# EVERYTHING YOU WANTED TO KNOW ABOUT HOW STRESSED SINGAPOREAN ENGLISHES ARE

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## 1 Singaporean English(es) and stress

It is somewhat intriguing that, in spite of Singapore's multi-ethnic multilingual population, most work on Singaporean English (SE) has essentially documented it as a homogeneous whole. Largely because the ethnically Chinese comprise the majority of the population, perhaps, many studies, explicitly or implicitly, simply use Chinese Singaporeans as a representative sample – certainly this also serves to control the variable of ethnic group and mother tongue, though the latter only in part, given the plethora of Chinese languages spoken by Singaporeans. The consequence of this, however, is that most of what has been documented as Singaporean English then is often really Chinese Singaporean English.

Where Singaporean English prosody is concerned, the situation is not much different. There has been renewed interest in its analysis in the past decade, with studies being less impressionistic and more systematically conducted than in the past, but again most still use Chinese Singaporeans as their sample (e.g. Deterding 1994a; Low 1998). It is promising that a few recent studies have started examining ethnic variation in SE prosody (Ariyaratne 2001; Lim 1996, 2000; Tan 1999; Wee 2000), primarily in intonation, and now, in stress.

It is well known that the phonetic realisation of stress in different languages and in different varieties of a language varies widely (Laver 1994), with prominence being produced by a selection or combination of the parameters of loudness, duration, pitch prominence or movement, and vowel quality. So although stressed syllables in Standard Southern British English (StdSBrE), for example, tend to be louder, longer and

higher than unstressed syllables, this is cannot simply be assumed for other varieties of English. However, most work on SE stress has done just that, with researchers, often BrE speakers themselves, making judgements on stress based on their own perceptions (e.g. Platt & Weber 1980; Tongue 1979) or simply assuming the higher pitched syllable to be the stressed syllable (e.g. Low 1998), even though pitch has been noted to be an unreliable cue for SE stress (Yeow 1987). The phonetic correlates of stress in SE – and in ethnic varieties of SE – have to established first before any reasonable investigation of other phenomena in SE stress can be conducted.

## 2 Current work on SE stress

In this section, some recent findings on SE stress and focus will be described. These are drawn mainly from two pieces of research, which complement each other, in that one used an acoustic analysis of an experimental corpus, and, in the other, spontaneously occurring data was auditorily analysed. Together they begin to provide us with a comprehensive picture of stress and focus in SE.

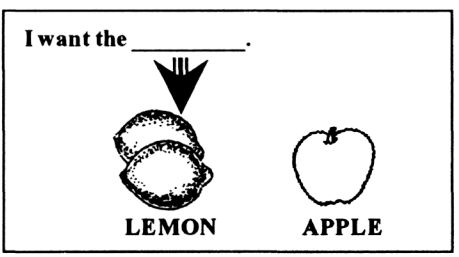
### 2.1 Acoustic correlates and stress placement in experimentally controlled speech (also see Lim & Tan 2001; Tan 2001)

In an attempt to identify the phonetic cues for SE stress, a very specific corpus of experimentally-controlled data was elicited from speakers.

Subjects: The subjects were three Chinese, three Indian and three Malay male university undergraduates, between 23 and 26 years' old. All are Singaporeans who have never lived abroad, were educated in Singapore, learning English and their respective mother tongue in school to pre-university level, and effectively bilingual in English and their mother tongue, the latter being the language used at home.

Material & procedure: Most previous work on SE stress has focussed on word stress placement (e.g. Low 1998; Low & Grabe 1999; Sng 1991). The use of noun-verb pairs or compounds and phrases were felt, however, not to be viable options as SE speakers do not make distinctions using different stress placement (Deterding 1994b; Platt & Weber 1980; Sng 1991; Tay 1982; Tongue 1979). Making the assumption that varieties of SE signal focus in the way StdBrE does, the material aimed to elicit neutral and emphatic stress in the sentence. Subjects were provided with 30 pictures, and were asked three questions (Q) per picture, in their answers (A) to which they had to use the sentence construction provided with each picture. The three questions were designed to elicit responses with a particular stress type and placement and, consequently, a different level of stress on the target item. In example 1, corresponding to example 1a, the item in bold is that which is stressed; *lemon* is the target item, with its varying levels of stress in parentheses (NS: neutrally stressed, ES: emphatically stressed, US: unstressed).

(1) Q1: Which fruit do you want?
A: I want the **lemon**. (NS)
Q2: You want the apple?
A: I want the **LEMON**. (ES)
Q3: Your mother wants the lemon?
A: **I** want the lemon. (US)




**Example 1a:** *Picture with prompt, corresponding to example 1.*

Additionally, target items were placed at two different positions within the utterance: utterance-finally and within the

first noun-phrase of the sentence – to investigate if SE speakers do indeed place prominence utterance-finally (Low & Grabe 1999; Platt & Weber 1980); this would also investigate if the acoustic correlates of stress differ depending on their different positions within the utterance.

Choice of data and measurement: Six SE speakers (two from each ethnic group) listened to the recorded utterances and indicated the word within each utterance they felt to be most prominent; utterances with fewer than five matching judgements were discarded. It is notable that although listeners could for the most part identify a most prominent word, many had difficulty identifying the actual syllable (in a polysyllabic word) stressed. The unit of measurement used then was that of the word, rather than the syllable. Utterances were digitised using the Kay CSL (Computerised Speech Laboratory) and measurements were made of 3 parameters: (i) highest fundamental frequency ($F_0$) value and (ii) highest energy level (intensity) within the target item, and (iii) duration of the entire target word.

### 2.1.1 Acoustic correlates of SE stress

$F_0$, intensity & duration in Chinese, Malay and Indian varieties of SE were measured and tested for significance in:

(1) unstressed (US) and neutrally stressed (NS) items: overall, and in non-utterance-final & utterance-final positions
(2) neutrally stressed items in utterance-final and non-utterance-final position
(3) unstressed, neutrally stressed and emphatically stressed (ES) items

Neutral stress: 27 sets of utterances were analysed, giving a total of 486 utterances for all subjects. Two-tailed t-tests ($p<0.05$) were performed. (See figure 1 and table 1.) In Indian SE, the difference between US and NS in both $F_0$ and amplitude, in both positions in the sentence, was significant. Duration, however, was insignificant in all contexts. In Malay

SE, the difference between US and NS in all three parameters in both sentence positions was significant. Interesting results were found for Chinese SE. For $F_0$, the difference between US and NS was not significant. With both intensity and duration, no significant difference in the overall means was found, nor in the means for non-utterance-final position. A significant difference was found, however, between the means for US and NS in utterance-final position.

Neutral stress by position: 16 utterances were then selected, eight with the target item in utterance-final position and eight with the same target items in non-utterance-final position, and a two-tailed t-test conducted on the difference between the stressed item depending on position in utterance. (See figure 2 and table 2.) For all three groups of speakers, significant differences in duration were found between the stressed words in utterance-final position and non-utterance-final position, suggesting a general tendency of utterance-final lengthening in SE. The significant difference in Chinese SE between US and NS in utterance-final position may thus perhaps be attributable to utterance-final lengthening and not stress.

Emphatic stress: 15 sets of utterances, i.e. a total of 405 utterances were analysed in this section. Analysis of variance (ANOVA) ($p<0.05$) was performed on the means of the three parameters. If a significant result was obtained, a post-hoc Scheffe test was applied to determine exactly which pair(s) of means were significantly different. (See figure 3 and table 3.) In Chinese SE, no significant difference was found between US, NS and ES for all three parameters. In Malay SE, with all three parameters, while significant differences were found between US and NS, and between US and ES, the difference between NS and ES was not significant. In Indian SE, as in Malay SE, with $F_0$ and intensity, significant differences were found between US and NS, and between US and ES, but not between NS and ES. However, with duration, while no significant difference was found between US and NS (also documented above), a significant difference was found between NS and ES.

Summary: Chinese, Indian and Malay varieties of SE seem to have quite different acoustic correlates for neutral sentence stress (focus). While Chinese SE potentially simply uses intensity and duration (though results not reaching significance levels), it is clear that Indian SE uses $F_0$ and intensity, and Malay SE uses all three parameters of $F_0$, intensity and duration to distinguish stressed and unstressed items. While Chinese and Malay SE do not distinguish between neutral stress and emphatic stress, Indian SE uses duration as a cue for emphatic stress, which interestingly is the parameter not used by this group for neutral stress.

### 2.1.2 Stress placement in SE

In a number of cases (which were excluded from the preceding analyses), interesting patterns of focus placement were found with subjects from all three ethnic groups.

| | | |
|---|---|---|
| (2) | Q1: | Which cake do you want? |
| | Expected A: | I want the **lemon** cake. (NS) |
| | Actual A: | I want the **lemon** cake. |
| | Q2: | You want the banana cake? |
| | Expected A: | I want the **LEMON** cake. (ES) |
| | Actual A: | I want the **lemon** cake. |
| | Q3: | Which lemon product do you want? |
| | Expected A: | I want the lemon **cake**. (US) |
| | Actual A: | I want the **lemon** cake. |

| | | |
|---|---|---|
| (3) | Q1: | Which one do you want? |
| | Expected A: | I want the **bag**. (NS) |
| | Actual A: | I want the **bag**. |
| | Q2: | You want the bed? |
| | Expected A: | I want the **BAG**. (ES) |
| | Actual A: | I want the **bag**. |
| | Q3: | Your mother wants the bag? |
| | Expected A: | **I** want the bag. (US) |
| | Actual A: | I want the **bag**. |

As illustrated in the examples above, in the answer to the third question, subjects were expected to highlight *cake* in example (2), placing it in contrast to *tea*, the other lemon product, and *I* in (3), in contrast with *your mother*. The actual answers instead still placed stress on old information.

When the same material was tested with an older generation of English-educated SE speakers, however, their responses matched the Expected Answer, i.e. they were closer to a Standard English norm (Fong & Lim 2000). It would appear then that a change in prosodic patterns in SE may have occurred over a single generation.

**2.2 Given, new and contrasted information in spontaneous speech** (also see Zhu in preparation; Zhu & Lim 1999)

It is obvious that the material used thus far was very controlled: under experimental conditions, subjects had to produce fixed, contrived responses. In this section, some findings from the spontaneous colloquial speech of young English-educated SE speakers will be described.

Corpus: The data were derived from the Grammar of Singapore English Corpus (GSEC), collected for the NUS-funded research project *Towards a Reference Grammar of Singapore English* (R-103-000-003-112) (Lim *et al*), comprising spontaneous conversations between pairs or groups of young Singaporeans.

Speakers: The speakers were 11 males and 36 females, of whom 18 were Chinese, 16 Malay and 13 Indian, all of them Singaporeans between 20 and 40 years' old, who had been educated in English, with educational qualifications ranging from GCE 'A' levels to bachelor's degree. All used primarily English, but also their mother tongue, at school, at home, at work and with friends.

Analysis: Approximately 400 minutes of 23 conversations were analysed. Because the recordings were all collected in the

field and almost always not in quiet conditions, resulting in data not amenable to acoustic analysis, an auditory approach was used in the analysis of intonation patterns, though where clarity of data permitted, some acoustic analysis was conducted to complement and check the auditory transcriptions. In the examples following, the transcription conventions used (developed for SE intonation, adapted from Zhu) are as follows: \ falling tone; / rising tone; = mid pitched level tone; ¯ high pitched level tone. Amongst the various forms and functions of intonation investigated, the signalling of given, new and contrasted information was examined.

### 2.2.1 Given and new information

It was observed that while new information was usually stressed, given information was hardly destressed, as illustrated in example 4, *rough paper* being the reaccented given information in B's turn. In many cases, the reaccenting of given information occurred at the end of a tone group or at the end of a turn; it has been suggested that this serves to indicate an end of an intonation phrase or turn (Deterding 1994a; Zhu in preparation).

(4) A: \Use them for ¯rough ¯pa =per *lah*
B: I've al¯ready =got a/nother =whole drawer of \rough \paper

### 2.2.1 Contrastive stress

Stress was also not found to be given to contrasted items in an utterance, as illustrated in example 5, where, in D's turn, *your*, contrasting with C's *my*, is not given prominence, while the non-contrastive information *parents* is.

(5) C: My /parents are very =old \fashion *ah*?
D: =Then your /parents *leh*?

Where contrastive information structures were used, the contrastive information was usually indicated with a mid or

low fall in the same way as new information was highlighted, though there were occasional uses of a high pitch and steep slope or a high fall-rise to indicate contrast.

These findings may be compared to patterns noted by Goh (2000) in data from read passages, on-air interviews and conversations, and informal exchanges: that although SE speakers did assign prominence to highlight new information, they also often assigned prominence to non-selective words in utterance-final position.

## 3 Concluding remarks: Findings and further seeking

Our research makes a significant contribution to research on stress and on varieties of Singaporean English, showing that not only do the phonetic cues for SE stress differ from StdBrE, but also that Chinese, Indian and Malay Singaporeans each seem to use different cues for stressed syllables, compared to unstressed syllables. Further, syllables or words which should receive emphatic stress are stressed no differently from those with neutral stress. Additionally, young Singaporeans do not always stress new or contrastive information, although older generation SE speakers do; contrastive stress is demonstrated more, however, in spontaneous discourse.

The implications for such findings for pedagogy and cross-cultural communication and international intelligibility have been discussed elsewhere (Lim & Tan 2001). Here we shall focus discussion on the issue of ethnic varieties.

Evidently, ethnic variation in SE prosody is not a negligible issue (Lim 2001). The next obvious question is whether these differences are a result of the influence of the stress cues and patterns of the local languages. Unfortunately, no work has been done on stress or other prosodic features in the Singaporean varieties of Mandarin, Malay and Tamil, and of the other Chinese and Indian languages. We may, however, for now, take our cue from some of the literature on these languages.

Where phonetic correlates are concerned, for example, duration has been found to be a cue to stress in Mandarin (Shen 1993) as well as in preliminary experiments on Hong Kong Cantonese (Bauer *et al* 2001). Our findings seem to suggest, however, that while Chinese SE's tendency (though not reaching statistical significance) is to use duration and intensity to cue stress, duration may still simply be a result of utterance-final lengthening. Descriptions of (Indonesian and Malaysian) Malay indicate that stress is purely a matter of pitch, with volume and quantity not playing a role in neutral speech (Prentice 1987). Our Malay SE, however, does use all three acoustic cues for signalling stress.

Turning to contrastive focus, in Malay this usually involves relativisation, equationalisation (clefting) or predicate-subject word order (*ibid.*). In Tamil whose basic word order in SOV, the subject in rhetorically marked contexts may be postposed rightwards over a finite V, typically when its referent is one whom the speaker wishes to make prominent (Steever 1987). Whether these strategies for focus are the same in Singaporean varieties of these languages, and whether they carry over into the corresponding varieties of SE needs to be investigated. It is quite possible, for example, that Chinese SE does not have focus accents, but signals focus by word order changes, and that the attaching of particles with their accompanying tones, so prevalent in all varieties of SE, is a strategy for focus in all the ethnic SE varieties.

The prosodic patterns, in terms of both phonetic cues and stress patterns, of Singaporean varieties of these languages (and the other Chinese and Indian languages), anticipated to differ from those reported in the literature, certainly need further investigation. Such findings will shed more light on the issues and effects of language contact, and consequently tell us more about everything we ever want to know about stress in Singaporean Englishes.

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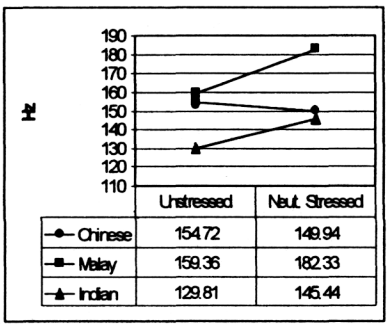
Fig 1. Means of (a) $F_0$, (b) amplitude & (c) duration of unstressed & neutrally stressed items in (i) non-sentence-final and (ii) sentence-final position in 3 ethnic groups.

(ai)

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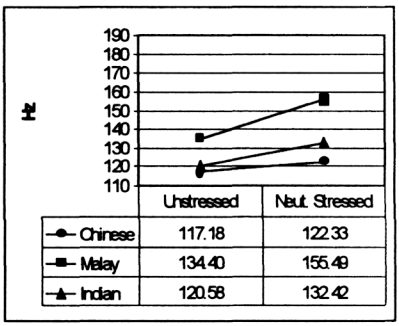


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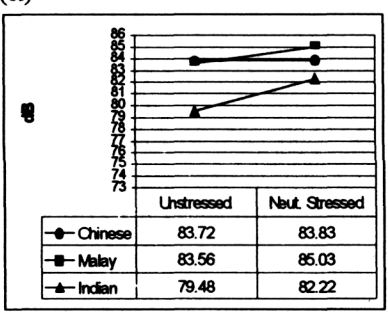


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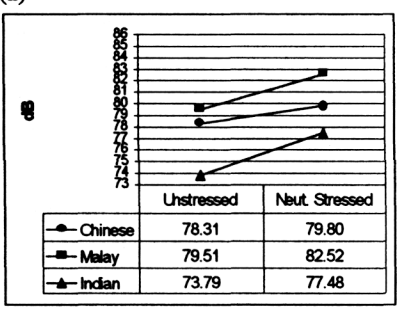


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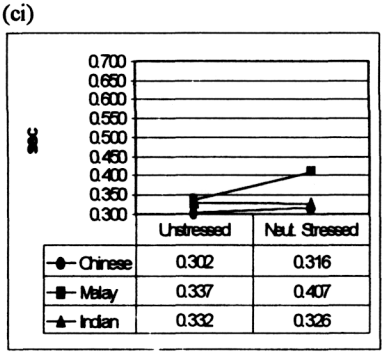


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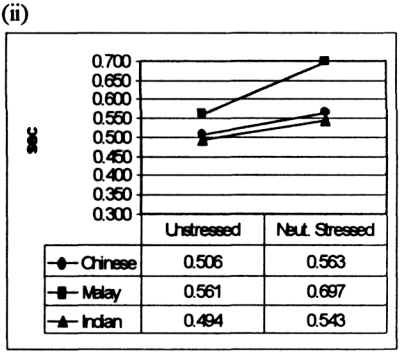
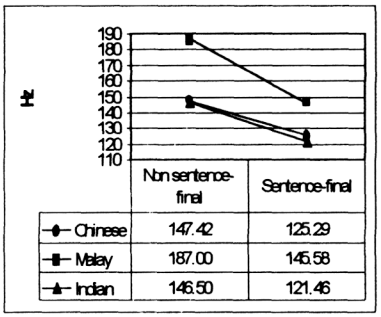


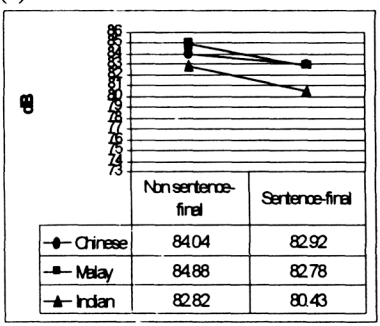
Fig 2. Means of (a) $F_0$, (b) amplitude & (c) duration of neutrally stressed items in non-sentence-final & sentence-final position for 3 ethnic groups.

(a)



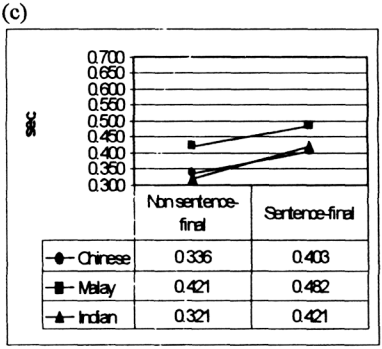

| | Non sentence-final | Sentence-final |
|---|---|---|
| Chinese | 147.42 | 125.29 |
| Malay | 187.00 | 145.58 |
| Indian | 146.50 | 121.46 |

(b)




| | Non sentence-final | Sentence-final |
|---|---|---|
| Chinese | 84.04 | 82.92 |
| Malay | 84.88 | 82.78 |
| Indian | 82.82 | 80.43 |

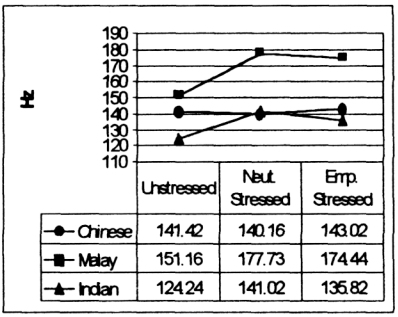
(c)




| | Non sentence-final | Sentence-final |
|---|---|---|
| Chinese | 0.336 | 0.403 |
| Malay | 0.421 | 0.482 |
| Indian | 0.321 | 0.421 |

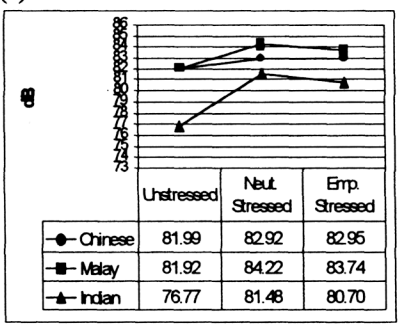
Fig 3. Means of (a) $F_0$, (b) amplitude & (c) duration of unstressed, neutrally stressed & emphatically stressed items for 3 ethnic groups.

(a)



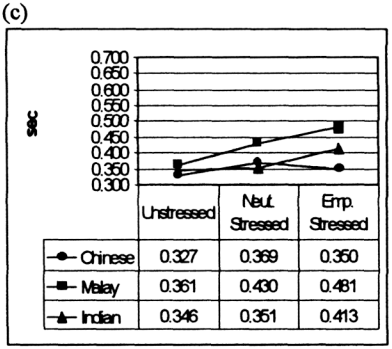

| | Unstressed | Neut. Stressed | Emp. Stressed |
|---|---|---|---|
| Chinese | 141.42 | 140.16 | 143.02 |
| Malay | 151.16 | 177.73 | 174.44 |
| Indian | 124.24 | 141.02 | 135.82 |

(b)




| | Unstressed | Neut. Stressed | Emp. Stressed |
|---|---|---|---|
| Chinese | 81.99 | 82.92 | 82.95 |
| Malay | 81.92 | 84.22 | 83.74 |
| Indian | 76.77 | 81.48 | 80.70 |

(c)




| | Unstressed | Neut. Stressed | Emp. Stressed |
|---|---|---|---|
| Chinese | 0.327 | 0.369 | 0.350 |
| Malay | 0.361 | 0.430 | 0.481 |
| Indian | 0.346 | 0.351 | 0.413 |

Table 1. Means of difference in $F_0$, amplitude & duration between unstressed & neutrally stressed items overall and in non-sentence-final and sentence-final position in 3 ethnic groups.

| | | overall | non-final position | final position |
|---|---|---|---|---|
| $F_0$/Hz | Chinese | 0.75 | 4.78 | 5.15 |
| | Malay | 21.93*** | 22.97* | 21.09** |
| | Indian | 13.53*** | 15.63*** | 11.84** |
| intensity/dB | Chinese | 0.87^ | 0.11 | 1.49** |
| | Malay | 2.32*** | 1.47** | 3.01*** |
| | Indian | 3.27*** | 2.74*** | 3.69*** |
| duration/sec | Chinese | 0.039^ | 0.014 | 0.057* |
| | Malay | 0.107*** | 0.070*** | 0.136*** |
| | Indian | 0.016 | 0.006 | 0.049 |

Table 2. Difference in $F_0$, amplitude & duration between neutrally stressed items in non-sentence-final & sentence-final position.

| | | NF v F |
|---|---|---|
| F0/Hz | Chinese | 22.13*** |
| | Malay | 41.42** |
| | Indian | 25.04*** |
| intensity/dB | Chinese | 1.12** |
| | Malay | 2.1*** |
| | Indian | 2.39** |
| duration/sec | Chinese | 0.067* |
| | Malay | 0.061* |
| | Indian | 0.100** |

Table 3. Difference in $F_0$, amplitude & duration between unstressed, neutrally stressed & emphatically stressed items.

| | | US v NS | US v ES | NS v ES |
|---|---|---|---|---|
| $F_0$/Hz | Chinese | 1.26 | 1.60 | 2.86 |
| | Malay | 26.57* | 23.28* | 3.29 |
| | Indian | 16.78*** | 11.58*** | 5.20 |
| intensity/dB | Chinese | 0.93 | 0.96 | 0.03 |
| | Malay | 2.30*** | 1.82*** | 0.48 |
| | Indian | 4.71*** | 3.93*** | 0.78 |
| duration/sec | Chinese | 0.042 | 0.023 | 0.019 |
| | Malay | 0.069*** | 0.120*** | 0.051 |
| | Indian | 0.005 | 0.067* | 0.062* |

Just-noticeable differences for perception of:
pitch: ~ 1Hz (80-160Hz) (Flanagan 1957)
intensity: ~ 0.5-1dB (Rodenburg 1972)
duration: ~ 0.01-0.04msec (Lehiste 1976)

*** : significant at $p<0.001$
** : significant at $p<0.005$
* : significant at $p<0.05$
^ : close to $p<0.05$