Predicting referents based on structural meaning – The case of the Mandarin Chinese *bǎ*-construction

Johannes Gerwien (Heidelberg University)

The characteristics of the Mandarin Chinese *bǎ*-construction allow to hypothesize an exceptional processing strategy in event comprehension: Besides other functions, the marker *bǎ* changes the canonical word order S-V-O to S-*bǎ*-O-V; it marks the noun to which it belongs as the direct object (cf. Yang & van Bergen 2007), and it signals that the corresponding referent must be interpreted as having changed from one state to another (cf. Li & Thompson 1981). The quality of the referent's initial and resultant state, however, is specified by the sentence-final verb. Thus, the *bǎ*-construction offers a unique case to study the online comprehension of structural meaning (temporal and causal relations) independent of content meaning. Can referent states be activated before they are qualitatively specified? While listening people use the current linguistic input to predict upcoming discourse (cf. Altmann & Mirković 2009). We hypothesized that the function word *bǎ* triggers predictions about the referent following it as an affected object.

In a visual world paradigm, we measured saccade-onset times directed to target objects under 2 conditions: In the critical condition, an auditorily presented target noun followed *bǎ*, whereas in the control condition it followed *de*, a possessive marker in our context. This yielded sentence pairs such as *tā bǎ xiǎoshuō sī huài le/tā de xiǎoshuō bèi sī huài le* ('He *bǎ* novel rip apart' / 'He *de* (=His) novel was ripped apart'). The visual stimuli always showed three objects, one of which was unambiguously depicted in a resultant state, e.g., a deformed plastic bottle (see Fig. 1). There were 12 *bǎ*/*de* stimulus pairs in total and 12 fillers. 26 Mandarin native speakers participated in the experiment. Two experimental lists ensured that every subject encountered only one pair-partner, 6 from each condition (but all fillers). The participant's task was to click on the object mentioned in the sentence. Our analyses revealed a reliable effect: There were significantly more pre-noun target-saccades in the critical condition (*bǎ*) compared to the control condition (*de*). Furthermore, the cumulative proportions of first target-saccades increased significantly more rapidly (see Fig 2).

Results of a second experiment confirm these findings and rule out alternative explanations. Only sentences like those in the critical condition in experiment 1 were used (He *bǎ* noun …). The nouns matched a visual target that this time was not depicted in a resultant state. Instead an irrelevant visual resultant-state competitor (torn book) was either present (critical), or not (intact book) (control). Participants looked faster to the target if the resultant-state competitor was not present. In addition, more and longer looks were registered to the competitor in the critical condition than in the control condition.

These findings suggest that processing *bǎ* activates an abstract, that is, a qualitatively unspecified representation for an affected object in the comprehender's situation model. This representation interacts with the *visual* input, and leads to predictions about the *linguistic* input. We interpret predictions on the basis of such type of structural information as a special kind of incremental processing which has not been reported previously.

Figures

Fig. 1: Example stimulus: bottle = second-state target object (flip-flops/stool = distractors); Note the position of targets varied over different trials

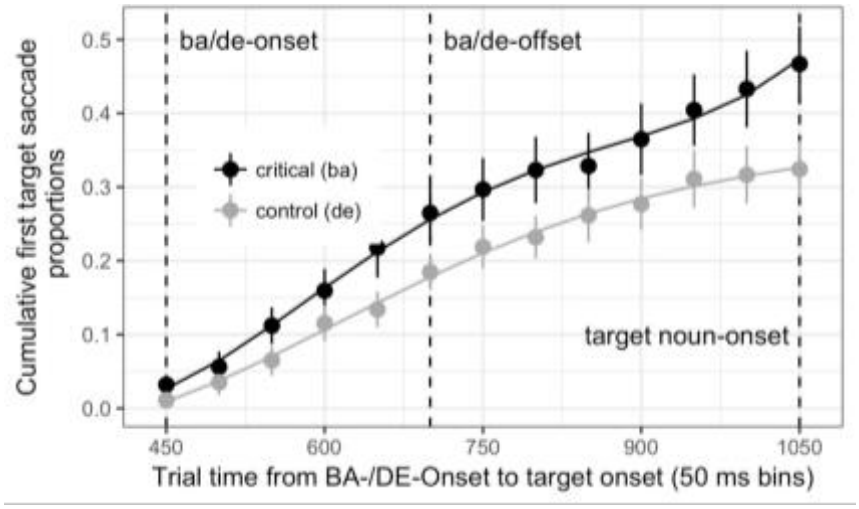

Fig 2: Cumulative first target-saccade proportions over time between the onset of the marker (bă/de, 450ms after stimulus onset in all trials) and the onset of the auditorily presented target nouns (1050ms after stimulus onset in all trials); dots show mean proportion values; vertical lines going through the dots show SE; curved lines visualize the fit of our growth curve analysis (Mirman, 2014)

References

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