

Prosodic cues in the perception of Cantonese sarcasm

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Verbal irony has generally been described as a rhetorical device for either implying the opposite of what the content is literally [2], or expressing a different meaning from what is said [7]. Sarcasm is referred to as one type of irony, the ironic criticism, that uses positive contents to deliver negative meanings [6].

A previous study suggested that prosodic properties such as pitch, duration, and amplitude were essential cues to distinguish sarcasm and non-sarcasm in Cantonese [3]. More recently, a perceptual study [4] compared how Cantonese and English speakers interpreted the sarcastic speech in their native and non-native language, indicating that acoustic markers such as the fundamental frequency (F0) played an essential role in recognizing sarcasm for Cantonese speakers. Except for [4], to our knowledge, no published research studied the prosodic cues of sarcasm in Cantonese from the perspective of speech perception. Furthermore, previous studies about the perception of the sarcastic intonation usually made use of the stimuli being produced by speakers with professional acting experience (e.g. [8]) or being validated to have the intended meanings (e.g. [3, 4]). Little is known about whether the listeners are able to distinguish sarcasm and non-sarcasm in more natural conversational condition. This study examined how prosodic features signal the sarcastic tone produced spontaneously in Cantonese and how well native Cantonese speakers can perceive them.

Six native Hong Kong Cantonese speakers, who were undergraduate students, were recruited to record the stimuli. They were provided with short scenarios with positive or negative situations commonly happened in daily life and produced the target utterances according to the contexts. There were two sets of target utterances, and within each set, the sentence structure was controlled. As exemplified in Table 1, the first set contained the utterances with a degree modifier, an adjectival phrase, and a sentence final particle. An intensifier /tsɛn˩hɛi˩/ ‘really’ was added to create the second set of the target utterances. To sum up, 96 target utterances including two attitudes (sarcastic and sincere) and two sentence sets (with and without the intensifier) were recorded. Twenty-six native Cantonese speakers participated in a perception task individually. The participants were asked to listen to the stimuli and rate for each target utterance on a 6-point Likert scale from 1 to 6 whether they perceived the sentence as being produced with a very sincere (1) or very sarcastic (6) tone of voice. In total, the rating scores from 2496 responses (96 target utterances × 26 participants) were analysed statistically. Two-way ANOVAs with repeated measures were conducted considering two factors: Attitude and the sentence Set.

The recorded utterances were analysed acoustically in Praat [1], and the results showed that, compared to the sincere production, sarcasm was significantly marked by a reduction in the speech rate, a lower mean F0, a lower mean amplitude, an enlargement of the amplitude-range, and an increase in the HNR (see Fig. 1). Fig. 2 summarizes the mean scores of the perceptual ratings for two attitudes across sets. A significant interaction between Attitude and Set was found ($F(1,623) = 8.314, p = .004$), together with main effects for the two factors: Attitude ($F(1,623) = 1096.497, p < .001$); Set ($F(1,623) = 57.344, p < .001$) in listeners’ ratings. Similar significant differences in listeners’ ratings between sarcasm and sincerity were found across sentence sets. This finding suggests that listeners were able to discriminate sarcasm from sincerity cueing by the prosodic features alone, since the sentence structure was controlled, and the only difference between the sarcastic and sincere utterances should be the speakers’ tone of voice. Additional examination was conducted across two sentence sets, showing that sarcastic utterances with the intensifier were rated significantly more sarcastic than those without the intensifier ($p < .001$). Possible explanation is that, in Cantonese, this intensifier was used frequently for expressing criticism [5], which may be considered as a semantic cue by the listeners in addition to the acoustic cues.

To conclude, prosodic features cueing the interpretation of Cantonese sarcasm by the native speakers were investigated. Extensive examination on how each of these acoustic variables is responsible for the perception of Cantonese sarcasm is currently underway. More participants are also needed to corroborate our current findings.

Table 1. Example of the contexts (1. negative; 2. positive) and the target utterances with English translations (a. sentence without intensifier; b. sentence with a target intensifier).

Contexts	
1.	What? Was yesterday the deadline for course registration? I thought it would be due today.
2.	It's raining. I know you have not taken your umbrella with you, so I bring one for you.
Target utterances	
a.	你好醒呀 [You are so smart]
b.	你真係好醒呀 [You are really (so) smart]

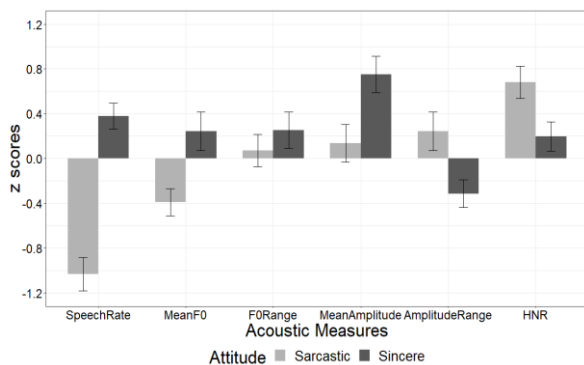


Fig.1 Mean values (z-scores) of the six acoustic variables across two attitudes. Error bars indicate the standard errors.

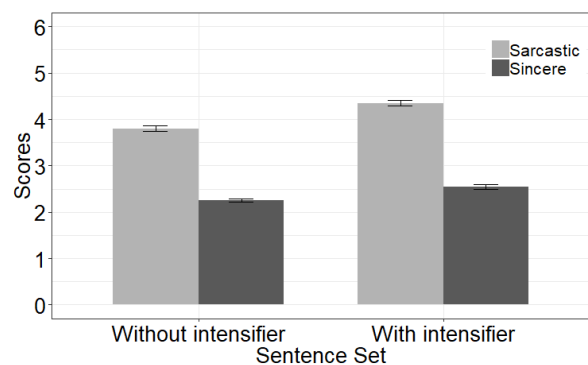


Fig.2 Mean rating scores of two attitudes across sentence sets. Error bars indicate the standard errors.

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