial: "Which team beat Chelsea at Arsenal?"
Medial: "Arsenal beat which team at Arsenal?"
Final: "Arsenal beat Chelsea where?"

The recordings were made in groups of eight, onto an MP3 recorder in social situations, re-recording immediately if there was a disruption.

For the main listening test, the fourth and fifth instances of each focus condition were taken per language and speaker, and a fresh randomised order created with the 160 stimuli. There were eight utterances per speaker per language, with five SSBE speakers and five Cameroon speakers recorded in English, Pidgin and Bangou.

The 24 stimuli in the pilot test were also in the first section of the main listening test. They were used for practice and comparison purposes.

For the wider investigation, an acoustic analysis has been carried out.

4.1.5. Pilot Listening test

English speaker EA and speakers CA, CB and CC from Cameroon, had been recorded for the following sentences with initial, medial and final focus in English for the pilot investigation. Three sentences from each of the four speakers made up the first twelve test sentences:

> *Chelsea beat Man City at home.*
> *Chelsea beat Man City at Stamford Bridge.*
> *Man City lost to Chelsea at Stamford Bridge.*
> *At Stamford Bridge Chelsea beat Man City.*
> *At Stamford Bridge Man City lost to Chelsea.*

The eight listeners were SSBE speakers aged 20-40, university students, four female, four male.

The twelve sentences were presented once each as audio buttons from a power point display, responses were recorded on a grid, with the focus conditions as column headings. They were expected to be able to recognise the football team names, and indicate whether and where they heard focus.

For the English speaker the result was that the eight listeners heard the focus where it was intended to be, in initial and medial positions. They did not, however, hear the focus where it had been intended for the Cameroon speakers.

A further test was carried out to determine whether focus was heard differently between the three languages in the English, Pidgin and Bangou speech of a Cameroon speaker. As it was again the name of a football team that would be in focus, it was useful to find out if this was a reasonable ask, as Pidgin and Bangou are not spoken by the listeners. Sentences were of the type:

Initial position	(verb= "beat")	Medial position	(prepos- ition)	Final position
Winner		Losing team		Place
Chelsea		*Tottenham*		*Chelsea*

The result was that none of the six listeners had more than three of twelve responses matching the intended focus and were unable to differentiate between the four focus types in the instances of the Cameroon speaker speaking English, or Pidgin and Bangou. Fourteen of the possible 72 responses matched the intended focus, the "accurate" responses were evenly divided between the three languages. The results suggest that naïve SSBE speakers cannot differentiate focus in Cameroon speaker utterances, and that this is irrespective of the language being spoken.

4.1.6. *Main Listening test*

The listeners were 13 SSBE monolinguals aged 20-50, who heard the stimuli presented from audio buttons in a powerpoint presentation on a laptop computer in small groups in informal settings such as home or place of work. The initial 24 stimulii from the pilot were presented as one block, then the randomized 160 stimulii were presented in blocks of 20. The listeners reported by marking boxes grid. These were then collated and the results assembled for t-test and Wilcoxon analysis. Mixed effects logistic regression analysis so far confirms the results but further such analysis is planned. In all there were 2080 instances for the Arsenal/Chelsea materials used in the main test, as well as the 312 responses to the Chelsea/ManCity/Tottenham materials from the pilot test.

4.2 Results

The hypothesis was supported in that it was possible for SSBE listeners to distinguish systematically the four focus conditions for the five English speakers, but that this was not the case with the five Cameroon speakers for any of the three languages recorded, as shown in Figure 1. Overall there was a pattern of a higher percentage of correct identifications for SSBE.
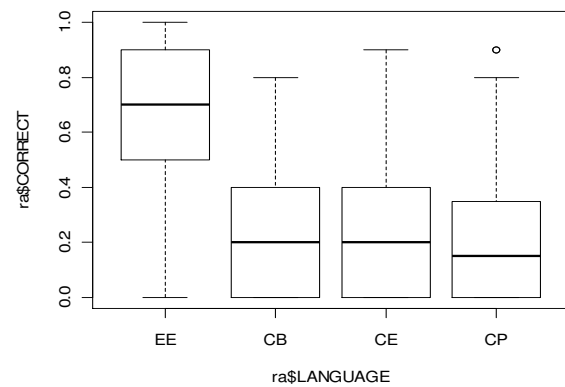

Figure 1 Boxplot of comparison of means for the percentage for all listeners of correctly identified focus condition responses for each of the four languages: EE English English (SSBE), CB Cameroon Bangou, CE Cameroon English and CP Cameroon Pidgin.

Neutral (broad) focus was the most frequently correctly identified focus condition, with medial most often correctly identified of the three narrow focus conditions, as shown in Figure 2.
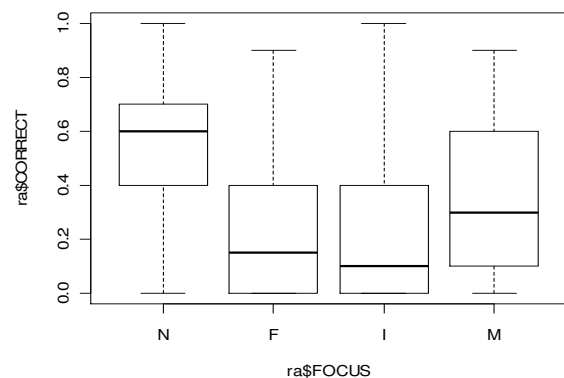
Figure 2 Boxplot of the percentage for all listeners over all languages of correctly identified focus condition responses: N = Neutral (Broad), F = Final, I = Initial, M = Medial.
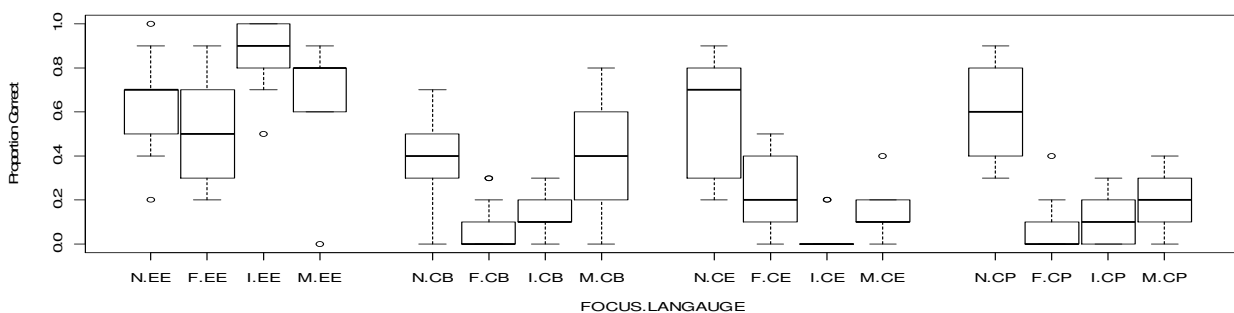
Figure 3 Boxplot of the percentage for all listeners of correct identifications of the four focus conditions: Neutral (Broad), Final, Initial, Medial; by language: English English (SSBE), Cameroon Bangou, Cameroon English and Cameroon Pidgin.

The results for each of the languages is displayed separately in figure 3, where it can be seen, as in figure 1, that focus was most often identified in SSBE, compared to the English, Pidgin and Bangou speech of speakers from Cameroon. In SSBE, of the four focus conditions, initial was the most often recognised. For both the English and Pidgin speech of the speakers from Cameroon, overall the recognition rate was lower than for SSBE, but of the four focus conditions, the neutral (broad) focus condition was the one most often recognised by the SSBE listeners. For Bangou both neutral (broad) focus and medial focus were more often identified.

The hypothesis is supported by the outcome, in that the mean performance in SSBE is different from the mean performance for the Bangou, English, and Pidgin speech of the speakers from Cameroon.

This is also supported by Wilcoxon rank sum tests with continuity correction comparing two means and the probability values that the observed differences could have arisen by chance. Comparing the English spoken by Cameroon speakers with SSBE speakers: $W = 2341$ and the p-value = 1.041e-10; while comparing the English of Cameroon speakers to their two main L1s, Bangou and Pidgin: $W = 1385.5$ and the p-value = 0.8272.

The mixed effects logistic regression analysis indicated that the focus conditions and the various languages were all significant. The probability of obtaining a correct focus label is affected firstly by the focus position, as neutral (broad) focus was better recognised than the other positions; and secondly by the language, as there were more identifications in SSBE. Further analysis is planned, when investigation into information transfer will also be undertaken.

The results are consistent the feature hypothesis of the Flege L2 acquisition speech learning model, that L2 speakers have difficulty producing L2 features not used to signal phonological contrast in their L1s.

5.   Discussion

The results of the main listening test support the hypothesis that naïve SSBE listeners identify four focus conditions reliably in English spoken by SSBE speakers, but not in English spoken by Cameroon multilinguals. Nor did they identify focus in Cameroon Pidgin, nor in Bamileke Bangou. There are clearly a number of variables impacting on these results, as focus condition and language are all significant. Work is in hand to identify the role of each through further mixed effects logistic regression analysis.

A secondary purpose in undertaking these listening tests was to ensure that SSBE listeners perceived focus where it was intended, in order to support the analysis of acoustic cues, and these correlations of the patterning of the perception of focus on the one hand for SSBE, and on the other for the Cameroon speakers.

Talla Sando Ouafue finds that intensity is used to signal new information in Cameroon English discourse, which can be examined in the wider investigation of acoustic correlates. [8] However, even if the information that was intended by the Cameroon speaker to be in focus was given greater intensity, in this investigation it was not perceived by the SSBS listeners as a focus cue.

Further tests are planned with the Cameroon speakers as listeners to investigate firstly whether they are able to systematically perceive the focus conditions that are not perceived by SSBE listeners in Cameroon speech; and secondly whether they perceive the focus conditions in the speech of SSBE speakers which they do not regularly produce. This may be due to processing overload and the different uses of duration in L1 and L2 and those sub system interactions, and cannot be assumed to be solely an issue of the use of duration in English needing to be acquired.

One further additional investigation planned for all these listening test results is an information transfer analysis of the extent to which the focus condition intended by the speaker is perceived by the listener.

6.   Conclusions

SSBE listeners perceive the four focus conditions of broad (neutral), narrow initial, narrow medial and narrow final reliably in the speech of Southern Standard English speakers, but not in the English speech of speakers from Cameroon, nor in their Pidgin or Bamileke Bangou speech. This supports the L2 acquisition theory in that L1 features used for different phonological contrasts in L2s are difficult to produce in a manner that is perceived as the speaker intended by the L2 listeners.

There is further investigation to be undertaken to determine the role of the focus and language variables in this pattern of perception, and of information transfer. Work is being undertaken to establish the acoustic cues that correlate to the focus conditions, and listening tests are planned with Cameroon listeners.

7.   Acknowledgements

8.   References

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