1. Introduction

Wh-movement languages (e.g., English) - The position of wh-phrases determines their scope.

(1) Did Mary say [if what John bought (t)]? (Embedded scope-YNQ)
(2) What did Mary say [if John bought (t)]? (Matrix scope-WHQ)

Wh-in-situ languages - The position of wh-phrases does NOT determine their scope. Sentences with wh-phrases are ambiguous between a Yes-No question reading and a wh-question reading.

(3) Bill-who Mary-nom-who asks Q asked-Q
Embedded wh-scope reading (YNQ): “Did Bill ask who Mary met?”
Matrix wh-scope reading (WHQ): “Who did Bill ask whether Mary met?”

To disambiguate, prosodic cues are utilized in these languages (Wu, 2017; Wang, 2017; 1.559; 1.73; 1.604; 0.929; 0.826; 1.45). Two factors were asked.

- To disambiguate, prosodic cues are possible in Wh-in-situ languages such as Mandarin, Japanese, and Korean.

2. Research Question

A. Similar to Japanese and Korean, will Chinese speakers use prosodic cues in order to disambiguate wh-scope in the ambiguous sentences as in (4)?
B. Will the same prosodic strategies be used to disambiguate wh-scope in production and perception?
C. Does the syntactic position of wh-phrase play a role in interpretation preference?

3. Experiments

3.1. In-situ wh-questions
- Production test
- Perception test
- Scrambled wh-questions
- Comprehension test
- Production test

3.2. Scrambling of wh-phrases are possible in Wh-in-situ languages such as Mandarin, Japanese, and Korean.

3.3. Experiment 1 – production test

Stimuli - Controlled syntactic factors
- Position of wh-phrases: subject vs. object
- Type of wh-phrases: regular wh-phrase vs. D-link phrase
- Embedded clause type: default question vs. not-as question
- Two contexts leading to embedded and matrix interpretations of wh-phrases
- 32 target sentences: 4 sets consisting of 8 sentences (±2×2×2)
- 64 sentences (32 targets + 2 interpretations) were recorded

An annotated example

Context (matrix scope)

Wang Qiang is a fashion leader and has influenced the fashion trend several times. Last night, your friend saw a TV interview of Wang Qiang by a journalist, Li Hua. By watching the interview, your friend learned some fashion trends that Wang Qiang has influenced. Suppose that you are chatting with your friend now and you want to know which fashion trends Wang Qiang has influenced.

Target sentence Q: Li Hua wen-guo Wangqiang tingxiang-guo shenme? "What did Wang Qiang influence has influenced?"
A:悬挂年
S: Korean wave
Context (matrix scope)

Wangqiang de sheji zai hangguo mingsheng hen hao. Wangqiang DE design in S. Korea reputation very good

Procedure
- 16 native Mandarin speakers participated in this experiment.
- First, they were asked to read each context silently;
- Then, they read the target sentence aloud;
- The target sentences were recorded twice.

3.4. Experiment 2 – perception test

Stimuli - The same target sentences in Experiment 1
- A Mandarin native speaker recorded two versions of every target sentence by using prosodic strategies observed in Experiment 1.
- 64 target sentences with 112 fillers were distributed across 4 sets in a Latin Square Design.

Procedure
- 30 native Mandarin speakers participated in this experiment.
- They were asked to complete a forced choice task after listening to an audio file.
- The two choices in the task corresponded to the two interpretations (matrix and embedded).
- The specific context was not given in order to exclude the effect of context.
- Quadratic was used in the experiment.

Results
- Prosodic cues observed in the production test do not play a role in perception disambiguation.

3.5. Experiment 3 – comprehension test

Stimuli - Modified from the same target sentences in Experiment 1
- Added syntactic factor: landing site of wh-scrambling
- Left edge of embedded clause (Short Distance Scrambling), left edge of matrix clauses (LDS)
- Removed factor: subject / object positions of wh-phrases

Procedure
- 30 native mandarin speakers participated in the experiment.
- Similar to Experiment 2, except that no audio recordings are played before forced choice tasks.

Results
- Scrambling wh-phrases increased the preference of matrix scope reading.

4. Discussion and Conclusion

4.1. A recap of experiment findings

- In-situ wh-questions
- Production test — Exp. 1: matrix scope, large pitch discussion on wh-phrases
- Perception test — Exp. 2: large pitch discussion not observed
- Scrambled wh-questions
- Comprehension test — Exp. 3: scrambled wh-phrases, matrix scope more likely
- Production test — Exp. 4: scrambled wh-phrases, prosodic emphasis less likely

From experiment 1 and 2

- There is a mismatch between speakers’ encoding and hearers’ decoding of wh-scope information in Mandarin.
- As a tone language, Chinese is typologically different from Japanese and Korean. The large pitch discussion is the only significant indicator of scope in Mandarin, which is possibly due to the need of tone preservation.

From experiment 3 and 4

- Overall syntactic movement of wh-phrases increased the likelihood of matrix scope interpretation
- Prosody and syntactic position are two cues for scope disambiguation. Under wh-in-situ conditions, prosodic cues are utilized to signal scope. When wh-phrases are scrambled, prosodic cues might not longer be necessary, under the economy view.

Next step

Since morphological information and syntactic information can affect wh-scope processing, it would be interesting to explore the predictive power of Mandarin sentence final particles –me and –ne.

5. Selected References