How does prosody distinguish Wh-statement from wh-question in Shanghai Chinese

Bijun Ling

Tongji University (China)
lingbijun@tongji.edu.cn

It has been widely acknowledged that wh-phrases in many languages (e.g. Chinese, Japanese, Korean) are ambiguous between interrogative and indefinite interpretations. Although wh-words can have different interpretations, the interpretation of wh-words in each sentence is in general unambiguous, as the different interpretations are connected to different licensors. Take Standard Chinese for example, in the absence of overt licensors, a wh-word like jǐ is typically interpreted as an interrogative word ('how many') and the sentence is a wh-question, as (1a); the indefinite interpretation of the wh-word jǐ ('several, many') has been shown to be licensed by sentences containing negation (1b), conditionals (1c), epistemic modalities (1d) or by yes-no questions (1e) (Yang et al., 2020) .

(1a) tā mǎi-le jǐ běn shū?
he buy-ASP how many m.w. book
How many books did he buy?

(1b) tā méi mǎi jǐ běn shū.
he not buy several m.w. book
He didn't buy many books.

(1c) rúguǒ tā mǎi-le jǐ běn shū, wǒ huì hěn kāixī.
if he buy-ASP several m.w. book, I will very happy
If he bought several books, I will be very happy.

(1d) tā hǎoxiàng mǎi-le jǐ běn shū.
he seem buy-ASP several m.w. book
He seems bought several books.

(1e) tā mǎi-le jǐ běn shū ma?
he buy-ASP several m.w. book Q-particle
Did he buy several books?

Though most cases of wh-words are unambiguous, there are a few instances where the wh-word is in fact ambiguous between a declarative and question interpretation, as illustrated in (2).

(2) Zhāng Sān mǎi-le jǐ běn shū gěi Lǐsì
Zhang San buy-ASP *how many/several* m.w. book for Lisi

(2a) How many books did Zhangsan buy for Lisi? [wh-question]
(2b) Zhangsan bought several books for Lisi. [wh-statement]

With ambiguous sentences like (2), the question arises how can the wh-question be distinguished from the wh-statement? Previous studies have demonstrated that prosody interacts with wh-phrases in languages like Japanese (Ishihara, 2007), Korean (Jun & Oh, 1996), German (Truckenbrodt, 2013) and Standard Chinese (Yang et al., 2020) in that wh-interrogatives manifest phonetic prominence whereas wh-indefinites do not. Furthermore, wh-questions in Japanese and Korean are also characterized by a post-wh-word de-phrasing, namely, a deletion of accentual phrasings following the wh-word, but there was no sign in Standard Chinese or Germany. In order to further our understanding of syntax-phonology interface, the paper aims to investigate how Shanghai Chinese speakers refer to prosodic cues in differentiating the ambiguities between jǐ-interrogative and jǐ-indefinite.

Shanghai Chinese, a Wu dialect, has five citation tones and they undergo sandhi changes when syllables are combined into words or phrases, as illustrated in Table 1. Furthermore, Selkirk & Shen (1990) proposed three types of prosodic units in Shanghai Chinese (prosodic word, prosodic phrase and intonational phrase) and the mapping rules between syntax and prosodic units.

The unique prosodic features make Shanghai Chinese an interesting case for the study of the semantics-prosody interface and syntax-phonology interface. Our research questions are as follows:

(1)When statements are string identical to questions, how do speakers use prosodic cues to disambiguate wh-questions from wh-statements in Shanghai Chinese? Specifically, does the

process modify the prosodic phrasing like in Japanese and Korean or maintain the same prosodic structure like in Standard Chinese ?

(2) When there are overt licensors and the interpretation of wh-words is unambiguous, do speakers still use different prosodic cues to represent wh-questions and wh-statements? Essentially, wh-word interpretations are disambiguated only depending on syntactic licensors or on prosody as well?

Table 1: the value of citation tones and sandhi tones (using Chao's five-level numerical scale, which divides a speaker's pitch range into five scales with 5 indicating the highest and 1 the lowest).

Register	Duration			Citation tone	Sandhi tone	
	long [CV(N)]		short [CV?]		T+X	T+X+X
				T1 53	55+31	55+33+31
high	T1[HL]	T2[MH]	T4[H]	T2 34	33+44	33+55+31
low		T3[LH]	T5[LM]	T4 55	22+44	33+55+31
	falling	rising		T3 13	33+44	22+55+31
	Contour			T5 12	11+13	11+22+13

Based on our production data, wh-statements are lower in F0 and smaller in F0 range than wh-questions at the wh-word and there is a F0 range compression in the post-wh-word region in wh-questions. An implication of this study shows that wh-words are foci in wh-questions but cannot be foci in wh-declaratives. Therefore, we conclude that the F-feature that is treated as lexically inherent to wh-words in Truckenbrodt (2013) is however claimed to be unspecified in Shanghai Chinese. Furthermore, wh-word interpretations are disambiguated mainly depending on syntactic licensing conditions, whereas prosody might serve a subsidiary role.

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