

ABSTRACT

The extent to which Chinese is represented phonologically or orthographically in verbal short-term memory was investigated using a short-term cued recall task (Tehan & Humphreys, 1998). In all conditions, proactive interference was induced by providing a retrieval cue (e.g. *wild animal*) that subsumed a to-be-recalled target word (e.g. *leopard*) and a to-be-forgotten foil word (e.g. *tiger*), so that the foil was sometimes recalled instead of the target. In two critical conditions, filler words presented with the target word shared orthographic properties with the foil word, or shared phonological properties with the foil word. These two conditions increased the level of foil intrusions observed relative to the standard interference condition where the retrieval cue subsumed target and foil semantically, but not orthographically or phonologically. The results suggest that both phonological and orthographic codes are represented in verbal short-term memory for Chinese words.

INTRODUCTION

- Dominance of phonological coding in short-term memory tasks using alphabetic languages
 - Phonological similarity effect, word-length effect, unattended speech effect, modality effect, articulatory suppression effect.
- Conflicting findings in word recognition, word categorisation, and lexical decision tasks in Chinese
 - Greater phonemic than visual coding (Cheng 1992; Chu-Chang & Loritz, 1977; Ellis, 1992; Lau & Hoosain, 1999; Wu & Liu, 1996).
 - Greater visual than phonemic coding (Chen & Cutler, 1997; Chen, Yung, & Ng, 1988; Hong, Yelland, & Chen, 1997; Ju & Jackson, 1995; Liu, 1997; Perfetti & Zhang, 1991; Tavassoli & Han, 2001; Wong & Chen, 1999; Zhang, Xiao, & Weng 2012).
- Possible confound of word frequency
 - High and medium frequency words may be stored more phonemically, while low frequency words are stored visually (Hue & Erikson, 1988; Lau & Leung, 2004).
- Question: what is the relative influence of phonology and orthography in short-term memory processing of Chinese words?
- Use short-term cued recall paradigm (Tehan & Humphreys, 1998)
 - Explicit semantic processing task.
 - Can examine automatic influence of other underlying codes (phonological and orthographic)

METHOD

- Two and one-block trials interspersed
 - 4 words per block; one target for cued recall.
- For two-block trials, participants are to forget the first block

Experimental Conditions

No interference



Radish Recall cue: Vegetable

Target

- Recall cue only subsumes target; no proactive interference (PI) expected.

Standard interference



Tiger Leopard Recall cue: Wild animal

Foil Target

- Recall cue subsumes target (second block) and foil (first block) – PI (foil intrusions) induced

Phonological interference



King Prince Recall cue: Member of royalty

Foil Target

- Fillers in target block contain phonological features of foil – **will PI for foil increase?**

Visual interference



Rose Lily Recall cue: Type of flower

Foil Target

- Fillers in target block contain orthographic features of foil – **will PI for foil increase?**

- N = 94
- Language use and proficiency measures (academic and self-rated) also obtained.

RESULTS

- Planned comparisons showed more foil intrusions for phonological, $t(93) = 3.18, p < .01$, and visual, $t(93) = 3.78, p < .001$, conditions compared to the standard interference condition.
- No difference between phonological and visual interference conditions, $t < 1$.

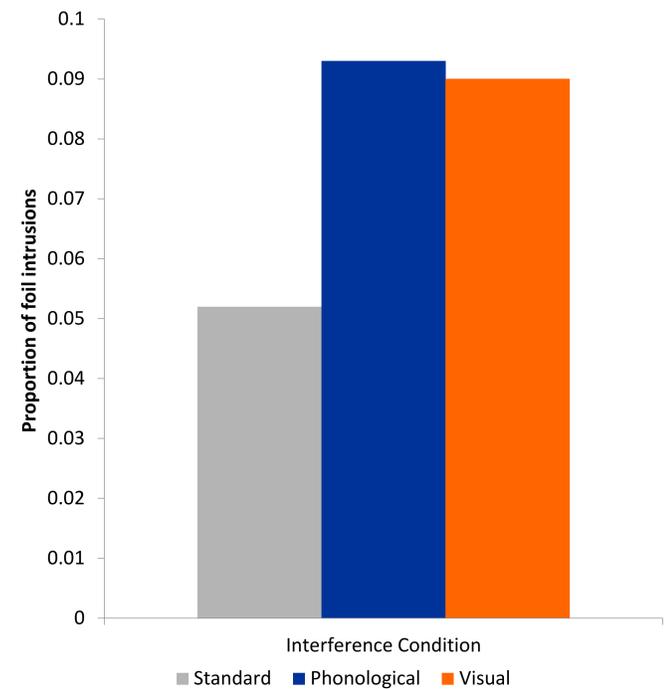


Figure 1. Degree of proactive interference by conditions

- Language proficiency measures correlate with one another, $r_s > .80$, but not with proportion of foil intrusions, $r_s < .08$

DISCUSSION

- Evidence for use of both phonological and orthographic codes in STM for Chinese words.
 - Distributed phonological and visual traces in memory for the second block of to-be-remembered words converged on the shared features found in the foil of the to-be-forgotten words in the first block, increasing the likelihood of the foiled being recalled beyond the standard interference condition.
- Rate of PI not moderated by language proficiency.

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NOTES

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