Perception and Analysis of Utterance-Final Lengthening of Cantonese ma:^{33}

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Nutshell: This paper investigates the perception of the Cantonese sentence final particle (SFP) ma:^{33}, and confirms that its two distinctive usages (formal question vs reasoning statement) can be perceived by native speakers in a response-choice task. Further analysis reveals that the duration of the statement particle is significantly longer, and can be analysed as the combination of SFP ma:^{33} and boundary lengthening :%.

Background: This paper explores the two distinct realisations of SFP ma:^{33} [1]. This SFP is known to have two meanings: it can turn a statement into a formal yes-no question, as in (1); and it can also be used to make a comment about the reason of something, as in (2).

(1) question **ma:^{33}**	(2) statement **ma:^{33}**
nej^{23} høj^{33} ma:^{33}	nej^{23} høj^{33} ma:^{33}
you go SFP	you go SFP
Are you going?	That is because you are going.

The same two morphemes can also be found in Mandarin, and the two can be distinguished by pitch [2]. Similar strategy is impossible in Cantonese. The two functions are quite distinctive and must be confusing if native speakers cannot distinguish the two.

Experiment: The goal is to establish that the two kinds of ma:^{33} can be perceived by native speakers, i.e. whether it is a question or a statement is not judged purely by context.

Task: Subjects (16 participants recruited) were asked to participate in a simulated instant messaging activity and their task was to choose the correct response to answer a friend's recorded message. In each trial, the subject would see a message written in Cantonese (displayed in Han characters) that was supposedly sent by the subject, and then the subject would hear a recorded message form a friend. Next the subject would be asked to respond to this friend by choosing the correct message from two available options.

Stimuli: There were 24 groups of sentences, presented in one of the four conditions below. Conditions *ama_S* and *A-not-A* were controls. Another 48 groups of fillers were added.

(3) (a) *ma_S*　　　　　　　kʰøj^{23} pu:n^{25}sɐn^{55} sɪk^{55} nej^{23} ma:^{33} …
　　　(b) *ama_S* (control)　kʰøj^{23} pu:n^{25}sɐn^{55} sɪk^{55} nej^{23} a^{55}ma:^{33} …
　　　　　　　　　　　　　　3.SG originally know you SFP
　　　That is because he knew you before.
　　　(c) *ma_Q*　　　　　　kʰøj^{23} pu:n^{25}sɐn^{55} sɪk^{55} nej^{23} ma:^{33} ?
　　　　　　　　　　　　　　3.SG originally know you SFP
　　　(d) *A-not-A* (control) kʰøj^{23} pu:n^{25}sɐn^{55} sɪk^{55}m̩^{21}sɪk^{55} nej^{23} ka:^{33} ?
　　　　　　　　　　　　　　3.SG originally know_AnotA you SFP
　　　Did he know you before?

The two choices were *answers* ("Yes, he knew.", valid for questions) and *doubts* ("Oh really?", valid for reasoning statements). The statements were recorded by a female speaker who were given an appropriate context so that the resulting recordings would be in expected intonations.

ma:33

Fig.1. *Answer* versus ***Doubt*** in subject response

Results

Subjects were expected to choose *answers* in response to the questions, and *doubts* in response to reasoning statements. That describes the general trend of the controls and the *ma_S* condition. The response type for *ma_Q* (that is question usage of the particle) was less clear, probably because some subjects found *doubts* would also be valid responses.
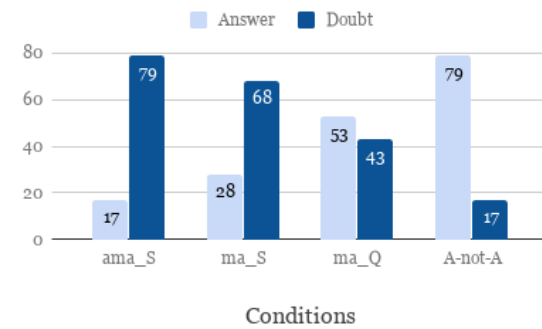
Discussion: One would expect chance-level performance (i.e. 48-48 for both *ma_S* and *ma_Q*) if the two were not distinctive. The experiment showed that this distinction is categorical and can be perceived by native speakers.

Post-hoc analysis of the distinction of the two particles: Recorded stimuli (48 recordings) were analysed to confirm the difference between the two usages. Both question and statement usage of ma:^{33} show slight declination (a drop of less than 5Hz for both questions and statements), and the statement usage is significantly longer than question ma: (statement ma: μ=470ms, S.D.=39.2; question ma: μ=198ms, S.D.=28.4).

Proposal: The difference between (1) and (2) is purely durational. SFPs are systematically lengthened as a result of the realisation of the boundary lengthening morpheme :**%**, which causes lengthening of the last syllable of the utterance. This can be controversial since boundary tones are usually not compatible with SFPs, e.g. interrogative **H%** cannot occur with any SFPs. I argue that the incompatibility is solely due to syntactic restrictions.

Implications: Cantonese has a dense specification of tones, and it is likely that the temporal dimension is used as an alternative to F0 for intonation morphemes. This study confirms the impressionistic description about the "protracted intonation" [3], which should be added to the boundary tone inventory, detailed in Cantonese ToBI [4]. The grammaticality of the co-occurrence of boundary tones and SFPs can be used to ascertain the hierarchical structure of the left periphery [5]. If this lengthening (:%) is analysed as an intonation morpheme that heads a projection, then one needs to explain why it occurs after ma:^{33}, which is supposed to be the highest projection (AttitudeP)[6]. One either needs to analyse ma:^{33} as a syntactically lower element, or assume other higher projections. Syntactic analysis of the left periphery would certainly benefit from further investigation of boundary tones in other SFP languages.

References

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