Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Auditory Implicit Memory and Context Effect in Early EFL Learners

Fan Jiang
PhD. student of Northeast Normal University, China,
Jiangf028@nenu.edu.cn

Yongbing Liu
Professor and Dean of School of Foreign Languages, Northeast Normal
University, China
liuyb008@nenu.edu.cn

Abstract

Adopting the priming paradigm, the present study examined the impact of mode of presentation, either in isolation of in a coherent text on the auditory implicit memory of early EFL learners in China. The results showed that previous encounters with the English words sped up later processing in both groups. However, compared with listening to words presented in the context, listening to words presented in isolation contributed more to the implicit memory. The result confirmed the existence of auditory priming and context effect in early L2 vocabulary learning. Finally, the reasons why priming occurred and why context reduced the auditory priming effects were discussed in terms of the Logogen Model and Transfer-appropriate processing. In addition, teaching strategies for enhancing the auditory implicit memory of words presented in context were suggested.

Keywords: L2 vocabulary acquisition; implicit memory; auditory priming; context effect

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

1. Introduction

Vocabulary acquisition occupies an important field in second language acquisition (L2) research. Before the 1990s, a majority of studies focus on explicit memory, which means the conscious recollection of previous experiences. Later, researchers found that previous encounters with the test materials could facilitate subsequent processing of the same materials when subjects did not consciously think back to the study episode. This implicit facilitation was termed implicit memory (Graf & Schacter, 1985). Studies investigating auditory implicit memory have revealed a number of its characteristics, such as specificity of stimulus (Church & Schacter, 1994), stability (Church & Fisher, 1998) and etc.

Research on implicit memory is usually conducted using the priming paradigm. Priming is regarded as a type of implicit memory, which refers to the fact that previous encounters with words or other stimulus could facilitate subsequent recognition or processing of the same words (Tulving & Schacter, 1990). In the priming paradigm, subjects read or listen to a set of words in the study phase. Then after some time spent in the distracter phase, subjects have to read or listen to another set of words mixed with the previous set of words. In this test phase, subjects may be asked to complete some word stems or fragments, or decide whether the given words constitute real words or non words or simply to repeat the words orally. If the reaction time for the repeated words is statistically faster than that of the unrepeated words, or the reaction accuracy for the repeated words is statistically better than that of the unrepeated words, priming effects are established.

Most studies are concerned with the priming effects of isolated words (e.g. Burt, Connors & Grant-Taylor, 2003). However, L2 learners encounter L2 words more often in coherent texts than in isolation. It is necessary to compare the impact of mode of presentation on priming effects. It has been demonstrated that priming for words presented in contexts is either smaller than words presented in isolation (Bestken &

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Mullian, 2010) or nonexistent (Levy & Kirsner, 1989). This is termed context effect, which refers to the fact that priming effects are either weakened or eliminated for words presented in meaning contexts.

Currently, most relevant research is done in the visual modality (e.g. Burt, Connors & Grant-Taylor, 2003). Results show that context effects exist when target words are either presented with their antonyms (Blaxton, 1989) or in coherent texts (Nicolas & Leroux-Ziegler, 2000). As far as we know, a handful of studies have investigated context effects in the auditory modality. For example, Besken & Mulligan (2010) compared the priming effects of words presented in isolation and those presented in context with a word fragment completion task and a word stem completion task. The results confirmed that context effect also exists in the auditory modality.

A number of theoretical accounts have been proposed to explain the cause of context effects, among which three are most representative. Bainbridge, Lewandowsky, & Kirsner (1993) hold that when words appear in meaning contexts, the meaning of the words may be different relative to the time when they stand in isolation. In the test phrase, when context is unavailable, subjects may endow the target words which appear in a context in the study phase with different meanings. When words appear in a meaning context, their perceptual and conceptual processing may be reduced compared with the isolated words. Subjects may use the contextual information to aid word recognition. Secondly, the contextual framework account, proposed by Levy & Kirsner (1989), assumes that contextual representation is holistic, which preserves the word information and perceptual processing in the contextual episodic representation. In the text phrase, where context is unavailable, subjects can not retrieve individual words from their contextual memory, which leads to the disappearance of priming effects. Finally, according to the transfer-appropriate processing hypothesis (Roediger, 1990; Roediger & McDermott, 1993), memory

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

performance depends on the nature of processing operations in the study phase and test phase. The more similar the processing operations are, the better the memory performance will be. This is due to the transfer of processing operations in the two experiences.

As Ellis (1994) pointed out, the form, part of speech and collocation of L2 word are acquired in an implicit way. Especially to L2 beginners, who are just starting to develop an L2 lexicon, it is of high significance to explore how they build auditory presentations of L2 words and develop their L2 auditory lexicon. Using the priming paradigm, Trofimovich (2005) demonstrated that priming effects occurred in L2 learners of English, who were adult university students. The present study addresses two questions. The first question is whether auditory priming exists in Chinese L2 beginners when they listen to words presented in isolation and in contexts. The second question is whether context effects can be found in Chinese L2 beginners when they listen to words presented in a short article. Based on the Logogen Model (Morton, 1982) and Transfer-appropriate processing hypothesis, it is hypothesized that auditory priming and context effects can be discovered in Chinese L2 beginners as well.

2. Method

2.1 Participants

56 second graders from No. 4 Middle School of Liaoyuan City participated in the study. They had learned English for a year and a half at the time of test. The grades in the most recent English test showed that their English proficiency did not differ statistically (M=113.69, SD=2.78). All participants had normal or corrected to normal vision and no hearing problems were reported either by the students themselves or their head teachers. The 56 subjects were randomly assigned to a isolation group (n=28) and a context group (n=28). They were all rewarded with a pen after the experiment.

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

2.2. Materials

First, 3 English passages were chosen and they were judged by a group of 20 second graders in the same school. None of the 20 students participated in the final experiments. They were asked to read the passages and circle any word that they didn't know. The passage that contained the fewest new words (M=1.5) were chosen as the final test material. Next, 30 notional words were picked out from the passage (syllable mean=1.4, SD=0.62) and they make up the repeated target words. Then another set of 30 notional words were randomly chosen from *Go for it!*, students' English textbook as the unrepeated target words (syllable mean:1.43, SD=0.57). The final test materials for the isolation group include the 60 target words and the materials for the context group consist of the 60 words and the passage.

The test materials were recorded by a Chinese English teacher using a voice record (Sony Model: ICD-AX80) in a soundproof lab. In order to avoid the fluctuation in stress and intonation, the speaker read each target word in a sentence "This is …." for two times and paused for approximately 1 second before and after the target word. Then the target words were cut off using Sony Digital Voice Editor 3.3 and all target words were digitized at 44.1 kHz and normalized for intensity. In addition, the passage was also read twice. Finally, the searcher and speaker selected a better token for each target word and one passage to make up the final test materials.

2.3 Design

A 2*2 mixed factorial design is adopted. The between subject variable is the mode of presentation, which has two levels: isolated presentation and contextual presentation. The within subject variable is the word identity, which has two levels: repeated words and unrepeated words. The dependent variable is the reaction time.

2.4. Equipment

The experimental program was made by E-prime 2.0. The serial response box was connected to the computer had a 14inch monitor (CPU: Intel(R) Pentium(R) 1.5GHz；

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Memory:1G).

2.5 Procedures

(1) Isolation group

Each subject was tested individually for about 5 minutes in a brightly light room with a comfortable temperature. The subject was seated at about half a meter away from the monitor and was asked to put on the headphone. After they fully understood the test instructions, they began the experiment. First, in the study phrase, the subjects heard 30 individual words played at an interval of 3000ms and they were not asked to make any response. Then in the distracter phase, the subjects had to finish 15 simple math questions. Finally, in the test phase, the subject heard 60 words played at an interval of 4000ms and were asked to repeat each word after they heard it as rapidly and accurately as possible.

(2) Context group

In the study phase, the subjects in the context group heard the passage instead of individual words. Except for this, the procedure was the same as that of the isolation group.

3. Results

Before the statistical analysis the data, each subject's reaction time was checked for any outliers. Reaction time (RT) that exceeds 2000ms or is less than 500ms was considered as outliers in the present study. The outliers were excluded in the finally data analysis, and they accounted for 1.45% of the total data. The reaction time for the repeated words and unrepeated words in both groups is shown in Figure 1.

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Figure 1. Reaction time to the target words in both groups
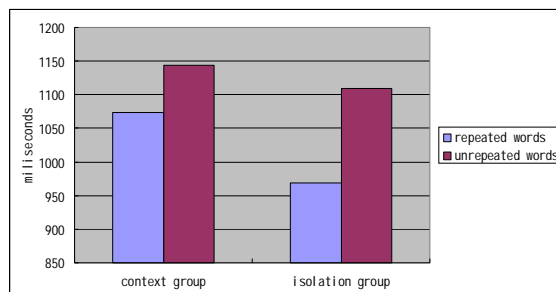
As can be seen from Figure 1, the reaction time for the repeated words is less than that for the unrepeated words in both groups. In addition, the reaction time for the target words in the isolation group is less than that of the context group. The data is subject to a paired sample t-test and an independent t-test by SPSS 17.0, the results of which are shown in the following:

(1) Auditory priming effects of L2 words

In the isolation group, the independent variable is word identity: repeated words and unrepeated words. The dependent variable is the reaction time. A paired-sample t-test shows the following:

Table 1. Reaction time for the target words in the isolation group

Word identity	RTmean	SD
Repeated words	968.22	57.38
Unrepeated words	1109.80	77.32

As Table 1 indicates, the reaction time of the repeated words is significantly faster than that of the unrepeated words, $t=-10.513$, $p=0.00$. This means previous encounters with the words presented in isolation sped up the processing for the subsequent encounters. Auditory priming effects are obtained in the isolation group.

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

In the context group, the independent variable is also the word identity: repeated words and unrepeated words. The dependent variable is the reaction time. A paired-sample t-test shows the following:

Table 2. Reaction time for the target words in the context group

Word identity	RTmean	SD
Repeated words	1074.07	82.53
Unrepeated words	1143.81	76.66

Table 2 shows that the reaction time of the repeated words is significantly faster than that of the unrepeated words. t=-7.375，p=0.00. The result also confirmed the existence of auditory priming effects.

The statistical analysis of the data shows that the reaction time for the repeated words is significantly faster than that of the unrepeated words in both groups, suggesting that auditory priming effects could occur irrespective of the presentation manipulation.

(2) Context effect in L2 word auditory perception

An independent t-test is conducted to compare the reaction time for the repeated words in both groups in order to see the impact of mode of presentation on auditory implicit memory. The independent variable is the mode of presentation and the dependent variable is the reaction time. The result is shown in Table 3.

Table 3. RT for repeated words in the context group and isolation group

Group	RTmean for the repeated words	SD
Context group	1074.07	82.53
Isolation group	968.22	57.38

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

From Table 3 we can see that the reaction time of isolation group is significantly faster than that of the context group. t=5.572, p=0.00. This means that words presented in isolation induced more auditory priming effects than words presents in the context, i.e. a context reduced priming effects.

Finally, an independent t-test was conducted to examine the difference in reaction time for the unrepeated words in both groups. The result is shown in Table 4.

Table 4. RT for unrepeated words in the context group and isolation group

Group	RTmean for the unrepeated words	SD
Context group	1074.07	82.53
Isolation group	968.22	57.38

It can be seen that the reaction time for the unrepeated words is faster in the isolation group than in the context group, but the difference was not statistically significant. t=1.653, p=0.104.

4. Discussion

The present study addresses the impact of different modes of presentation on auditory implicit memory. The results are discussed in the following.

(1) Auditory priming of L2 words

The results show that the reaction time of the repeated words are significantly faster than that of the unrepeated words in both the isolation group and the context group. This indicates that auditory priming effects occurred irrespective of the modes of presentation of the target words, either in isolation or in a context. Moreover, the subjects only heard the target words once and this single encounter may speed up

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

subsequent processing of the same words. It seems that auditory priming in early L2 learners is similar to that of native speakers in terms of its rapidity of occurrence (Goldinger, 1996). Though the subjects have only learnt English for a year and a half and their vocabulary stock and auditory input is much smaller and less than those of the intermediate and advanced learners, this does not seem to affect the occurrence of auditory priming effects.

Researchers have always been concerned with whether the priming effects were contaminated by explicit memory strategies in an implicit memory test. Two reasons may prove that the priming effects obtained in the present study were exempt from the contamination by explicit memory strategies. First, the subjects were unaware of the purpose of the experiment. They were simply told that this was a pronunciation test. Consequently, it would become unlikely for the subjects to think back consciously to the study episode when they carried out the repetition task. Second, the test materials are highly familiar to the subjects, which rules out the possibility that the subjects had difficulty reading them. As a result, the subject would not have the need to use explicit strategies to read the target words.

Then why did auditory priming occur? The subjects in both groups listened to the repeated words after a short interval. According to the Logogen Model (Morton, 1982), the target words were activated when the subject heard them for the first time. Then before the reaction returned to a resting level, the subjects heard the same word again. Consequently, the retrieval was accelerated. In addition, the perceptual representation system processes and represents information about the structural information of words, objects and other type of stimulus, but not the semantics or associative meaning (Ellis & Young, 1998). In the present study, the target words are highly familiar to the subjects, i.e. they have already had the phonological and semantic representations in their mental lexicon. In the repetition task, the subjects only need to access the pre-existing phonological representation. Thus the occurrence

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

of auditory priming can be attributed to the reactivation of the abstract phonological representations.

More importantly, priming is believed to be a cognitive mechanism underlying first language auditory lexical representational development and the use of the such representation in language processing (Church &Fisher, 1998). Based on the present study and the study of Trofimovich (2005), the author believes that auditory priming is also a mechanism responsible for building L2 auditory lexical representation and for using those representations in L2 auditory processing. To L2 beginners, at the initial phase of auditory lexical development, they must build long term L2 phonological representations and then map them onto their denotations or connotations, i.e. labeling (Aitchison, 2003). Auditory priming enables learners to build the phonological representations when they receive repeated L2 auditory input and then use those representations to identify L2 words in different contexts. In addition, as the encounters with L2 words increase, learners use auditory priming to access pre-existing phonological representations and make accelerated access and retrieval of them. So auditory priming reflects not only the new representations in the perceptual presentational system, but also the activation of pre-existing abstract representations (Schacter, 1990). Auditory priming seems to be both a psycholinguistic phenomenon and a cognitive mechanism underlying the development of lexical representations. It assumes a critical role in the lexical development both in L1 and L2.

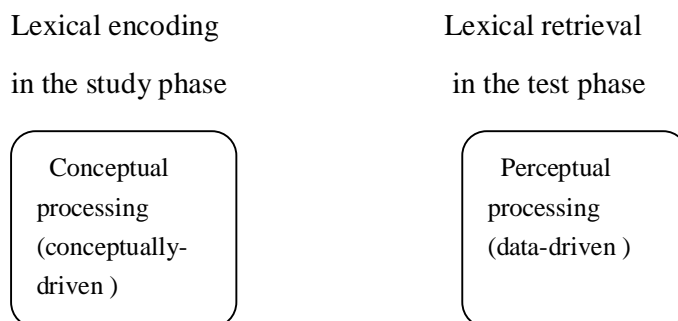*(2) Context effect in L2 auditory perception*

The reaction time for the repeated words is significantly faster in the isolation group than that in the context group. This means that presenting words in isolation contributes more to the auditory priming effects. As far as we know, this is the first study to prove the occurrence of context effect a coherent L2 article.

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Then why context effect is obtained needs more discussion. According to the processing view of implicit memory, information encoding and retrieval mainly include two modes, i.e. conceptually-driven processes and data-driven processes (Jacoby, 1983; Roediger & Blaxton, 1987). Conceptually-driven processes refer to the cognitive activities initiated by the subjects, such as elaboration, organization or reorganization, while data-driven processes are initiated by the information of data of the test material. The author agrees with the transfer-appropriate processing view and believes that when the subjects in the context group listened to the target words presented in the meaningful context, their attention was allocated mainly to the semantic level of the passage. The conceptual information in the passage induced a top-down processing strategy in lexical perception, consequently reducing the necessity of perceptual analysis. However in the test phase, when the subjects were asked to repeat the individually presented words, their attention focused more on the perceptual feature of the target words. According to the lexical route model (Gupta & MacWhinney, 1997), repetition only accesses the phonological phase of the words, i.e. to retrieve the phonemes of the words and does not retrieve the semantics of the words. As a result, the processing operations the subjects used in the two phase differ, making it a failure to transfer the processing operations from the study phase to the test phase, as shown in Figure 2.

Figure 2 Processing operations used by the subjects in the context group

Lexical encoding   Lexical retrieval

in the study phase   in the test phase

Conceptual   Perceptual
processing   processing
(conceptually-   (data-driven)
driven)

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

On the contrary, the subjects in the isolation group heard target words individually played both in the study and the test phase. They were engaged mainly in the perceptual analysis of the target words. The two episodes contain the same perceptual features of the target words, making it possible to transfer the processing operations from the first to the second phase, as shown in Figure 3.

Figure 3. Processing operations used by the subjects in the isolation group

Lexical encoding   Lexical retrieval

in the study phase   in the test phase

Implications can be drawn from the results that auditory priming should be attached more importance in L2 research and teaching practices. On a larger scale, it is concerned with the understanding of the role of L2 listening. The optimal goal for L2 listening development is to enable L2 learners to learn an L2 through auditory input, but not merely to enable them to understand the L2 input (Rost, 2001). However, the process of learning to listen does not coincide with the process of listening to learn. Schmidt (1990) emphasized that only when learners notice the linguistic structure from the auditory input can they benefit from it. However, the L2 words learners encounter usually appear in a coherent context, which may divert their attention to other aspects of input rather than the lexical form and this may does harm to the implicit learning of L2 words (Parry, 1991).

So the teaching tasks and learning situations designed by teachers of English should demand the same or similar processing operations which are involved in actual

156

MJAL5:3 Spring2013   ISSN 0974-8741
Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

language use. In addition, it is necessary to cultivate awareness in learners to pay attention to the phonological and morphological structures of the L2 words in contexts. Teachers can achieve this by designing tasks that could concentrate learners' attention to the language forms. The following two tasks are believe to be effective in this aspect.

 (a) Form-focused task

After listening comprehension, teachers can play the recording again and ask learners to count the frequency of certain words or pay attention to the neighbors of the target words. This task could focus learners' attention on the forms of the auditory input and contribute to the perceptual processing of the target words in contexts.

 (b) Lexical judgment task

Teachers could prepare a word list including some new and old words. The new words should appear in the recordings for the day. After listening comprehension, teachers may play the recording again and ask the learners to tick the words they hear in order to allocate more attention to the target words in contexts.

Finally, as L2 learners acquire more experience with the auditory input and increased attention to the phonological forms in the input, they could abstract important phonological rules from the input and construct phonological representations in the mental lexicon and use them to identify words in various contexts (Trofimovich, 2005).

5. Conclusion

L2 vocabulary acquisition research has witnessed a transition in research orientation from explicit memory to implicit memory. Priming, as a type of implicit memory offers a way to gauge lexical implicit memory. The present study utilizes the priming paradigm to compare the impact of mode of presentation, either in isolation or in a context, on the auditory implicit memory of L2 words in early Chinese L2

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

learners. Distinctive from previous research, the target words in the context group were presented in a coherent article. What's more, a repetition task enjoying more advantages in measuring auditory implicit memory was used.

The results showed that the repeated words in both the isolation group and the context group were processed faster than the unrepeated words. This indicates that previous encounters with L2 words may facilitate subsequent lexical processing. It provides evidence that auditory priming is used by early L2 learners as well. In addition, the reaction time for repeated words in the context group is significantly slower than that in the isolation group, suggesting that auditory context effects also occurred in early L2 learning.

Finally, the researchers discussed why auditory priming and context effects occurred in the present study in terms of the Logogen Model and transfer-appropriate processing hypothesis. Implications from the study and concrete teaching strategies aiming at facilitating auditory implicit memory are also suggested. Whether these strategies are effective or not remains to be further tested.

References

Aitchison, J. (2003). *Words in the Mind: An Introduction to the Mental Lexicon*.
        Oxford: Blackwell Publishers Ltd.

Bainbridge, J. V., Lewandowsky, S., & Kirsner, K. (1993). Context effects in
        repetition priming are sense effects . *Memory & Cognition, 21,* 619-626.

Besken, M. & Mulligan, N.W. (2010). Context effects in auditory implicit memory.
        The Quarterly Journal of Experimental Psychology, 63, 2012-2030.

Blaxton, T. A. (1989). Investigating dissociations among memory measures: Support
        for a transfer-appropriate processing framework. *Journal of Experimental*
        Psychology: Learning, Memory and Cognition, 15, 657-668.

Burt, J. S., Connors, M. D., & Grant-Taylor, K. (2003). Stem-completion priming for

158

MJAL5:3 Spring2013   ISSN 0974-8741
**Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu**

words studied in sentences: the context deletion effect under direct and indirect memory instructions. *Australian Journal of Psychology, 55,* 1-8.

Church, B., & Fisher, C. (1998). Long-term auditory word priming in preschoolers: Implicit memory support for language acquisition. *Journal of Memory and Language, 39,* 523-542.

Church, B., & Schacter, D. L. (1994). Perceptual specificity of auditory priming: Implicit memory for voice intention and fundamental frequency. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 20,* 521-533.

Ellis, N. C. (1994). "Introduction: implicit and explicit language learning – an overview". In Ellis, Nick (ed.). *Implicit and explicit learning of languages.* London etc.: Academic Press, 1-31.

Ellis, A., & Young. A. (1998). *Human Cognitive Neuropsychology.* Lawrence Erlbaum Associates. London.

Gatbonton, E., & Segalowitz, N. (2005). Rethinking communicative language teaching: A focus   on access to fluency. *Canadian Modern Language Review, 61,* 325-353.

Goldinger, S. D. (1996). Words and voices: Episodic traces in spoken word identification and recognition memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 22,* 1166-1183.

Graf. P., & Schacter, D. L. (1985). Implicit and explicit memory for new associations in normal and amnesic subjects. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 11(2),* 386-396.

Gupta, P., & MacWhinney, B. (1997). Vocabulary acquisition and verbal short-term memory: Computational and neural bases. *Brain and Language, 59,* 267-333.

Jacoby, L. L. (1983). Remembering the data: Analyzing interactive processes in Reading. *Journal of Verbal Learning & Verbal Behabior, 22,* 485-508.

Levy, B. A., & Kirsner, K. (1989). Reprocessing text: Indirect measures of word and

159

MJAL5:3 Spring2013   ISSN 0974-8741
Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

message level processes. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 15,* 407-417.

Masson, M. E. J ., & MacLeod, C. M. (2000). Taking the "text" out of context effects in repetition priming of word identification. *Memory and Cognition, 28,* 1090-1097.

Morton, J. (1982). Disintegrating the lexicon: An information processing approach. In J. Mehler, E. Walker, & M. F. Garrett (Eds.), *On mental representation*.89-109. Hillsdale, NJ: Erlbaum.

Murphy, V. (1997). The effect of modality on a grammatical judgment task. *Second Language Research, 13*, 34-65.

Nicolas, S., & Leroux-Ziegler, C. (2000). Why is it so difficult to find priming effects for target words embedded in coherent texts. *Current Psychology Letters: Behaviour, Brain & Cognition, 2,* 7-23.

Parry, K. (1991). Building a vocabulary through academic reading. *TESOL Quarterly, 25,* 629-653.

Roediger, H. L.,& Blaxton, T. A. (1987). Retrieval modes produce dissociations in memory for surface information. In D. S. Gorfein & R. R. Hoffman (Eds.). *Memory and cognitive processesL The Ebbinghaus centennial conference.* 349-379. Hillsdale, NJ: Erlbaum.

Roediger, H. L. (1990). Implicit memory: Retention without remembering. *American Psychologist, 45,* 1043-1056.

Roediger, H. L.,& McDermott, K. B. (1993). Implicit memory in normal human subjects. In H. Spinnler & F. Boller(Eds.), *Handbook of neuropsychology*, *Vol. 8.* Amsterdam:Elsevier.

Rost, M. (2001). *Teaching and researching listening.* London: Longman.

Schacter, D. L. (1990). Perceptual Representation Systems and Implicit Memory-Toward a Resolution of the Multiple Memory Systems Debate. *Annals of the New York Academy of*

160

MJAL5:3 Spring2013   **ISSN 0974-8741**
Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Sciences, 608, 543-571.

Schacter, D. L., & Church, B. A. (1992). Auditory priming: Implicit and explicit memory for words and voices. *Journal of Experimental Psychology: Learning, Memory, & Cognition, 18,* 915-930.

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics, 11,* 129-159.

Trofimovich, P. (2005). Spoken-word processing in native and second languages: An investigation of auditory word priming. *Applied Psycholinguistics, 26,* 479-504.

Trofimovich, P. (2008). What do second language listeners know about spoken words? Effects of experience and attention in spoken word processing. *Journal of Psycholinguistic Research, 37,* 309-329.

Trofimovich, P. & Gatbonton, E. (2006). Repetition and focus on form in L2 Spanish word processing: Implications for pronunciation instruction. *The Modern Language Journal, 90,* 519-535.

Tulving, E., & Schacter, D. L. (1990). Priming and human memory systems. *Science, 247,* 301-306.

Liu, D. Y., & David, N. (2005). *Go For it.* People' Education Press. Beijing, China.

Test passage：http://www.doc88.com/p-631428618880.html

Auditory Implicit Memory and Context Effect in Early EFL Learners by
1.Fan Jiang & 2. Yongbing Liu

Appendix

Test materials

1. Repeated words

   children, watch, TV, interesting, see, learn, know, thing, country, world, radio, new, hear, time, rest, help, open, eye, mind, way, find, have, Saturday, evening, busy, lesson, night, bed, late, friend

2. unrepeated words

   touch, tree, funny, three, study, now, thief, count, wear, nice, twice, hill, mouth, wait, feel, how, Sunday, event, chicken, fashion, kite, bought, last, exciting, people, healthy, reading, flower, brother, early

3. English passage

   Most children like to watch TV. It is very interesting. By watching TV they can see and learn a lot and know many things about their country and the world. Of course, they can also learn over the radio. But they can learn better and more easily with TV? Why is that? Because they can hear and watch at the same time. But they can't see anything over the radio.

   TV helps to open children's eyes. TV helps to open their minds, too. They learn newer and better ways of doing things. They may find the world is now smaller than before. Many children watch TV only on Saturday and Sunday evening. They are always busy with their lessons. But some children watch TV every night. They go to bed very late. They can't have a good rest. How about you, my young friends?