

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

The Role of Working Memory in Homograph Recognition

Permalink

<https://escholarship.org/uc/item/61b904zx>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 22(22)

Author

Kobayashi, Yuki

Publication Date

2000

Peer reviewed

The Role of Working Memory in Homograph Recognition

Yuki Kobayashi (yukikoba@srt.l.u-tokyo.ac.jp)

Department of Psychology, University of Tokyo; 7-3-1 Hongo Bunkyo-ku
Tokyo, 1130033 Japan

Recognition of homographs is usually assumed to consist of two process stages: automatic access to mental lexicon and inhibition of meanings irrelevant to context (Miyake et al., 1994). Working memory is related to the inhibition: Kobayashi and Takano (1999) showed that readers with larger working memory capacity can inhibit irrelevant meanings faster than those with smaller capacity. The homographs used in the study had only two major meanings. The number of meanings can effect to recognition of homographs. I predicted that readers with larger working memory capacity cannot inhibit when the number of meanings increases more than two meanings.

Method

Subjects

The subjects were 29 undergraduates from the University of Tokyo. All were native speakers of Japanese.

Materials

Lexical Decision Task Fifteen homographs were selected as first primes. Five homographs each had four major meanings, and ten each had two major meanings. They were all written in *kana* (i.e., Japanese phonogram). Targets were these homographs written in *kanji* (i.e., Chinese ideogram). Second prime was a pair of *kanji* related to the target in meanings (consistent condition), an asterisk (neutral condition), and a pair of *kanji* related to another target in meanings (inconsistent condition).

Japanese Reading Span Test We used Osaka and Osaka's (1994) Japanese version of the test.

Design

The independent variables were consistency (consistent vs. neutral vs. inconsistent) and number of irrelevant meanings (three vs. one). I examined reading span scores as a pseudo-independent variable, too. The dependent measure was RT for targets.

Procedure

Japanese reading span test Osaka and Osaka's (1994) test was administered.

Lexical Decision Task After a fixation point was presented for 1s, first prime, second prime and target were presented successively. The SOA of primes was 500ms. Subjects were requested to judge whether the target was word or non-word as accurately and quickly as possible.

Results and Discussion

Subjects with reading spans of 3.0 or greater were considered to be high-span readers; those with spans of 2.5 or less, to be low-span readers.

The main results are presented in Figure 1. High span readers took longer time in inconsistent condition than in neutral condition, whereas low span readers showed no significant difference between neutral condition and inconsistent condition (Figure 1). The number of meanings had no significant interaction with consistency and reading span. High-span readers could inhibit irrelevant meanings though meanings increased, whereas low-span readers couldn't even inhibit one irrelevant meaning. We conclude that the number of meanings didn't effect to inhibition in working memory.

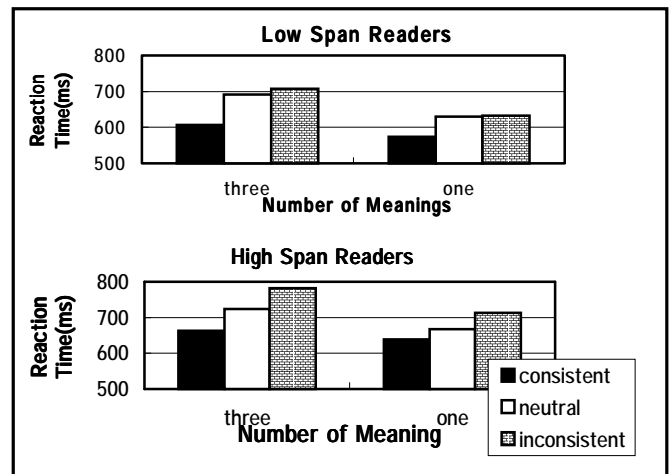


Figure 1: Reaction time of low span readers and high span readers.

Reference

- Kobayashi, Y. , & Takano, Y. (1999). The mental process of homograph recognition : The examination of inhibition in working memory. *Proceedings of the 2nd International Conference on Cognitive Science*, 507-510. (In Japanese)
- Miyake, A., Just, M.A., & Carpenter, P.A. (1994). Working memory constraints on the resolution of lexical ambiguity : Maintaining multiple interpretations in neutral contexts. *Journal of Memory and Language*, **33**, 175-202.
- Osaka, M., & Osaka, N. (1994). Capacity related to reading – Measurement with the Japanese version of reading span test. *Japanese Journal of Psychology*, **65**,339-345.