Developing Mandarin Cloze Probability Norms for Spoken Predictive Processing

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Background: Prediction can enhance sentence comprehension. For example, when someone says "let's go to the library and borrow a –," people would expect to hear "book" upon completion, thereby facilitating communication. Prediction has thus become a central issue in psycholinguistics. In the current study, we investigate cloze probability in Mandarin, which serves as the foundation for our future projects that will directly examine how the prediction-by-production mechanism plays a role in sentence comprehension [1, 2]. To reach our goal, we will establish a full range of contextual Mandarin sentences, spanning from low to high predictability, using a cloze probability task. Our research question is: How strongly do Mandarin speakers converge on the same upcoming word (target verb) given a sentence context, and can the materials reliably create high versus medium/low predictability conditions? In high predictability contexts (typically verb-constraining contexts), the target word will reach about 70% cloze probability or higher. In medium/low predictability contexts (less constraining verbs or contexts), the target word will be around 50% or lower. The goal is to generate a graded range of predictability, not just a binary contrast [3, 4].

Method: We will recruit 120 native Mandarin speakers (ages 18–35) with normal or corrected-to-normal vision and hearing. The materials will include approximately 250 sentence contexts, each with a single missing verb (one blank). Items will be pre-screened to ensure (i) the blank position is unambiguously a verb and (ii) the sentence is grammatical and natural, with multiple plausible verbs for low-constraint items. The task will be an online cloze procedure: participants read one context at a time and type the *single best verb* that completes the sentence naturally. We will enforce character limits and prohibit multi-word continuations; responses will be collected in Chinese characters. Two practice trials will be included. Contextual constraint will be manipulated via event plausibility and verb selectional restrictions (e.g., cleaning the bread maker strongly licenses "buy/collect/take"vs. a weaker context that supports many actions), and we will iteratively refine contexts based on pilot data.

Planed Analyses: For response coding, we will normalize verb completions by correcting typos and grouping near-synonymous responses at the lemma level when justified by pre-registered rules. Ambiguous cases will be double-coded by two coders, and we will report inter-coder agreement. Predictability will be quantified continuously using cloze probability—computed both as the proportion of the most frequent response (top-1 cloze) and, when an intended target verb is specified, as the proportion of that target response (target cloze). We will also compute entropy over the full response distribution to capture overall uncertainty. These continuous measures will be reported for all items and used in graded analyses [3, 4].

Discussion: The current study will produce a publicly usable set of Mandarin cloze probability norms for word recognition and sentence comprehension research. Because large-scale predictability norms remain far less available for Mandarin than for many Indo-European languages, this dataset fills a key methodological gap and enables more principled cross-linguistic comparisons of predictability effects. Crucially, the contribution is not only preparatory for our planned visual-world eye-tracking work: by providing graded, well-characterized Mandarin contexts spanning the full predictability spectrum, the norms will support reuse across future studies and help evaluate whether widely observed prediction phenomena generalize beyond languages with extensive existing norming resources.

Example sentences (medium/low predictable sentence vs high predictable sentence)

(1) 下次 上课之前，小明 要去 - 那邊的 麵包.
Next time attend class before, Xiaoming is going to - that DE bread.
‘Before the next class, Xiaoming is going to - the bread in the corner.’
(Expected medium/low predictable sentence)

(2) 清理 完 麵包機. 之後，小明要去 - 那邊的 麵包.
Cleaning finish bread maker after Xiaoming is going to - that DE bread
‘After cleaning the bread maker, Xiaoming is going to - the bread there.’
(Expected high predictable sentence)

References

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