L2 Learners' Vocabulary Learning: Differential Effect(s) of Comprehension-Based vs. Production-Based Proactive/Reactive Focus on Form

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Abstract

This study aims to compare the effects of four types of FFI on second language vocabulary learning. To do so, the study adopted a quasi-experimental pretest-posttest design, including five groups, each receiving a distinct treatment. The participants were 80 fourth-grade male students ranging in age from 17 to 19. Before the treatment phase, the participants took a researcher-made test of vocabulary as a pretest which was meant to measure the participants' prior knowledge about the target words. After the treatment phase, the participants took a researcher-made test of vocabulary as posttest to measure the students' achievement of the target words. Independent samples t-test and one-way ANOVA were run to analyze the scores from the pretest and the posttest. The results indicated that there was no statistically significant difference between proactive and reactive FonF in the comprehension mode in terms of promoting vocabulary learning. There was also no statistically significant difference between these two forms of FonF in the production mode in terms of promoting vocabulary learning. However, there was a statistically significant difference between the comprehension-based and production-based FonF in enhancing vocabulary learning. These results extend the positive effect of FFI to L2 vocabulary teaching/learning.

Keywords: Focus on Form, Reactive, Proactive, Vocabulary, Comprehension-Based vs. Production-Based

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1. Introduction

Dating back to the early 90s, the term Focus on Form (FonF) was introduced by Long (1991) with the hope of compensating for the drawbacks of the other two types of instruction, i.e. Focus on Forms (FonFs) and Focus on Meaning (FonM). According to Doughty and Williams (1998a), FonFs is limited to a focus on formal elements of language and the major issue of this type of instruction is that learners could learn the grammatical features and make accurate sentences, but they could not use the language fluently in communication. On the other hand, FonM excludes attention to the formal elements of language (Doughty & Williams, 1998a) and understanding the message is the sole goal of instruction. The problem with this type of instruction is that learners are just taught to communicate fluently at the expense of accuracy.

Here is where FonF comes into the scene. It incorporates certain degrees of attention to form during a communicative activity. Thus, both the form and the meaning are important for in type of instruction. In other words, FonF goes after both accuracy and fluency.

After the introduction of FonF (Long, 1991) in the 90s, there were many studies which investigated this new form of instruction whose results have led to the expansion of Long's original definition and consequently, FonF is perceived differently by different scholars (Doughty & Williams, 1998a; Ellis, 2001; Spada, 1997). Long (1991) defined it as "overtly drawing students' attention to linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning, or communication" (p. 45-46). Spada (1997) used the umbrella term of Form-focused Instruction (FFI) and defined it as:

> Any pedagogical effort which is used to draw the learners' attention to form either implicitly or explicitly…within meaning-based approaches

> to L2 instruction in which a focus on language is provided in either spontaneous or predetermined ways (p. 73).

Doughty and Williams (1998a) suggested that FonF can be achieved reactively and proactively; that is, both in response to learner errors and by addressing specific linguistic forms in a predetermined manner. Ellis (2001) defined it as "any planned or incidental activity that is intended to induce language learners to pay attention to linguistic form" (p. 12). In spite of these differences in defining FonF, one thing that these definitions have in common is drawing students' attention to linguistic forms during a lesson with an overriding focus on message and communication. As Mayo (2011) claimed, "the concept includes now both preplanned and reactive approaches to… [language] instruction and is generally understood as any activity that draws the learners' attention to form within a meaningful context" (p. 17).

Over the years, a wide range of studies has been conducted by researchers in order to find out the efficiency of this new type of instruction. Researchers mainly tried to answer this question: "Does Focus on Form instruction work?" This was done by examining "whether learners learned the specific forms they were taught" (Ellis, 2001, p. 5). The conclusion was that instruction would cause a change "especially if the learners were developmentally ready to acquire the targeted structure" (Ellis, 2001, p. 6). However, this is just the beginning of a long journey to find the answer to the ″how″ question. In other words, "the question is no longer whether explicit grammar instruction helps learners gain proficiency in English, but rather how this approach can best be accomplished" (Rodríguez, 2009, p. 3). Regarding this new issue, a number of questions about FonF have yet to be addressed. Some questions are concerned about the timing of FonF (Doughty & Williams, 1998a), some with different

types of FonF's effects on second language learning (Rahimpour, Salimi, & Farrokhi, 2012), and so on.

Finally, with the developments in L2 acquisition theory and appearances of the several new hypotheses such as noticing hypothesis (Schmidt, 1990), limited processing ability (VanPatten, 1990), and pushed output (Swain, 1985); FonF gained some ground and some of these questions were investigated. However, nowadays most of the studies are comparing different pedagogical or instructional options in FonF instruction. Additionally, FFI has not received a fair share of treatments in relation to various aspects of language. For example, FFI has not received much research attention in the area of vocabulary learning and teaching, and the majority of research on FonF instruction has been conducted in the context of grammar teaching. However, as Doughty and Williams (1998b) cautioned the term form must not be limited solely to grammar points, but should rather include all aspects of the L2, including vocabulary. Therefore, it can be argued that FonF can be extended to vocabulary learning if students see themselves as language users and the language as a tool for communication. All in all, with the recent extension of FonF to vocabulary instruction, there is a need to elaborate more on the efficiency of FonF for vocabulary teaching. There are, however, a few studies that have explicitly linked FFI to vocabulary instruction (e.g., Mason & Krashen, 2004).

Although the majority of the FonF studies such as those cited above have compared the effectiveness of FonF with that of more traditional ones, i.e., FonFs and FonM or have investigated the effectiveness of specific FonF techniques, including input flood, task-essential language, consciousness raising, and input processing, the present study attempts to add a new angle to the current knowledge of FonF studies by investigating distinctive realizations

of FonF with different combinations of aspects, which include proactive or reactive (Doughty & Williams, 1998a) and comprehension-based or production-based dimensions (Shintani, Li, & Ellis, 2013).

Specifically then, the study deals with the following questions:

1. Is there any significant difference between Comprehension-based Reactive Focus on Form and Comprehension-based Proactive Focus on Form in promoting learning?
2. Is there any significant difference between Production-based Reactive Focus on Form and Production-based Proactive Focus on Form in promoting learning?
3. Is there any significant difference between Comprehension-based Focus on Form and Production-based Focus on Form in promoting learning?

2. Review of the Related Literature

2.1. FFI and The Options

Ellis (2012) states that "different instructional approaches involve different combinations of options" (p. 278), we can have so many different types of FFI. In addition, regarding the exact point that the current study is directed at i.e., what are teachers' options in helping students increase their store of words? What needs to be done, then, is to elaborate on different aspects of the targeted FFI options in this study, namely, Comprehension-based Reactive Focus on Form (CRFonF), Production-based Reactive Focus on Form (PRFonF), Comprehension-based Proactive Focus on Form (CPFonF), and Production-based Proactive Focus on Form (PPFonF). But first the aspects, namely, being proactive, reactive, comprehension-based, and production-based should be elaborated.

PFonF, in this study, means whatever the teachers do before conducting the main activity in order to induce learners' attention to the targeted linguistic forms. This term was first used by Doughty and Williams (1998a) to refer to a type of FFI that can be achieved proactively; that is, by addressing specific linguistic forms in a predetermined way. In a similar vein, Spada (1997) and Ellis (2001) used the terms of 'predetermined' and 'planned', respectively. Proactive in this study is, in some ways, a mixture of all these terms. In other words, it is both predetermined and planned at a time.

RFonF, in this study, is used to refer to whatever the teachers do during and after conducting the main activity in order to deal with students' problems with new linguistic forms. Doughty and Williams (1998a) claimed that we can have RFonF in terms of the responses that the teachers provide for learners regarding their problems with linguistic forms. Spada (1997) used the word 'spontaneous' to refer to RFonF. She believes that we can have FFI in spontaneous ways. Along the same lines, Ellis (2001) used the term 'incidental' to refer to the same concept. All in all, RFonF used here is, somehow, an all-inclusive term to cover all the things that teachers are doing during and after teaching, dealing with students' problems with linguistic forms like grammar and vocabulary.

Comprehension-based Focus on Form (CbFonF) is a concept which comes from CBI. As Shintani et al. (2013) states "CBI does not require production of the target features [but] it aims to teach them by embedding them in input" (p. 298). Students just have to comprehend the targeted linguistic forms. In other words, what is important for this type of instruction is to see whether learners have successfully comprehended and processed the target forms in the input or not (cf. Shintani et al., 2013). To be more pertinent in the discussion at hand, it is time to turn to different input-based (or comprehension-based) options in

FFI. These options, as Ellis and Loewen (2009) claim, "involve the manipulation of the input that learners are exposed to or are required to process. They include enriched input, enhanced input, structured input" (p. 237) and even comprehension-based multiple-choice question activities, which examine whether students have successfully comprehended the targeted linguistic forms. In the current study, CbFonF is a type of instruction in which there is no attempt to require students to produce the linguistic forms.

Production-based Focus on Form (PbFonF) is a concept taken from PBI. In contrast to CBI, as Shintani et al. (2013) put it "PBI seeks to elicit the correct production of the target features" (p. 298), and it views production rather than comprehension of the target feature as a sign of acquisition. In other words, learners have not learned the targeted linguistic forms successfully, unless they produce them correctly. There are several production-based options in FFI. To use the words of Ellis and Loewen (2009), these options are "directed at enabling/inducing learners to produce utterances containing the targeted linguistic forms" (p. 237). They involve text-manipulation (e.g., fill in the blank exercises) or text-creation. The former is more of an explicit instruction, and the latter is more implicit (cf. Ellis & Loewen, 2009).

Now in this part, the four above-mentioned FFI options are explained in a somehow operational way. The first one is CRFonF. This option consists of two aspects, namely, comprehension-based and reactive. To put it in simple words, this option is operationalized reactively i.e. in response to learners' problems with targeted linguistic forms during and after conducting the main activity; all the time what matters is comprehending and successful processing of the targeted linguistic forms. In other words, students just need to show that they have successfully comprehended the forms. PRFonF is the next one which is

almost the same as the previous one with a single difference; that is, it is production-based and seeks to examine the learners' ability to produce the targeted linguistic forms taught during the lesson reactively. CPFonF is another one. In a lesson based on CPFonF option, the teacher tries to induce learners' attention to the targeted linguistic forms before conducting the main activity with the premise that the focus is on comprehension of the targeted linguistic forms. In simple words, it is directed at drawing students' attention to the linguistic forms and checking on students' comprehension of the forms. Finally, PPFonF as the last option used for this study is operationalized almost the same way as the previous one with the difference that it aims at checking on students' ability to produce the linguistic forms correctly.

2.2. FFI Research in Second Language Vocabulary Teaching

Vocabulary learning can occur incidentally; that is, when learners' main focus is on doing something else like reading for comprehension. However, the vocabulary learning process can be enhanced through providing deliberate attention to vocabulary. This is possible by designing activities that draw learners' attention to vocabularies. Not to deny the value of incidental learning, but the main reason for a deliberate attention to vocabularies is that it is effective and can lead to greater and faster gains (e.g., Lehmann, 2007; Peters, Hulstijn, Sercu, & Lutjeharms, 2009), with a better chance of retention and of reaching productive levels of mastery (cf. Schmidt, 2008). In a similar vein, Schmidt (2008) argues that although research has shown learning can occur through incidental exposure; intentional vocabulary learning can always be fruitful. Along the same lines, Schmidt (1990) by introducing the term 'noticing' (i.e., awareness) claimed that it was the necessary and sufficient prerequisite for acquisition to take place.

Now, FFI as a type of instruction can be a way to increase noticing on the side of learners by providing deliberate attention to vocabularies. To shed more light on the current issue, this part is concerned with FFI research in second language vocabulary teaching. FFI in second language vocabulary teaching can be whatever teachers do before, during, and after performing the main activity to draw learners' attention to linguistic items (vocabulary, in this case) which are made salient either by the teacher or by the teaching resources in a predetermined (proactive) or spontaneous (reactive) way. It can be said that "FFI helps learners make more efficient use of their limited exposure to the sounds, words, and sentences of the language they are learning" (Spada & Lightbown, 2008, p. 182). In other words, drawing learners' attention to linguistic forms, because of time limitation, can be more fruitful than letting learners attend to the linguistic forms on their own.

However, vocabulary learning has been neglected by FFI researchers due to the fact that they mainly have been focusing on the role of FFI in grammar learning or on the effect of corrective feedback during thirty years of FFI research history. To use the Pawlak's (2006) words, the reason for such neglect of vocabulary and other language subsystems in FFI research,

> Can be explained in terms of the fact that while focus on form may be unnecessary for lexis and insufficient for pronunciation, the effectiveness of form-focused instruction in the area of morphosyntax is much more complex and variable, which justifies undertaking so many research endeavors (p. 27).

In spite of this fact, with vocabulary making up a large proportion of unplanned FonF, the importance of investigating the ways that different types of FFI may enhance vocabulary is crystal-clear. In a similar vein, Farrokhi, Ansarin, and Mohammadnia (2008) found that students tend to focus more on

vocabulary than on other forms. Based on two studies done by Williams (1999) and Poole (2003), students infrequently attend to grammar (20%) in favor of vocabulary (80%). All these findings are in line with such claims that even though the original idea of FFI was developed with reference to grammar acquisition, it can be well applied to vocabulary learning. Along the same lines, Doughty and Williams (1998b) cautioned that the term 'form' should not be limited to grammatical points. Moreover, Ellis, Basturkmen, and Loewen (2002) asserted, "the term 'form' is often used to refer exclusively to grammar, however, … it is used more generally to refer to any aspect of linguistic form-phonological, graphological, lexical or grammatical" (p. 419). In the next and last part, some particular FFI studies conducted within the area of vocabulary will be discussed.

3. Methodology

3.1. Participants and Context

One hundred and six Iranian fourth-grade male students of five intact classes in Sadra, Shariati, and Emam Hosein high schools in the city of Ashkhaneh participated in the study. Their age ranged from 17 to 19. In order to homogenize the participants in terms of their general language proficiency, a language proficiency test was administered to 106 students and those participants whose scores were one SD above or one SD below the mean (M=15.83) were considered as outliers and therefore, eliminated from further analyses in the first place. Consequently, the results of the present study are based on the performance of 80 participants. Table 1 presents descriptive statistics of the 80 participants.

Table 1. *Descriptive Statistics of 80 Participants*

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Proficiency Test	80	11.00	10.00	21.00	15.12	3.08	9.503

After making sure of the homogeneity of the final sample from the study, these five intact classes were assigned to five groups: one control group consisted of 15 students; CPFonF group with 15 students; CRFonF group included 17 students; PPFonF group consisted of 15 students; and PRFonF group comprised of 18 students. All groups were taught by their regular teacher except one experimental group who was taught by the researcher. The control group was taught traditionally, and the four experimental groups were taught through the four methods investigated in the present study.

3.2. Materials and Instruments

The following instructional materials and assessment instruments were used in the current study:

3.2.1. The Third Lesson's Text from Pre-university English Book

This is the text from which all the 10 words were taken. The reason behind using this text was its suitability in terms of difficulty level and feasibility.

3.2.2. Comprehension-based Activities

These activities tried to check whether students comprehended the target words' meaning. They, mostly, included fill-in-the-blanks and matching exercises. The students were not required to produce any of the target words; they were just required to choose the right answer.

3.2.3. Production-based Activities

Unlike the comprehension-based activities, these activities tried to examine students' ability to produce the target words. To do so, the students were required to write the words, complete a cloze text, and make a piece of writing by the target words.

3.2.4. Comprehension Check Questions

These questions were presented and worked on after the text was finished in each group to help students comprehend the text and the meaning target words' meaning.

3.2.5. The Language Proficiency Test (LPT)

This test was administered to achieve homogeneity among the participants regarding their general language proficiency. The LPT was a short form of an online language proficiency test devised and used by Transparent Language organization to measure their customers' English proficiency to assign them in the right class. The original form of the test can be retrieved from the following link (http://www.transparent.com/learn-english/proficiency-test.html). The LPT included three parts with a total number of 35 multiple-choice items. Part one consisting of 15 questions was devoted to Grammar. Part two and three, each of them with 10 questions, were directed at Vocabulary and Reading respectively. The grades were calculated out of 35. To ensure the test' validity, two of the teachers involved in the study were asked to express their opinions about its validity. The reliability of this test was also calculated by KR-20 formula, which was 0.85.

3.2.6. The Researcher-made Test of Vocabulary (Pretest)

A vocabulary pretest, consisting of 20 multiple-choice items devised by the researcher, was employed to ensure that the participants do not know the target words before the study. After running a one-way ANOVA test, it was justified that most of the target words are unknown to the participants in all groups (it verified their homogeneity too). All the questions were devised based on the content of the first three lessons from the pre-university English book, and the 10 target vocabulary items were spread out throughout the test randomly. The validity of the pretest was checked by asking two teachers' opinion about the test. Their comments were taken into account in revising the test. The reliability of the pretest was 0.70, which was calculated using the KR-20 formula.

3.2.7. The Researcher-made Test of Vocabulary (Posttest)

A vocabulary posttest with 25 multiple-choice items was employed to determine any possible effect of the treatments and to measure the participants' lexical gain at the end of the treatment phase. The grades for this test were calculated out of 25. Regarding the validity of the posttest, it was checked by the same process which checked the validity of the pretest. Like the pretest, the 10 target words were spread out through the test randomly, and all the questions were developed based on the first three lessons from the pre-university English book. About the reliability of the test, it was calculated by KR-20 formula and was 0.87.

3.3. Pilot Study

In order to identify potential problems that may have happened because of the low reliability of the assessment instruments used for this study, a pilot study was conducted before the main study and the reliabilities of the three tests of LPT, pretest, and posttest, which were devised and/or used by the researcher in the current study were measured by KR-20 formula. To do so, each test was administered to a total number of 30 students of almost the same proficiency level. The reliability index for the three tests of LPT, pretest, and posttest was 0.76, 0.73, and 0.85 respectively.

3.4. Instructional Treatments

The purpose of this study was to compare the effects of four instructional treatments on vocabulary learning both with each other and with a control group. With the same amount of time dedicated to all groups, the treatments are as follows:

3.4.1. Comprehension-based Proactive Focus on Form Treatment

In CPFonF treatment, the 10 vocabulary items were taught at starting part of the lesson before the beginning of the second part. The target vocabularies were presented on an overhead transparency and pronounced by the teacher. The teacher then orally defined the words. After providing each word's meaning, a sample sentence was shown to the participants on an overhead transparency, and the word's meaning was explained in relation to the context of this example sentence. After the 10 target words were taught, in the second part, students worked on some comprehension-based exercises to consolidate the target words' meaning introduced in the previous part. Right after finishing the exercises, the warm-up part in which teacher and students discussed the

title of the reading started and then the teacher started reading and translating the text. The 10 target words were made bold in the text, but the teacher paid no further attention to them when they came up in the reading. After finishing reading and translating the reading, several comprehension check questions were worked on, first, to check whether students grasped the reading or not; second, to see whether students knew the target words' meaning.

3.4.2. Comprehension-based Reactive Focus on Form Treatment

In CRFonF treatment, there was no pre-teaching of target vocabularies. In other words, instead of presenting words to the students out of text and in a list, the teacher started reading and translating the text (without any bold words in it) immediately after the warm-up. During the reading and translating of the text, care was taken by the teacher not to ignore the students' questions related to the new words and especially the target words. After a question was asked by a student, the teacher made the meaning of the word at issue crystal-clear not just for the student who asked the question but also for the whole class. After finishing the text, several comprehension check questions were asked by the teacher, and the students tried to answer them. The goal here was to see whether they comprehended the reading or not. Finally, for the last part of the lesson, students worked on some comprehension-based exercises to help them consolidate the words' meaning that were presented during reading and translating the text.

3.4.3. Production-based Proactive Focus on Form Treatment

In PPFonF treatment, at the beginning of the lesson before the second part started all 10 target words were presented on an overhead transparency. Then, the teacher pronounced and defined the words. After the words' meaning was provided, an example sentence was shown for each word, and the words' meaning was explained in relation to the context of this example sentence. After the 10 target vocabulary items were taught, in the second part, the students worked on some production-based exercises to consolidate the target words' meaning introduced in the previous part. The goal of these exercises was to make students produce not to choose the correct answer. Right after finishing the exercises, the warm-up part in which the teacher and students discussed about reading's title started and then the teacher started reading and translating the text orally. The 10 target words were made bold in the text, but the teacher paid no further attention to them when they came up in the reading. After finishing the text, several comprehension check questions were worked on, first, to check whether the students comprehended the reading or not, second, to see whether students knew the target words' meaning.

3.4.4. Production-based Reactive Focus on Form Treatment

In PRFonF treatment, there was not much difference with CRFonF. In other words, the lack of pre-teaching vocabularies was still the feature of this treatment, and the teacher started reading and translating the text (without any bold words in it) immediately after the warm-up. Care was taken by the teacher not to ignore the students' questions on new words and especially the target words during reading and translating the text. All the questions asked by the students were required to be answered by the teacher on sight. The teacher did so by explaining the word's meaning for the whole class not just for the student

who asked the question. Some comprehension check questions were worked on after finishing the reading and translating the text to see whether students comprehended the reading or not. Now, the distinctive point of PRFonF in relation to CRFonF was the use of production-based exercises instead of comprehension-based ones. These exercises intended to check the ability of students in producing the target words and to help them to consolidate the words' meaning in a more challenging manner.

3.5. Design

This study followed a quasi-experimental pretest-posttest design to compare the effects of five vocabulary instruction methods for second language vocabulary learning. The effects of four treatments were compared with a typical traditional instruction in Iranian high schools on learning 10 vocabulary items taken from the third lesson from the pre-university English book. Table 2 shows the vocabulary items:

Table 2. *Target Vocabulary Items*

Cause	Climate	Concern	Environment	Extinction
Mainly	Pollution	Recycle	Region	Trap

3.6. Procedures

To achieve the purpose of the present study, the whole study was conducted in three weeks composed of five full sessions. At the initial session of the first week, the LPT was administered to select the study's participants from among 106 students of five intact classes who took part in the study. To have a homogenous sample, just those students whose scores were between one SD above the mean and one SD below the mean were selected as the participants

of the present study. The next step was to assign these five classes to five different groups. Then, in the following session of the first week, a researcher-made vocabulary test as a pretest was administered to check how many of target vocabularies were known by the students within each group. The test's time was 25 minutes for each group. After administering the LPT, care was taken not to inform the participants of taking the pretest in the next session in order to prevent students from pre-reading of the words.

Table 3. *Flow Chart of the Research Design*

Week 1	Session 1: All 106 participants took part in the LPT
	Session 2: A researcher-made vocabulary test as a pretest was administered
Week 2	Session 3: The first part of the lesson was taught in each group
	Session 4: The second part of the lesson was taught in each group
Week 3	Session 2: A researcher-made vocabulary test as a posttest was administered

The treatment phase was conducted during the study's second week. Because of the length of the lessons for each of the groups, the lessons were divided into two parts according to the pace of the teaching and teachers' ideas on how to progress. So the teacher of each group decided how much of the lesson was to be taught in the initial session of the second week and how much of it at the following session. The time of instruction for all five groups was similar. Each group was taught through the type of instruction, which was assigned for them. At the end of the last session of the second week, again, care was taken not to inform students of coming of the posttest in the next session. At last, in the third week a researcher-made vocabulary test was administered, as a posttest, to measure the students' achievement of the target words within each group.

3.7. Data Analysis

In this study, the independent variable was the instructional method which had five levels: Traditional Method, CPFonF, CRFonF, PPFonF, and PRFonF. The dependent variable was the participants' achievement of 10 target words. The design to carry out this study was quasi-experimental, with a pretest, five different treatments for experimental and control groups, as well as a post-test. To answer the research questions about the difference between the five distinctive instructions, in this study, first a one-way ANOVA was used to check the homogeneity of the 80 participants who formed the five groups of the present study based upon their scores in the LPT. Then, a one-way ANOVA was used to show whether the five groups were different in terms of their knowledge about the target words according to their scores on the pretest before the treatment phase or not. Next, a one-way ANOVA and Scheffe post hoc analysis were run on the participants' scores on the posttest to show the likely differences between the study's five groups in learning the 10 target words. Finally, with keeping proactive and reactive aspects constant, an independent t-test was used to show the difference between CbFonF group (consisted of CPFonF and CRFonF groups) and PbFonF group (consisted of PPFonF and PRFonF groups) in terms of their scores on the Posttest.

4. Results

First, the LPT was administered to 106 participants from five intact classes. The main reason behind the administration of the LPT, at the outset of the study, was to select a relatively homogenous sample from among these 106 participants. To homogenize the participants regarding their general language proficiency, the researchers decided to exclude those participants who had gained extreme scores (highest and lowest scores) on the LPT. Therefore, those students whose score was more than one SD above, and one SD below

the mean were excluded from the study. This exclusion reduced the number of participants in the study to 80. Table 4 shows the descriptive statistics of the 80 participants.

Table 4. *Descriptive Statistics of the 80 Participants*

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
LPT Scores	80	24.00	10.00	21.00	15.12	3.08	9.50

The results of a one-way ANOVA, $F(4, 75)=.626$, $p=.646$, also revealed no significant difference between the four groups in language proficiency.

Additionally, to homogenize the participants in terms of their knowledge of the target words, a pre-test was administered to them. Results of a one-way ANOVA revealed the existence of no significant differences among the groups in their knowledge of the target words, $F(4, 75)=1.442$, $p=.229$.

Once the homogeneity of the sample and the knowledge levels of the participants about the target words in five groups had been checked, it was time to proceed with finding the answers to the research questions of the study and examining the null hypotheses related to each one. Descriptive statistics of posttest scores in the five groups are presented in Table 5.

Table 5. *Descriptive Statistics of Posttest Scores in Five Groups*

Posttest	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum

Control	15	3.06	1.48	.38	1.00	6.00
CPFonF	15	5.93	1.53	.39	4.00	8.00
CRFonF	17	5.41	1.17	.28	4.00	8.00
PPFonF	15	6.40	1.72	.44	4.00	10.00
PRFonF	18	7.88	1.27	.30	6.00	10.00
Total	80	5.81	2.11	.23	1.00	10.00

Now, in order to find the answers to the first two questions of the current study and to examine their respective null hypotheses, a one-way ANOVA was conducted to compare the effect of instructional treatments on students' vocabulary gain across the five groups.

Table 6. *One-way ANOVA of Posttest Scores in the Five Groups*

Posttest	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	198.82	4	49.70	23.99	.000
Within Groups	155.36	75	2.07		

As shown in Table 6, there was a statistically significant effect of instructional treatments on students' vocabulary gain at the $p<.05$ level for the five conditions, $F(4, 75)=23.99$, $p=.000$. Now, post hoc analyses, using the Scheffé post hoc test, were performed to identify exactly where significant differences existed.

Table 7. *Scheffe Post Hoc Test Multiple Comparisons for Posttest Scores in the Five Groups*

(I) Groups	(J) Groups	Mean Difference (I-J)	Std.Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Control	CPFonF	-2.86*	.52	**.000**	-4.52	-1.20
	CRFonF	-2.34*	.50	**.001**	-3.95	-.73
	PPFonF	-3.33*	.52	**.000**	-4.99	-1.67
	PRFonF	-4.82*	.50	**.000**	-6.41	-3.23
CPFonF	Control	2.86*	.52	**.000**	1.20	4.52
	CRFonF	.52	.50	.902	-1.08	2.13
	PPFonF	-.46	.52	.939	-2.12	1.19
	PRFonF	-1.95*	.50	**.007**	-3.54	-.36
CRFonF	Control	2.34*	.50	**.001**	.73	3.95
	CPFonF	-.52	.50	.902	-2.13	1.08
	PPFonF	-.98	.50	.446	-2.59	.62
	PRFonF	-2.47*	.48	**.000**	-4.01	-.93
PPFonF	Control	3.33*	.52	**.000**	1.67	4.99
	CPFonF	.46	.52	.939	-1.19	2.12
	CRFonF	.98	.50	.446	-.62	2.59
	PRFonF	-1.48	.50	.078	-3.07	.10
PRFonF	Control	4.82*	.50	**.000**	3.23	6.41
	CPFonF	1.95*	.50	**.007**	.36	3.54
	CRFonF	2.47*	.48	**.000**	.93	4.01
	PPFonF	1.48	.50	.078	-.10	3.07

*. The mean difference is significant at the 0.05 level.

Post hoc comparisons, using the Scheffe post hoc test (see Table 7), indicated that the mean score for all the experimental groups was significantly different from the control group (M=3.06, SD=1.48). However, the CPFonF

group (M=5.93, SD=1.53) did not significantly differ from the CRFonF group (M=5.41, SD=1.17). Besides, the PPFonF group (M=6.40, SD=1.72) did not significantly differ from the PRFonF (M=7.88, SD=1.27). Taken together, these results suggest that all instructional treatments in experimental groups really do affect vocabulary learning. Specifically, the results suggest that the PRFonF group (M=7.88, SD=1.27) was the most significantly different group of this study.

To shed more light on the superiority of the PRFonF group over other groups in terms of vocabulary learning, it can be seen from table 4.10 that the mean difference of PRFonF group (MD=5.94) from pretest to posttest was higher than other groups. In addition, the mean difference for PPFonF (MD= 4.40) and CPFonF (MD=4.40) was higher than the other two groups of CRFonF (MD=3.94), and Control (MD=1.86). Figure 4.1, also, shows the same issue schematically.

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Table 8. *Mean Difference from Pretest to Posttest for Five Groups*

Paired Differences

		Mean Differ	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig.(2-tailed)
					Lower	Upper			
Control	Pretest Posttest	**1.86**	1.72	.44	.91	2.82	4.18	14	**.001**
CPFonF	Pretest Posttest	**4.40**	1.54	.40	3.54	5.25	11.00	14	**.000**
CRFonF	Pretest Posttest	**3.94**	1.47	.35	3.18	4.70	10.99	16	**.000**
PPFonF	Pretest Posttest	**4.40**	2.02	.52	3.27	5.52	8.40	14	**.000**
PRFonF	Pretest Posttest	**5.94**	1.69	.39	5.10	6.78	14.86	17	**.000**

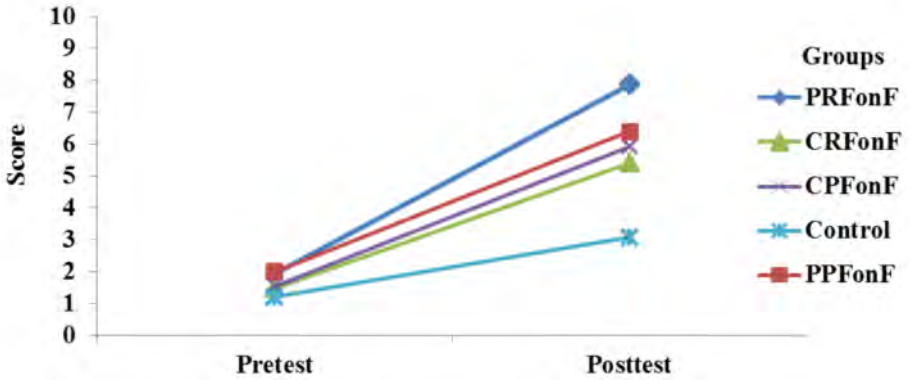
Figure 1. *Group Means for Five Groups in Pretest and Posttest*

Regarding research question 1 which was concerning the possible significant difference between CPFonF and CRFonF groups, it can be seen that there was no statistically significant difference between these groups in terms of vocabulary gain. So, the null hypothesis would not be rejected. Talking about research question 2 and its respective null hypothesis, no significant difference between PPFonF and PRFonF was reported based upon the Scheffé post hoc test. So, again, the second null hypothesis would not be rejected.

To answer the research question 3, an independent-samples t-test was conducted to compare students' vocabulary gain in CbFonF and PbFonF groups. Table 9 presents descriptive statistics for posttest scores in CbFonF and PbFonF groups.

Table 9. *Descriptive Statistics for Posttest Scores in CbFonF and PbFonF groups*

Groups	N	Mean	Std. Deviation	Std. Error Mean



Posttest	CbFonF	32	5.65	1.35	.240
	PbFonF	33	7.21	1.65	.28

Table 10. *Independent Samples t-test for CbFonF and PbFonF on Posttest*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differ	Std. Error Differ	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest	Equal variances assumed	.760	.387	-4.13	63	.000	-1.55	.37	-2.30	-.80
	Equal variances not assumed			-4.15	61.36	.000	-1.55	.37	-2.30	-.80

As shown in Table 10, there was a significant difference among the scores for CbFonF (M=5.65, SD=1.35) and PbFonF (M=7.21, SD=1.65) groups; t (63)=-4.13, p=.000. These results suggested that PbFonF was more effective than CbFonF in promoting learning.

5. Discussion

The whole idea behind this study was to investigate the effects of four different types of FFI on second language vocabulary learning. To fulfill this purpose, a quasi-experimental pretest-posttest design with four experimental groups and

one control group was used to see whether there was any significant difference between these four types of instruction in terms of students' vocabulary gain. Then, three research questions with their respective null hypotheses were raised from the outset of the study. Moreover, to seek the answers to the questions, some statistical tests were conducted on the collected data, and the following results were obtained regarding each of the three research questions.

The first question was asked to check whether there was any statistically significant difference between the two of the types of FFI, i.e., comprehension-based proactive focus on form vs. comprehension-based reactive focus on form. Based on the results of the statistical tests, no statistically significant difference between CPFonF and CRFonF was reported. Consequently, the respective null hypothesis could not be rejected. In order to be more interpretive, we can conclude that presenting vocabularies either in a proactive manner or reactive manner does not make any statistically significant difference to the number of target words acquired by the participants in these two groups.

This result was in line with the work of some other researchers who conducted investigations on comparing the effects of proactive and reactive FFI on learning different linguistic forms. Spada and Lightbown (2008) claimed that FFI can be provided either in an isolated (proactive) manner or an integrated (reactive) one. Their study concluded that both types of instruction can be effective. However, it was too soon to end the story; more studies needed to be done. So, a more recent study directed at vocabulary learning, File and Adams (2010) compared the effects of these two types of FFI on vocabulary learning. The conclusion was that although both instructions had the same effect, both were better than incidental vocabulary learning.

The second question probed in the present study sought to investigate whether proactive or reactive FFI complemented with production-based

activities could make any significant difference in terms of the instructional outcome between the two groups of PPFonF and PRFonF. Like the previous research question, the answer was no. There was not any statistically significant difference between the ultimate performances of the participants of these two groups on the posttest's scores. Therefore, again, the respective null hypothesis could not be rejected.

However, it should be noted that in each of the studies investigating the effects of PFonF or RFonF, proactiveness and reactiveness were defined and operationalized in distinctive ways. For example, in Elgün-Gündüz, Akcan, and Bayyurt's (2012) study, the proactive (isolated in their words) was operationalized through activities different from the activities used in the current study. In order to clarify the point at issue, it can be said that this discrepancy in operationalizing can have its own effects on the study's final results, and ignoring the possible effects of these different activities on the ultimate findings can be misleading. This study operationalized both the PFonF and RFonF by making students work on several comprehension and production-based activities in each of the groups.

The third research question of the current study was raised to check the effect of the above-mentioned comprehension and production-based activities regardless the proactive or reactive manner. The findings indicated a statistically significant difference between the two groups which were taught the target words through each of these activities in terms of the number of words they acquired.

This finding is in line with Vosoughi and Mehdipour (2013) who concluded that production tasks are more effective than recognition tasks for vocabulary teaching. It also falls in contrast to Hashemzadeh (2012) who claimed that recognition exercises were more effective than production exercises in EFL

vocabulary retention. However, again, it should be noted that the activity nature can have different impacts on the final outcomes for the study. However, in this study using production activity in a reactive manner yielded the best results.

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