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1aSCa4.   Preliminary observations of phonetic characteristics cuing turn continuation in spoken Mandarin

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  One of the grossly apparent facts about conversation is that speakers take turns to talk (Sacks, Schegloff & Jefferson 1974). Both syntactic and prosodic cues contribute to the smooth transition between conversational turns (Couper-Kuhlen & Ford 2004, Ford & Thompson 1996). Two prominent and similar turn-holding devices have been identified, namely, rush-through (Schegloff 1982, 1998) and latching (Liddicoat 2007), which enable speakers to bid for turn continuation beyond possible completion of a turn. However, systematic and detailed examination of their exact phonetic design has been reported only recently for the English data (Walker 2003, 2010). In this study, data from naturally-occurring Mandarin Chinese conversations have been examined for prosodic correlates which are associated with turn continuation. These correlates include pitch variation, intensity, and vowel duration. It is found that prosodic cues vary between the two turn-holding devices. The findings have also been compared with those reported for English conversations. This research contributes to cross-linguistic investigation of the prosody that constitutes turn-holding functions in conversation.

1. Introduction

One of the most apparent facts about conversation is that speakers take turns to talk (Sacks, Schegloff & Jefferson 1974). Turn-taking management is localized at the possible completion of a turn-constructional unit (TCU). Both syntactic and prosodic cues from a TCU-in-progress help to signal whether the turn is coming to its completion (Couper-Kuhlen & Ford 2004, Ford & Thompson 1996). For instance, longer duration or slow-down is observed as one of the perceptual cues associated with TCU completion in English and Mandarin Chinese (Local, Kelly & Wells 1986, Ford & Thompson 1996; Tao 1996; Li 2011). Speeding up near TCU ending is associated with turn continuation in English (Schegloff 1982, 1987, 1998; Walker 2003, 2010). This paper reports on phonetic practices of turn continuation in spoken Mandarin. Such practices are referred to as 'rush-through' (Schegloff 1982, 1987, 1998) and 'latching' (Atkindson & Heritage 1984, Hutchby & Wooffitt 1998, Liddicoate 2007) in the literature of Conversation Analysis (CA).

'Rush-through' refers to speeding up the pace of talk and continuing into the next TCU without any gap. 'Latching' refers to contiguous talk which is heard without any gap either between two turns by separate speakers, or between two TCUs in a turn by the same speaker. This second use refers to a phenomenon similar to rush-through. However, a rigorous analysis of the exact phonetic design of rush-through is not available until Walker's (2003, 2010) studies based on English conversation. By examining characteristics of rush-through with regard to duration, juncture and pitch, he concludes that "it is the co-occurrence of close juncture with localised speeding-up around the possible end of a TCU which are the hallmarks of a rush-through", and that pitch seems to play no role (Walker 2010:65). In the following we present the findings from a phonetic analysis of rush-through and latching in Mandarin conversation. These two closely related phenomena are found to accomplish similar interactional activities (Barth-Weingarten 2009; Zhang 2012). The focus of this study is to determine their phonetic features in Mandarin conversation.

2. Data and methodology

The data for this study is collected from 11 dyadic Mandarin conversations between college colleagues and graduate students, totaling approximately 5 hours of recordings. To control the environment for measuring latching and rush-through, we focused on TCUs which were followed by another unit started with the connective *yin1wei4* 'because' which is produced by the same speaker. Ninety-three instances were identified, from which 67 were excluded due to reasons such as overlapping talk or poor sound quality, resulting in 26 instances examined for this study. Based on impressionistic listening, these instances were first classified into 3 groups, namely, rush-through (6), latching (14) and normal[1] (6). The phonetic design of each group was then examined using Praat (Boersma & Weenink 2012). As rush-through and latching refer to phonetic practices around TCU endings associated with turn continuation, our target is the last word in the pre-*yin1wei4* "because" TCUs. The last syllable of these words is examined on its temporal and spectral characteristics such as syllable duration and pitch variation. Word duration is measured in each TCU. The average duration of syllables is calculated and used to calculate the normalized duration of a word within a particular TCU. A ratio was then obtained between the actual word duration of a target and its normalized duration. Pitch variation is calculated by measuring the pitch differences between the F0 offset of a target and the F0 onset of the following word.

3. Preliminary results and discussion

Among the 26 cases, the normal group exhibit a perceptually and acoustically noticeable gap between the pre-*yin1wei4* 'because' TCU's end and the start of the *yin1wei4* 'because' clause. In contrast, such gap is absent in the latching and rush-through groups. Results and discussion of word duration from the three groups are presented as follows, and those on pitch variations and vowel reduction are presented and discussed by each group.

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[1] The non-latching/rush-throughs are referred to as "normal" for convenience.

In general, mean word durations for the three groups are: 390ms for normal, 350ms for latching, and 270ms for rush-through. Mean durations are then used to calculate the normalized duration for each pre-*yinwei* 'because' TCU. A ratio is then obtained between these two for cross-speaker and cross-group comparisons. A value of the ratio greater than 1 suggests a lengthened target compared with the rest words in the context; and a smaller-than-1 value indicates a shortened target. An illustration of the ratios obtained from three groups is shown in Figure 1. As expected, rush-through examples show a ratio smaller than 1, suggesting that targets in this group are much shorter on average than other words in the same TCU. Latching and normal groups both show a ratio greater than 1, suggesting that targets in these groups are much longer on average than other words in the same TCU. T-tests on ratios between the three groups reveal significant differences between rush-through and normal groups (t=3.94, df=6, p=0.0028, effect size r=0.75), and between rush-through and latching groups (t=3.43, df=18, p=0.003, effect size r=0.69). No significant difference is found between latching and normal groups (t=0.174, df=18, p=0.86, effect size r=0.047). The results confirm the classification of latching and rush-through examples based on impressionist listening to the temporal cues.
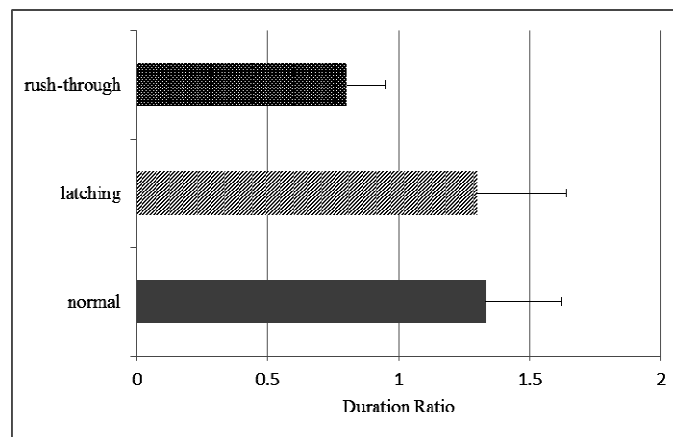

Figure 1. Mean ratio of target words' actual durations to their normalized durations

3.1 Rush-through

Similar to rush-throughs in English, a localized speed-up is observed in our rush-through group where the last syllable of the TCU is much shorter compared with the mean duration of syllables in surrounding contexts. The vowel in the last syllable is therefore often reduced rather than fully articulated. However, no 'cut-offs', or abrupt stop, is observed with the "rushed-vowel" which is unlike the shortened syllables resulting from repair (Schegloff, Jefferson & Sacks 1977; Jasperson 2002).

The other feature of the rush-through group is the temporal proximity at the juncture of pre- and post-rush-through TCUs. Similar to the findings from English conversations, temporal proximity is exhibited in voicing maintained across the juncture when the pre-rush-through unit ends with a sonorant and the post-rush-through begins with a sonorant. Figure 2 below shows rush-through between *wen4ti2* 'problem' and *yin1wei2* 'because'.
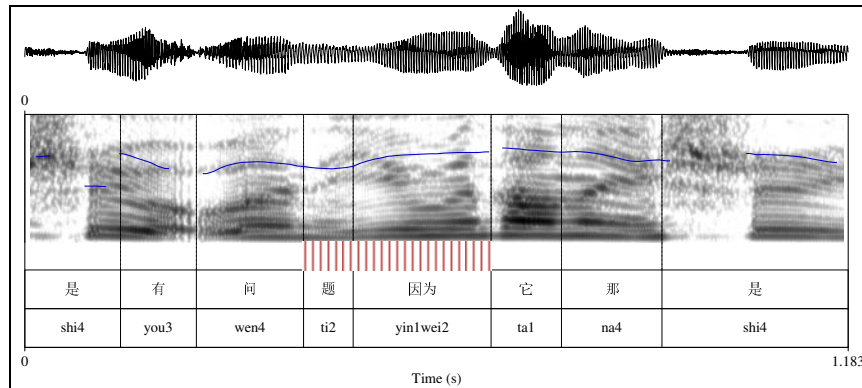
Figure 2: Waveform and spectrogram of a rush-through instance. The striped section is where the juncture is. The solid line in the spectrogram indicates f0.

The characteristics that can be seen include (1) shortened second syllable *ti2* (95ms compared to the mean syllable duration at 150ms) in the last word *wen4ti2* 'problem' in pre-rush-through talk and (2) the fusion of the vowel [i] and the approximant [j] across the juncture of two TCUs. The vowel in *ti2* is reduced in both duration and pitch range (f0 from 211Hz at onset to 230 Hz at the offset), so that continued articulation gets smoothed into the first syllable of the next word *yin1wei4* 'because' (235Hz at f0 onset). The boundary between these neighboring syllables at the juncture is hardly discernible acoustically or perceptually.

In sum, the phonetic characteristics, especially the speeding up of the last syllable of a possibly complete TCU, are good indication that the speaker's intention to keep the turn for further talk is displayed just before he/she reaches the current TCU's end. Preparing for entering the next TCU in advance may help gain an advantage in getting into the next unit earlier than anticipated, and therefore ensure continued speakership.

3.2 Latching

Lathing between two units of the same speaker's talk is impressionistically similar to rush-through. However, no systematic phonetic analysis seems available. The findings from our Mandarin data suggest that it shares with rush-through the temporal proximity in that the articulatory characteristics of vowels at the juncture of pre- and post-latching is similar to those of rush-through. However the difference is in duration. While the last syllable of pre-rush-through unit is noticeably shortened, this characteristic is absent in latching. Rather, the duration of the last syllable in pre-latching may show slow-down as with normal TCU completion, and its vowel is usually fully articulated. In some cases, the length of the last syllable of the pre-latching talk may not have an obvious slow-down but it is still not longer, or just a little shorter, than the mean syllable duration of the carrying TCU. Figure 3 below shows latching between *qu4-bu-qu4* 'go-not-go' and *yin1wei2-1* 'because'.
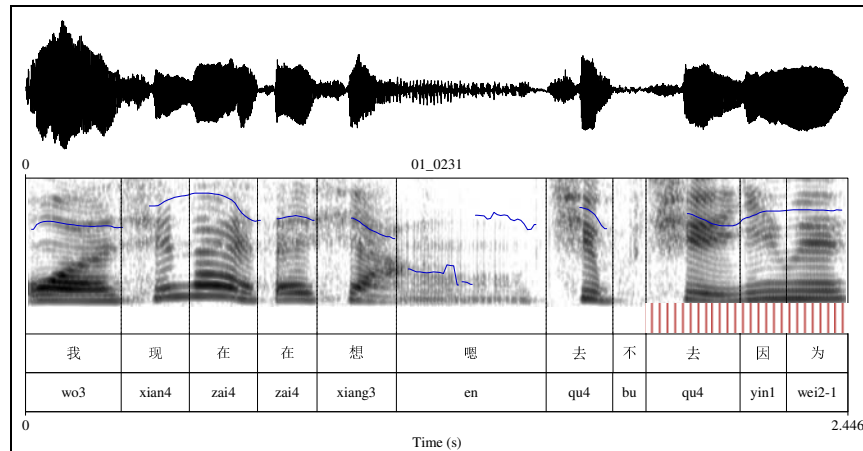
Figure 3: Waveform and spectrogram of a latching instance. The striped section is where the juncture is. The solid line in the spectrogram indicates f0.

It can be seen that (1) the second *qu4* 'go', which is the last syllable in pre-latching, is much longer (279ms) than the first *qu4* 'go' (198ms) in the A-not-A question format, and is longer than the mean syllable duration (222ms) of the TCU that carries it, and (2) no "pause" is observed at the juncture. Perceptually, the second *qu4* 'go' is long but incomplete. Its pitch does not drop as expected at utterance boundary. Moreover, *qu4* bears a high falling tone, but the pitch range of the second *qu4* (303Hz at f0 onset, 232Hz at f0 minimum, and 243Hz at f0 offset) is much narrower than that of the first one(329Hz at f0 onset and 217Hz at f0 offset). Pitch variation of the second *qu4* maintains at a relatively high f0 range and continues into the next syllable, *yin1* (the first syllable of *yin1wei2* 'because') that bears a high level tone (235Hz at f0 onset).

These phonetic characteristics of the pre-latching show no particular cues for turn continuation (except perhaps the pitch) until the start of the post-latching which is produced with such articulatory characteristics that by compressing the space allowed for turn transition, the speaker of the pre-latching may still gain a little advantage in "interdict" (Schegloff 2005:470) any incipient speakers.

3.3 In-between cases

We also found that some cases seem to stride between rush-through and latching. Although they are not included in the 3 groups we examined, one such case is presented in Figure 4 below. The duration of the last syllable *yue4* at 120ms in the last word *huo2yue4* 'active' of the first TCU is similar to the mean syllable duration at 123ms, showing a non-rush-through characteristic. However, if compared with the duration of first syllable of the word, *huo2* at 186ms, *yue4* is shorter on the spectrogram and to the ear. This is a characteristic typical of a rush-through. However, further study is needed for a better account of such cases.
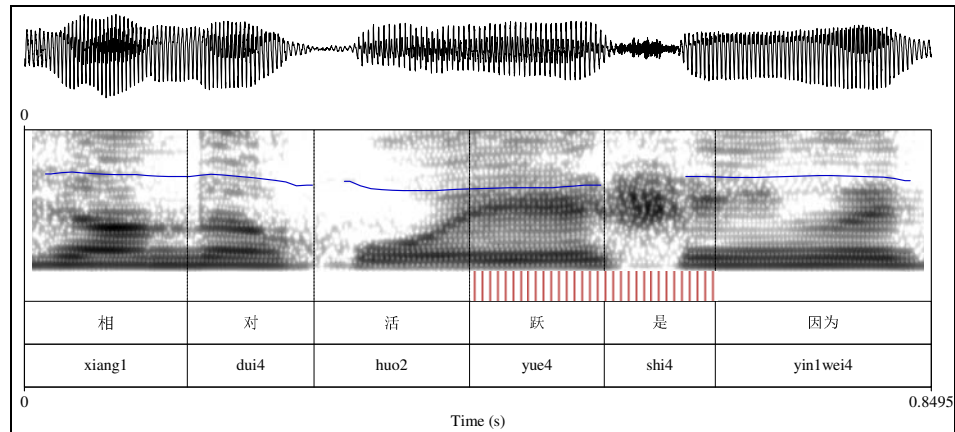
Figure 4: Waveform and spectrogram of an intermediate instance. The striped section is where the juncture is. The solid line in the spectrogram indicates f0.

Another point of interest of Figure 4 is the role of pitch. The syllable *yue4* bears a high-falling tone, but is instead maintained relatively level at a high f0 range (209Hz at f0 onset and 216Hz at f0 offset). This lack of pitch change may be the speaker's preparation for the next syllable *shi4,* the tone of which is also high falling as it starts at 255Hz at f0 onset. The pre-latching syllable *qu4* in Figure 2 exhibits a similar pitch characteristic. As Mandarin is a tone language, pitch contours of its tones interact with intonation (Chao 1968). Although Walker (2010) finds that pitch plays no role in rush-through in English, our example suggests that pitch may play a role in turn-holding which is different from that in a non-tonal language such as English.

4.   Conclusion

Our study has aimed at examining phonetic cues to rush-through and latching used by Mandarin speakers to signal turn continuation when a turn is reaching or has reached a possible completion point. Similar to the findings from English (Walker 2003, 2010), rush-through in Mandarin is characterized by localized speed-up at the last syllable of TCU endings, and articulatory characteristics that run across the juncture of pre- and post-rush-through talk. Latching, conversely, does not exhibit localized speed-up at the last syllable of pre-latching. But it shares with rush-through the compression of transition space by phonetic correlates that span across the juncture where the first syllable of a next TCU is latched onto the last syllable of the pre-latching TCU. In our future study, more systematic investigation can be made to look into the role of pitch in rush-through and latching in a tone language such as Mandarin Chinese.

Acknowledgements

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