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Academic Listening: A Source of Vocabulary Acquisition?

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This paper presents an empirical study of the acquisition of EFL vocabulary through academic listening. A review of the L1 and L2 literature on vocabulary learning through aural input reveals a gap in this field and the need for further research. The present study also explored the effect of EFL proficiency and lecture comprehension on vocabulary acquisition as well as the relationship between vocabulary gain and the following factors: *frequency of occurrence, type of word, type of word elaboration* and *predictability from word form and parts.* The effect of lecture listening on vocabulary acquisition as well as the interaction effect between EFL proficiency and vocabulary acquisition were found to be significant. A significant difference was also found between lecture listening and post-lecture listening and between post-lecture listening and the pre-test, indicating that, although only part of the vocabulary gain was retained in the memory after four weeks, the vocabulary knowledge retained was still superior to the knowledge the students had before listening to the lectures. *Predictability from word form and parts* was found to be the best predictor of vocabulary gain, followed by, in this order, *word type, type of elaboration,* and finally *frequency of occurrence.*

INTRODUCTION

English is one of the major languages of spoken academic discourse: it is widely used in international conferences and seminars worldwide (Long and Richards 1994) and it is also the medium of instruction for EFL students who attend content-based classes or English-speaking universities. Therefore, given the large number of foreign and second language university learners who are frequently exposed to academic listening and who need to continue developing their language competence, it seems worth researching into this type of speech as a possible source of language input.

Research conducted in recent years has thrown light on the nature of lectures, learner behaviour, and strategies when attending lectures as well as the features of lectures and learner behaviour that facilitate comprehension (Chaudron 1995). However, very little experimentation has been carried out into the implications of academic listening for language acquisition and more specifically for vocabulary acquisition. To be more precise, most of the research into vocabulary acquisition in academic settings has been conducted in the field of reading (Bramki and Williams 1984; Paribakht and Wesche 1997; Parry 1991, 1993; Zimmerman 1997, etc.). As Chaudron (1995: 16) put

it, 'There has as yet been insufficient research on the acquisition or retention of vocabulary based on lecture presentation'.

This paper, then, deals with the university lecture and its implications for EFL vocabulary acquisition and reports a study which was conducted to explore this main effect as well as the role of four word related features on it.

AUDITORY PRESENTATION, PHONOLOGICAL MEMORY, AND VOCABULARY ACQUISITION

Models of speech processing, such as those developed by Clark and Clark (1977) and by Jarvella (1971), among others, formulate that when listeners take in raw speech, words verbatim are not stored in memory. According to Clark and Clark (1977), during the construction process,[1] the verbatim constituents are held in working memory only for a brief period of time, after which they are eliminated and replaced by a representation of the finished interpretation of the sentence, which is finally retained in long-term memory. In other words, exact wording is only stored for very short periods of time and unless actively rehearsed, is lost very quickly. Likewise, Jarvella (1971) claims that for the abstract representations of the speech heard to be retained in long-term memory further recording and rehearsal processes are needed. Therefore, since listeners do not usually store the exact wording when they listen for meaning, the question remains of whether the academic lecture can in fact be an important source of lexical input.

Research into phonological memory, on the other hand, has revealed that phonological short-term memory plays an important role in vocabulary learning (Gathercole and Baddeley 1989; Ellis and Beaton 1993a, 1993b; Papagno *et al.* 1991, Service 1992). These empirical studies draw on the working memory framework developed by Baddeley and Hitch in 1974 and subsequently elaborated by Baddeley and his collaborators. According to this framework, working memory comprises a number of subsidiary slave systems. One of these systems is the phonological loop, which automatically registers heard speech and stores it for about one-and-a-half to two seconds. After this time, the memory traces in this phonological store fade unless a control process, which also forms part of the phonological loop, refreshes them in the store again by means of subvocal rehearsal (Baddeley 1997). Research findings revealed that if articulatory rehearsal is prevented by using articulatory suppression, for example, vocabulary learning is impeded (Papagno *et al.* 1991). Apparently, whereas syntactic and semantic coding are more suitable for learning to associate familiar words, phonological coding seems to be more adequate for learning novel vocabulary (Papagno *et al.* 1991).

The phonological loop component of working memory also plays an important role in the acquisition of vocabulary in a foreign language (Papagno *et al.* 1991). For example, in a study which involved Finnish children learning English, Service (1992) demonstrated that since all new words are initially

foreign-sounding, the ability to create accurate phonological representations of them in working memory plays a crucial role in their learning.

It could be concluded then that auditory presentation seems to be well-suited for vocabulary learning. However, it should be noted that the studies mentioned above are highly controlled laboratory experiments in which students were instructed to perform different tasks in order to learn certain lexical items. Therefore, they do not necessarily reflect what EFL students do under normal circumstances, for example when listening to a lecture.

Research findings obtained in more natural contexts than the ones reported above, provide evidence of this type of learning with both L1 and L2 children. To begin with, a study carried out by Elley (1989) revealed vocabulary learning for 7–8 year-old native speakers when listening to stories.

The positive findings of Elley's study could be attributable to the fact that it was conducted with L1 children; however, as already mentioned, positive findings were also obtained with L2 students. Schouten-van Parreren (1989) conducted a long-term case study with three L2 children to investigate the acquisition of vocabulary through picture books—most of which were read aloud—and she also found vocabulary gain. The role of the visual aids seemed to be, as in Elley's study, very helpful for vocabulary learning.

In these last two studies, the learning stage of the subjects as well as the rich context which supported the target words seemed to have been crucial for vocabulary acquisition to take place. It is noteworthy, though, that most of the studies reported so far focused on the beginning stages of both first and second language vocabulary learning and, as Meara (1984) points out, vocabulary learning does not necessarily occur in similar ways at different stages of proficiency. Hence it seems worth exploring further the effects of auditory presentation of vocabulary with more proficient students.

VanPatten (1989) required university students of Spanish to perform different tasks while listening to a three-minute passage, in order to determine to what extent L2 students are able to simultaneously process form and meaning. The findings of this study led the author to conclude, among other things, that if students concentrate on meaning first, a task involving conscious attention to important lexical items does not necessarily hinder comprehension. Thus, students can apparently concentrate on both form and meaning when required, but do they tend to do this when listening to academic lectures?

Toya (1992) carried out a study in which 109 Japanese university students of English as a second language were asked to listen to two passages of approximately 3 minutes each. Since none of the texts chosen for this study contained difficult vocabulary items, some of the expressions in them were replaced with more difficult synonyms. In this study, repeated exposures to the passages also resulted in vocabulary gain.

To our knowledge, apart from Schouten-van Parreren's (1989) and Toya's (1992), there seem to be no other studies on the acquisition of L2 vocabulary through listening or, more precisely, through academic listening. Thus,

considering the importance of vocabulary growth for EAP students and the noticeably sparse research in this field, we believe there is clearly a need for further experimentation which, at least, overcomes the limitations of the research studies carried out so far and in particular considers the following issues:

1 Presentation of vocabulary through realistic lectures. As Flowerdew (1994: 25) points out 'one of the problems with the research base in second language lectures is that many of the studies . . . are not focussed on lectures *per se*'.
2 Appropriate measurement of vocabulary gain. The procedure of the research study should not lead the students to think they have to memorize the lexical items in a mechanical way because they are going to be evaluated on their learning later on.
3 Use of different lectures to determine whether the lecture topic has any effect on the possible vocabulary gain.
4 Use of standardized tests to determine the subjects' proficiency level and explore the relationship between possible vocabulary gains and proficiency level.

Apart from taking into account the issues mentioned above, the research study described in this paper explores further the notion of vocabulary retention, and also tries to contribute to the currently available picture of factors that affect EFL vocabulary acquisition. Findings concerning these factors will be briefly reviewed before reporting our study.

Vocabulary retention

This paper deals mainly with one aspect of the process of lexical attrition, namely its relation with proficiency. The classical theory of forgetting (Ebbinghaus 1885, cited in Weltens and Grendel 1993) states that the original proficiency level of the subject determines to a great extent the amount of knowledge that he or she will lose; to be more precise: the more you know, the more you forget. More recent findings do not seem to confirm this hypothesis. According to Bahrick (1984, cited in Weltens and Grendel 1993) and Weltens (1989) attrition rates are independent of proficiency levels.

Frequency of word occurrence

Multiple exposures to a word are believed to lead to its acquisition (Beck, McKeown, and Omanson 1987; Elley 1989; Sternberg and Powell 1983, etc.). Research findings, which do not show full agreement and are based mainly on reading research, suggest that at least between six and sixteen exposures are needed for learners to develop fluent and precise word knowledge (see Beck *et al.* 1987; Nation 1990; Coady, Huckin, and Haynes 1993).

Elley (1989) and Toya (1992) also found a positive effect for this factor,

though in Toya's study, the multiple listenings were most effective when the subjects were expected to get the vocabulary meanings intentionally and the explanation was provided rather explicitly. In contrast to these findings, the levels-of-processing view of memory (Craik and Lockhart 1972) states that the maintenance rehearsal of an oral representation does not necessarily lead to its long-term retention and associated research provides considerable evidence that it is the deeper processing of the lexical items and the semantic associations thereby elaborated that lead to the formation of long-term representations (Ellis and Beaton 1993a).

Word elaborations

The role of lexis and its simplification and/or elaboration in oral discourse has normally been analysed because of its effect on comprehension; very few studies have analysed the relationship between vocabulary elaboration and vocabulary acquisition. A study that has looked into this issue was that conducted by Toya (1992). She found a significant effect for explicit explanations on vocabulary acquisition; implicit word elaborations, on the other hand, were not found to be any more effective than no elaboration at all.

As regards implicit elaborations, other research findings also revealed that parallelism, apposition, and paraphrase can be extremely ambiguous and often suggest additional rather than alternative information to L2 learners (Chaudron 1982).

Types of vocabulary

Due to the scarce research in this field, this study set out to investigate the relationship between different types of words and their acquisition through oral input. In order to do so, we resorted to the classification provided by Nation (1990: 19), which classifies words as: *high-frequency, academic, technical,* and *low-frequency.*

RESEARCH QUESTIONS

Main analysis

Within-subjects main effect

1 What is the effect of listening to academic lectures on EFL vocabulary acquisition (as measured by pre- and post-test vocabulary scores)?
2 If learning does occur, is the vocabulary knowledge acquired retained for a longer period in memory (over the duration of four weeks), as measured by a delayed post-test?

Covariates effect

3 Does students' proficiency in English have an effect on vocabulary acquisition?
4 Does lecture understanding have an effect on vocabulary acquisition?

Secondary analysis

5 What is the relationship between vocabulary gain and the following factors: *frequency of occurrence* (number of times the word is said in the lecture), *type of word* (technical, academic, or low-frequency word), *type of elaboration* that accompanies the word (explicit elaboration, implicit elaboration, no elaboration at all) and *predictability from word form and parts* (unpredictable, deceptively transparent, morphologically predictable, similar to Spanish—L1)?

Given the scarce and contradictory evidence there is in this area and the very little training in listening that Spanish secondary school students of English have, null hypotheses were formulated for each of the research questions presented above.

METHOD

Subjects

The participants were all first-year university students (n = 122) on a three-year course leading to a Diploma in Tourism who were attending a compulsory ESP course at the Universidad Autonoma de Madrid.

Since we were aware of the pre-existing individual differences between first-year university students of English as a foreign language coming from different schools, we measured the subjects with respect to their level of language proficiency some days before the experiment took place. Table 1 displays both their TOEFL listening scores and TOEFL Total scores. Their average TOEFL score was 507 and these scores ranged from 387 to 661.

The subjects, who were almost in the middle of their ESP programme when they viewed the lectures, were tested in intact classes. Six students who had not attended all the sessions were excluded from the study. Thus, the analyses were finally performed on a sample of 116 students.

Table 1: Descriptives for TOEFL

	n	Mean	SD
TOEFL Listening Subtest	116	50.78	5.89
Total TOEFL	116	507.01	57.03

Materials

Lectures

Three video-taped lectures on the economic, sociocultural, and environmental impacts of tourism were constructed for use in this study (see Appendix B). They were of approximately equal length (14–15 minutes): the first contained 1,738 running words, and the second and third contained 1,837 and 1,812 tokens respectively. These lectures, which were of the reading style (Dudley-Evans 1994), were developed from authentic sources and modified before they were recorded by the lecturer, a native speaker teaching at the Universidad Autonoma de Madrid. With the purpose of sounding as natural and clear as possible, during the recordings for both the pilot-testing and the main study, the lecturer rephrased some of the information as if she were interacting with the listeners.

The year before the experiment took place, the three lectures, together with their corresponding listening cloze and true–false tests, were pilot-tested on a sample of 78 first-year tourism students who were attending English I at that time. On the basis of the pilot test results, the parts of the lectures and measures that proved misleading were revised. Then the lectures were video-taped again by the same lecturer.

It is worth mentioning that, except for the repetitions and word elaborations, no attempt was made to modify or simplify the lectures in any other formal way.

Target words

Words were selected according to their appropriateness (Nation 1990) in the lectures and their frequency and necessity (West 1953) in the samples on the basis of which the lectures were constructed. No attempt was made to control for the learning burden of the target words[2] (Laufer 1990; Ellis and Beaton 1993a, 1993b, de Groot and Lotto 1998; de Groot and Keijzer 2000). Neither did we try to include items that were easily explained or translated. Our choice was topic-oriented instead.

Type of words

According to Nation's (1990) classification, the target words finally analysed in this study fall into these three main categories: *technical, academic,* and *low-frequency* words. The criteria on which they were selected were the following:

1 *Technical words*: had to be necessary for the development of the topic of the lecture and for subsequent research and specialization in the field and appropriate for the given context.
2 *Academic words*: had to be in common use in the academic field. These words are included in the University Word List[3] (Xue and Nation 1984).
3 *Low-frequency words*: had to appear less frequently in the sources used for

the construction of the lectures and be necessary for the development of main or supporting ideas expressed in them. We checked their frequency against different frequency counts. We used mainly Kucera and Francis' (1967) list and confirmed the results with the British National Corpus (BNC). We also consulted Johansson and Hofland's (1990) count and occasionally Thorndike and Lorge's (1944), which did not always agree with the other corpora. All the words were previously checked against West's (1953) count to make sure they were not listed as high-frequency words. According to Kucera and Francis' list (1,014,232 words of natural-language text), except for *overwhelming*, all the other target words classed in our study as low frequency had a frequency that ranged from 2 to 7 occurrences per million words. The word *overwhelming*, which according to Kucera and Francis had a frequency of 20, was not excluded from the study because in our sources it was found only once and according to the BNC it had a frequency of about 13 per million words. The frequency of the word *hinterland*, not included in Kucera and Francis' list, was checked against the BNC and Johansson and Hofland's. As for the rest of the words, the BNC and Kucera and Francis' count agreed on the rank order of frequency figures.

To summarize, thirty-six target words were used in this study—twelve in each lecture—and they were classed as technical, academic, and low-frequency words. We avoided cross-over use of the same target items in the different lectures.

Since the pilot-testing had revealed that some low-proficiency students marked as known words they had most probably never seen, eighteen non-words were included in the vocabulary tests with the purpose of controlling for students' overestimating their vocabulary knowledge. These non-words, which amounted to 33 per cent of the total number of words analysed in this study, were formed by changing some letters in real words. Non-words with English-like spelling were also used (Anderson and Freebody 1983).

Frequency of word occurrence

The number of occurrences were fixed at 6, 5, 4, 3, 2, and 1 times in each lecture type, attending mainly to the topics and their original sources.

Type of word elaboration

According to the framework of speech elaborations developed by Chaudron (1982) and to the classification of definitions proposed by Flowerdew (1992), the elaborations that accompanied the target words were classified as *explicit* and *implicit*. Besides there was a group of target words which received *no elaboration* at all.

With respect to the explicit elaborations, they combined what Flowerdew (1992) referred to as formal and semiformal definitions, and comprised the

functions of naming, definition, description, and questioning. Implicit elaborations, also called substitutions by Flowerdew, included parallelism, paraphrase, and synonymy.

Predictability from word form and parts

Drawing on the results of the pilot-test and the usual lexical and background knowledge of university students at this learning stage, this classification was meant to reflect the students' recourse to phonological and morphological word features in order to guess the meaning of a word. The target items were classified as *unpredictable, deceptively transparent,*[4] *morphologically predictable,* and *similar to Spanish.*

We regarded as similar to Spanish those words which, because of their phonological and semantic similarity to L1 ones, could be recognized and understood by the listeners on hearing the lectures. It is important to highlight that special care was taken not to select words whose meaning could be directly deduced when encountering them in isolation. The target words classed as morphologically predictable were those whose meaning the students could deduce by breaking them into word parts or by relating them to known words. And finally we classed as deceptively transparent those target items which: (a) were false cognates; (b) were polysemous (the students only knew one of the word meanings and were unable to consider any other possibility); and (c) looked transparent from their parts but whose meaning could not be guessed in such a way.

The classification of the target words was carried out by a native teacher of English, an experienced Spanish teacher of English and the researcher herself. When there was no complete agreement, the final classification was based on the classes on which at least two of the raters agreed.

Measurement

Lecture comprehension

Three ten-item true–false and three twenty-item listening cloze tests were selected as the means of measuring *lecture comprehension.* The scoring method chosen for the cloze test was the exact word method (Chaudron *et al.* 1986): each correct item was awarded 1 point. The true–false questions were scored as right (1 point), partially right, i.e. incomplete (0.5 points) and wrong (0 points). A maximum score of 10 could be achieved on the T/F test and 20 on the listening cloze.

Vocabulary gain

As for the measurement of vocabulary knowledge, in this study no attempt was made to make a clear-cut distinction between receptive and productive word knowledge since, as Laufer (1990) states, it would be a rather difficult

and unnatural task. We adopted, instead, the view that regards vocabulary knowledge as a continuum between ability to recall the meaning of a word and ability to activate it automatically for communication purposes (Faerch, Haastrup and Phillipson 1984).

The students were given a list with the target words plus some distractors, that is non-words,[5] before listening to the lectures, after each of them and a month later (see Appendix B). Their level of knowledge for each target item was measured on a modified version of the Vocabulary Knowledge Scale (VKS) (Paribakht and Wesche 1993, 1997). In our –1–5 point scale, we added three more categories to Paribakht and Wesche's original five and slightly changed the scale ratings, resulting in the scale displayed below. These modifications were meant to reflect the different levels of word knowledge the students' pilot-test responses had revealed as well as some of the categories proposed in different descriptions of word knowledge (see Jenkins and Dixon 1983; Beck *et al.* 1987; Nation 1990). As already mentioned, the vocabulary tests also included non-words (Anderson and Freebody 1983; Meara and Jones 1990) in order to control for the learners' overestimating their vocabulary knowledge—especially for those cases in which they responded that they had heard the word but did not answer any of the other questions. A maximum score of 60 could be achieved on each of the three immediate vocabulary post-tests and 180 on both the pre-test and delayed post-test.

Despite the limitations of the VKS (see Read 2000), we considered it a suitable measure for tracking the early development of specific words in an experimental situation like the one described in this study (Wesche and Paribakht 1996, as cited by Read 2000). Apart from measuring depth of lexical knowledge acquired incidentally, a written instrument of this type allows a considerable number of words to be covered in a reasonable period of time and therefore fits in with the complex design of this experiment and the large number of students to be tested.

Scale

- –1 point: recognizes a non-word
- 0 points: does not recognize the word
- 1 point: recognizes having heard the word
- 2 points: has a vague/partial idea of the meaning of the word.
- 2.5 points: has a vague/partial idea of the meaning of the word but produces a clear example, similar to the one in the lecture.
- 3 points: shows a full understanding of the meaning of the word.
- 4 points: shows a full understanding of the meaning of the word and is able to provide a Spanish translation or use the word in a sentence.
- 5 points: shows a full understanding of the meaning of the word and is able to provide a translation and use the word in a sentence.

Thus, six comprehension measures (one cloze and one true–false test per

lecture) and five vocabulary tests (one pre-test, three immediate post-tests, and one delayed post-test) were administered in this study.

Design and procedure

The research design was a pre-test, post-test repeated measures design with one within-subjects factor.

Some days before the experiments took place, the subjects sat for the TOEFL exam and were pre-tested on their knowledge of the target words. Then, within a four-week period and on different days, the subjects were presented with a series of three 15-minute lectures. While they viewed each lecture, the students were asked to take notes although they could refrain from doing so if they considered it would hinder their comprehension process. Once the lecture was over, the notes were collected. Immediately afterwards, and in order to check their comprehension, the subjects were asked to answer ten true–false questions and complete a listening cloze test. Next, and with the aim of determining whether listening to academic lectures in EFL is, in fact, a source of vocabulary acquisition, the students were tested on their knowledge of the target words introduced in the given lecture. A month later they were post-tested[6] on the total number of target words included in the three lectures. The students' knowledge of the target words was also assessed four months later (the analysis of this data is still under way).

The main effect was then studied by means of the repeated measures analysis of covariance technique with *lecture listening* the within-subjects factor and *proficiency* in English and *lecture comprehension* the covariates. The relationship between vocabulary gain and these four variables: *type of word, frequency of word occurrence, type of word elaboration* and *predictability from word form and parts* was analysed by categorical regression with optimal scaling.

It is worth noting here that the pilot project conducted the previous year with an equivalent population, had shown no effects attributable to the administration of a pre-test.

RESULTS

Preliminary analyses

Table 2 shows the numbers, means, and standard deviations for the vocabulary tests (pre-test; lectures 1, 2, 3; and delayed post-test) and for the true–false questions and cloze tests (lectures 1, 2, and 3) as well. The reliability measures of each test are also displayed. As can be seen in Table 2, both the listening clozes and the true–false questions are reliable measures.

The relatively lower reliability of the pre-test vocabulary exam (0.62) may be due to the fact that many of the words tested were low-frequency words and technical words which not even high-proficiency students knew. Thus, there were too many low scores grouped together, showing little variance among item types. All the other vocabulary tests, on the other hand, did

Table 2: Reliability coefficients and descriptive statistics

		Mean	s.d.	*n*	*k*	*r*
Vocabulary measures						
Pre-test		1.41	3.50	116	54	.62
Lecture 1	Vocabulary test 1	9.86	9.70	116	18	.83
Lecture 2	Vocabulary test 2	10.02	8.59	116	18	.75
Lecture 3	Vocabulary test 3	10.53	8.59	116	18	.75
Post-test		16.38	17.56	116	54	.88
Comprehension measures						
Lecture 1	Listening Cloze 1	6.63	3.80	116	20	.80
	True–false test 1	4.12	2.29	116	10	.70
Lecture 2	Listening Cloze 2	7.15	3.85	116	20	.79
	True–false test 2	4.72	2.56	116	10	.75
Lecture 3	Listening Cloze 3	6.59	3.26	116	20	.70
	True–false test 3	4.56	2.60	116	10	.74

Note: r = Cronbach's alpha; $p = .05$

discriminate among item types and individuals and they have, therefore, higher reliability.

In order to determine if the three lectures were equivalent, an ANOVA with repeated measures was performed. As Table 3 shows, no significant difference was found between the three lectures, being $F = .716$, df = 2, $p = .490$. Therefore, the null hypothesis that there was no difference between the three levels could not be rejected and it can be concluded that none of the lectures was unusually difficult or easy; they were equivalent in terms of response. These results enabled us to proceed to the analysis of the main effect, ignoring lecture as a factor.

It should be mentioned here that, in the main study which will be reported below, aggregate scores were used for *lecture comprehension* (a weighted combination of T/F and listening cloze, based on a 10-point scale, so that each of these measures contributed to the final score in the same proportion) as

Table 3: Repeated measures ANOVA for lectures 1, 2, 3

Source	Df.	F	p
Lectures #1, #2, #3	2	.716	.490

Table 4: Descriptives for aggregate scores

	n	Mean	Sd.
Aggregate comprehension scores	116	3.9296	1.8838
Aggregate vocabulary scores	116	30.4138	24.6350

well as for *lecture listening* (the sum of the three lecture vocabulary scores). The descriptive statistics for these aggregate scores are displayed in Table 4.

Main analysis

An ANCOVA with repeated measures was conducted in order to test the within-subjects factor main effect and answer research question 1, namely what is the effect of listening to academic lectures on EFL vocabulary acquisition. The within-subjects factor, namely *lecture listening*, had three levels: *no lecture listening* (measured by the pre-test scores), *lecture listening* (measured by the three lecture vocabulary scores), and *post-lecture listening* (measured by the delayed post-test vocabulary scores). The variables *lecture comprehension*, as measured by both the true–false questions and cloze tests, and *proficiency*, as measured by the TOEFL scores, were entered in the model as covariates, though the *lecture comprehension* measure had to be finally excluded from the study because it correlated highly with proficiency (Pearson *r*: .84).

After applying the Huynh–Feldt epsilon to correct the degrees of freedom because the sphericity assumption was not met, the main effect was found significant, F (1.685, 192.084) = 98.428, p = 0.000 (see Table 5). Therefore, the null hypothesis that all levels of the within-subject factor are equal was rejected.

The profile plot displayed in Figure 1 (based on the estimated marginal means displayed in Table 6) shows that there was an increase in vocabulary knowledge from the pre-test (*no lecture listening*) to the immediate vocabulary post-tests (*lecture listening*). This finding is confirmed by the within-subjects contrasts displayed in Table 7. As can be seen, regarding *lecture listening*, a significant difference was found between *no lecture listening* and *lecture listening*.

Table 5: Test of within-subjects effects for lecture listening

Source		df.	F	*p*
Lecture listening	Huynh-Feldt	1.685	98.428	.000
Lecture listening * proficiency	Huynh-Feldt	1.685	147.626	.000
Error (lecture listening)	Huynh-Feldt	192.084		

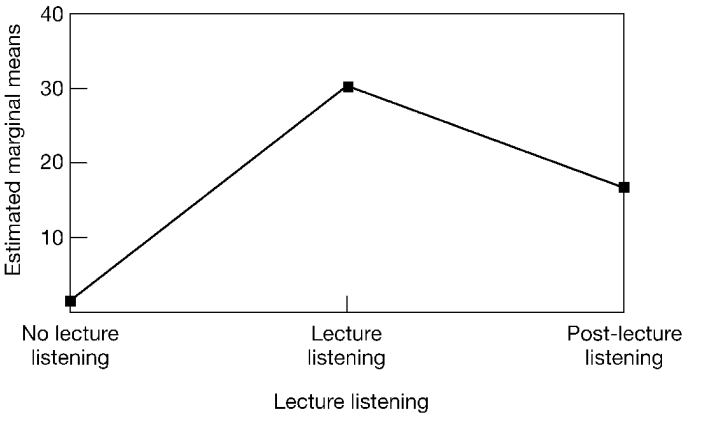

Figure 1: Profile plot for vocabulary acquisition

Hence, in answer to research question 1, it can be concluded that listening to the lectures in EFL did result in vocabulary learning.

The profile plot in Figure 1 also shows that there was a decline on the delayed post-test (*post-lecture listening*). This decline brings us to research question 2, namely whether the vocabulary knowledge acquired was retained in memory for a period of four weeks, as measured by the delayed post-test. As Table 7 shows, the difference between *lecture listening* and *post-lecture listening* was also found to be significant, which answers research question 2, that is, not all the learning that resulted from listening to the lectures was retained in long-term memory.

Now, in order to answer research question 3, namely whether the students' proficiency in English had an effect on vocabulary acquisition, let us return to Table 5. As can be seen, the *lecture listening* * *proficiency* interaction effect was found to be significant F (1.685, 192.084) = 147.626, $p < 0.001$, which indicates that the effect of *lecture listening* on vocabulary gain was not the same across all the values of the covariate. Besides, since EFL *proficiency* and *lecture*

Table 6: Estimated marginal means

Lecture listening	Mean	Sd	95% confidence interval	
			Lower bound	Upper bound
No lecture listening	1.500	.272	.961	2.039
Lecture listening	30.414	1.355	27.730	33.098
Post-lecture listening	16.414	1.110	14.215	18.613

Note: Mean values adjusted for covariate. Proficiency = mean (507.0115)

Table 7: Within-subjects contrasts

Source	Lecture listening	df.	F	*p*
Lecture listening	Level 1–Level 2	1	132.518	.000
	Level 2–Level 3	1	37.468	.000
Lecture listening * proficiency	Level 1–Level 2	1	200.106	.000
	Level 2–Level 3	1	63.294	.000

Note: Level 1 = No lecture listening
Level 2 = Lecture listening
Level 3 = Post-lecture listening

comprehension were found to correlate highly with one another, the same conclusions could be drawn for students' comprehension of the lectures—which would answer research question 4.

In order to get a clearer understanding of this interaction effect, let us analyse the contrasts displayed in Table 7. As for the *lecture* listening * proficiency interaction effect, the model determined that it was significant between levels 1 and 2 and between levels 2 and 3. These results indicate the following: first, the knowledge gained by listening to the lectures varied according to the students' proficiency and secondly, the loss and retention in long-term memory of the vocabulary knowledge acquired also varied according to the students' level of proficiency.

This interaction effect implies that the slopes of the regression lines between vocabulary acquisition and *proficiency* did not remain the same across the different levels of *lecture listening*—the within-subjects factor—showing that the homogeneity of regression slopes assumption was not met. Therefore, since the slopes were not equivalent, the pairwise comparisons which are needed to determine the significance of the main effect when the covariate effect is removed were not valid for all the levels of proficiency in English and so had to be calculated separately for the different levels of proficiency considered of interest. The rest of the analysis was then aimed at determining the significance of the effect of *lecture listening* on vocabulary acquisition for different values of *proficiency*. With this purpose, SPSS was run repeatedly to apply the ANCOVA model to different values of TOEFL and to calculate the corresponding pairwise comparisons and profile plots. The selected *proficiency* values were: the first quartile (TOEFL = 473); the third quartile (TOEFL = 543); the mean (TOEFL = 507); and the 95th percentile (TOEFL = 605). As Table 8 shows, the differences between levels 1 and 2, 2 and 3, and 1 and 3, for each of the TOEFL values selected, were all found to be significant.

These results indicate that, for these TOEFL scores, listening to the three lectures did result in vocabulary acquisition and that, although a month later the students tended to forget part of what they had acquired, they did not lose

Table 8: Pairwise comparisons for different TOEFL values

Lecture listening (*i*)	Lecture listening (*j*)	Difference between means (*i–j*)	Std error	*p*	95% confidence interval for the difference	
					Upper bound	Lower bound
TOEFL = 507 (mean)						
1	2	−28.914	1.264	.000	−31.985	−25.843
	3	−14.914	.971	.000	−17.273	−12.555
2	1	28.914	1.264	.000	25.843	31.985
	3	14.000	.873	.000	11.879	16.121
3	1	14.914	.971	.000	12.555	17.273
	2	−14.000	.873	.000	−16.121	−11.879
TOEFL = 473 (1st quartile)						
1	2	−18.205	1.473	.000	−21.785	−14.626
	3	−8.365	1.132	.000	−11.114	−5.615
2	1	18.205	1.473	.000	14.626	21.785
	3	9.841	1.017	.000	7.368	12.313
3	1	8.365	1.132	.000	5.615	11.114
	2	−9.841	1.017	.000	−12.313	−7.368
TOEFL = 543 (3rd quartile)						
1	2	−40.245	1.496	.000	−43.880	−36.609
	3	−21.844	1.149	.000	−24.636	−19.051
2	1	40.245	1.496	.000	36.609	43.880
	3	18.401	1.033	.000	15.890	20.912
3	1	21.844	1.149	.000	19.051	24.636
	2	−18.401	1.033	.000	−20.912	−15.890
TOEFL= 605 (95th percentile)						
1	2	−59.765	2.521	.000	−65.890	−53.640
	3	−33.782	1.936	.000	−38.486	−29.077
2	1	59.765	2.521	.000	53.640	65.890
	3	25.983	1.741	.000	21.753	30.213
3	1	33.782	1.936	.000	29.077	38.486
	2	−25.983	1.741	.000	−30.213	−21.753

Differences significant at .05
Significance adjusted for multiple comparisons using Bonferroni test.

all the gain they had made by listening to the lectures, since the difference between levels 1 and 3 was found to be significant in every case.

The graph in Figure 2, apart from displaying the gains and losses for the first quartile, the third quartile, the 95th percentile, and the TOEFL mean, also clearly shows that the higher the proficiency the greater the vocabulary gain. On the other hand, the graph also shows that the slope declines more steeply the higher the proficiency level. In other words, those students with a higher proficiency in English, lost more of the vocabulary knowledge initially gained. More specifically, those students who got a TOEFL score of 473 (the first quartile) lost 46 per cent of their gain, those who had the TOEFL mean (i.e. 507) lost 51.58 per cent of their gain, those who got a TOEFL score of 543 (the third quartile) lost 54.27 per cent and, finally, those whose TOEFL score was 605 (the 95th percentile) lost 56.40 per cent of their vocabulary gain.

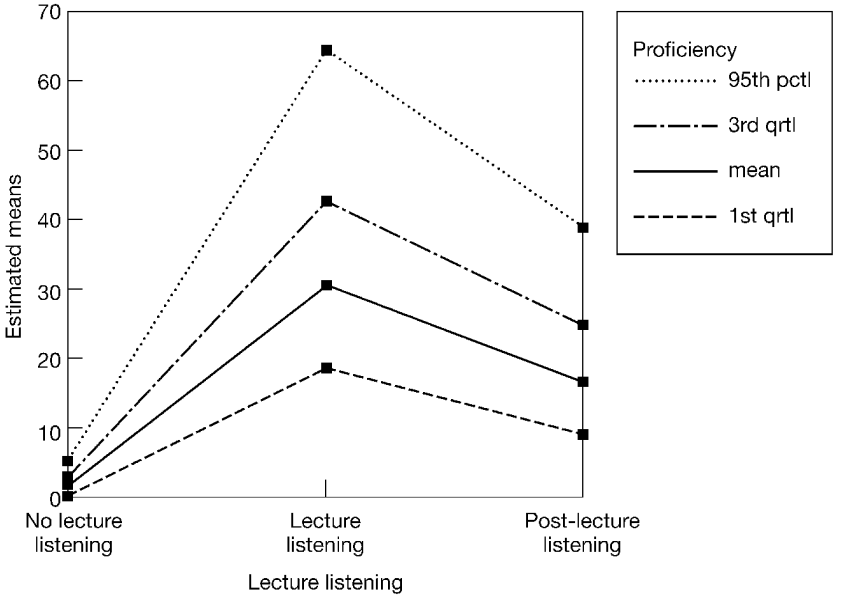

Figure 2: Profile plot for different levels of proficiency

Secondary analysis

To begin with, it should be noted that given the limited size of the sample data, the findings presented here are not meant to be generalized to larger samples but rather are used to reveal possible trends worth examining in further research.

As mentioned above, categorical regression with optimal scaling (CATREG) was used to examine the influence of the following factors on vocabulary

acquisition: *type of word, frequency of occurrence, type of word elaboration,* and *predictability from word form and parts.*

As can be seen in Table 9, CATREG yielded an R^2 of .77, indicating that 77 per cent of the variance in the transformed vocabulary gain was explained by the four transformed predictors.

Table 9: Model summary statistics

R	R^2	Adjusted R^2
.880	.774	.745

The analysis of variance reported in Table 10 shows an F statistic of 26.516 with $p < 0.001$ which, together with R^2, indicate that the model performed well. Then, based on the overall F statistic, we can reject the null hypothesis that there is no linear relationship between the transformed predictors and the transformed response.

Table 10: Anova table

Model	Sum of squares	df.	Mean square	F	Sig.
Regression	27.858	4	6.964	26.516	.000
Residual	8.142	31	.263		
Total	36.000	35			

By inspecting the partial correlation coefficients, the part correlation coefficients and the F test for each variable (see Tables 11 and 12), it can be concluded that *predictability from word form and parts* is the variable in the model that best predicts vocabulary gain. It has a partial correlation of .76 so it explains 58 per cent of the variation in vocabulary gain if the effects of the other variables are removed.

Table 11: Standardized coefficients for transformed predictors

	Standardized coefficients		F
	Beta	Standard error	
Predictability from word form and parts	.578	.089	42.451
Type of word	.345	.092	14.175
Type of word elaboration	.277	.089	9.792
Frequency of occurrence	.183	.089	4.205

Table 12: Zero-order, part, and partial correlations for transformed variables

	Correlations		
	Zero-order	Partial	Part
Predictability from word form and parts	.685	.760	.557
Type of word	.591	.560	.322
Type of word elaboration	.402	.490	.267
Frequency of occurrence	.343	.346	.175

The other three variables contribute to the model in a similar proportion (after removing the effects of the other predictors), with *type of word* accounting for 31 per cent of the variation in vocabulary gain, followed by *type of word elaboration* and *frequency of occurrence* in the lecture, which explain, respectively, 24 per cent and 11 per cent of the variation in vocabulary gain.

Now, let us analyse the transformation plots (Figures 3, 4, 5, and 6) and the mean gains, grouped by factor levels, in order to see the trends in each variable.

Let us start with the transformation plot for *predictability* displayed Figure 3. Since the corresponding regression coefficient is positive (Table 11), the increasing trend of this transformation plot indicates that gain rises as the degree of *predictability* of the word rises, with *words similar to Spanish* getting the biggest gain, followed by *morphologically predictable* words, *deceptively transparent* words and, finally, *unpredictable* words (this rising trend is also

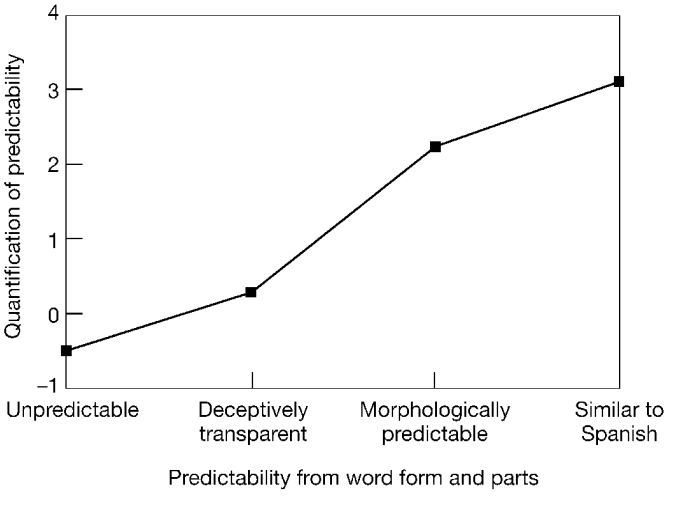

Figure 3: Transformation plot for predictability

Table 13: Word gain observed after lecture listening by predictability

Predictability	Mean	Standard deviation
Unpredictable	67.8800	50.0246
Deceptively transparent	99.7143	86.5572
Morphologically predictable	204.2500	111.3693
Similar to Spanish	275.2500	45.6084
Total	93.1667	80.4929

revealed in Table 13). As Figure 3 shows, the distance between the transformed values for unpredictable words and deceptively transparent words is smaller than the distance between the transformed values assigned to deceptively transparent and morphologically predictable words, indicating that morphologically predictable words obtained much more gain than deceptively transparent words. Likewise, the trend in the graph also indicates that the acquisition of words similar to Spanish was even easier for EFL language learners than the acquisition of morphologically predictable words, though there was only a slight difference in gain between them.

As regards *frequency of occurrence*, the regular rising trend of its transformation plot displayed in Figure 4, together with its positive regression coefficient (Table 11) indicate that gain increases as the word is repeated more times. The means displayed in Table 14 confirm this rising trend, except for words that were repeated 5 times, which show less gain than those repeated 4 and 3 times. This is most likely due to the fact that all but one of the words

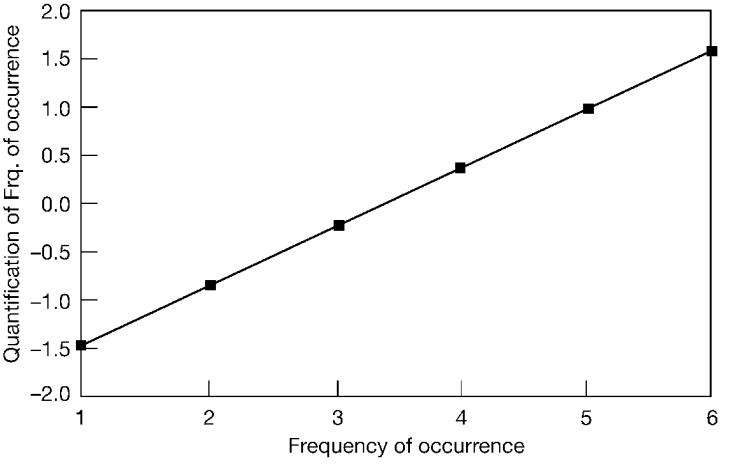

Figure 4: Transformation plot for frequency of occurrence

Table 14: Word gain observed after lecture listening by frequency of occurrence

Frequency of occurrence	Mean	Standard deviation
1	46.6667	51.5661
2	56.2500	29.7317
3	114.0625	81.9300
4	122.1667	139.5299
5	94.8500	83.1635
6	169.6667	89.8086
Total	93.1667	80.4929

that were repeated 5 times were unpredictable from their form and parts and, as we have seen above, this factor correlates highly with vocabulary gain.

The transformation plot for *type of word elaboration* in Figure 5 shows that the more explicit the elaboration, the greater the gain. Besides, the gain rises in a similar fashion across the different levels of the variable. The means displayed in Table 15 do not confirm this trend for implicit elaboration, but this fact could be attributable to intercorrelations similar to the ones explained above for *frequency of occurrence*, which because of space restrictions we cannot go into in this paper.

As for *type of word*, the transformation plot in Figure 6 illustrates that students performed much better on the technical items than on academic or low-frequency ones. The effect of the other two levels on the response was

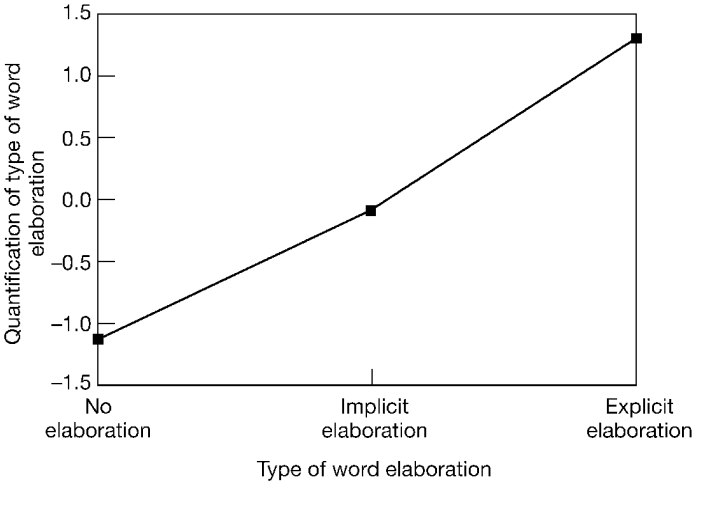

Figure 5: Transformation plot for type of word elaboration

Table 15: Word gain observed after lecture listening by type of word elaboration

Type of word elaboration	Mean	Standard deviation
No elaboration	72.1923	89.0093
Implicit elaboration	60.2273	31.9776
Explicit elaboration	146.0833	79.8948
Total	93.1667	80.4929

practically the same, though low-frequency words seemed to be acquired more easily than academic lexical items (see Table 16).

It should be finally noted that this regression analysis was completed by means of the analysis of the residuals (not shown here for reasons of space), which indicated that the regression model assumptions were met and therefore confirmed that the model performed well.

Table 16: Word gain observed after lecture listening by type of word

Type of word	Mean	S.d.
Low frequency	63.2500	46.3107
Academic	45.0909	30.7366
Technical	148.3667	91.7836
Total	93.1667	80.4929

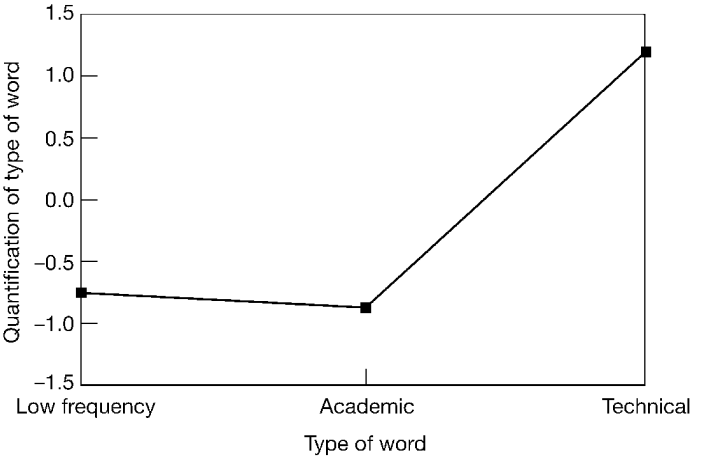

Figure 6: Transformation plot for type of word

DISCUSSION AND CONCLUSIONS

The experiment described in the previous section provides evidence that listening to academic lectures in EFL can be considered a source of EFL vocabulary acquisition. The findings of this study also indicate that vocabulary gain and retention are influenced by the subjects' EFL proficiency as well as, apparently, by their degree of lecture comprehension. It also shows that part of the vocabulary knowledge acquired is retained in memory for a period of at least four weeks.

This study identifies, as well, several features that appear to account for a large portion of variance in the likelihood that EFL learners will learn a certain word, namely *predictability from word form and parts, type of word, type of word elaboration,* and *frequency of occurrence.* We will explore each of these issues in more depth.

Vocabulary acquisition and EFL proficiency

The findings of this study indicate that those students with a higher level of proficiency in English acquired more vocabulary knowledge and, on the other hand, also lost slightly more of the knowledge gained than weaker students, who showed a smaller increase but retained a slightly bigger proportion of their vocabulary gain. These results may be explained by the fact that 'the amount of target language input that can be successfully processed seems to increase as proficiency in the language increases' (Call 1985: 769). Most probably, those students with higher proficiency in L2 were able to understand more conceptual information, which in our case was closely related to the technical words used in the lectures, as well as more details. As regards retention, it could be speculated that the processing of some of this information was not deep enough to be transferred to and stored in long-term memory for a longer period (Craik and Lockhart 1972; Baddeley 1997). In this line of reasoning, it could also be argued that part of these high proficiency students' initial learning was apparently the result of the important role that the phonological loop plays in the acquisition of vocabulary (see the section on Auditory presentation, phonological memory, and vocabulary acquisition, above). Less proficient students, on the other hand, may have made more effort to process and understand, at least, some of the main concepts developed in the lecture and they were, therefore, slightly more successful in retaining them. This is also consistent with the view that sees forgetting as a product of interference: more proficient students initially understood more words, which resulted in more interference than in the case of less proficient students who understood less information (Wingfield and Byrnes 1981).

It is perhaps also noteworthy here that these findings would seem to support the classical theory of forgetting (Ebbinghaus, 1885, cited in Weltens and Grendel 1993), according to which the subject's original proficiency level

determines to a great extent the amount of knowledge he or she will retain: more proficient students lost more of the gain made than less proficient students. As already mentioned, this hypothesis is not confirmed by other recent studies (see the section on Vocabulary retention, above). Needless to say, our findings are only preliminary: analysis of the data collected four months after the students viewed the lectures as well as further experimentation which considers longer periods of non-use are needed to help illuminate the relationship between vocabulary attrition rate and language proficiency.

Vocabulary acquisition and lecture comprehension

Since *EFL proficiency* and *lecture comprehension* were found to correlate highly, it may be speculated that the degree to which the lecture was understood influenced the students' vocabulary acquisition: the higher the level of lecture comprehension, the greater the vocabulary gain. In other words, those students who were more proficient apparently achieved a deeper understanding of the lectures and, therefore, a greater vocabulary gain.

Vocabulary retention

The students in this study retained part of the learning they had achieved by listening to the lectures. To be more precise, these subjects retained, approximately, between 43 and 54 per cent of their initial gain (i.e. they lost between 46 and 57 per cent), depending on their EFL proficiency. These results are somewhat different from the results obtained by Toya (1992), whose L2 subjects lost between 66 and 75 per cent of the gain they initially made by listening to two passages and they also differ from those of Elley's (1989) study, whose L1 children showed a decline of only 2–3 per cent in the incidental learning they had made by listening to two stories.

We can only speculate on the causes of these differences. At first glance, it could be concluded that EFL students seem to lose more of the lexical gain they make through auditory presentations than L1 students, whose learning seems to be relatively permanent (Elley 1989). However, it should be born in mind that Elley's study was conducted with children and that these children received follow-up reinforcement. In other words, they heard the same story read three times over the same week and, as Stevick (1976) and Baddeley (1997) argue, distributed practice has proved to be superior to numerous consecutive exposures to an item. It should also be born in mind that some of the words were illustrated with pictures that were shown to the students, a factor which proved to be an important predictor of vocabulary learning.

In spite of the differences with Elley's results, it can be concluded that the subjects in the present study retained a considerable amount of the lexical knowledge acquired. Most probably, if they had continued listening to lectures on these topics during their regular lessons, which is normally the case in content-based classes, the reinforcement would have probably resulted

in higher retention in the delayed post-test. In other words, a delayed post-test administered four weeks after the instruction, and completely isolated from the context in which the aural input was processed and internalized, could have hindered, to a certain extent, the retrieval process. Most probably, the students had to retrieve many more clues than they would have had to if the recall of the items had been the natural result of their communicative needs. In this respect, Craik and Lockhart (1972: 678) point out that 'the effectiveness of a retrieval cue depends on its compatibility with the item's initial encoding or, . . . the extent to which the retrieval situation reinstates the learning context'.

As regards the role of context, here again, it is important to note that the three lectures were delivered within an existing curricular context, a possible reason for the slight difference in retention results between our study and Toya's. Toya's passages were not part of the subjects' syllabus and, as she admitted, this could have been one of the causes of the students' substantial loss of vocabulary learning.

Needless to say, it is too early to draw any firm conclusions on the basis of these results. Lexical knowledge is supposed to attrite relatively easily (Weltens and Grendel 1993) and our findings seem to confirm this, at least to a certain extent, but further research is obviously needed.

Word-related features that influence vocabulary learning

As Table 9 shows, regression with optimal scaling indicated that 77 per cent of the variance in the transformed vocabulary gain was explained by the four transformed predictors, namely *predictability from word form and parts, type of word, type of elaboration,* and *frequency of occurrence*. We shall now explore each of these features in more detail.

Predictability from word form and parts

This was the variable in the model that best predicted vocabulary acquisition. It explained 58 per cent of the variation in vocabulary gain if the effects of the other variables were removed. As the transformation plot displayed in Figure 3 indicates, gain rose as the degree of *predictability* of the word rose, with *words similar to Spanish* getting the biggest gain, followed by *morphologically predictable* words, *deceptively transparent* words, and finally *unpredictable* words.

Certain aspects of each level of this variable are also worth considering. To begin with, lecture presentation seems helpful in the acquisition of certain cognates or EFL concepts similar to L1 ones whose phonological and orthographic form is not easily recognized by EFL students. The presentation of this type of words in aural contexts tends to make students aware of their meaning and therefore contributes to their learning. This was, for instance, the case of the word *niche* which most students did not recognize in the pre-test. Lecture presentation also seems helpful in the acquisition of certain

words which are deducible from their parts but whose morphological analysis may be somewhat misleading when the word is encountered in isolation. For example, as the pre-test revealed, many students analysed the compound *manpower* as meaning 'powerful man'. However, the presentation of the word in the context of the lecture made these students reconsider their first analysis and helped them recognize the word's meaning.

These findings and the evidence derived from other studies (Ellis and Beaton 1993b; Holmes and Ramos 1993; Nagy *et al.* 1993; de Groot and Lotto 1998; de Groot and Keijzer 2000) show that the existence of cognates and L2/FL words similar to L1 ones should be regarded as especially valuable in academic discourse, since this type of lexical item can be easily learned and facilitate comprehension. This is probably so because, as de Groot and Keijzer (2000) hold, whereas in learning non-cognates new entries have to be created in memory, cognate learning usually involves adapting or adding new information to memory representations that already existed in memory prior to learning.

Notwithstanding, words similar to L1 ones may also be a source of interference or negative transfer, as we will exemplify in what follows. To begin with, deceptively transparent words tend to hinder the lecture comprehension and vocabulary acquisition process, since students are usually unaware of the difference in meaning between the EFL concept and the L1 one they relate it to. For instance, in the case of false cognates, students tend to stick to the L1 meaning they know and build a representation of that part of the text around it, even when it makes no sense in the context in which the word is used, as their notes revealed. Very similar evidence is provided by Holmes and Ramos (1993) in a study conducted with reading texts. Their findings seem to confirm the evidence we obtained with listening: students do not tend to check their initial guesses of deceptively transparent words; they are normally satisfied with their interpretation.

The same is the case with polysemous words: as our findings showed, learning new meanings for known words is a very difficult task. To give an example, in the present study, the word *province* showed very little gain, which reflects the fact that the students recognized it, but stayed with the meaning they already knew; they could not even realize there was something different in the use of this word in the context of the lecture.

The analysis of word parts may also sometimes be misleading. This was the case, for instance, of the word *acculturation*, which many of our students interpreted as meaning 'with no culture, ignorant'.

Type of word

In our study, this variable was the second best predictor of vocabulary learning. It accounted for 31 per cent of the variation in vocabulary gain.

Table 16 and the transformation plot displayed in Figure 6 illustrate that students performed much better on the technical items than on academic or

low-frequency ones. These results reflect that, as Nation (1990: 141) points out, 'learning technical words is closely connected with learning the subject'. These words were crucial for the understanding of the lectures and learning them must have been a considerable burden for these students since, as the pre-test showed, these concepts were apparently not known by the vast majority of the subjects,[7] and understanding them entailed learning new factual information. It is perhaps precisely because each of these technical concepts was learnt within the context of a related system (Anderson and Freebody 1979; Mezynski 1983) that the gain students made was much greater than the gain they made for academic or low-frequency words. These more elaborated networks of meaning probably enhanced the learning of the technical words as well as the content of the lectures.

As regards the other two types of words, students scored slightly higher on low-frequency than on academic lexical items. In order to explain these slight differences in gain, it can be argued, in the most general sense, that academic words are more abstract and less specific than low-frequency lexical items. Some low-frequency words even share some characteristics with technical words. As Nation (1990: 125) states 'what are technical words for one person may be low-frequency items for another'. In other words, some low-frequency words seem to be more specific and relevant to the development of the lecture content than academic words. The latter, on the other hand, are common to many different disciplines, which apparently indicates that they tend to be used to support or explain many of the main concepts introduced in academic lectures. Hence, academic words may pass unnoticed to the listener who is engrossed in understanding the related system of technical concepts being introduced in the talk.

Type of word elaboration

The type of elaboration that accompanied the word was also found to contribute to vocabulary learning in an important way (24 per cent). The rising trend displayed in Figure 5 indicates that words that received elaboration achieved greater gains than those that received no elaboration and that the more explicit the elaboration that accompanied the target word, the bigger the gain.

The reason for the considerable difference in vocabulary gain between words accompanied by an implicit elaboration and those defined by a more formal or explicit elaboration may be partly explained by the fact that second language learners' capacity to process speech is limited by, among other things, a lack of facility in recognizing certain syntactic structures in the target language which are unfamiliar to them (Call 1985). If they cannot recognize the relationship among the words they have heard, it is difficult for them to retain the input for long enough to try to analyse it. It should also be noted that the students' notes revealed that in some instances of parallelism, paraphrase, and synonymy, the learners focused on the elaboration of the

concept, which they could understand more easily, and disregarded the target word, which they probably found very difficult to identify in connected speech.

Frequency of word occurrence

The results of this study suggest that frequency of word occurrence is also a predictor of vocabulary gain. Although out of the four factors analysed, it was the one that contributed least to vocabulary gain, it accounted for 11 per cent of its variance. As Nation (2001: 81) claims 'the correlations between repetitions and learning generally are only moderate'. Needless to say, further research is needed in this area but, at first glance this evidence would seem to suggest that, as regards EFL learners, mere repetition does not always seem to be enough; more attention, effort and consequently deeper processing of the word seem to be necessary in order for a higher vocabulary gain to take place.

Finally, it can also be speculated that the effect of frequency of occurrence on vocabulary acquisition could have been stronger if the words had been repeated in different lectures. As Sternberg and Powell (1983: 883) point out: 'variability of contexts increases the likelihood that a wide range of types of cues will be supplied about a given word's meaning. In contrast, mere repetition of a given unknown word in essentially the same context as that in which it previously appeared is unlikely to be as helpful as a variable context repetition'.

(Revised version received July 2002)

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APPENDIX A

Classification of target words

Target word	Type of word	Frequency	Type of elaboration	Predictability
Trace	Academic	1	No elaboration	Unpredictable
Niche	Technical	3	No elaboration	Similar to Spanish
Upsurge	Academic	2	Implicit elaboration	Deceptively transparent
Encroachment	Technical	2	Implicit elaboration	Unpredictable
Advocate	Academic	4	No elaboration	Deceptively transparent
Jeopardise	Low frequency	3	Implicit elaboration	Unpredictable
Haphazard	Low frequency	5	Explicit elaboration	Unpredictable
Loom	Low frequency	2	No elaboration	Unpredictable
Pursue	Academic	3	Implicit elaboration	Unpredictable
Trample	Low frequency	1	Implicit elaboration	Unpredictable
Offset	Technical	4	Implicit elaboration	Unpredictable
Boost	Technical	5	No elaboration	Unpredictable
Cogent	Academic	1	No elaboration	Unpredictable
Poignant	Low frequency	2	Implicit elaboration	Unpredictable
Comply	Academic	5	Implicit elaboration	Unpredictable
Compel	Academic	6	No elaboration	Unpredictable
Asset	Academic	5	Explicit elaboration	Unpredictable
Contingent	Academic	1	Implicit elaboration	Deceptively transparent
Fringe group	Technical	5	No elaboration	Unpredictable
Conveyances	Technical	3	Explicit elaboration	Unpredictable
Sewage	Technical	5	No elaboration	Unpredictable
Upheaval	Low frequency	5	Explicit elaboration	Unpredictable
Income leakage	Technical	2	Explicit elaboration	Unpredictable
Deprived	Academic	2	Implicit elaboration	Unpredictable
Hinterland	Low frequency	3	Explicit elaboration	Morphologically predictable
Acculturation	Technical	1	Implicit elaboration	Deceptively transparent
Weave	Low frequency	5	Explicit elaboration	Unpredictable
Carrying capacity	Technical	3	Explicit elaboration	Deceptively transparent
Ethos	Technical	3	Explicit elaboration	Unpredictable
Commodification	Technical	6	Explicit elaboration	Unpredictable
Enclave	Technical	6	Explicit elaboration	Deceptively transparent
Overwhelming	Low frequency	1	No elaboration	Unpredictable
Manpower	Technical	4	No elaboration	Morphologically predictable
Sustainable development	Technical	5	Explicit elaboration	Similar to Spanish
Endeavour	Low frequency	5	No elaboration	Unpredictable
Province	Academic	3	No elaboration	Deceptively transparent

APPENDIX B

Lecture II excerpt

Today we are going to continue looking at the impacts of tourism, in particular, I'm going to concentrate on its social and cultural impact on tourist destinations.

As I mentioned in the previous lecture, at the end of the 1960s numerous poor regions in the world were transformed into holiday resorts for thousands of holiday-makers from industrial countries. This process was promoted by international organizations in conjunction with multinational enterprises for transport and amenities. The official doctrine *advocated* by these organizations was that tourism was a key factor for the economic development of a region. So poor regions felt practically *compelled* to adopt tourism as their last chance to be rediscovered and improve their depressed economies. During the 1980s and 1990s, the world economic crisis started and large industrial countries also turned to tourism to solve their economic difficulties.

So, as you can see, the promotion of tourism is becoming a universal model for development. And nowadays almost every government is trying to derive advantages from this activity

Now, what is it that enters a country with tourism? With tourism, what enters a country is not only visiting tourists and foreign currency but also all the apparatus of tourist production. Here, the aims of the tourism industry come first and so the place starts being reconstructed from a tourist point of view.

When a society decides to become a tourist destination it is *compelled* to open its frontiers and its homes to foreign visitors and it is usually also *compelled* to exhibit, to sell its culture, heritage, and traditions. Let me rephrase this a little bit. Certain groups in the population become merchandised, making their own lives a 'tourist product'. This phenomenon is called *commodification.*

Vocabulary pre-test excerpt

Name:
VOCABULARY PRE-TEST Page 1

A. Have you heard/seen this word before? If so, where/when?
B. Provide a full explanation (in Spanish or in English) of all the meanings of the word you know.
C. Provide a Spanish translation of the word.
D. Make a sentence in English using the word.

Flort
A. Heard or seen? Say where, when
B. Provide a full explanation
C. Spanish translation
D. Make a sentence in English

Encroachment
A. Heard or seen? Say where, when
B. Provide a full explanation
C. Spanish translation
D. Make a sentence in English

Endeavour
A. Heard or seen? Say where, when
B. Provide a full explanation
C. Spanish translation
D. Make a sentence in English

NOTES

1 According to Clark and Clark (1977) the *construction process* has to do with the way listeners construct an interpretation of a sentence after having heard the speaker's words.
2 In this study the terms *word* and *lexical item* are used indistinctly to refer to any word or sequence of words which operates as a single semantic unit.
3 Another academic word list appeared subsequently (Coxhead 2000).
4 This term was borrowed from Laufer's (1990) description of derivational complexity, but is used here in a somewhat different and broader sense.
5 Although there is little research into the type and proportion of non-words as well as the formula to be used for scoring this type of vocabulary check, the positive answers to the non-words in our study had a very small incidence in the results, which seems to indicate that, in our case, the students did not tend to mark words they did not know. The sufficiently high reliability measures of these vocabulary tests indicate that the formula adopted can be considered a valid measure of vocabulary knowledge. The results obtained for these non-words can also be taken as an indicator of the fact that these students did not learn vocabulary just by doing the exams, since the amount of non-words marked as known did not show any increase between tests.
6 Given the complexity of a repeated measures design, the lectures were spread over four weeks. This meant that in the case of the first and second lectures the delayed post-test occurred eight and six weeks later respectively.
7 Evidence of these students' lack of prior

knowledge of the technical concepts introduced in the lectures also comes, among other factors, from the fact that these first-year university students viewed the lectures in the first semester, when the only subjects they had to attend were Law, Business Administration, Introductory Economics, and English. Therefore, their background knowledge in the sociocultural, environmental and economic aspects of tourism tended to be—as their ESL teachers could learn through the debates and discussions held in class—fairly basic and, more often than not, inaccurate. Moreover, in the pretest they did not recognize words of Latin origin such as *acculturation, enclave, sustainable, niche,* etc which have a similar form in L1. Undoubtedly, they would have recognized them if they had learnt these issues in their university classes or if these concepts formed part of their prior knowledge.

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