

The role of input flood and input enhancement in EFL learners' acquisition of collocations

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The study investigated L2 learners' acquisition of verb-noun and adjective-noun collocations following two kinds of instruction: input flood only and input flood plus input enhancement (in the form of underlining). L1 Polish learners of English as a foreign language were exposed to infrequent collocations embedded in stories that were read during three consecutive weeks. Their collocational competence was subsequently assessed in a battery of delayed tests tapping into productive and receptive levels of collocational mastery. Input flood plus input enhancement resulted in the acquisition of collocations but only at the level of form recall and form recognition. The findings are discussed with reference to the complexity of acquiring and measuring L2 collocational knowledge. The article concludes with implications for instructed second language acquisition.

Keywords: SLA, foreign language teaching methodology, corpus linguistics

Badanie dotyczyło przyswajania kolokacji czasownikowo-rzeczownikowych i przymiotnikowo-rzeczownikowych przez uczących się drugiego języka na skutek dwóch różnych form nauczania: zwiększonego wkładu językowego i zwiększonego wkładu językowego wraz z graficznym uwydatnieniem (w formie podkreślenia). Przez okres trzech tygodni polscy uczniowie języka angielskiego jako języka obcego czytali krótkie opowiadania zawierające kolokacje o niskiej frekwencji. Następnie ich kompetencja leksykalna została oceniona za pomocą odroczonej testów sprawdzających produktywną i receptywną poziomą wiedzy. Zwiększony wkład językowy wraz z graficznym uwydatnieniem doprowadził do przyrostu wiedzy, ale tylko na poziomach przywołania i rozpoznania form kolokacji. Wyniki przedstawione są w odniesieniu do złożoności procesu przyswajania i mierzenia kolokacji w drugim języku. Artykuł kończy się omówieniem zastosowania wyników badań w nauczaniu języka angielskiego w warunkach formalnych.

Słowa kluczowe: przyswajanie drugiego języka, metodyka nauczania języków obcych, językoznawstwo korpusowe

Introduction

Collocations have been defined differently depending on the research interests of particular scholars. Generally, they are regarded as habitually co-occurring lexical partnerships with relative transparency of meaning that contribute to L2 fluency (Keshavarz and Salimi 2007; Laufer and Waldman 2011; Henriksen 2013). In broader terms, collocations belong to formulaic sequences, which have been described as a core characteristic of language (Sinclair 1991; Wray 2002; Schmitt 2010). As recent research demonstrates, formulaic sequences afford processing advantages (Conklin and Schmitt 2008) and help speakers fulfill many pragmatic functions (Bardovi-Harlig 2009). Consequently, the effective use of collocations needs to be perceived as an important aim for second language (L2) learners.

Unfortunately, L2 learners, even those at advanced levels of proficiency, experience difficulty in using collocations (Howarth 1998; Altenberg and Granger 2001; Laufer and Waldman 2011). First, in comparison to native speakers, learners use fewer collocations and, second, they tend to make collocational errors (e.g. 'make homework'), which result mainly from crosslinguistic phraseological differences (Nesselhauf 2003). Such errors negatively influence the perception of L2 learners' linguistic performance (Boers, Eyckmans, Kappel, Stengers, and Demecheleer 2006). There thus arises a question of how formal instruction can assist L2 phraseological development.

However, despite a recent rise in interest in formulaic language, relatively little research exists on how formulaic sequences should be approached in the language classroom. Alali and Schmitt (2012) explored how idioms and individual words are acquired by EFL learners in Kuwait. They found that repetition was an effective teaching technique for both idioms and words, leading to gains at receptive (recognition) and productive (recall) levels. Webb and Kagimoto (2011) analyzed how the number of collocates (six, three and one), the position of the node word (e.g. the word 'good' is in the +1 position in 'good laugh,' and the word 'time' is in the -1 position in 'difficult time') and synonymy (learning collocations for pairs of synonyms together) affected EFL learners' learning of frequent collocations. Their results revealed that learning more (six or three) collocates for the same word (e.g. learning 'laugh,' 'reason' and 'behavior' as collocates of the word 'good') is more effective than learning single collocates for a larger number of different words. Also, simultaneous learning of collocations for synonyms was found to have a negative effect on learners' results. Finally, Laufer and Girsai (2008) looked at the acquisition of collocations by Israeli learners of English in three different treatment conditions: meaning-focused instruction (reading comprehension and group discussion), contrastive form-focused instruction (comparing collocational patterns in learners' L1 and L2) and non-contrastive form-focused instruction (two tasks emphasizing collocational patterns). Their results showed that contrasting the use of collocations in learners' L1 and L2 was the most effective way of enhancing L2 collocational knowledge.

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These findings, as well as her research on individual words, have led Laufer (2010) to emphasize form-focused instruction (FFI) as a necessary supplement to incidental vocabulary learning. Following Long's (1991) and Ellis' (2001) earlier work, she perceives FFI as a dichotomy of focus-on-form (FonF) and focus-on-forms (FonFs). The former consists of communicative treatments during which learners' attention is drawn to linguistic forms, while the latter can be understood as decontextualized activities that target linguistic forms in a non-communicative way. Similarly, Doughty (2003) notes that FFI embraces many types of pedagogical interventions including both implicit (e.g. input flood or input enhancement) and explicit procedures (e.g. FonFs or consciousness raising). Since all these treatments can potentially be used in the classroom, it is vital to determine which of them constitute the optimal conditions for teaching formulaic sequences. Szudarski (2012) explored the acquisition of frequent collocations of delexical verbs (e.g. 'take office' or 'do damage') by EFL learners in two different conditions: meaning-focused instruction and meaning-focused instruction plus FonFs (decontextualized activities targeting collocations). Findings suggested that the addition of FonFs improved learners' knowledge of collocations at both the productive level of form recall (being able to produce a collocation when given its meaning) and the receptive level of form recognition (being able to select a collocation from several response options). However promising these results are, L2 learners need to acquire infrequent combinations as well and little is known about this process. Additionally, not all collocations (and other formulaic sequences for that matter) can be addressed explicitly through time-consuming FonFs. Therefore, implicit interventions such as input enhancement or input flood targeting infrequent L2 collocations are considered in the present study.

Input enhancement, input flood and L2 acquisition

Input enhancement is defined by Kim (2006: 345) as "pedagogical techniques designed to draw L2 learners' attention to formal features in the L2 input." It is based on Sharwood Smith's (1991) suggestion that changing the quality of input can stimulate learners' processing of linguistic material. Schmidt's (2001) Noticing Hypothesis provides a theoretical rationale for the use of input enhancement, the aim of which is to draw learners' attention to linguistic forms via formatting techniques such as bolding, italicizing or underlining. So far, most of the empirical work on input enhancement has addressed grammatical acquisition (White 1998; Izumi 2002; Leow, Egi, Nuevo, and Tsai 2003; Jahan and Kormos in press). However, no definite conclusions on the effectiveness of input enhancement can be drawn, mainly due to considerable methodological differences between studies (Han, Park and Combs 2008).

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As far as L2 vocabulary is concerned, research on input enhancement has focused on individual words. Kim (2006) investigated lexical elaboration (provision of meaning) and textual enhancement (bolding) as two factors influencing the incidental acquisition of words by Korean learners of English. No positive effects of textual enhancement were found when it was used alone. However, when combined with lexical elaboration, it resulted in learners' better form recognition of target words. Furthermore, Barcroft (2003) explored the effects of input enhancement and its distinctiveness on L1-English learners' acquisition of unknown Spanish nouns. His aim was to determine how many words out of all target items needed to be enhanced in order to find positive results. Gains were found only when a limited number of words (three out of 24) were enhanced. This means there is a risk of 'bidirectionality,' that is, both positive and negative effects of input enhancement, for Barcroft found it to be ineffective when nine out of 24 words were enhanced.

Another form of instruction that can contribute to L2 vocabulary acquisition is input flood which, as Han et al. (2008) explain, increases the saliency of a target language feature through artificially engineered frequency. The effectiveness of input flood is based on a large body of work showing that repetition is an important factor in the process of attaining proficiency in an L2 (e.g. Ellis 2002; VanPatten, Williams, and Rott 2004). Research on individual words demonstrates that L2 learners need to encounter unknown items several times before any learning occurs (Pigada and Schmitt 2006; Webb 2007; Chen and Truscott 2010). For example, Chen and Truscott (2010) designed a study in which Chinese-speaking learners of English read 13 passages (250–300 words each) where 10 unknown target words were presented one, three or seven times. Following Webb's (2007) design, the authors used a battery of seven tests tapping into different aspects of lexical knowledge and found that repetition had a positive effect on learners' results at both a productive and receptive level. This design is a well-founded example of the measurement of L2 learners' lexical development. As Schmitt (2010) explains, vocabulary learning is an incremental process in which different types of lexical knowledge are gradually acquired and only multiple measures of the construct allow us to comprehensively describe learners' progress. Lastly, several authors have explored the role of repetition in combination with other factors. Laufer and Rozovski-Roitblat (2011) investigated L2-English learners' acquisition of words as dependent on repetition and task type (reading a text plus FonF and reading a text plus FonFs). Repetition was found to have an effect on learners' gains only in the FonFs condition. Rott (2007) studied the effects of repetition and input enhancement (bolding) on L2-German learners' lexical knowledge and found that four encounters led to better results than one encounter at both productive and receptive levels. However, once learners established initial form-meaning links, input enhancement did not develop their lexical knowledge further. These findings suggest an interaction of repetition with

othervariables which collectively influence the process of L2 vocabulary acquisition.

Effects of input enhancement and repetition on the acquisition of formulaic sequences

The above overview clearly shows that both input enhancement and repetition are important factors in the process of L2 learners' acquisition of single words. A question arises, however, whether the same applies to formulaic language. So far, very few studies have focused on the use of input enhancement with regard to formulaic sequences. One of them is Bishop's (2004) small-scale experiment in which learners of English were divided into two groups: an experimental group that read a text with enhanced words and formulaic sequences and a control group that read a regular text. In both groups, the target items were hyperlinked with glosses in such a way that each time a student clicked on a word or formulaic sequence, its definition, written in simpler language, would appear on a screen. Bishop was interested in determining whether perceptually salient (red and underlined) words and formulaic sequences would be clicked on more often than unenhanced items and how this would influence learners' reading comprehension. Results revealed that learners clicked on the salient formulaic sequences significantly more frequently and the experimental group comprehended the text significantly better than the control group. Unfortunately, the author did not measure learners' knowledge of the formulaic sequences and, therefore, it is impossible to predict whether the more frequent clicks in the enhanced group resulted in gains in the formulaic items.

Peters (2012) investigated the role of input enhancement in the process of teaching formulaic language in L2 German. She analyzed the effects of an explicit treatment (instructing learners to focus on formulaic language) and input enhancement (bolding and underlining) on the recall of formulaic sequences and single words. Learners were explicitly told to pay attention to both formulaic sequences and single words (an experimental group) or to unfamiliar vocabulary in general (a control group). As far as input enhancement is concerned, half of the 24 target items were presented as typographically salient (six formulaic sequences and six words) and the other half were not. The results of a form recall test provided a mixed picture. Directing learners' attention did not have an effect on their recall of the target vocabulary, while increasing its typographical salience led to significantly higher scores on the target sequences. However, as Peters acknowledges, marginal glosses with L1 translation that learners had been exposed to could have influenced the results as well.

As far as repetition is concerned, Webb, Newton and Chang (2013) found frequency effects in their study of EFL learners' incidental learning of verb-noun collocations consisting of frequent words. L1 Chinese university

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students of English in Taiwan read and listened to a graded reader that contained one, five, ten or 15 occurrences of the target collocations. The authors included four versions of the graded reader, each with a different number of occurrences of the collocations. As soon as the treatment ended, a post-test (four subtests of productive and receptive knowledge of form and meaning) followed. Results revealed that collocations were learned, with the higher numbers of repetition (15, ten and five encounters) leading to significantly higher gains than the lower numbers of repetition (one and zero encounters). However, these findings were based on immediate post-tests and therefore the study offers little information about durable learning gains, which are normally considered the ultimate aim of language instruction (Schmitt 2010). Second, the tests that were used during the pre-test and the post-test sessions differed, that is, the pre-test did not include any measures of learners' productive knowledge (only a multiple-choice test of form recognition was administered). As the target collocations consisted of frequent words, participants might have exhibited some levels of productive collocational knowledge before the treatment. Without establishing whether this was the case, the gains reported by the authors might have resulted not only from the exposure to the graded reader but also from learners' previous knowledge. The present study aims to address these issues as it explores the acquisition of infrequent collocations by EFL learners.

Research questions

The study aims to answer three research questions:

1. Do EFL learners acquire infrequent collocations following two treatments: input flood plus input enhancement (IEN) and input flood only (IFO)?
2. Is there a difference in effectiveness between the two experimental treatments?
3. Does repetition (the number of encounters with collocations) influence learners' gains?

Methodology

Participants

Forty-one learners of English in Poland took part in the study. They were recruited from three intact classes which formed two experimental groups (thirteen participants each) and a control group (fifteen participants). All participants were eighteen-year-old students of the last grade in a secondary school and Polish was their L1. They had studied English for at least six years. To determine their lexical knowledge, the *Vocabulary Levels Test (VLT)*, a

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receptive test of vocabulary size developed by Schmitt, Schmitt, and Clapham (2001), was administered. Learners' average scores (standard deviations in the brackets) for the 2,000, 3,000 and 5,000 frequency levels were: 18(6)/30, 15(5)/30, and 13(6)/30. The threshold for the mastery of a given level suggested by Schmitt et al. (2001) was 26 out of 30. Therefore, our participants' vocabulary knowledge was rather low.

Target items

In this study, collocations were defined as word partnerships that frequently co-occur within a given word span (Sinclair 1991) and are characterized by specific degrees of fixedness (Nesselhauf 2003). This is a hybrid approach to collocations which draws from both the phraseological and frequency-based traditions (Barfield and Gyllstad 2009). Twenty collocations were chosen as target items for the study (see Appendix 1). Ten of them were verb-noun collocations that consisted of frequent verbs 'make,' 'take,' 'have,' 'give,' 'hold' and infrequent nouns for instance, 'hold a banquet'. Such frequent verbs often form collocations in which they become delexical, that is, the meaning of the whole phrase is carried mostly by a noun. Previous research (Altenberg and Granger 2001) has found such collocations to cause difficulty for L2 learners. Moreover, since formulaic language embraces different types of collocations, the other ten target items were adjective-noun collocations consisting of frequent adjectives and infrequent nouns (for instance, 'deep aversion').

Importantly, all the collocations were matched in terms of their formal characteristics. First, they had a high (> 3) Mutual Information (MI) score, which is a commonly used test indicating strong collocational patterns (Clear 1993; Hunston 2002). MI tends to highlight combinations whose components are strongly associated with each other and consequently tend to co-occur. The only exception were collocations with the verb 'have' whose MI scores are not high due to the fact that this verb is often used as a function (auxiliary) word and co-occurs with many different words. Second, since the target items were infrequent collocations with fewer than 40 occurrences in the BNC, they were unlikely to be known by our participants who, as demonstrated by their VLT results, were intermediate learners. Finally, the target collocations were matched in terms of the frequency of the individual words they comprised. All of them consisted of one frequent (all adjectives and verbs belonged to the first 3,000 most frequent word families in English) and one infrequent word (none of the nouns belonged to the first 3,000 word families).

Treatment

The entire study spanned seven weeks. The treatment phase lasted three weeks and consisted of reading six stories (see Appendix 2). Each week

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participants read two stories that contained the target collocations. The treatment was preceded by a pre-test (administered two weeks before the treatment started), which helped us to determine whether the target collocations were unknown by our participants. No immediate post-test was conducted for this would have constituted additional exposure to the target collocations. Since we were interested in long-term learning gains, we delayed the post-test and administered it two weeks after the treatment ended.

In order to explore the effects of two different treatments, one experimental group, the input enhancement (IEN) group, read the stories in which all the target collocations were underlined. The other experimental group, the input flood (IFO) group, read the same stories but, in contrast, the target collocations were not highlighted in any way. There was also a control group that participated only in the pre-test and post-test sessions.

In order to explore the role of repetition, each story contained 10 collocations (five verb-noun and five adjective-noun collocations) which occurred once and 10 other collocations (five verb-noun and five adjective-noun collocations) which occurred twice. Similarly to Webb et al. (2013), the verb-noun collocations appeared in different grammatical forms (e.g. 'make forays' and 'made forays') to create conditions that resemble speakers' exposure to formulaic sequences in natural discourse. The target items were inserted at different points of the stories. Six stories were read overall, with the target collocations being encountered either six or 12 times. Research on individual words suggests that large lexical gains occur after multiple encounters: seven repetitions in Chen and Truscott (2010) and ten plus repetitions in Pigada and Schmitt (2006). As our treatment was relatively short, the number of encounters with the collocations had to be compromised and we included six and 12 repetitions. Short stories containing too many examples of the same collocations would have been perceived as unnatural texts.

All the stories were written specifically for this study and consisted of around 600 words each. The texts were intended to be easy as far as reading comprehension is concerned. Consequently, except for the nouns forming the target collocations, all the words used in the stories belonged to the first 3,000 most frequent word families in English (Nation 2006). In order to ensure that learners focused on the meaning of the texts, five statements (none of them containing the target collocations) followed each story and participants were told to decide whether they were true or false. Their results (a mean comprehension level was 80%) suggest that comprehending these texts was not problematic.

Testing measures

As mentioned above, vocabulary knowledge consists of different aspects (meaning, form and use) and should be measured at both a productive and

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receptive level. As the study included two different types of collocations, separate measures tapping into the verb-noun and adjective-noun combinations had to be included. Our participants were intermediate learners and they were familiar with the metalinguistic terms 'noun' and 'adjective.' This was confirmed by the results of our collocational tests which elicited these collocations that we had asked for (see below).

Participants' collocational knowledge was measured by means of a battery of five tests developed on the basis of Laufer and Girsai (2008) and Webb et al. (2013). In order to avoid any learning from the measures themselves, the tests were administered in a specific order: productive tests (Test 1, Test 2 and Test 3) were followed by receptive tests (Test 4 and Test 5). All the tests were scored dichotomously: 1 point for a correct answer and 0 points for an incorrect/no answer. No partial knowledge was taken into account.

Test 1 (form recall)

This test was a productive test of verb-noun collocations in which learners had to translate Polish phrases into English.

Translate into English
Is c' na skróty _____
*('take a shortcut')**

* This information was not included in the testing. It is given here only for clarification purposes.

Test 2 (form recall)

This test was a productive test of form recall. On the basis of the definition that was written in the brackets, learners had to provide an adjective forming a collocation with a noun. In order to avoid eliciting different answers that would fit the context, the first letter of the adjective and dashes indicating the missing letters were given.

Complete these phrases with an adjective so that they express the meaning provided in the brackets. If you think more than one answer is possible, give all alternatives. The number of dashes indicates the number of missing letters.

q _ _ _ _ retort (a speedy reply produced with an angry voice)
*('quick' is the correct answer)**

Test 3 (form recall)

This test used the same format as Test 2. On the basis of the provided definition, learners had to write a verb forming a collocation with a noun.

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However, in this case neither the first letters of verbs nor the number of dashes indicating the missing letters were given. This would have made the test too easy. The delexical verbs used in the study are four-letter words and, thus, once the first letter is known, it is easy to provide the missing verb without focusing on the collocate.

Complete the phrases with one verb so that they express the meaning provided in the brackets. Don't use the verbs from the brackets.

_____ a shortcut (to follow an alternative and usually shorter route)
(‘take’ is the correct answer)*

Test 4 (meaning recall)

This test was a receptive test of the adjective-noun collocations where learners had to provide Polish translations of the English phrases. A meaning recall test of the verb-noun collocations was excluded. Participants were exposed to the Polish translations of these items on Test 1 and therefore it was not possible to measure their knowledge of meaning recall as they were likely to remember the correct answers they had seen.

Translate these phrases into Polish. Remember to translate both the adjective and the noun.

quick retort _____

Test 5 (form recognition)

This test was a receptive test of the verb-noun collocations where learners had to choose the correct answer out of the four options that were provided. Even though, as Schmitt (2010) argues, in real-life situations speakers are rarely presented with a choice of options of form or meaning, in this study it was important to include this measure so that learners' knowledge of delexical verbs could be evaluated. Additionally, in order to reduce learners' guessing, participants were provided with an 'I don't know' option and asked to circle it when they did not know the correct answer. This format has been used in previous research on L2 vocabulary (Brown, Waring and Donkaewbua 2008).

*Choose the verb that best completes the following phrases in such a way that the meaning provided in the brackets is expressed. If you don't know the answer, **don't guess** and choose response e) I don't know.*

_____ a shortcut (to follow an alternative and usually shorter route)
a) hold b) take c) do d) give e) I don't know

Results**Research question 1**

Participants' pre-test and post-test results are presented in Table 1. Since a pre-test post-test design was employed, there was a need to control for the pre-test results and, consequently, a series of Kruskal-Wallis tests was conducted for all the five tests (non-parametric tests were used since the data were not normally distributed). No significant differences on either of the five tests were found. The fact that the experimental groups did not differ from each other on the pre-test was crucial, for this meant that learners' collocational gains observed on the post-test could be attributed to the treatment. In order to determine the effects of the treatment, learners' results on the pre-test and post-test were compared with each other. This was done separately for each group and the number of occurrences of the target collocations.

IEN group

With six occurrences, significant differences were found on Test 2 ($z = -2.21$; $p = 0.027$), Test 4 ($z = -2.33$, $p = 0.02$) and Test 5 ($z = -2.85$, $p = 0.004$). Differences on the two remaining tests were non-significant (Test 1: $z = -1.0$, $p = 0.317$; Test 3: $z = -1.9$, $p = 0.058$).

With 12 occurrences, significant differences were found on Test 2 ($z = -2.66$; $p = 0.007$) and Test 3 ($z = -2.65$; $p = 0.008$). Test 1 ($z = -1.0$; $p = 0.317$), Test 4 ($z = 0$; $p = 1.0$) and Test 5 ($z = -1.9$; $p = 0.058$) did not reveal any significant changes.

IFO group

With six occurrences, only the results of Test 3 ($z = -2.33$; $p = 0.02$) and Test 4 ($z = -2.46$, $p = 0.014$) revealed a significant difference. Learners' results on all the remaining tests were non-significant (Test 1: $z = 0$, $p = 1.0$; Test 2: $z = -1.63$, $p = 0.102$; Test 5: $z = -1.39$, $p = 0.165$).

With 12 occurrences, none of the tests revealed significant differences (Test 1: $z = 0$; $p = 1.0$; Test 2: $z = -1.16$, $p = 0.248$; Test 3: $z = -1.13$; $p = 0.257$; Test 4: $z = -0.45$, $p = 0.655$; Test 5: $z = -0.71$, $p = 0.48$).

Control group

With six occurrences, only the results of Test 2 revealed a significant difference ($z = -2.1$; $p = 0.035$). Differences on all the remaining tests were non-significant (Test 1: $z = -0.58$, $p = 0.564$; Test 3: $z = -1.93$, $p = 0.054$; Test 4: $z = -1.0$, $p = 0.317$; Test 5: $z = -1.29$, $p = 0.196$).

Table 1. Mean pre-test and post-test results on five tests of collocational knowledge

Gr	T	I		E		F		M			
		M	SD	M	SD	M	SD	M	SD		
IEN group 6 occur.	pre-test	0(0)		11(18)		11(10)		05(12)		15(15)	
	post-test	03(11)		35(38)		20(20)		23(20)		50(25)	
IEN group 12 occur.	pre-test	0(0)		15(17)		06(10)		09(13)		20(14)	
	post-test	05(17)		48(30)		16(22)		09(13)		29(19)	
IFO group 6 occur.	pre-test	0(0)		08(10)		06(10)		02(06)		18(15)	
	post-test	0(0)		14(13)		17(14)		15(17)		28(17)	
IFO group 12 occur.	pre-test	0(0)		18(13)		06(10)		09(10)		26(10)	
	post-test	0(0)		25(19)		11(13)		11(16)		29(16)	
Control gr. 6 occur.	pre-test	01(05)		15(14)		07(12)		15(21)		19(16)	
	post-test	03(07)		24(23)		17(24)		16(23)		27(20)	
Control gr. 12 occur.	pre-test	0(0)		11(18)		03(07)		12(17)		31(15)	
	post-test	0(0)		20(20)		04(08)		12(21)		24(22)	

Max score = 5.

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With 12 occurrences, none of the tests revealed significant differences (Test 1: $z = 0$; $p > .05$; Test 2: $z = -1.94$, $p = 0.052$; Test 3 $z = -0.58$; $p = 0.564$; Test 4: $z = 0$, $p = 1.0$; Test 5: $z = -0.89$, $p = 0.374$).

Research question 2

Since the second research question concerned the effectiveness of the treatments (IEN and IFO), Kruskal-Wallis tests comparing learners' post-test results were conducted. The two experimental groups did not differ significantly from the control group on Test 1 after six occurrences ($X^2(2, 41) = 1.71$, $p = 0.426$) and twelve occurrences ($X^2(2, 41) = 2.15$, $p = 0.341$) and Test 4 after six occurrences: $X^2(2, 41) = 1.80$, $p = 0.407$ and twelve occurrences ($X^2(2, 41) = 0.036$, $p = 0.982$). Consequently no claims about the successful acquisition of collocational knowledge at these levels can be made. However, significant differences between the three groups were found on Test 2 after twelve occurrences ($X^2(2, 41) = 7.20$, $p = 0.027$), Test 3 after 12 occurrences ($X^2(2, 41) = 11.23$, $p = 0.004$) and Test 5 after six occurrences ($X^2(2, 41) = 8.39$, $p = 0.015$).

In order to establish which group differed from which, the data were further analyzed by means of Mann-Whitney tests. On Test 2 after twelve encounters, the IEN group outperformed the IFO group ($U = 41$; $z = -2.31$; $p = 0.021$) and the control group ($U = 51$; $z = -2.24$; $p = 0.025$) but the IFO group did not differ from the control group ($U = 88$; $z = -0.46$; $p = 0.641$). Similar results were found on Test 3 after twelve encounters: the IEN group outperformed the IFO group ($U = 48$; $z = -2.04$; $p = 0.042$) and the control group ($U = 38.5$; $z = -2.98$; $p = 0.03$) with the IFO group not differing from the control group ($U = 82$; $z = -0.84$; $p = 0.40$). On Test 5 after six encounters, the IEN group outperformed the IFO group ($U = 33$; $z = -2.76$; $p = 0.006$) and the control group ($U = 39.5$; $z = -2.77$; $p = 0.006$) however the IFO group did not differ from the control group ($U = 86$; $z = -0.56$; $p = 0.574$). A summary of these analyses is presented in Table 2.

Research question 3

In order to determine how repetition (six vs. 12 encounters) influenced learners' collocational gains, the results of the IEN group (no analysis of the IFO group's data was conducted as this group did not make any gains) were explored. Wilcoxon tests revealed that twelve encounters resulted in significantly higher scores on Test 2 ($z = -2.07$, $p = 0.038$). Rather surprisingly, the results of Test 4 ($z = -2.3$, $p = 0.021$) and Test 5 ($z = -2.21$, $p = 0.027$) were reversed: six encounters with the collocations led to significantly higher scores than twelve encounters. No significant differences between six and

Table 2. Effectiveness of treatments

Test	Repetition	IEN vs. IFO	IEN vs. control	IFO vs. control
Test 1	6	n.s.	n.s.	n.s.
	12	n.s.	n.s.	n.s.
Test 2	6	n.s.	n.s.	n.s.
	12	IEN >* IFO	IEN >* Control	n.s.
Test 3	6	n.s.	n.s.	n.s.
	12	IEN >* IFO	IEN >* Control	n.s.
Test 4	6	n.s.	n.s.	n.s.
	12	n.s.	n.s.	n.s.
Test 5	6	IEN >* IFO	IEN >* Control	n.s.
	12	n.s.	n.s.	n.s.

* $p < 0.05$.

twelve encounters were found either on Test 1 ($z = -0.45$, $p = 0.655$) or Test 3 ($z = -0.79$, $p = 0.429$).

Discussion

The acquisition of collocations

The study investigated the acquisition of collocations by EFL learners in two different classroom conditions: IEN and IFO. Our results indicate that combining input flood with input enhancement can promote L2 collocational knowledge. This adds more evidence to a growing body of research showing that FFI can generate collocational gains (e.g. Laufer and Girsai 2008; Webb and Kagimoto 2011; Szudarski 2012). Importantly, the present study demonstrates this in learners' acquisition of infrequent, and hence difficult, collocations. As highlighted by Wray (2002), natural discourse is characterized by different types of phraseological units and many of them turn out to be infrequent items when their occurrence is compared with individual words (Webb et al. 2013). Therefore L2 learners, especially those in EFL contexts where only limited L2 input is available, are unlikely to acquire them incidentally. Consequently, FFI techniques such as input enhancement and input flood can be used to remedy the situation.

The effectiveness of IEN and IFO

In order to answer the second research question, learners' scores in the two experimental treatments were contrasted. Only IEN resulted in improvement, as IFO did not appear to enhance learners' knowledge,

irrespective of how many times the target collocations were encountered. The conditions created in the IFO group can be conceptualized as incidental vocabulary learning, which is defined as the process of learning something without intending to do so (Brown et al. 2008). Throughout the entire IFO treatment, no mention of collocations was made and learners' attention was not intentionally drawn to the target items by any external factors. As stated by Peters et al. (2009), incidental learning of vocabulary is a slow and error-prone process and the results of the present study suggest that L2 learners might need much more exposure than twelve encounters spread over three weeks to successfully acquire infrequent collocations. Unfortunately, such conditions are difficult to create in many EFL contexts where learners often have only two or three short classes of instruction a week. Also, teaching materials do not contain many activities highlighting collocations as important targets for instruction (Brown 2011) and, consequently, learners may not get enough exposure to collocational patterns. Thus, we support Laufer's (2010) claim to supplement incidental learning with various types of FFI that will target L2 collocations.

Moreover, the effectiveness of the treatments needs to be discussed with reference to the productive and receptive aspects of L2 collocational knowledge. Learners from the IEN group made gains on the productive tests of form recall (Test 2 and Test 3) and the receptive test of form recognition (Test 5). Productive use of collocations has been highlighted as an area that L2 learners often struggle with (e.g. Nesselhauf 2003) and thus it was encouraging to observe learners' gains after our three-week treatment. At the same time, however, there was a lack of gains on Test 1 (form recall) and Test 4 (meaning recall), which shows that different aspects of L2 collocational competence respond differently to the combination of input flood and input enhancement. We can only hypothesize that Test 1 on which learners had to translate the target collocations from Polish into English was too difficult for our intermediate participants. In turn, the lack of gains on Test 4 tapping into learners' knowledge of the meaning of collocations can be explained by the theoretical underpinnings of textual enhancement. According to Sharwood Smith (1991), enhancing input via graphical techniques is aimed at drawing learners' attention to the form of the specific language features that are to be acquired. However, there is "no guarantee that they will attend to these features" (Kim 2006: 345). It is likely that our participants noticed the underlined collocations but did not process them robustly enough to make semantic gains. Perhaps a more explicit treatment is needed to promote this type of collocational knowledge. Input enhancement, therefore, should not be assumed to be equally applicable to all classroom contexts, regardless of learners' instructional needs. Crucially, such differences in the acquisition of the productive and receptive aspects of L2 collocational competence would not have been found had we relied only on one generic measure of the construct. This highlights the importance of using multiple measures of L2 vocabulary mastery (see Webb 2007; Chen and Truscott 2010).

The role of repetition

According to Hulstijn (2001), vocabulary acquisition from reading is a process that is contingent on learners' discovery of the meaning of unfamiliar words, elaborate processing of lexical information and reinforcement of the form-meaning link by means of repetition. The present study demonstrates that the treatment consisting of 12 occurrences and underlining improved learners' collocational knowledge at the level of form recall. At the level of form recognition, however, the highest gains were found when learners encountered the underlined collocations six times, for encountering them 12 times did not lead to better results. This suggests that more encounters with collocations will not automatically translate into better results at all levels of collocational competence. Interestingly, research on the role of FFI in the acquisition of individual words revealed the positive effects of repetition but only in FonFs conditions (Laufer and Rozovski-Roitblat 2011). Eckerth and Tavakoli (2012), in turn, found that the frequency effect was overridden by the effects of the Involvement Load Hypothesis (Laufer and Hulstijn 2001), that is, the cognitive elaboration with which learners process L2 words. This confirms Hulstijn's (2001) claim that the acquisition of L2 words is a complex and multifaceted process where frequency plays a major role but it must be considered with reference to other factors that collectively determine learners' success. Our results show that the same applies to the acquisition of collocations.

It can be hypothesized that the inconsistent frequency effect could have been caused by the fact that all our target collocations contained infrequent nouns unlikely to be known by our participants. Consequently, they could have faced a dual task of learning collocations and individual words simultaneously, which could have lessened the impact of the frequency effect on the acquisition of infrequent collocations. As Webb et al. (2013: 112) rightly note, "prior knowledge of the items that make up the collocations may have an effect on the amount of knowledge that is gained." Perhaps the frequency effect for such difficult collocations can be observed if learners are exposed to both input enhancement and semantic elaboration.

Pedagogical implications

The study has several pedagogical implications. First, it shows that input flood combined with input enhancement can improve learners' L2 collocational knowledge. This means that not only FonFs (e.g. Laufer and Girsai 2008) but also implicit types of FFI that are less obtrusive (Doughty 2003) should be considered by teachers and language practitioners. A follow-up interview-based study (Szudarski in press) revealed that learners from the IEN group were positive toward textual enhancement as a pedagogical treatment. They acknowledged that the underlined collocations

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had attracted their attention. Consequently, input flood and input enhancement, treatments used mainly in L2 grammar research, should also be seen as a potential way of facilitating L2 phraseological progress.

Furthermore, on the basis of the differential effects of the two treatments used in the study, it can be claimed that input enhancement might reduce the number of encounters needed to make L2 collocational gains. At the same time, however, input enhancement cannot be regarded as a universal technique that will solve all the problems L2 collocations tend to pose. As our study demonstrates, no gains on Test 1 and Test 4 were observed, which suggests that form- and meaning-related aspects of collocational knowledge might call for different pedagogic treatments. In practical terms this suggests that decisions on how to approach collocations and other formulaic sequences should be determined by learners' phraseological needs. For example, if learners' productive knowledge of collocations needs to be increased, then input enhancement, input flood and potentially semantic processing could be combined. However, if we want to promote receptive collocational knowledge, input flood might be sufficient (Webb et al. 2013). In light of this, we second Meunier's (2012: 212) suggestion that different treatments might be needed for the development of different aspects of L2 formulaicity: "simple input enhancement for some [. . .] and more productively oriented approaches for some others."

Limitations and future research

As far as limitations of our study are concerned, we relied on a relatively small sample of participants. However, given that the research was conducted in a classroom environment where language classes could not be larger than 15 students, it was not possible to change this aspect of the design. Nevertheless, we treat our suggestions as tentative claims and call for more empirical work on the acquisition of L2 collocations in different instructional contexts.

Future research should address the potential problem of over-enhancement where combining several types of textual enhancement and input flood becomes counterproductive by, for example, lowering learners' reading comprehension scores (Han et al. 2008). Such research would allow us to establish the right balance between the positive and potentially negative effects of input enhancement on different aspects of L2 performance.

Conclusions

The study investigated the process of acquiring L2 English collocations as a result of two treatments in an EFL classroom: input flood only and input flood with input enhancement. Through a battery of tests tapping into different aspects of collocational mastery we demonstrated that input flood combined with input enhancement led to the improvement of L2 learners' results at the

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level of form recall and form recognition. The study shows that acquiring L2 collocational knowledge is a complex process that involves an interaction of several factors: typographical salience of input, frequency of encounters and specific aspects of collocational competence. Future research should explore these issues further so that we are able to establish the optimal conditions for promoting different levels of collocational competence in classroom instruction.

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Appendix 1. Target items

No.	No. of occurrences	Adjective-noun collocations	Verb-noun collocations
1.	12	Deep aversion	Hold a banquet
2.	12	Quick retort	Have a grumble
3.	12	Human decency	Keep sanity
4.	12	Moral precept	Take a shortcut
5.	12	Rare insight	Give an ovation
6.	6	Drunken brawl	Take a swipe
7.	6	Lonely vigil	Give a nudge
8.	6	Wooden pillar	Make forays
9.	6	Untidy heap	Have custody
10.	6	Amazing feat	Hold a raffle

Appendix 2. Fragment of Story 1 read by the IEN GROUP

Mary was a psychologist and she worked for a social welfare agency. Her responsibilities involved deciding who should have custody of children and protecting them. Since her job gave her a rare insight into families where children were not loved and moral precepts were not followed, Mary had a deep aversion to all those who abused children. For her, it was a matter of human decency to provide such children with help. But this often meant making hard decisions and Mary sometimes had a grumble about all the stress her job involved. So, in order to keep her sanity, whenever she had time, Mary played the guitar in a band. Sometimes the band was invited to perform at banquets that were held in different companies. Their performances were great so they were often given an ovation.

Comprehension questions (True or false)

1. Mary's job involved making decisions about people's lives.
2. Mary played in the band because she needed money.
3. Mary found a reason why Tom had changed so much.
4. Mary asked Tom to help her at work.
5. Tom's father refused to come to his son's concert.