Sentence context processing has priority over constituent word processing

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This study investigated the relationship between word and sentence context processing in the early stage of sentence reading. We examined the influence of sentence context on the perception of contextually anomalous words in a Japanese text. A target word (contextually anomalous two-kanji compound word or its contextually consistent counterpart) in a short text was briefly presented, followed by a four-alternative forced-choice (4AFC) recognition task. The recognition list consisted of four two-kanji compound words: contextually anomalous target word, consistent target word, anomalous new word, and consistent new word. The results showed that the participants recognized anomalous words less frequently than their correct counterparts, and they were more likely to select contextually consistent words. The context effect was obtained even when the participants possessed only information of content words in a sentence. These results demonstrate that processing sentence context has priority over processing each constituent word and that semantic information of content words plays a primary role in the early stage of Japanese sentence reading.

**Key words:** anomalous word, content word, reading, sentence processing, word perception

**Method**

**Participants** Twenty-eight adult Japanese native speakers participated in this experiment.

**Stimuli** One-hundred-and-twenty short Japanese sentences were used as stimuli. Each sentence included a target word, and there were two factors involving target word consistency in the sentences: whether they were contextually anomalous (e.g., “私の友人の勤務先は場合だ。”: “A friend of mine works for case.” The target word is underlined.) or consistent (e.g., “私の友人の勤務先は銀行だ。”: “a bank”). There were three conditions involving the location of the targets in each sentence: top, middle, and bottom. In addition, there were two conditions for the type of information provided to the participants: “whole” and “content words only.” In the whole condition, the entire sentence was displayed (e.g., “私の友人の勤務先は場合だ.”). However, in the content words only condition, all the function words were replaced by “&’s” and only information of content words was provided (e.g., “私と友人勤務先と場合だ.”). Further, sixty contextually consistent filler sentences were included.
The recognition list appeared in a four-alternative forced-choice (4AFC) recognition task consisting of four two-kanji compound words: anomalous target word (e.g., “場合”); anomalous new word (e.g., “紅茶”: “tea”), consistent target word (e.g., “銀行”), and consistent new word (e.g., “病院”: “hospital”). “Target” refers to a word that was presented as a target, while “new” refers to one that did not appear in the experiment. These four types of words were approximately equally familiar and were orthographically dissimilar.

Procedure In each trial, a stimulus sentence was displayed for 200 ms, followed by a 4AFC word recognition task on the target word in the stimulus sentence. Next, a sentence comprehension test was administered. The participants were informed beforehand that in certain trials, they might encounter some absurd sentences.

Results and Discussion

The mean error rates and details of error responses are shown in Figure 1. A three-way ANOVA with target consistency, information type, and target location as factors and Tukey's HSD tests were conducted in the subsequent analyses. The main effects of target consistency, information type, and location, and interactions between consistency and information type, and consistency and location were all significant: $F(1, 27)=242.21, p<.01$; $F(1, 27)=5.97, p<.05$; $F(2, 54)=52.28, p<.01$; $F(1, 27)=11.44, p<.01$; $F(2, 54)=17.39, p<.01$, respectively. It was shown that the participants recognized the anomalous words less frequently than their correct counterparts, regardless of the information type, that is, whether the whole sentence or only content words were presented. What is interesting is that the participants were more likely to select the contextually consistent words (consistent targets and consistent new words) when they misrecognised targets, as shown in Figure 1. Performance on the sentence comprehension test was generally good regardless of target consistency and the type of information furnished. These results indicate that processing sentence context has priority over processing each constituent word and that semantic information of content words plays a primary role in the early stage of Japanese sentence reading.

References
