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Mandarin is a wh-in-situ language, in which wh-words remain at their base position just as their declarative counterparts do, and hence Mandarin has no wh-movement to type the clause as a wh-question. Mandarin is also known to be a wh-indeterminate language, in which wh-words like shénme can have both interrogative (‘what’) and non- interrogative interpretations (e.g. existential interpretation, ‘something’), but unlike other wh-indeterminate languages like Japanese and Korean, Mandarin has no particles to license the interpretations of the wh-indeterminates. Due to the wh-in-situ and wh-indeterminates nature of Mandarin, clausal typing in Mandarin and the licensing of Mandarin wh-indeterminates have long been two intriguing topics in the fields of syntax and semantics. Different from traditional studies, this dissertation investigates the licensing of Mandarin wh-indeterminates and the clausal typing of sentences containing them from the perspective of prosody and processing. To better explore the topics, a variety of methodologies are adopted in this dissertation, including production / acoustic study, audio-perception /gating paradigm, self-paced reading and electrophysiological means. These diversified empirical studies provide evidence for the role of prosody in clausal typing in Mandarin, based on which an extended clausal typing hypothesis is proposed; the licensing evidence and constraints of wh-interrogatives (e.g. ‘what’) and wh-existentials (when wh-words have existential interpretations, e.g. ‘something’) are also explored in Mandarin, the two most frequently used interpretations of wh-indeterminates.

This dissertation consists of seven chapters. Chapter 1 briefly introduces the background of the main research issues to be discussed, lays out the research questions and provides an overview of the dissertation.

Chapter 2 investigates the prosodic markings of wh-questions and wh-declaratives (declaratives containing wh-words interpreted as wh-existentials, which are string identical to wh-questions in our study) through a production experiment on native Mandarin speakers from Beijing. The fine-grained analysis of the audio recordings demonstrates that wh-declaratives differ from wh-questions in terms of different prosodic properties such as duration, F0, F0 range and intensity range. It shows that already from the clause onset the two clause types already show prosodic differences. In particular, wh-declaratives are longer than wh-questions in terms of duration starting from the subject and the pattern reverses at the wh-word; wh-declaratives 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. Wh-declaratives show larger intensity range than wh-questions at the verb and the pattern reverses at the wh-word. The production study in this chapter demonstrates that prosody is indeed utilized in clausal typing.

Based on the results of Chapter 2, Chapter 3 further explores whether listeners can identify as well as anticipate the clause types (wh-questions and wh-declaratives) based on prosodic cues only. This chapter reports an audio-perception experiment, in which participants were asked to listen to a sentence (containing wh-questions or wh-declaratives) and complete a dialogue. The audio-perception study includes an
audio-gating experiment, where the audios of sentences (wh-questions or wh-declaratives) are segmented into different lengths of fragments / gates for listeners. The audio-gating experiment investigates whether participants can anticipate clause types before hearing the wh-word and if so, at which gate they succeed in doing that. The results of the audio-perception and gating experiment show that 1) Participants can make use of prosody to differentiate the two clause types; 2) Starting from the onset of the first word of the sentence (wh-question or wh-declarative), participants already demonstrate a preference for the clause type that was intended by the speaker. Moreover, the more listeners hear of the sentence, the more accurate their anticipation for the clause type becomes.

Chapter 4 discusses the licensing of the existential interpretation of wh-indeterminates (i.e., wh-existentials) in Mandarin. Wh-existentials have been considered to be licensed only in non-veridical contexts in previous literature, for instance, in contexts containing non-veridical operators such as negation, questions, conditionals and epistemic modalities, in which the truth of a proposition cannot be entailed in the sentence. In this chapter I challenge this claim, by demonstrating that Mandarin wh-existentials can also be licensed in veridical contexts. I focus on the investigation of veridical wh-sentences containing diǎnr ‘a little’ and discuss the licensing of wh-existentials with diǎnr. I conducted a sentence reading experiment where participants read veridical sentences containing wh-indeterminates with and without diǎnr and the results show that wh-sentences containing diǎnr are ambiguous between wh-questions and wh-declaratives. This provides empirical evidence that wh-existentials can also be licensed in veridical contexts. In order to further shed light on the licensing conditions of diǎnr on wh-existentials, a special gate in the gating study was designed. The result of this gating study shows that listeners are reluctant to interpret a wh-word as a wh-existential when the verb and diǎnr are separated into different prosodic domains.

I discuss the licensing of Mandarin wh-interrogatives in Chapter 5. I conducted self-paced reading studies on Mandarin simplex wh-questions (containing simplex wh-words such as ‘who’) in comparison with their declarative counterparts containing ‘someone’, and on complex wh-questions (containing wh-words such as ‘which x’; also known as discourse-linked wh-words) in comparison with their declarative counterparts containing ‘an x’. The results show that questions are processed with a higher cost than declaratives, providing empirical evidence for covert dependency between the in-situ wh-word and the Spec-CP or C' domain. This study also implies that complex wh-questions are processed differently from simplex wh-questions due to the discourse-linking property of the former.

In Chapter 6 I report the results of two ERP experiments and provide electrophysiological evidence for the role of prosody in clausal typing during online sentence processing. As the audio-perception study (Chapter 3) shows that listeners can identify wh-questions and wh-declaratives accurately by hearing the wh-word, in the first ERP Experiment, I cross-splice audio-recordings of wh-questions and wh-declaratives from wh-words onwards and test wh-declaratives (D), wh-questions (Q) and their cross-spliced conditions D-Q and Q-D, all preceded by contexts biasing towards the clause type of the pre-wh-word region. Furthermore, as our audio-gating study (Chapter 3) shows that listeners can anticipate clause types by hearing the sentence beginning (e.g. subject), the second ERP experiment manipulates the
congruity between contexts biasing *wh*-questions (Q) / *wh*-declaratives (D) and target sentences of *wh*-questions (Q) / *wh*-declaratives (D). Electrophysiological results of both experiments reveal (early) prosodic negativities, indicating an early detection of clause type incongruity based on prosody during online sentence processing; but the negativities are only found in the incongruent condition of D-Q, which implies a different accommodation in processing the incongruities.

Lastly, Chapter 7 returns to the research questions raised in Chapter 1 and summarizes the main findings of the dissertation. At the end of this chapter, I conclude this dissertation and provide suggestions for future work.