Effects of Different Cognitive Learning Strategies on EFL Learners’ Receptive Retention of Vocabulary

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ABSTRACT: The present study examines the effects of different cognitive learning strategies on the immediate and long-term receptive retention of EFL vocabulary. The difference between the performance of male and female subjects who used the three different cognitive strategies of consultation, keyword mnemonic and context-based inferential on two tests of immediate and delayed recall was tested. Moreover, the relationship between the performance of male and female strategy users on the two tests of recall was tested against each other to find any probable interaction. The statistical analysis revealed that there appeared to be a non-significant relationship between male and female different strategy users and the number of words recalled. However, the results obtained proved that different vocabulary learning strategies do affect retention of new items differently.

Keywords: vocabulary cognitive learning strategies, receptive retention

The pre-eminent role of knowledge of vocabulary in language acquisition in general and in foreign or second language learning in particular is undeniable. What is the most significant way of presenting words, of making their meanings clear and causing them to be learned with a view to long-term retention? This is a central question concerning vocabulary learning, a question that despite years of research is still to be answered. Although problems involved in vocabulary learning have been addressed by different studies, good research appears to be scarce and is often focused on certain aspects, so that no overall picture emerges. Of the kind of research that would undoubtedly lead to the best and most useful ways of dealing with words are the ones which primarily aim at finding a systematically elaborated strategy for vocabulary acquisition.

The concept of strategy is defined by a number of scholars. Rubin (1994) defines strategy as those procedures which are used by the learner
to facilitate the storage, retrieval, and use of information. That is precisely what the learners do to learn and do to regulate their learning. Moreover, Bialystok and Sharwood (1985) writes that strategy is a matter of controlling the process of learning and also who controls the learner, if language learning is managed by the learner herself, then, the strategy would be a teaching strategy; however, if planning and management of learning is carried out both by the teacher and the learner we would have a kind of teaching-learning strategy. This definition assumes a congruity between teaching and learning strategies, at least to the extent that they both focus on ‘planning’ for effective learning.

By drawing on Rubin’s (1994) definition of strategy which encompasses what learners do to learn and what they do to regulate their learning, one can make a marked distinction between cognitive and metacognitive strategies. Cognitive strategies, by definition, are thought processes used directly in learning which enable learners to deal with the new information presented in tasks and materials by working on it in different ways like directly analysing, transforming or synthesising learning. However, according to O’Malley (1997) metacognitive strategies are those learning strategies that involve thinking about or knowledge of the learning process, and self-evaluation of learning after the task has been completed.

Furthermore, learning strategies as ways in which learners attempt to work out the meaning and use of words, grammatical rules, and other aspects of language have been classified by analyzing the results of a number of studies concentrating on the ‘good language learner’. These are strategies reported by subjects or observed in language learning situations that appear to contribute to learning. Rubin (1994) in an attempt to describe learning strategies subsumes learning strategies under two distinct primary groupings and a number of subgroups. She claims that the first primary category consists of those strategies that directly affect learning. As such are clarification/verification, monitoring, memorization, guessing/inductive reasoning, deductive reasoning and practice. The second primary category consists of strategies that contribute indirectly to learning. This category includes creating practice opportunities and using production tricks such as communication strategies. Naintan, Frohlich, Stem, and Todesco (1978 cited in Cook 1991, 2003) propose a classification scheme that contains five broad categories of learning strategies and a number of secondary categories. The primary category includes active task approach, realization of language as a system, realization of language as a means of communication and interaction, management of affective demands and monitoring second language performance.
Yet, Wong-Fillmore (1985) proposes another classification for learning strategies. Fillmore believes that learning strategies are the major influence on the rate and level of second language acquisition. The types of strategy described by Fillmore include knowledge, mental skills, and strategic processes. The strategies suggested by him include associative skills, memory, social knowledge, inferential skills, analytical skills, pattern recognition, induction, categorization, generalization, inference.

One of the ideas that gained ground in past years with regard to vocabulary acquisition is the view that inferring the meaning of a word from its context makes an important contribution towards the retention of the word in question. With regard to this, a theory in which an attempt has indeed been made to combine certain findings from linguistics and learning psychology into a systematic way of word acquisition is the theory of Schouten-Van Parreren (1989). Her theory is based on a particular view on the receptive acquisition of words. Schouten-Van Parreren wrote that inferring the meaning of words from the context would have a positive effect on retention. She believes that learning of words can best be achieved by reading. The learning of words through bilingual word-list should be rejected for the following reasons:

- Words that have been learned through a list are easily mixed up.
- They are easily forgotten because of the lack of any cognitive foothold.
- Words that are known within the list may not be known outside the list.
- The meanings of a word as learned in a list are often not appropriate in the context encountered by the learners.
- The learning motivation of the pupils will be slight because s/he has not yet felt the need to find out the meaning of a particular word.

Schouten-Van Parreren (1989) concentrates on reading with the primary goal of vocabulary acquisition. She argues that a combination of three actions of inferring, verifying and analyzing the meaning of each word that has to be learned is very effective for this purpose. She defines guessing as inferencing meaning of an unknown word from the context. This is an action which is thought to contribute to a great extent to the retention of new words. The second action which is the action of verifying the guess is looking up words in a dictionary. The third action according to Schouten-Van Parreren (1989) comprises the recognition of the relationship between new words and already known words in the target language or the mother tongue. What can be concluded from her theory is that inferring meaning of a word from the context is conducive to retention. This implies, incidentally, that wrong guessing should be prevented as far as possible, as incorrectly guessed meanings also tend to
stick in the mind. Therefore, to make guessability of words optimal, the context in which the new word occurs must be a context that offers ample clues for finding the meaning of the new word, this kind of context is labelled by Van-Parreren a pregnant context.

There are three different groups of factors which determine the guessability of words they include: contextual factors, word-factors and reader/learner factors. Clarke and Silberstein (1977) have listed a number of contextual factors. Their list includes: synonym in apposition, antonym, cause and effect, association between an object and its purpose or use, description and example. As for the word factors, they enlist categories as part of speech, the degree of concreteness or abstraction, the transparency of the word structure, the degree of the correspondence between the referential meaning of the foreign word and that of the word in the reader’s mother-tongue. However, the reader/learner factors concern the knowledge and the skills of the person who is guessing. In this connection, the knowledge of words that occur in the context, the ability to analyze the word-form (with the help of knowledge of morphology and etymology), the ability to make use of the syntactic and semantic context, and knowledge of the world are useful. Schouten-Van Parreren (1989) states that in the process of guessing there is a distinct interaction between contextual factors, word factors, and reader/learner factors. Guessing is conducive to retention in that, in the process of guessing, the reader performs a mental action on the word-form, making association between the context and his own personal knowledge and thus establishing a cognitive foothold. Moreover, guessing results in a strong effective involvement on the part of the guesser, notably if the guessing is followed by the verification of the meaning.

Another strategy for learning second language vocabulary is the use of Mnemonic Devices among which the key-word mediation is well-known in the educational literature for its effectiveness in accelerating learning speed and in boosting immediate recall of second language vocabulary. Use of mnemonic devices includes key-words as a way through which we can enhance storage. This is done by encouraging students to use such memory techniques which are helpful aids to commit words to memory. As a matter of fact, a key-word is a familiar word that bears an acoustic, orthographical or etymological resemblance to a novel word. The mnemonic benefit is provided by generating an interactive visual image liking the two words, namely the key-word and the target word translation. The common explanation for the success of these systems is that the keyword enables people to combine in a single associative image the referent of one native word with that of a second native word that sounds like the foreign word, that is, the meanings of the native word and the key
word are integrated in one image. There are two stages in recall using key words.

The first stage of recalling the meaning of a foreign word involves remembering the native key word that sounds like the foreign word, the second stage involves accession of an interactive image containing the referent of the key word and ‘seeing’ the object with which it is associated. The involvement of key word mediators introduces a number of additional potential psycholinguistic determinants of success. Atkinson and Raugh (1975) state four criteria of a good keyword. They are briefly quoted in Ellis and Beaton (1993) as:

- Reminding power of foreign word for key word;
- Reminding power of the key word for foreign word;
- Imaginability of key word;
- Imaginability of mediational sentence.

Reviewing the related literature, one may find numerous subsequent studies confirming the effectiveness of the keyword method in FL and native language vocabulary learning, of which are Levin and Pressely (1985) and Cohen (1987). The results of these studies show that keyword mnemonic strategy is more effective than direct methods such as rote rehearsal. Sternberg (1987) claims that for learning specific vocabulary, the key word strategy of vocabulary learning and teaching is faster and more efficient than learning from context. To end, according to Carter and McCarthy (1988) this is a technique which is valuable for students at both advanced and beginning levels who are to find the best way of acquiring second language vocabulary.

Consultation strategy, simply using dictionaries and thesaurus, is yet another strategy of learning second language vocabulary. Many scholars including Carter and McCarthy (1988) have talked in favour of using dictionaries as a valid activity for foreign learners of English both as an aid to comprehension and production. Essential to note here is the point that they do not claim that using a dictionary is the only best, or easiest source of the linguistic knowledge needed to understand English accurately, but simply that in addition to other learning strategies, such as making guesses about new words encountered in reading texts, students can and should be encouraged to avail themselves of the substantial information contained in their dictionaries.

McCarthy (1988) argues that although decoding newly encountered words by means of contextual clues is a widely agreed pedagogic principle, it cannot be always the best solution. In reality, unknown words are very often not deducible from contextual clues. Consequently, one solution would be the use of dictionaries. This is while using dictionaries for language learning has in fact been largely ignored in the wealth of books and articles on language learning by linguists, psychologists and
language teachers. They can serve as a great help to students learning new words in different ways. One is that they provide further exposure for the word in other contexts, with different collocates and constructions, by making the student think about the words in relation both to the passage being read and the dictionary. What dictionaries do, is restating the concept behind the word, either in simpler terms or by breaking the concept down into constituent parts.

The mental activity involved in unpacking the definition would help to implant the word and its concept into the student’s mind. Another effective point done by dictionaries by means of usage notes is differentiating similar words from each other which is a necessary factor for accurate comprehension. Moreover, drawing the user’s attention to opposites or words with close meaning will also help fix new vocabulary in the memory. And the last but not the least, examples in dictionaries are essential both to extend the user’s comprehension and to provide models for students to remember and perhaps eventually produce the words.

There are a number of studies reported in literature regarding using dictionaries in ESL learning settings. For instance, Pitts, White, and Krashen (1995), and Jacobs and Dufons (1994) studied the effectiveness of glosses in vocabulary learning and came up with the result of significant effect of using glosses in English learning. However, this significance was not apparent on a delayed vocabulary test. In contrast, Day (1992) reported that in his study subjects who had used this strategy did significantly better on a delayed vocabulary test.

The above claims and predictions led to conducting the present study which attempts to answer the question of the preference of one of the strategies of context-based, key-word mnemonic and consultation over the other two in view to retention of the English vocabulary for Iranian male and female English language learners.

In other words, the present study attempts to find out a systematically elaborated strategy for vocabulary acquisition. To accomplish this goal the effectiveness of the three different vocabulary learning strategies, namely text-based inferential strategy, keyword mnemonic strategy and consultation strategy in view to short and long-term receptive retention of words has been studied. Consequently, the problem is stated in forms of the following questions:

1. Is there any significant difference between the immediate and delayed recall of new/unknown words of the three EFL groups who employ guessing, dictionary, and key-word learning?

2. Is there any significant difference between males and females in their success in learning vocabulary?
3. Is there any significant relationship between sex, different learning strategies in combination and the receptive retention of foreign language words?

The rationale behind drawing distinction between receptive and productive retention for the researcher is what Carter and McCarthy (1988) state. They believe that any discussion of vocabulary acquisition or language performance in general needs to draw a clear-cut distinction between comprehension and production as different skills that require different methods and strategies. Comprehension of vocabulary relies on strategies that permit one to understand words, store them and to commit them to memory while production concerns strategies that activate one’s storage by using those stored words in appropriate situations. In other words, receptive retention concerns only the recall of words meaning over a time, while productive retention means being able to use the stored knowledge productively.

Method
Participants
Participants in this study, at first attempt were 220 Iranian Farsi speaking freshmen and women students studying English Translation at Islamic Azad University. After testing their homogeneity in terms of their language proficiency by means of the Michigan Test, 90 intermediate students were selected and randomly assigned to three separate groups, each with 30 subjects. These students were those who had never been to any English speaking country before, or to any English courses; moreover, who have had no pervious instruction in English except six or seven years during their school days. Out of 30 subjects in each group, 14 to 16 of them were boys and the rest, girls.

Instrumentation
The homogeneity of the subjects in terms of their language proficiency was controlled through their scores on the Michigan test. The test had four parts testing grammar (40 items), vocabulary (80 items), and reading comprehension (4 passages) of the subjects. Ninety homogenous subjects were selected from among the 220 subjects who had taken the Michigan test.

A pre-test was conducted across the three groups to see if the target words were in fact unfamiliar to the subjects. In this test that had been administered prior to any attempts in learning words by means of one of the mentioned strategies, the subjects were asked to write down (either in English or Farsi) the common meanings of the target words they knew. This test was scored by two experts strictly on the basis of net work. That
is, when it turned out that the target word was not known to a subject (as indicated by a correct response of the word meaning stated by the subject in the pre-test) that very target word was counted in neither of the tests of immediate and delayed recall.

The second test instrument in this study was ‘the test of recall’. For each of the three groups, one test of immediate and one test of delayed recall were used.

Tests of immediate and delayed recall for the context based inferential group: During the testing time of immediate recall, subjects were asked to translate 20 target words written in the form of a list. After that in the test of delayed recall students were also asked to translate the target words that they had previously inferred from the context. However, this time these words appeared in the form of phrases. This was done to have a cued recall test for the other two groups. The researcher has taken new phrases because one can only speak of word knowledge when words are known also in unfamiliar contexts. (Since the test was intended exclusively to measure the guessing skill, isolated words in the immediate test of recall were used.) To eliminate the effects of ranking order, the order of sentences on the test paper was reversed vis-à-vis that on the guessing sheet. The time available for the immediate recall test was 125 seconds (5 seconds for each word) and for the delayed test 250 seconds.

Tests of immediate and delayed recall for the key-word mnemonic group: In the immediate test of recall, the subjects were allotted a total of 250 seconds to write the Farsi equivalent and the key-word next to the English word in a test paper given to them. The first was presented in a different presentation order from the original word list. However, in the delayed test of recall, subjects were asked to write the Farsi equivalent of the novel words as well as the imagery sentence while given the key-word. The majority of key-words chosen by subjects were quite different. Crucial to note here is that the researcher had to write for each individual his/her own key words for the delayed recall test. In this way, the test was made a test of cued recall. The English word list, in this test, was also presented in an order different from the previous test of immediate recall. To control any practice on English-Farsi pairs during the delayed interval, subjects had not been informed in advance that there would be such a test of delayed recall after two weeks.

Tests of immediate and delayed recall for dictionary learner group: The recall test for the third group also consisted of two tests of immediate and delayed recall. In the test of immediate recall, subjects were asked to write the meaning of the novel words either in English or Farsi. To control any probable memorization of the novel words on the part of the subjects, they were not informed in advance that there would be such tests of immediate and delayed recall. The delayed-recall test procedures were the
same as the first recall test except that this time students had been provided with the part of speech of each novel word. This was done to have a cued recall test, as it was the same for the other two groups in the study.

Procedure

To make sure that all the words needed for the experiment were definitely unknown to the subjects, the four English books of high school were analyzed by the researcher and the words of different categories were listed. Then, the 20 words chosen from Barons TOEFL Test for the experiment were checked against the aforementioned list. Furthermore, to check whether the subjects have had previous formal course-work or extensive experience with the English language, a questionnaire was used. Next, the subjects took the aforementioned pre-test. In the next step, the subjects were assigned into three groups of equal size. One group used the context-based inferential strategy, one the key-word mnemonic strategy and the last one consultation strategy. The procedure of the study is as follows.

Group one: Learners using context-based inferential strategy — the subjects were guided to use the context-based inferential strategy to learn 20 target words novel to them. Twenty items each consisting of two or three sentences with one new underlined word (the meaning of which is to be guessed) were given to them. Since this was not a test of word-knowledge or reading in one or any other way, rather a reading task for primary aim of learning vocabulary, there was no time limitation. However, subjects were all to finish the passage within one single session. To make sure that the subjects were all familiar with the strategy of guessing, they were briefed on the guessing procedure that they were to use to ensure that they were making good use of available context clues. This strategy procedure is exactly what Clarke and Nation (1980) suggest. Their procedure consists of five stages which are as follows:

1. Finding the part of speech of the unknown word;
2. Looking at the immediate context of the unknown word;
3. Looking at the wider context of the unknown word;
4. Guessing the meaning of the unknown word;
5. Verifying their guesses to see whether their guesses are correct or not by simply replacing the guess for the unknown word or check the part of speech of the guess with the unknown word. If it does make sense in context, they can go on with the task, if it does not they are to guess once again.

Since the precondition for any guessed meaning of a word from context, if it is to have any contribution towards retention, is that the meaning should be guessed correctly, the researcher herself at the end of the guessing session checked the meaning of words with the subjects.
Finally, finishing the guessing of words, the subjects took two tests of recall, one immediately after the guessing time and one with a two-week interval.

Group two: Learners using key-word mnemonic strategy — before providing the participants with the unknown English words, the procedures of this strategy were also elaborated for them. This strategy procedure according to Atkinson and Raugh (1975) is as follows:

1. Forming a native language homophone for the target language in the second language
2. Visualizing an interactive image involving both the keyword and the Farsi translation of the word given to them

To ensure that participants have completely understood these two stages, the researcher presented a simple word and described how a keyword and the Farsi equivalent word can be linked in a mental image. Next, a list of 20 unknown English words was given to the subjects. Then, they were asked to find each English word a key-word with the above-mentioned features. Next, they were given the very English words written on a separate piece of paper and were asked to visualize an interactive image involving the key-word and the translation. They were also asked to write this imagery sentence in the space provided. At last, subjects were tested on two recall tests; one testing participants’ immediate recall and one testing their delayed retention with an interval of two weeks.

Group three: Learners using consultation strategy — this group was formed so as to learn 20 English words with which they were totally unfamiliar. They were directed to find out the part of speech of the target word, its definition(s), and at least one example for it.

Since the aim set for this group was to learn new words by means of consultation, one meaning of each unknown word in case of having more than one did suffice.

Scoring has been done by the researcher herself and two other experts in the field of language teaching. They have judged the correctness of the answers provided by the subjects, by assigning 1 point to those answers that agreed with the meaning of the novel words and 0 point when that was not so. Two multivariate analyses of variance (MANOVA) were run to answer the three questions of the study.

Results

This study has been conducted to answer whether different vocabulary cognitive learning strategies would affect short and long term retention of words differently; if so which one of the strategies is the most effective one. Moreover, this study aimed at investigating any probable effect of sex on short and long term retention of words; furthermore whether there is
any possible relationship between sex, learning strategies, and short as well as long term retention of words.

As stated above, to test the three null hypotheses of the study, two multivariate analyses of variance (MANOVA) were run. The MANOVA of the whole data showed that different learning strategies would affect short and long term retention of words differently. However, the differences observed were not affected by the learners’ sex (or gender); and respectively the three-way interaction of ‘sex x learning strategies x retention’ of words appeared to be non-significant (see Table 1).

Table 1. Tests of Significance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>F</th>
</tr>
</thead>
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<tr>
<td>tests</td>
<td>120.31*</td>
</tr>
<tr>
<td>learning strategies by tests</td>
<td>31.91*</td>
</tr>
<tr>
<td>sex by tests</td>
<td>1.81</td>
</tr>
<tr>
<td>learning strategies by sex by tests</td>
<td>3.54</td>
</tr>
</tbody>
</table>

* p <0.05

To test the hypothesis of no significant difference between the performance of guess learners, key-word mnemonic learners, and dictionary users on both tests of immediate and delayed recall, one 2 x 3 multivariate analyses of variance was run. An alpha level of 0.05 was used as the criterion of statistical significant for all the results of the data analyses of the study.

The results showed that there were significant differences between the performance of dictionary users and the key-word mnemonic learners on both tests of recall. Both groups performed highly better on the immediate test of recall ($t_{obs}$ for the dictionary users = 10.66; $t_{obs}$ for the key-word mnemonic learners = 8.78; d.f. = 28). However, the performance of the context-based inferential group was not significantly different on the tests of immediate and delayed recall ($t_{obs}$ = 0.23, d.f. = 28). In other words, the learners in group one made more or less the same gains on these two tests. Furthermore, there appeared to be no significant difference between short term retention of keyword learners, short and long term retention of context-based inferential learners ($t_{obs}$ for short term retention of keyword learners with short term retention of guessers = 1.28 and $t_{obs}$ for short term retention of keyword learners with long term retention of guessers = 1.05).

Cell means and the standard deviation of the three groups of strategy users on both tests of recall are reported in Table 2.
The results of MANOVA did not reject the null hypothesis of no significant difference among the performance of males and females on the immediate and delayed test of recall. In other words, males and females could retrieve words equally (see Table 1).

The hypothesis of no difference among the performance of males and females context-based inferential, key-word mnemonic and dictionary learners on the two tests of recall was not rejected (F= 2.76, d.f. (2.84)). In other words, there was no interaction between sex, learning strategies, and retention of words. This means that both males and females could equally benefit from the three learning strategies used in this study.

Cell means and the standard deviation of each group of males and females using different learning strategies are presented in Table 3.

Table 3. Descriptive Statistics for Different Sex Groups

<table>
<thead>
<tr>
<th>strategy</th>
<th>X(short)</th>
<th>SD(short)</th>
<th>X(long)</th>
<th>SD(long)</th>
</tr>
</thead>
<tbody>
<tr>
<td>consultation</td>
<td>11.14</td>
<td>3.46</td>
<td>5.64</td>
<td>3.00</td>
</tr>
<tr>
<td>male</td>
<td>11.81</td>
<td>3.20</td>
<td>4.62</td>
<td>2.65</td>
</tr>
<tr>
<td>female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>key-word</td>
<td>15.87</td>
<td>2.72</td>
<td>9.56</td>
<td>3.07</td>
</tr>
<tr>
<td>male</td>
<td>14.92</td>
<td>2.89</td>
<td>10.85</td>
<td>3.50</td>
</tr>
<tr>
<td>female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>context-based</td>
<td>15.35</td>
<td>1.55</td>
<td>14.28</td>
<td>2.16</td>
</tr>
<tr>
<td>male</td>
<td>14.06</td>
<td>2.67</td>
<td>15.25</td>
<td>4.94</td>
</tr>
<tr>
<td>female</td>
<td></td>
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</tr>
</tbody>
</table>

Discussion

This study was carried out to find out a type of systematically elaborated strategy for vocabulary learning. To do so, attempts have been made to compare three different vocabulary learning strategies and their effects on short and long term retention of words. Ninety male and female EFL learners were assigned to three groups each learning twenty novel
words by means of either context-based inferential, key-word mnemonic or consultation strategy. Subjects’ retention of words was measured by two tests of immediate and delayed recall.

The multivariate analyses of variance (MANOVA) of the whole data showed that context-based inferential strategy users made more gains both on the immediate and the delayed recall tests. This supports the superiority of guessing over the other two strategies.

Furthermore, the results obtained indicated that the key-word mnemonic learners made more or less the same gains as the guess learners. This means that these two strategies affect short term retention equally. Therefore, it can be claimed that when the primary aim of teaching is not merely acquiring vocabulary but comprehending a technical text which contains a number of unknown words, one might use his/her mother tongue to learn the meaning of new items and keep them in his/her short memory to be used within a short period of time.

The results of the study support the importance of strategic learning and teaching. Since strategies are complex procedures that learners apply to tasks, they may be learned through cognitive and associative stages of learning. Using strategies in early levels of learning should be conscious and later be performed without personal awareness if they are to be pure learning strategies. Since, as Rivers (1981) notes, vocabulary cannot be taught although it can be explained, presented, demonstrated along with other techniques and activities, and must be learned by individuals. In early stages of learning a foreign language teacher can make learners aware of different learning strategies and provide learners with ample examples so as they can use them automatically in later stages.

A syllabus aimed at teaching vocabulary must be rich in adequate cues. Pregnant context could not only enhance inferring and remembering the meaning of unfamiliar words in context but also relieve language learners from the anxiety of unfamiliar words. It might follow that more comprehensive input should be involved in acquiring vocabulary. To provide more comprehensible input means to provide more accessible frames of reference; namely, attributes and contexts which are familiar to text receiver. This being the case, the learner can learn what is unknown by employing what is known.

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