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What is similar in phonological-similarity effect?

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Introduction

A robust finding in working memory research is that to recall a set of phonologically similar words is much more difficult than to recall a set of phonologically dissimilar words, which is the well-known phonological-similarity effect (Conrad & Hull, 1964). This finding points out that the capacity of information retention in our working memory store more or less depends on the phonological nature of the to-be-memorized information. The more similar (phonologically) of the to-be-memorized item, the more difficult to retain in the working memory store. However, most of the Chinese people have the subjective experience that to immediately recall a set of colloquial slogans in television advertisement is much more easier than to immediately recall a set of common sentences due to the similarity of prosody. There is also evidence showing that rhyming of verbal information usually enhances our memorization ability (Fallon, Groves, & Tehan, 1999). Therefore, how to explain these contradicting observations is very important in order to get a fuller understanding to the operation of the working memory model (Baddeley, 1992).

In the memory study done by Saito (1998), he reported that intonation of a sentence might make a contribution to participants' recall performance (see also Pennington & Ellis, 2000). Following to this point and together with our aforementioned subjective experience, we can see that prosodic information may be useful to our recall performance to the verbal information to an extent, simply like to recall a colloquial slogan in advertisement for a brief period of time. Reviewing the relevant literature so far, there are a lot of empirical works conducted on this issue in the domain of language research: comprehension and production (Sevald & Dell, 1994; Slowiaczek, McQueen, Soltano, & Lynch, 2000; Soto-Faraco, Sebastián-Gallés & Cutler, 2001). However, little consideration has been given to how these different phonological characteristics of a word affect the recall performance in working memory so far despite of their interdependency.

Hence, the major objective in the present study is to examine how the phonological characteristics of a word influence the recall performance in working memory, which is a theoretically interesting but still unexplored question.

Experiment

A typical word span task with Chinese words as the materials was used to examine the phonological characteristics of a word on the recall performance. The main variable in the present experiment is the different degree of phonological similarity, whether those Chinese words presented in the testing lists shared any phonological characteristics (onset, rime and tone) among themselves or not (see Yip, 2004 for details).

Procedure

Participants were asked to read aloud lists of displayed Chinese words on the computer screen one by one. And then, they were asked to recall the Chinese words from the list out loud as many as possible, and the experimenter counted the correctness of

their verbal responses at the end of each list. Altogether, each participant received forty lists with a total of 400 Chinese words in the experiment within two sessions with a break. Each session included 100 phonologically similar items and 100 phonologically dissimilar items. The order of presentation for the lists was randomly assigned in the two sessions. The whole experiment lasted for forty minutes.

Results and Discussion

Two main findings in the present study were concluded.

First, the present results indicate that one major source of phonological-similarity decrement comes from the overlapping of the segmental information of the to-be-memorized materials. This phonological overlapping among the to-be-memorized words poses difficulties for participants to perceive and to rehearse because of the acoustic confusion among the words, which is consistent with the previous research findings.

Second, the prosodic information of the to-be-memorized materials seems to be retained longer in the working memory. This overlapping of tonal information among words even produces a phonological-similarity facilitatory effect. Finally, based on the present results, the traditional concept of the term "similar" in the phonological-similarity effect should be re-conceptualized. Because similarity in prosodic information, unlike the similarity in segmental information, will not create any interference effect in working memory, but a facilitatory effect will occur in working memory instead.

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