Intonation of angry and happy Singapore English acted speech  

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Intonation conveys multiple levels of information such as organizing word, phrasal, and turn boundaries, invoking implicatures and pragmatic meaning, and central to the interest of this work – expressing or even revealing cues about the emotions that a speaker may be experiencing [1], [2]. Though it may seem to be the case that emotions can be “taken to be more directly expressed intonationally” [2, p.223], for example, anger and happiness presenting themselves in intonation with a larger pitch range and steep falling pitch contours [3], [4], it is still unclear how these same emotions modulate intonation for speakers of different cultures and even different language varieties. As [5, p.4] noted, “the same kind of melodic rise or fall can be the result of different grammatical features or properties, assigned in different ways to prosodic constituents.” For Singapore English (SgE), this is even more complex. One needs to understand the ways in which intonation acts as a medium for emotion communication given Singaporeans’ multicultural and multilingual background. This throws into question as to whether the same intonational patterns and structure derived from studies primarily focusing on English-speaking counterparts in the Western world could still be applicable to Singapore English. Singapore’s population is made up of three main ethnic groups – the Chinese, Malays, and Indians. Studies have found that collectivism, which describes the three Asian communities, is correlated with less emotional expressivity norms as compared to Western countries that rank higher for individualism [6]. Furthermore, [7] reported ethnic differences among Singaporeans in the expression/suppression of disgust. In tandem with these cultural differences, research on the prosody of SgE has also found that the variety is “radically different” from Southern British English [1, p.453]. Some observations of these intonational differences that have been made include the tendency for phrase-final syllable and word prominence that is not necessarily realized by a change in pitch but rather in terms of lengthening and increase in loudness, as well as the possibility for multiple prominent syllables in the same tone group even when it is non-contrastive [8]-[12].

This work therefore is twofold. Firstly, it aims to present a first look at understanding the intonation produced by Singaporean actors in their portrayals of anger and happiness. Secondly, it aims to consider how SgE speakers of Chinese, Malay, and Indian ethnicity may perceive different emotions expressed from these intonations. An auditory perception test was conducted online using 26 stimuli (10 anger, 10 happiness, 6 neutral) acted by 12 Chinese Singaporeans from the VENEC corpus [13]. The corpus used two semantically neutral sentences of different word lengths as scripts. Respondents listened to each stimulus then rated the level of valence, arousal, and dominance they perceived based on a 9-point Likert Scale, as well as labelled the emotions in a Choose-All-That-Apply format.

256 eligible responses (167 Chinese, 48 Malay, 41 Indian) were analyzed for effects of ethnicity on the perception of anger and happiness in speech. The results so far showed that respondents, regardless of ethnicity, rated and labelled the anger and happiness portrayals similarly. Overall, anger portrayals were rated accurately for negative valence and respondents converged on what they perceived to be prototypical anger portrayal, with 60% rating it as most negative in terms of valence and 76% labelled it as “anger”. Recordings that were rated not as negatively for valence were also the same across the ethnic groups. Similar rating patterns were observed for happiness portrayals across all the ethnic groups, with 40% of the respondents rating the same recording as most positive. Figures 1 and 2 show the pitch contours for anger and happiness portrayals respectively. F0 measurements were obtained in semitones using ProsodyPro [14] on Praat [15] based a 10 time-step for each annotated interval to normalize the duration of each recording. Obstructs were excluded from the measurements to prevent interferences with the pitch tracking [16]. The ST-AvgF0 method in [17] was used to normalize sex-related pitch variation in relation to each speaker’s average pitch in each recording. Further analyses comparing the intonational qualities along with intensity and duration are currently in progress. The present results support the finding of a large pitch range in angry and happy speech. However, steep rising contours can also be observed for recordings that had congruent ratings. These results have
implications for understanding how SgE intonation varies and interact with emotional prosody as well as the relevant cues that SgE speakers use to distinguish emotional meanings from the other levels of meaning that intonation encapsulates.

![Figure 1: Pitch contours for anger portrayals (Normalized F0 in semitones. Contours in red: recordings that scored most negative in valence; in blue: recordings that scored least negative in valence).
](image1)

![Figure 2: Pitch contours for happiness portrayals (Normalized F0 in semitones. Contours in red: recordings that scored most positive in valence; in blue: recordings that scored least positive in valence).
](image2)

References


