

PROSODIC PATTERNS IN SINGAPORE ENGLISH

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ABSTRACT

Research on Singapore English has concentrated on segmental rather than prosodic aspects although it is prosody that contributes most to its distinctive character. The few existing analyses of Singapore English intonation are based on the "British tradition" of intonation analysis. This paper investigates whether the British model is suitable for Singapore English.

INTRODUCTION

The nature of Singapore English has sparked off much interest and research in the past two decades. Kachru's [1] notion of nativisation accounts for its distinctive character. Nativisation is the process of acculturation of a language into a society which gives the language a distinct identity. As a result of this process, we find systematic differences between Singapore English (SE) and British English (BE). These differences involve the syntactic structure of SE, the lexicon, and especially its pronunciation.

A number of studies have investigated the pronunciation of SE [2,3,4]. Most authors focus on segmental rather than prosodic aspects. However, as Brown [5] points out, it is the prosodic aspects that contribute most to its distinctive character. The few existing analyses of Singapore English intonation [6,7,8] are based on the British model of intonation analysis [9]. This model has developed the concept of the 'tone unit' as a unit of intonational analysis. Tone units are stretches of utterance consisting of an obligatory element, the nucleus, and three optional elements, the prehead, the head and the tail. The definition of the tone unit relies on a set of underlying assumptions about the prosodic structure of English, in particular a distinction between unstressed, stressed and accented syllables. A stressed syllable is perceived as prominent in relation to other syllables in a given tone unit. In BE, this distinction is closely related to the one between full and reduced vowels [10]. Accented syllables are considered

more prominent than stressed syllables and characterised by some degree of pitch movement. Accents may be pre-nuclear or nuclear, i.e. distinctions are made among accents.

A number of studies have applied the British model to Singapore English. This suggests that the authors assume that SE exhibits the prosodic parameters relevant to a successful application of this model, i.e. that we find unstressed, stressed and accented syllables. However, Brown [4] and Deterding [8] have cited the absence of reduced vowels and a lack of prominence contrasts as factors contributing to what has been termed the rhythmic 'staccato-effect' of SE. Our informal auditory analysis of SE confirmed that a clear distinction between stressed, unstressed and accented syllables cannot be established. Moreover, nuclear accents - crucial to the British model - could not be identified with any degree of certainty. At the functional level, we found that SE did not exhibit deaccenting. These observations shed doubt on the applicability of the British framework of intonation analysis to SE. In the following sections, we present experimental work attempting to provide an acoustic explanation for two of the observed aspects of SE prosody:

- (i) the perception of 'staccato' rhythm
- (ii) the apparent lack of the deaccenting function

STACCATO RHYTHM

Previous research [2,3,4,6] has explained the 'staccato' rhythm of SE by suggesting that SE is in fact syllable-timed, unlike BE which is frequently referred to as stress-timed. Syllable-timing is attributed to languages perceived to have near equal duration of syllables while stress-timing characterises languages perceived to have near equal intervals between prominent syllables. Here, we assume this distinction to be representative of a continuum between languages which are prepared to make durational adjustments for rhythmic purposes ("stress-timed") and those that

do not. Adopting this view, it seems reasonable to look for an acoustic explanation for the perception of syllable-timing in SE.

Method

Yeow [11] measured syllable duration in SE and failed to find acoustic correlates for the perception of syllable-timing. Taylor [12] suggests that the acoustic correlate of SE's syllable-timed rhythm is primarily one of nearly equal vowel duration in syllables, not near-equal syllables. This view receives support from Brown's [4] and Deterding's [8] comments on the absence of reduced vowels. This led us to test whether in the acoustic domain, a measure of vowel duration reflected the rhythmic structure of SE more accurately than one of syllable duration. We hypothesised that SE vowel were more nearly equal in duration than BE vowels.

Three British and three Singaporean subjects read a set of sentences. In order to test our hypothesis, a measure was needed to summarise the patterning of vowel durations in the two samples. We considered using the standard deviation of vowel durations, but, although a larger variation from syllable to syllable as expected in "stress-timing" would yield a high standard deviation of vowel duration, this would not unambiguously demonstrate the durational patterning SE vowels exhibit. It could, in principle arise if vowel duration became steadily longer as an utterance progressed. A measure which more securely reflected alternations of longer and shorter vowels would be the mean absolute difference between successive pairs of vowels in an utterance. This can be expressed as

$$\frac{1}{m-1} \left[\sum_{k=1}^{m-1} |d_k - d_{k+1}| \right] / (m-1)$$

where m = the number of vowels in the utterance

d = the duration of the k th vowel

Informally, the difference in duration between each successive pairing of words in the utterance (d_1 and d_2 , etc) is calculated, and the absolute values taken (by discarding the negative sign where it occurs). The mean difference is calculated by summing the differences, and dividing by the number of differences (i.e. one

less than the number of vowels) and this is expressed in terms of an index.

Results

Table 1 and 2 show the vowel duration index values obtained for SE and BE speakers. A t-test showed that the difference between the overall index in SE and BE was highly significant. Clearly, durations of adjacent vowels in SE are more nearly equal in SE than in BE and we suggest that this lack of difference in successive vowel durations is largely responsible for the perception of syllable-timing in SE.

Table 1. Index for Singapore English

Speakers	1	2	3	All
Sentence 1	34	49	49	
Sentence 2	34	43	51	
Sentence 3	33	31	35	
Sentence 4	32	37	51	
Sentence 5	31	40	41	
Sentence 6	29	29	30	
Average	32	38	43	38

Table 2. Index for British English

Speakers	1	2	3	All
Sentence 1	40	74	59	
Sentence 2	74	71	70	
Sentence 3	63	60	51	
Sentence 4	60	56	50	
Sentence 5	56	48	43	
Sentence 6	35	30	29	
Average	55	56	50	54

DEACCENTING

Cruttenden [13] discusses deaccenting in the context of given and new information. In BE, given information is frequently deaccented. The most obvious type of given information involves verbatim repetition. Our materials included sentences with repeated lexical items. We hypothesised that the absence of pitch obstruction in a lexical item representing given information would signal deaccenting. Hence, we predicted that in SE, repeated items would exhibit a step-up in fundamental frequency (f_0) from preceding unstressed syllables whereas they would not do so in BE.

Method

Sentences (1) and (2) illustrate the results. (1) contains a lexical item repeated at the end of the sentence. (2)

acts as a control; it contains new information at the end of the sentence. In (1) *I went to the shop to buy sweets but they'd totally run out of sweets*, SE subjects accented the second mention of *sweets*, whereas BE subjects did not. In the control sentence (2) *I wonder why Chinese girls are better speakers than Chinese boys*, both SE and BE subjects accented the new information *boys*. In (1), peak f0 was measured on *out* which was perceived to be the last accented syllable in BE. The values were compared with peak f0 on the following two syllables. In the control sentence (2), peak f0 was measured on the last three syllables.

Results

Figures 1-4 illustrate peak f0 on the last three syllables of (1) and (2). Figure 1 shows that in BE, speakers 1 and 2 deaccented *sweets*, corresponding to a peak f0 lower than that of the preceding unstressed syllable. Speaker 3 accented *sweets* and this is reflected in the rising f0 from *out* to *sweets*.

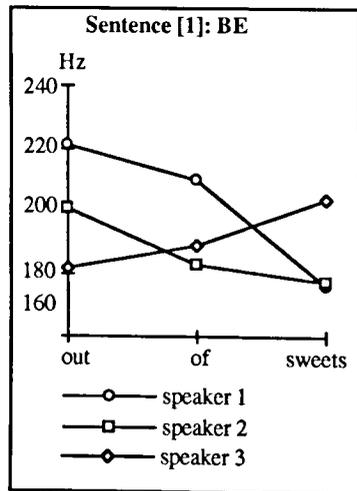


Figure 1. Given information - peak f0 in syllable

In Singapore English, the given information *sweets* was accented. Figure 2 shows that in this case *sweets* is characterised by an f0 value higher than that of the preceding syllable for all three speakers.

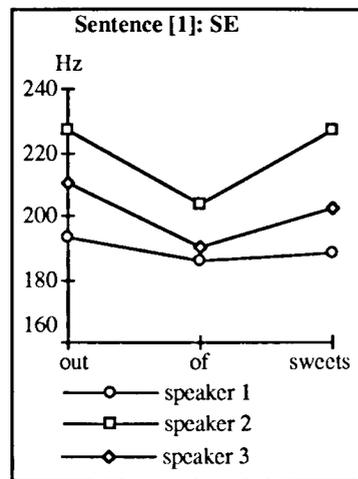


Figure 2. Given information - peak f0 in syllable

In the control (2), the new information *boys* was accented by all speakers. Again, peak f0 was measured on the last three syllables. Figures 3 and 4 show that in BE and SE the accent on *boys* corresponds to a step-up in f0 from the preceding syllable.

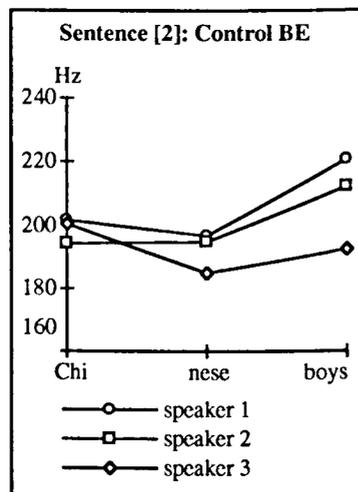


Figure 3. New information - peak f0 in syllable

We conclude that while BE assigns accent to new information and frequently

deaccent given information, SE does not exercise this distinction.

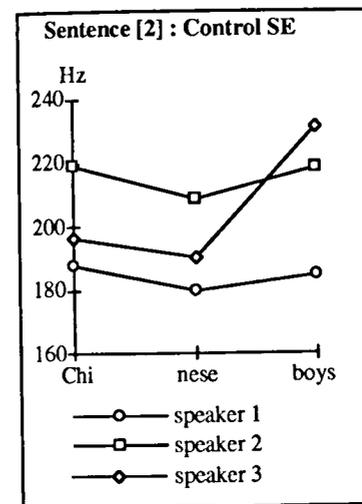


Figure 4. New information - peak f0 in syllable

CONCLUSION

The successful application of the British model of intonation analysis relies on the prosodic characteristics of British English. British English is a stress-accent language; i.e. we find a distinction between stress and accent, and accents are anchored to stressed syllables [14]. Our auditory analysis of SE suggested the absence of these distinctions. An acoustic investigation confirmed that at least two aspects of the prosodic system of SE differ crucially from that of BE, namely rhythm and the use of the deaccenting function. In Beckman and Edwards' [10] prosodic prominence hierarchy for English, the lowest level of distinction is characterised by the difference between full and reduced vowels, which in turn is closely related to that between stressed and unstressed syllables. Our results show that SE does not exhibit a comparable distinction, and suggest that the two varieties of English are not characterised by equivalent stress systems. This non-equivalence results in a lack of comparable anchor points for accents in SE, and contributes towards explaining the different distributions of accent placement. As a result, the overall rhythm of BE is perceived to be nearer

"stress timing" and the one of SE produces nearer "syllable timing". Future research will focus on the notion of accent in SE and aims to establish how SE makes use of a phonological distinction in pitch.

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