

Direct teaching of vocabulary after reading: is it worth the effort?

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This experimental study evaluated the effectiveness of direct teaching of new vocabulary items in reading passages. The study compared vocabulary learning under a reading only condition (incidental learning) to learning that is aided by direct communication of word meanings (explicit learning). Three levels of vocabulary knowledge (form recall, meaning recall, and meaning recognition) were assessed using three tests (completion, L1 translation, and multiple choice, respectively). Incidental learning plus explicit instruction was found to be more effective than incidental learning alone for all three levels. The results also showed that direct instruction is especially effective in facilitating the deepest level of knowledge, i.e. form recall. These findings demonstrate the value of the time and effort spent on direct teaching of lexical items in EFL reading classes.

Background

Lexical researchers have proposed two main approaches to vocabulary learning in a L2: ‘explicit learning’, i.e. learning vocabulary when the focus is on the words to be learnt, and ‘incidental learning’, i.e. learning vocabulary as a by-product of any language learning activity, such as reading. Incidental learning is clearly the dominant path of vocabulary acquisition in the L1 (for example Nagy 1997), and reading research has shown that incidental vocabulary acquisition also occurs in the L2, although only with relatively small gains and after repeated exposure (see, for example, Waring and Takaki 2003). However, with extensive and sustained reading, the cumulative learning can be substantial. Unfortunately, Nation (2001: 232) notes that ‘many [L2 learners] do not experience the conditions that are needed for this kind of learning to occur’. Thus, he claims that activities focusing on the word itself (explicit learning activities) are essential for successful L2 vocabulary acquisition.

In practice, teachers of English in many foreign language contexts combine explicit and incidental approaches, and with good reason, as research has shown that this combination is effective. For example, Hill and Laufer (2003) found that post-reading tasks explicitly focusing on target words led to better vocabulary learning than comprehension questions which required knowledge of the target words’ meaning. Mondria (2003) found that the combination of word inferencing followed up by verification with a word list led to just as much vocabulary learning (about 50 per cent) as giving students an L1 translation before memorization. This shows that incidental learning plus explicit follow-up can be just as effective as a purely explicit approach.

So incidental and explicit approaches are generally complementary and are often usefully combined (Schmitt 2008). But can the case for explicitly teaching vocabulary items after learners have read them in a text be generalized to different teaching contexts? For example, in Saudi Arabia, reading courses incorporate a direct teaching component focusing on new vocabulary items in reading passages. This practice aims not only at enhancing comprehension but also at developing knowledge of technical and academic vocabulary items. However, is the time taken to teach new vocabulary after it has already been met in a passage justified, and does it add anything to the incidental learning which has already taken place?

Previous research

Some previous research suggests that it does. In Canada, with mixed-L1 participants, Paribakht and Wesche (1997) compared vocabulary learning in a reading-only condition to learning that occurs through reading plus various types of vocabulary exercises. Both treatments led to vocabulary gains, but the latter treatment (reading + exercises) resulted in a larger quantity and deeper quality of vocabulary knowledge. In a study set in California (also with mixed-L1 participants), Zimmerman (1997) found that a group which completed interactive vocabulary exercises after reading improved more than a reading-only group. Based on these two studies, it might be concluded that explicit vocabulary instruction is a useful follow-up to incidental learning.

However, these two studies used tests which covered the whole range of vocabulary mastery (zero knowledge to complete productive mastery). As the first step in learning, a new word is likely to entail mainly acquisition of its form–meaning link (for example being able to recognize the written form of an L2 word and remembering its meaning), it might be better to try to measure this initial stage of learning in more detail (Schmitt op.cit.). Laufer, Elder, Hill, and Congdon (2004) explored this stage extensively when developing a new vocabulary test and proposed a four-element description of the various degrees of knowledge of the form–meaning link. Schmitt (2010) relabelled this description to make it more transparent (see Table 1). As Laufer and colleagues found that recognition of form and meaning tended to have similar scores, we will only test ‘form recall’, ‘meaning recall’, and ‘meaning recognition’ in our study. We will discuss the relative difficulty of these ‘levels of mastery’ in the Results and Discussion section.

TABLE 1
Levels of mastery of the form–meaning link (Schmitt 2010)

Word knowledge given	Word knowledge tested	
	Recall	Recognition
Meaning	Form recall (supply the L2 item)	Form recognition (select the L2 item)
Form	Meaning recall (supply definition/L1 translation, etc.)	Meaning recognition (select definition/L1 translation, etc.)

To explore the added value of explicit instruction in addition to incidental vocabulary learning from reading, the present study compares vocabulary learning from two methodologies:

- 1 incidental learning from reading only (Read-Only)
- 2 a combination of incidental learning from reading plus explicit instruction (Read-Plus).

Unlike most previous research in this area, we also test vocabulary knowledge of the form–meaning link at three different levels (meaning recognition, meaning recall, and form recall) in order to explore two research questions:

- 1 Is incidental learning plus explicit instruction (Read-Plus) more effective than incidental learning alone (Read-Only)?
- 2 To what degree do the Read-Only and Read-Plus input conditions facilitate acquisition of the three levels of mastery of the form–meaning link (form recall, meaning recall, and meaning recognition)?

The study

Participants

Forty female students of Medicine at Umm Al-Qura University, Makkah, Saudi Arabia, participated in the study. These students were all native speakers of Arabic who started learning English as a school subject at the age of 12 (6–8 years of study). They were majoring either in Laboratory Medicine ($N = 21$) or in Pharmacology ($N = 19$) and were enrolled in a first-year English for Specific Purposes (ESP) module.

Materials

In order to ensure a suitable level of difficulty, the reading passage was selected from the students' ESP reading coursebook *The Language of Medicine in English* (Tiersky and Tiersky 1992: 38–44). A 700-word extract was chosen and 20 low-frequency or medical words were selected which occurred only once in the passage.¹ After being matched for difficulty (i.e. part of speech and length), the words were divided between Read-Only and Read-Plus conditions.

Three paper-and-pencil tests were developed to measure the target items. First, a completion (fill-in-the-blanks) test was developed to assess form recall. Participants were presented with a concise meaning plus the first three letters of each target word and were asked to complete the form.

- A (thr_____) is a blood clot.

Second, meaning recall was assessed using L1 translation.

- Thrombus (_____).

Finally, meaning recognition was measured using multiple-choice items (hereafter MC). Each item included five choices: the correct answer, three distracters, and one 'I do not know' option to reduce guessing.

- Thrombus
 - a Blood clot
 - b Poor blood supply
 - c Damage to a blood vessel
 - d Too many white blood cells
 - e I do not know.

Procedure

To assess pre-knowledge of the target items, participants took a translation test one week before the teaching session. The 20 items were intermixed with 40 high-frequency words in order to prevent alerting participants' attention to the target words. Results of the pre-test showed that 38 participants did not know any target item. Two learners knew one word each, and this was later adjusted for in the analysis. Thus, the learners started the study with no knowledge of the target items.

One week later, the teacher,² who had three years of teaching experience, mostly in ESP reading courses, conducted the study. In order to prevent any intentional learning of the target words, participants were not told about any upcoming vocabulary tests. Copies of the passage were distributed, and learners were told to read it silently in ten minutes. Comprehension was then assessed with general and specific questions and words under the Read-Plus condition were directly explained. The teacher gave two meanings for each target item, wrote them on the board, and repeated them once. The time devoted to explicitly explaining these words did not exceed one minute for any target item. Words under the Read-Only condition were deliberately ignored in terms of explicit instruction.

Immediately after the teaching session, three immediate post-tests (form recall, meaning recall, and meaning recognition) were administered. One week later, the same three tests were administered unannounced in the same order to assess retention of the target words over time (i.e. delayed post-tests). The teacher, however, noted that a large percentage (over 50 per cent) of the participants read the passage again during this week on their own initiative. This unexpected circumstance will have an important bearing on our interpretation of the results.

The tests were scored as follows. Completion items were scored 1 if they were completed accurately without any spelling mistakes and 0 when completely wrong answers were given. For answers where only one vowel/consonant was missing or misplaced, half a mark (0.5) was awarded. A full point (1) was awarded on the translation test for fully correct answers (for example 'thrombus–blood clot'), half a point (0.5) for partially correct answers (for example 'thrombus–a clot'), and no point (0) for a totally wrong answer (for example 'thrombus–vessel'). Finally, a correct answer on the MC test was awarded 1, 'I don't know' or no answer were scored 0, and any distracter selected was scored –.33 to adjust scores for guessing.

Results and discussion

Vocabulary gains for Read-Only and Read-Plus

As all students read the same text and were tested on both Read-Only and Read-Plus words, the results from the Read-Only and Read-Plus conditions are directly comparable. Also, as the students started with zero knowledge of the target items, Table 2 represents the total learning gained from the Read-Only and Read-Plus input, both immediately and after one week. However, as the delayed post-test scores are a better indication of durable learning, we will concentrate our analysis on these figures.

Session	Condition	Type of vocabulary knowledge								
		Form recall (completion)			Meaning recall (translation)			Meaning recognition (MC)		
		M ^a	SD	%	M ^a	SD	%	M ^a	SD	%
Immediate	Read-Only	0.26	0.86	2.89	0.35	0.75	3.89	3.26	2.11	36.22
	Read-Plus	1.08	1.07	10.80	1.49	1.57	14.90	6.76	2.64	67.60
One week delay	Read-Only	0.25	0.76	2.68	0.59	1.17	6.56	3.41	2.21	37.89
	Read-Plus	0.93	1.35	9.30	1.88	1.58	18.80	5.23	5.87	52.30

TABLE 2
Mean vocabulary gains under Read-Only and Read-Plus in both testing sessions ($N = 40$)

^aMaximum score under Read-Only = 9; maximum score under Read-Plus = 10

In the Read-Only condition, the students gained very little form recall (≈ 3 per cent) or meaning recall knowledge (≈ 7 per cent), although they were able to recognize the meaning of about 38 per cent of the target items on the MC test. In comparison, the students in the Read-Plus condition produced higher scores at all three levels of mastery (about 9 per cent for form recall, 19 per cent for meaning recall, and 52 per cent for meaning recognition). The amount of advantage of the Read-Plus instruction over the Read-Only instruction (effect size) was large for meaning recall ($r \geq .5$) and medium for form recall and meaning recognition ($.3 < r < .5$).³

On the basis of these findings, a clear answer to the first research question emerges. An uninstructed, incidental, approach to L2 vocabulary acquisition does result in lexical gains, but they are modest. However, direct instruction clearly adds value to the learning process and leads to greater learning. From only one or two (see below) reading exposures with one explicit instruction, the learners were able to recall the meaning of nearly one-fifth of the target items and recognize the meaning of over one-half of the items. Taken with the previous research surveyed in Schmitt (2008), this further strengthens the case for explicit vocabulary instruction, in this case after incidental learning from reading. Thus, it might be concluded that the widespread teaching practice of explicit vocabulary instruction combined with reading is not a waste of time and effort; it is rather a practical investment of time in the EFL reading class for building a large repertoire of L2 vocabulary.

It is also notable that the delayed figures do not show the attrition typical in most vocabulary learning studies. This is most likely explained by the additional reading of the text which over half of the students did on their own after the treatment. In the Read-Only condition, the second reading served to consolidate and maintain the learning at all three levels of mastery. In the Read-Plus condition, there was a little attrition for form recall and even an improvement in meaning recall, although both of these were changes in rather small amounts of absolute learning. There was somewhat more attrition in meaning recognition, but this was the easiest level of knowledge, and it may be the case of 'easy come, easy go', i.e. shallower levels of knowledge which do not require substantial integration with the lexical network may be the most easily forgotten. Even here, the initial learning was largely maintained over the course of a week. Repeated exposure is one of the keys to vocabulary learning, and this study shows the value of this recycling combined with explicit instruction. Moreover, if consolidation is not pursued, the initial learning may all be in vain. Rott, Williams, and Cameron (2002) found that reading + multiple-choice glosses lead to better immediate scores than incidental (reading-only) learning alone, but after five weeks, the scores had decayed to the same level as the incidental learning condition. Thus, the improved learning gained from an incidental exposure + explicit learning approach needs to be recycled in order to be maintained, otherwise any learning advantage may well be lost.

Levels of vocabulary knowledge

The second research question explores how well the two instructional approaches facilitated the learning of the three levels of form–meaning mastery. Under both learning conditions and on both immediate and delayed tests, meaning recognition was the level that was best learnt,

followed by meaning recall. In three out of the four cases, meaning recall was learnt better than form recall.⁴ This agrees with the ease-of-learning ranking found by Laufer *et al.* (2004), and can be summarized as follows (> represents 'more learning than'; = represents 'equal learning'):

Immediate post-test:

Read-Only: Meaning recognition > Meaning recall = Form recall

Read-Plus: Meaning recognition > Meaning recall > Form recall

Delayed post-test:

Read-Only: Meaning recognition > Meaning recall > Form recall

Read-Plus: Meaning recognition > Meaning recall > Form recall

These results follow the general pattern that receptive knowledge (i.e. recognition) is easier to acquire than productive knowledge (i.e. recall). They also highlight the importance of repetition in building up to a recall level of mastery, as the minimal exposures in this study only resulted in modest recall gains. Moreover, the results highlight the importance of word form. While many teachers focus on meaning when teaching new words, in many cases, it may well be the form of the word which is the most difficult aspect to learn.

Pedagogical implications

The main pedagogical implication of the present study is based on the superiority of incidental + explicit learning over incidental learning alone. Leaving L2 students to learn vocabulary in context does not seem to get them any deeper than meaning recognition knowledge (i.e. the ability to recognize word meanings on a multiple-choice test). In any vocabulary teaching programme, where the purpose is achieving deeper levels of vocabulary knowledge, direct instruction should be adopted. Sökmen (1997: 239) concluded that 'the pendulum has swung from direct teaching of vocabulary . . . to incidental . . . and now, laudably, back to the middle: implicit and direct learning'. The present research evidence reinforces this, showing the value of both approaches used in conjunction to facilitate vocabulary acquisition. The present evidence also suggests that language teachers should not neglect the development of word form in vocabulary learning, as it may be more difficult than learning meaning (see also Barcroft 2002).

Another implication of the study is related to the positive, reinforcing, effect of reading on L2 vocabulary gains. Based on this finding, teachers might consider the value of reading to consolidate the learning done in the classroom. This study has demonstrated its value in consolidating vocabulary learning, and one might speculate that it would also be useful in maintaining the learning of other linguistic aspects as well. Of course, it also helps to improve reading proficiency. Along these lines, the introduction of an extensive reading component into the curriculum has often been advocated (for example Day and Bamford 1998).

Overall, this study has shown that direct teaching of word meanings in a reading passage is more effective than an uninstructed vocabulary learning approach in building three levels of the form–meaning link: form recall, meaning recall, and meaning recognition. Moreover, while only meaning recognition was achieved to any extent under incidental learning, all three levels can be learnt with additional explicit instruction. Finally, it

has been shown that a second reading of a passage within one week may prevent attrition of vocabulary gains achieved under incidental and explicit learning conditions. To answer the question in the article title, the direct teaching of vocabulary during reading is definitely worth the effort.

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Notes

- 1 One of the words in the Read-Only condition was inadvertently explained before the treatment session and so had to be deleted. This left nine target words in the Read-Only condition and ten in the Read-Plus condition.
- 2 We are deeply indebted to the Saudi language teacher, Ramia Hariri, who conducted the study in her classes, for her valuable comments on material selection and for the time she dedicated to conducting this study.
- 3 Wilcoxon signed-rank tests showed that the advantage of the Read-Plus condition over the Read-Only condition was statistically reliable for all three types of vocabulary knowledge (form recall: $z = -3.93, p < .001, r = .44$; meaning recall: $z = -4.51, p < .001, r = .50$; meaning recognition: $z = -3.67, p < .001, r = .41$).
- 4 Friedman Tests compared mean gains in the three tests. Results revealed significant differences across the three levels of vocabulary knowledge in the immediate test under Read-Only ($df = 2, \chi^2 = 72.57, p < .001$) and Read-Plus ($df = 2, \chi^2 = 62.32, p < .001$). The same result was found in the delayed test under Read-Only ($df = 2, \chi^2 = 62.83, p < .001$) and Read-Plus ($df = 2, \chi^2 = 62.38, p < .001$). Wilcoxon signed-rank tests were then used as a post hoc analysis. All the comparisons were significant at the $p < .05$ level, except meaning recall versus form recall in the immediate post-test of the Read-Only condition.

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