

The Contribution of Lexical Access and Working Memory to FL reading and Incidental Vocabulary Learning

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Abstract

Keywords

Lexical access, working memory, FL reading, incidental vocabulary learning

1 Introduction

Reading involves coordination of multiple levels of processes: lower-level and higher-level processes. Lower-level processes are linguistic processes, which have the potential to become automatized; whereas higher-level processes involve construction of meaning of texts (Grabe, 2009). Theoretical models of reading place different emphases on lower-level and higher-level processing in reading comprehension. Some researchers suggest that inefficient word processing inhibits higher-level reading comprehension processes (e.g. Perfetti, 1988); and other researchers emphasize the role of strategic processing in reading comprehension, maintaining that, as long as readers have sufficient time to carry out the reading task, inefficiency in lower-level processing does not normally hinder global reading comprehensions (e.g. Walczky, 2000). The current study aims to test whether time pressure in reading influence the role of lower-level processing (i.e. word processing and working memory) to FL reading comprehension and incidental vocabulary learning for Chinese learners of English as a foreign language (EFL).

2 Literature review

2.1 Verbal efficiency model (VEM)

VEM assumes that the cognitive resources (attention and WM) necessary for good reading comprehension are limited in capacity. Therefore, efficient lower-level processing skills allow cognitive resources to be used for other higher-level comprehension processes. Efficient word processing skills are central to the model and VEM maintains that the inefficient word processing skills often inhibit readers' problems with higher-level comprehension skills (e.g. processing of the concepts in texts, building a coherent interpretation of text content, and use of reading strategies) (Perfetti, 1985, 1994, 1999).

2.2 Compensatory-encoding model (C-EM)

Walczky and his associates (e.g. Walczky, 2000; Walczky, Marsiglia, Bryan, & Naquin, 2001) adopted basic assumptions of the VEM model but added compensatory mechanisms, which are metacognitive in nature (Walczky, 1995). According to the C-EM, in fluent reading, lower-level processing (e.g. processing words) tend to be carried out automatically. As a result, WM can be used for higher-level comprehension processes. The first prediction of the C-EM is that when there is no time pressure, inefficient word processing and small WM "does not normally affect performance during reading because compensatory mechanisms operate routinely during performance" (Walczky, 1993, p. 127).

2.3 Research questions

The present study aims to test whether time pressure plays a role on the magnitude of relationship between lower-level processing and text comprehension in FL reading and incidental vocabulary learning. It asks:

1. To what extent does lower-level processing (i.e. LA and WM) relate to reading comprehension in a. untimed and b. timed FL reading?
2. To what extent does lower-level processing (i.e. LA and WM) relate to incidental vocabulary learning in a. untimed and b. timed FL reading?

3 Research methods

3.1 Setting and participants

Altogether 404 Chinese EFL learners at university level participated in the study.

3.2 Instruments

The participants were asked to do two computer and two paper tests. The two computer tests measured participants' efficiency of lexical access of English words and working memory. The two paper tests measured participants' reading comprehension and incidental vocabulary learning in the two reading conditions: reading without time pressure (untimed reading) and reading without time pressure (timed reading).

3.3 Data analysis

To examine the relationship between lower-level processing and reading comprehension, a series of bivariate correlation were carried out separately for the two reading conditions. Similarly, to answer the second research question, correlation analyses were conducted.

4 Results

4.1 Results for research question 1

There was no significant correlation between students' LA and reading comprehension in untimed reading condition ($r=-.09, p=.07$), whereas a small and negative relationship was found between LA and reading comprehension in timed reading ($r=-.22, p<.01$). Since RTs was used to measure LA, a negative relationship between LA and reading comprehension means that readers who were slower to access meanings of English words (who had longer RTs) tended to achieve poorly in timed FL reading; whereas readers who were faster to get access to meanings of English words (who had slower RTs) had a tendency to obtain better comprehension in timed FL reading. Secondly, WM was shown to be correlated positively with students' reading comprehension in both untimed ($r=.11, p<.05$) and timed reading conditions ($r=.20, p<.01$), and both the values of correlation were small. The magnitude of correlation between WM and comprehension in untimed reading was smaller than that between WM and comprehension in timed reading. This means that students who had larger WM were more likely to be associated with better reading comprehension in both reading conditions. But WM had stronger association with comprehension in timed reading than in untimed reading. Additionally, LA was found to be significantly and negatively correlated with WM ($r=-.28, p<.01$).

4.2 Results for research question 2

To investigate the relationship between lower-level processing (i.e. LA and WM) and meaning measure for incidental vocabulary learning, a series of Pearson Product Moment correlation analyses were performed using RTs for LA, and composite Z-scores for WM to correlate with meaning measure for incidental vocabulary learning in untimed and timed reading. In untimed condition, LA was found to be negatively and significantly associated with the meaning measure for incidental vocabulary learning ($r=-.25, p<.01$). In timed condition, LA was significantly and negatively correlated with meaning measure for incidental vocabulary learning ($r=-.18, p<.01$). The negative correlation between LA and the meaning measure means that readers who were slower to access meanings of English words tended to be associated with poorer performance on the meaning measure for incidental vocabulary learning through reading in both reading conditions. In contrast, readers who were faster to in

processing English words were more likely to be associated with better performance on the meaning measure for incidental vocabulary learning in two reading conditions. The magnitude of correlation between LA and the meaning measure in untimed condition was slightly larger than that in timed condition.

5 Discussion and conclusion

The results correlation analyses showed that time pressure influences the role of LA and WM to reading comprehension and incidental vocabulary learning in a different way.

6 References

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