



## Exploring Implicit and Explicit Lexical Strategies in L2 Learners' Incidental Vocabulary Learning While Reading

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**Abstract:** Vocabulary learning can occur incidentally when explicit and implicit cognitive processes are at work. The present study investigated how frequently a set of (implicit/explicit) lexical strategies was used by Iranian learners of English while reading journalistic texts for comprehension, and how effective they were regarding vocabulary retention in incidental vocabulary learning. Also, it examined the role of gender in lexical strategy use in such a context. To this end, 40 upper-intermediate learners of English, including 20 males and 20 females, were selected and asked to read journalistic texts. To collect the data, think-aloud and a retention test (Vocabulary Knowledge Scale) were used. Descriptive and chi-square data analyses revealed that the most frequent lexical strategy was consulting a dictionary (particularly a bilingual dictionary), followed by inferring (particularly contextual strategies) and ignoring strategies. The male participants were found to use inferring strategies more frequently whereas the female participants were found to use the ignoring strategy more frequently. Moreover, significant differences were observed between explicit and implicit strategy types with higher lexical use and retention effect for explicit ones. Findings provide implications for L2 vocabulary learning.

**Keywords:** Lexical Strategies, L2 Learning, Vocabulary, Gender.

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## Introduction

Vocabulary plays a pivotal role in second/foreign language (L2) learning (Tovar Viera, 2016) and reading comprehension (Hyso & Tabaku, 2011). Nonetheless, implementing effective strategies for learning vocabulary has not gained remarkable attention in many L2 contexts, including EFL (English as a foreign language) classes in contexts such as Iran. Some EFL teachers still teach L2 (English) vocabulary traditionally and have their students memorize them in isolation, rather than in context. In turn, many Iranian EFL students are not well aware of their best choice of different vocabulary learning strategies in reading comprehension based on their learning preferences. Thus, research in the realm of L2 lexical learning strategies in reading comprehension looks promising.

Gender may also play a role in strategy use by L2 learners while encountering unknown lexical items when reading for comprehension. Gender differences in cognitive abilities have been highlighted by some researchers (e.g., Catalán, 2003; Wehrwein, Lujan, & DiCarlo, 2007; Wei, 2014) and have been the subject of research with regard to L2 vocabulary learning (e.g., Lin, 2011) and vocabulary learning strategies (e.g., Catalán, 2003; Gu, 2002; Soureshjani, 2011; Yilmaz, 2017). However, little research has been done on its role in lexical cognitive processing strategy use in EFL contexts such as Iran. Presumably, many EFL teachers and learners are not well conscious of gender differences in cognition and learning preferences, in general, and reading comprehension, in particular. Thus, any research about gender differences in the domain of L2 lexical strategy use while reading for comprehension can contribute to better awareness and give some insights regarding learners' learning preferences.

It is equally important to know that learning does not all occur the same way. There exists incidental learning in contrast to intentional learning. Similarly, Dörnyei (2009) makes a distinction between implicit vs. explicit learning. Whereas implicit learning happens without consciousness, explicit learning happens with awareness. In the area of vocabulary learning, explicit learning takes place while the learner utilizes strategies to work out the meaning of a lexical item while his or her attention is focused on words selectively (Ellis, 1994a), whereas implicit learning is brought about unconsciously and incidentally (Ender, 2016). Given the distinction in mind, as Fraser (1999) has emphasized, it is worth examining the type of "lexical processing strategy", namely, the type of "the recognized strategic options" (p. 539) in L2

vocabulary learning, which can be either implicit or explicit, when students read a text for comprehension.

In light of the above issues, the present study sought to examine what lexical cognitive processing strategy was frequently used by Iranian EFL learners coming across unfamiliar words when reading a text (a journalistic text) for comprehension. Moreover, it investigated the role of gender in the frequency of lexical strategy use by EFL learners. Lastly, it probed the type of lexical cognitive processes, that is, implicit vs. explicit lexical strategies, together with the vocabulary retention effect regarding these strategies in dealing with unfamiliar words in the text. The findings are expected to inform L2 teachers about students' lexical strategies and help them make better decisions when teaching instructional materials.

## Literature Review

### *Incidental Vocabulary Learning*

Incidental learning in the realm of L2 vocabulary learning takes place when L2 learners do not have the intention to acquire new words (Ellis, 1994b). As Ender (2016) explains, incidental learning can consist of both implicit and explicit learning. Ender considers explicit learning as a process at work when attention is focused on the vocabulary and its meaning, like when a learner tries to look a word up in a dictionary. Implicit learning is learning vocabulary without attention, such as ignoring the word in favor of grasping a global understanding of the text.

There are a number of studies (e.g., Brown, Waring, & Donkaewbua, 2008; Hulme, Barsky, & Rodd, 2018) on incidental vocabulary learning in L1 and L2 contexts. For instance, in the context of Japan, Brown et al. (2008) compared the effects of input modes on incidental EFL vocabulary learning in stories with 35 Japanese students of English literature. The input modes were (a) reading, (b) reading-while-listening, and (c) listening. The results demonstrated that incidental learning could happen in the three mentioned modes. Also, investigating the effect of exposure frequencies on incidental learning and long-term retention, Hulme et al. (2018) conducted a study on 64 adult monolingual native English speakers who encountered familiar L1 words with new meanings. The results indicated that only after two encounters, the participants manifested a good recall of the meaning. The results also showed an incremental increase in recall with more exposures. Based on the review of the related literature, incidental vocabulary learning could happen for L1 readers successfully. However, more research should be done in the realm of incidental vocabulary

learning in EFL contexts, particularly in the EFL context of Iran where research on this topic is scant, to see whether explicit or implicit lexical strategies are used frequently and effectively by EFL learners.

### *Vocabulary Learning Strategies*

Vocabulary learning strategies are considered the actions learners take to learn new lexis (Asgari & Mustapha, 2011). This definition is similar to the definition of the term *lexical processing strategies* proposed by Fraser (1999). Fraser defines them as “any of the recognized strategic options a learner has when dealing with an unfamiliar word” (p. 539). Both explicit and implicit lexical processing strategies aim at learning novel words and increasing the number of newly acquired words through explicit and implicit processing. Whereas explicit lexical processing/explicit learning strategies involve selective attention, implicit lexical processing/implicit learning strategies involve a lack of conscious awareness (Ellis, 1994a).

Several researchers (e.g., Bruen, 2017; Ender, 2016; Gu & Johnson, 1996; Örsdemir, 2017) have investigated the role of different implicit and explicit strategies in L2. Most of them assert that explicit involvement correlates positively with learning vocabulary. Gu and Johnson (1996), for instance, explored vocabulary learning strategies utilized by 850 Chinese learners of English. They also investigated the correlation between the strategies with vocabulary size and general English proficiency. They reported that the Chinese participants used guessing strategies and consulting dictionaries extensively.

Ender (2016) undertook a study on 24 German learners of French. She investigated the behavior of the learners encountering unknown vocabulary while reading for comprehension. Their behavior was classified as implicit or explicit strategies. The results indicated that in the German context, the explicit strategy of consulting a dictionary and the implicit strategy of ignoring, respectively, were utilized most frequently.

Similarly, Örsdemir (2017) investigated the frequency and retention effects of implicit and explicit vocabulary learning strategies by L2 elementary-level Turkish participants while reading for comprehension at an English preparatory school in Turkey. It was found that the most frequent lexical strategy was consulting a dictionary and inferring. Örsdemir also reported that implicit strategies could lead to incidental vocabulary learning.

In another research, Alahmadi and Foltz (2020) made a comparison between two explicit strategies of dictionary consultation and guessing unknown English words by 61

Arab students of English using semi-authentic English reading materials. They administered a pre- and delayed post-test to measure the learners' target vocabulary knowledge. They came to the conclusion that both strategies were equally effective for Arab students.

Dictionaries are often viewed as means designed to aid users in L2-related tasks (Lew, 2015). Taking into account that dictionary use as a kind of explicit strategy, Knežević, Halupka-Rešetar, Miškeljin, and Milić (2021) investigated the dictionary use habits of 705 Serbian EFL undergraduate students. The data from a questionnaire and interview showed that making use of bilingual dictionaries was more popular than monolingual ones. They also found that the Serbian students did not make use of online dictionaries.

### ***Gender and Vocabulary Strategy***

A body of research has been conducted on the role of gender in determining the kind of strategy use. For instance, Catalán (2003) undertook a study on 581 female and male Spanish-speaking students learning Basque and English as their L2. She found that the males and females differed significantly both in the number and types of vocabulary learning strategies.

Additionally, Gu (2002) undertook a study on a large number of adult Chinese EFL learners, including 337 males and 308 females, about the effect of academic major and gender on learning strategies. The findings showed that the female Chinese students were significantly different from the male learners in the application of some strategies meant for vocabulary learning, such as guessing, using a dictionary, and oral repetition. Also, the females were found to use more vocabulary learning strategies.

On the contrary, Wei (2014), in a study on 630 Chinese EFL university students, including 285 males and 345 females, found no considerable difference between the two genders in the number of vocabulary learning strategies, in general, though she reported some differences regarding vocabulary strategies of discovery and consolidating. Likewise, Yilmaz (2017), who carried out another research on 79 Turkish graduate students, reported a considerable difference between the two genders with the Turkish females' higher frequency use in vocabulary learning strategies.

Also, in the context of Iran, Soureshjani (2011), for example, did a study on 50 male and 60 L2 female learners at two language institutes. He reported a significant difference in the application of some strategies, such as connecting a word to its synonyms and antonyms,

on the part of male and female participants. In a study on 80 intermediate EFL learners by Ansari, Vahdany, and Sabouri (2016), the results revealed no noticeable differences between the genders in the use of vocabulary learning strategies.

To sum up, even though the findings of prior research on gender differences are not quite consistent, much of prior research in the realm of vocabulary learning strategies and gender indicated some potential differences between male and female L2 learners. To enrich the related literature and consolidate our understanding of the role of gender in lexical cognitive processing strategy use in reading, more research is indeed required in different contexts.

The results of prior studies on the vocabulary learning strategies utilized by EFL learners along with the retention effects these strategies bring about need more fact-checking and further research in various contexts. The current study aimed to examine the frequency of lexical cognitive processing strategies used by Iranian upper-intermediate EFL learners encountering unknown lexical items in reading journalistic texts, which are valuable English inputs and authentic sources for many L2 students (Wijayanti, 2020). Additionally, to contribute to the related literature in the realm of gender differences in vocabulary learning strategies, the current study examined the role of gender in lexical cognitive processing strategy use. This issue is especially important in the context of Iran where research on this topic is scant, and many EFL learners suffer from a lack of knowledge in the use of these strategies in incidental vocabulary learning while reading for comprehension. Moreover, the current study sought to give some insights into implicit and explicit cognitive processes, namely, implicit vs. explicit strategies because the results could provide evidence for the (in)effectiveness of several vocabulary learning strategies with regard to retention of incidentally learned lexical items. To this end, the following three research questions were developed:

1. What lexical cognitive processing strategy is frequently used by Iranian upper-intermediate EFL learners encountering unfamiliar vocabulary items when reading (journalistic) texts for comprehension?
2. Does gender make a significant difference in the frequency of lexical cognitive processing strategy use by Iranian upper-intermediate EFL learners while coming across unfamiliar lexical items in reading for comprehension?
3. Does explicit and implicit processing of novel vocabulary significantly differ regarding the retention/recall of new lexical items by Iranian upper-intermediate learners of English?

## Method

### *Participants*

Forty upper-intermediate EFL students, aged 18 to 22, including 20 male and 20 female students, constituted the participants. They were selected using the accessibility sampling method. Because of the COVID-19 outbreak, a larger sample was not available. Moreover, using think-aloud protocols along with the transcription and recording for each participant could make data analysis with a larger sample so difficult and practically impossible. All the learners taking part in the study were Persian native speakers, who were learning English in a language institute in Isfahan, Iran. They had registered for an English course at the upper-intermediate level. They had acceptable English learning experience because they had been learning English for 4-6 years. Only one of them was learning another language (French) simultaneously. Presumably, although they were approximately at the same level of proficiency, there could be individual variations regarding the size of their English vocabulary.

### *Instruments and Materials*

***Oxford Quick Placement Test.*** To ensure the homogeneous entry of the participants, Oxford Quick Placement Test (OQPT, 2001) was administered. The test used in the study consisted of 60 multiple-choice items measuring reading skill and vocabulary and grammar knowledge in two parts: The first part had 40 items for learners at or below the upper-intermediate level; the remaining 20 items in the second part were meant for L2 learners at the upper-intermediate or higher levels. The test is a standard one and its high-reliability index has been reported by some studies (e.g., Geranpayeh, 2003). The reliability index of this test measured through the Kuder-Richardson 21 formula in the current study was also high (0.85).

***Journalistic Texts.*** To investigate the strategies applied by the participants, three journalistic texts were selected, and the participants were asked to read through the texts. Special care was taken to ensure that they were appropriate for the participants in terms of difficulty (see Table 1). They were serious news reports without slang and word puns. The text difficulty level was calculated by the Flesch Reading Ease Test. The difficulty level and other features of the text were obtained by using the websites (see <https://www.webfx.com/tools/readable/flesch-kincaid.html> and <https://goodcalculators.com/flesch-kincaid-calculator/>).

Table 1. Features of the Texts

	Text 1	Text 2	Text 3
Topic	Coronavirus Wave	Football	Car Industry
Reading Ease	53.3	59.7	57.3
Reading Level	10.7	9.4	10.5
Number of Words	415	415	403
Average Words per Sentence	19.76	18.04	21.21
Number of Sentences	21	23	19
Number of Complex Words	60	51	60
Percent of Complex Words	14.46	12.29	14.89

**Vocabulary Retention Test.** Vocabulary Knowledge Scale (VKS) designed by Wesche and Paribakht (1996) was utilized to assess how each lexical cognitive processing strategy had influenced the retention of each word. For each lexical item, the participants had to reflect on a series of statements so that the researchers could assess vocabulary retention and evaluate their certainty levels. More precisely, this scale measures the certainty level for each separate target word by presenting 5 statements, only one of which should be selected by the learner. Level 1 is for those learners who do not remember having seen the target word at all. Level 2 represents ‘no recall’, even though the learner can remember having seen in the text before (“I have seen this word before, but I don’t know what it means.”) Level 3 is for those who can remember the target word and its meaning with doubt, in L1 or L2. Level 4 is for those who remember the word and its meaning, in L1 or L2 (“I know this word. It means ...”). Level 5 is for those who can remember the word’s meaning with no doubt and know how to use it in a sentence.

#### **Data Collection and Analysis Procedure**

First, 60 EFL learners, from a language institute were chosen to take the OQPT in person at the institute. Consent was obtained to ensure the acceptance of their participation. Just 40 EFL learners, including 20 males and 20 females, who scored between 40 and 47, were qualified as upper-intermediate participants. Then, in a separate session, these participants were asked to scan the three journalistic texts to highlight any unknown words they would come across. This phase of the study took each participant around 10-15 minutes to scan and highlight the words.

Then, each male and female participant was contacted and asked to read the texts. This was done in the language institute. The participants were asked to read the texts paragraph by paragraph, summarize it, explain what they had understood, and then, answer the comprehension questions. At the beginning of each session, they were told to feel free to take



any strategy/action concerning the new words for comprehending the passages. To identify what vocabulary learning strategies the participants used during reading the texts, think-aloud protocols were utilized; that is to say, they were given permission to speak their thoughts during summarizing the texts. This was done on an individual basis in a week and took 40 sessions, each lasting about 60 minutes for each participant. During the session, all the strategies adopted for every single unknown word were documented to be enlisted in the four lexical strategies (see below for more information) as suggested by Fraser (1999). Also, the sessions were video-recorded to monitor and observe how they dealt with the unknown words in case the researchers missed any important data when taking notes during the session.

After one week, they were contacted again and asked to take a retention test on an individual basis on the words they had not known before in the first phase. The test used in this phase was VKS by Wesche and Paribakht (1996). As mentioned above (see Instruments and Materials), for each lexical item, the participants needed to reflect on a series of statements for the purpose of assessing their retention. Finally, all the think-aloud of reading-for-comprehension sessions for all participants were transcribed. According to the transcripts and notes made by the present researchers during the sessions, all the strategies adopted by the participants were classified. Fraser's (1999) categories were used to classify the strategies utilized by the participants because Fraser's strategy types are commonly used in the literature while L2 learners are engaged in reading for comprehension. The classifications included ignoring the novel word, using a (bilingual or monolingual) dictionary, inferring the word's meaning by the use of various cues (intralingual, interlingual, and nonlinguistic or contextual), and trying to infer the word's meaning followed by using a dictionary to check it.

The VKS scoring categories proposed by Wesche and Paribakht (1996) were used to score the participants' responses (see Appendix). For each item, when there was no familiarity, a score of 1 was assigned. A score of 2 was given when the target item was familiar, but the meaning was not remembered. A score of 3 was given when the word was remembered, but the given synonym or translation was incorrect. A score of 4 was given when the word was remembered and the synonym or translation was correct. A score of 5 was given when the target word was remembered and used with both semantic and grammatical accuracy. The scores of 1 and 2 were considered to be signs of no clear vocabulary retention and were assigned to one group (Not Recalled). On the other hand, the scores of 3, 4, and 5 were assigned to another group (Recalled) indicating some kind of vocabulary acquisition or retention. Then, the (Recalled/Not Recalled) data were tabulated.

The think-aloud data were transcribed by the present researchers. Content analysis of the students' strategic behavior, based on the transcripts as well as the notes made by the researchers during the reading session, was then done to see which of the strategies the participants utilized in the think-aloud sessions to deal with unknown vocabulary (target words) in the texts. The corresponding actions were assigned to one of the four lexical strategies using Fraser's (1999) classification, and, then, the frequencies of lexical strategies were tabulated. Regarding the retention test, following the VKS scoring procedure, the frequency values of recalled/not recalled, that is, quantitative data for the retention were obtained for each participant. Finally, descriptive statistics and bar graphs were used regarding the frequency of the strategies employed by the participants. Also, the chi-square for goodness-of-fit, as well as the chi-square for independence, were run through SPSS (version 22) to compare the frequency of the various strategies.

## Results

### *Addressing the First Research Question: Frequent Lexical Strategies*

To answer the first question, the frequencies and percentages of use of the four lexical strategies were obtained (see Table 2):

**Table 2.** *Frequencies of Lexical Strategies*

	Ignoring	Consulting a Dictionary	Inferring	Inferring and Consulting a Dictionary	Total
<b>Frequencies</b>	201	618	220	82	1121
<b>Percentages</b>	17.93%	55.12%	19.62%	7.31	100%

According to Table 2, the participants used the strategy of consulting a dictionary the most ( $f = 618$ ); the least frequently used strategy was inferring and consulting a dictionary, in combination ( $f = 82$ ).

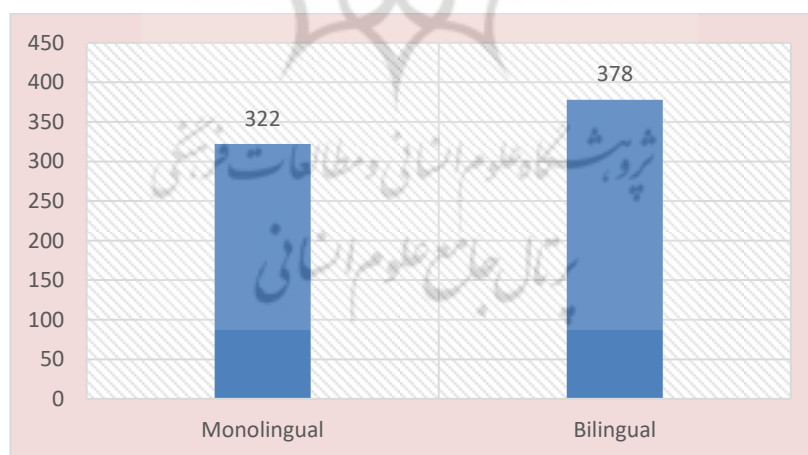
To compare the frequency use of these strategies, the chi-square tests were conducted in a pair-wise manner using chi-square for goodness-of-fit (see Table 3). Based on the analysis, all the pair-wise differences between the different types of lexical strategies, except the strategies of ignoring and inferring ( $p = .345$ ), were of statistical significance ( $p \leq .05$ ).

These analytical results confirm that *consulting a dictionary* was frequently and significantly used:

**Table 3.** Chi-Square Results Comparing Pairs Regarding Frequencies for Lexical Strategies

Pairs	N	Expected N	Chi-Square	df	Sig.
<b>Ignoring-Consulting a Dictionary</b>	819	409.5	212.319	1	.000
<b>Ignoring-Inferring</b>	421	210.5	.857	1	.354
<b>Ignoring-Consulting and Inferring</b>	283	141.5	50.039	1	.000
<b>Consulting a Dictionary-Inferring</b>	838	419.0	189.026	1	.000
<b>Consulting a Dictionary-Consulting and Inferring</b>	700	350.0	410.423	1	.000
<b>Inferring-Consulting and Inferring</b>	302	151.0	63.060	1	.000
<b>Total/Overall</b>	1121	280.3	582.654	3	.000

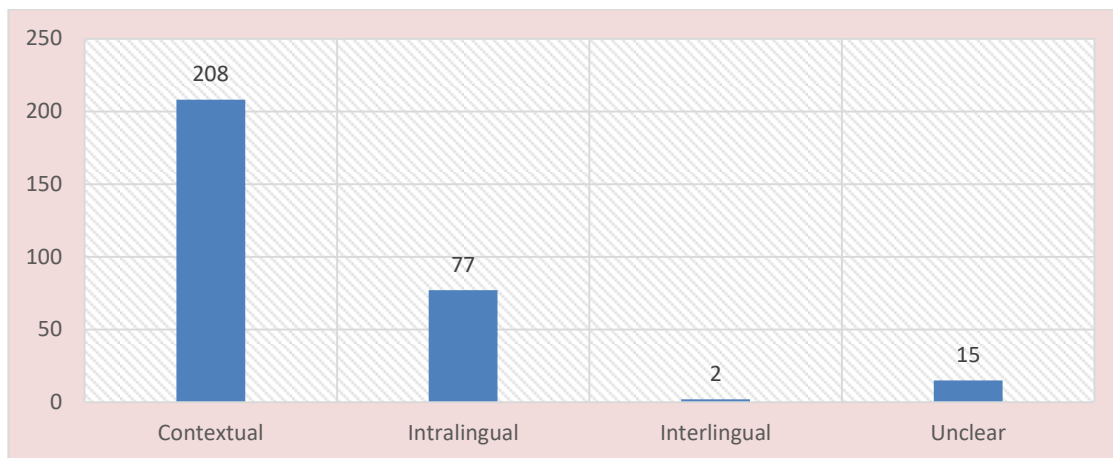
Further analysis of the data indicated that the participants used more bilingual than monolingual dictionaries when they consulted a dictionary. As Figure 1 displays, the frequency of use of a bilingual dictionary ( $f = 378$ ,  $p = 54\%$ ) was greater than that of a monolingual dictionary ( $f = 322$ ,  $p = 46\%$ ), and this difference between the frequencies was found statistically significant at .05 by chi-square ( $\chi^2 = 4.48$ ,  $p = .034$ ):



**Figure 1.** Frequencies of Use of Monolingual and Bilingual Dictionaries

Moreover, further detailed analysis demonstrated that among the four subcategories of inferring strategy, contextual strategies ( $f = 208$ ) were by far the most frequently used inferring strategy (see Figure 2). The chi-square tests in a pair-wise manner depicted that the frequency use of contextual strategies was significantly higher than other inferring strategy

subcategories (see Table 4), indicating their frequent use among the four subcategories of inferring strategy.



**Figure 2.** *Frequencies of Different Types of Inferring Strategies*

**Table 4.** *Chi-Square Results Comparing Pairs Regarding Frequencies for Inferring Strategies*

Pairs	N	Expected N	Chi-Square	df	Sig.
Contextual – Intralingual	285	142.5	60.214	1	.000
Contextual – Interlingual	210	105.5	202.076	1	.000
Contextual – Unclear	223	111.5	167.036	1	.000
Intralingual – Interlingual	79	39.5	71.203	1	.000
Intralingual – Unclear	92	46.0	41.783	1	.000
Interlingual – Unclear	17	8.5	9.94	1	.000
Total/Overall	302	75.5	352.596	3	.000

### *Addressing the Second Research Question: Role of Gender*

To answer the second research question, the frequencies and percentages of the different strategies used by each gender were tabulated (see Table 5):

**Table 5.** *Frequencies of Lexical Strategies Used by Males and Females*

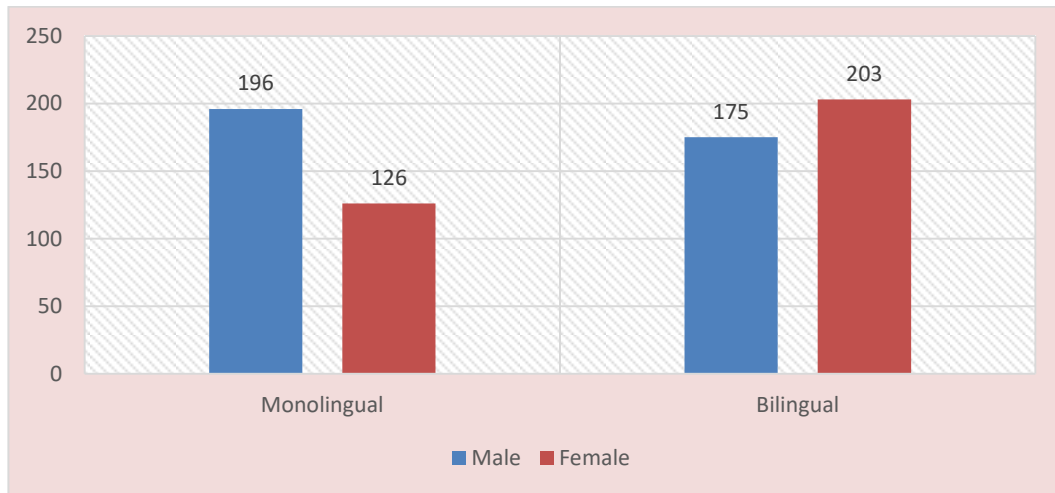
Gender	Frequencies/ Percentages	Ignoring	Consulting a Dictionary	Inferring	Inferring and	Total
					Consulting a Dictionary	
Male	Frequencies	59	309	138	62	568
	Percentages	10.38%	54.40%	24.29%	10.91%	100%
Female	Frequencies	142	309	82	20	553
	Percentages	25.67%	55.87%	14.82%	3.61%	100%

For the male participants, the highest frequency of use belonged to consulting a dictionary ( $f = 309$ ,  $p = 54.40\%$ ) and the lowest frequency of use went to the ignoring strategy ( $f = 59$ ,  $p = 10.38\%$ ). Regarding the female participants, consulting a dictionary was by far the most frequently used lexical strategy ( $f = 309$ ,  $p = 55.87\%$ ). However, the least frequent one was the strategy of inferring and consulting a dictionary ( $f = 20$ ,  $p = 3.61\%$ ). To see if the differences between both genders were statistically significant, the chi-square tests were conducted (see Table 6):

**Table 6.** *Chi-Square Results Comparing the Pairs Regarding Frequencies for Inferring Strategies*

Pairs	<i>N</i>	Expected <i>N</i>	Chi-Square	<i>df</i>	<i>Sig.</i>
<b>Males &amp; Females: Ignoring</b>	201	100.5	34.274	1	.000
<b>Males &amp; Females: Consulting a Dictionary</b>	618	309.0	.000	1	1.000
<b>Males &amp; Females: Inferring</b>	220	110.0	14.255	1	.000
<b>Males &amp; Females: Consulting and Inferring</b>	82	41.0	21.512	1	.000
<b>Total/Overall</b>	1121	-	69.852	3	.000

According to Table 6, the overall difference between the male and female learners reached statistical significance ( $\chi^2 = 69.85$ ,  $p = .000$ ). Also, the differences between the male and female learners with respect to the strategies of ignoring, inferring, and inferring and consulting a dictionary were statistically significant ( $p < .05$ ). Only for the strategy of consulting a dictionary, the significant difference was out of the question. Further analysis on the type of dictionary use indicated that the two gender groups used monolingual and bilingual dictionaries to a different degree and the difference regarding the dictionary type use was statistically significant, too ( $\chi^2 = 14.82$ ,  $p = .000$ ). As Figure 3 displays, the males used more monolingual dictionaries and the females used more bilingual dictionaries.



**Figure 3.** *Frequencies of use of monolingual and bilingual dictionaries by the males and females.*

### Addressing the Third Research Question: Difference between Implicit and Explicit Strategies Regarding New Vocabulary Retention

To address the third research question, the frequencies of the cognitive strategies (with the two values of implicit vs. explicit) and retention (with the two values of recalled vs. not recalled) were tabulated (see Table 7) and, then, the chi-square for independence test was used to compare the total frequencies.

**Table 7.** *Frequencies of Vocabulary Retention by Implicit and Explicit Strategies*

	Strategy		Total	
	Implicit	Explicit		
Words	Not Recalled	155 (77.12%)	470 (51.65%)	625
	Recalled	46 (22.88%)	440 (48.35%)	486
<b>Total</b>		201	910	1111

Regarding the implicit strategies, about one-third (22.88%) were recalled. For words for which explicit strategies were used, the findings were different; just about half of the words (48.35%) were recalled. Whereas the words retained through the implicit strategy of ignoring (22.88%) were substantially less than the words not recalled (77.12%), the words retained through the explicit strategy of inferring and consulting a dictionary were noticeable (53.66%). Almost half of the words using the explicit strategies of consulting a dictionary (47.03%) and inferring and consulting a dictionary, in combination (53.66%) were retained, and the percentage of the recalled words for inferring was also equal (50%). By way of conclusion, explicit strategies had more retention effects.

**Table 8.** *Frequencies of Vocabulary Retention by Different Strategies*

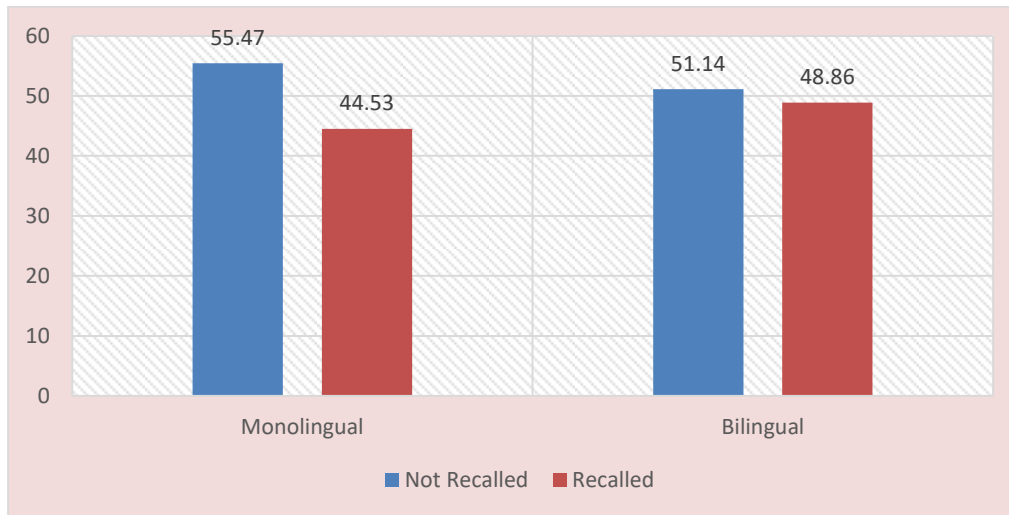
		Implicit		Explicit		Total
		Ignoring	Consulting a Dictionary	Inferring	Inferring and Consulting a Dictionary	
Words	Not Recalled	155 (77.12%)	321 (52.97%)	111 (50%)	38 (46.34%)	625
	Recalled	46 (22.88%)	285 (47.03%)	111 (50%)	44 (53.66%)	486
Total		201	606	222	82	1111

To find out whether the difference between the retention of words through the implicit and explicit strategies was of statistical significance, the chi-square for independence test was run (see Table 9). The retention outcome for the implicit strategy of ignoring was significantly different from the outcomes for the explicit strategies.

**Table 9.** *Chi-Square Results Comparing Pairs Regarding Frequencies for the Strategies*

Pairs	N	Value	Exact Sig. (2-sided)
Ignoring – Consulting a Dictionary	807	36.37	.000
Ignoring – Inferring	423	33.23	.000
Ignoring – Inferring and Consulting	283	24.43	.000
Consulting a Dictionary – Inferring	828	.57	.448
Consulting a Dictionary – Inferring and Consulting	668	1.27	.259
Inferring – Inferring and Consulting	304	0.32	.571
Total/Overall	1111	43.39	.000

As for the explicit strategy of consulting the dictionary, further data analysis (see Figure 4) showed that more words were recalled when the participants used bilingual dictionaries (48.86%) than when they used monolingual dictionaries (44.53%), but this difference did not reach statistical significance ( $\chi^2 = 1.11, p = .292$ ).



**Figure 4.** *Percentages of Vocabulary Retention using Monolingual and Bilingual Dictionaries*

## Discussion

As to the first research question, it was found that consulting a dictionary was the most frequently utilized lexical strategy. Inferring strategy was the second most frequently utilized strategy, but the strategies of inferring and consulting a dictionary, in combination, were the least frequently used strategies. One possible explanation for the wide usage of dictionaries is that the use of a dictionary is an easy and safe way to figure out the meaning of new words, and the learner makes sure that the meaning is free of error (Lew, 2015; Knežević et al., 2021; Örsdemir, 2017). This issue might also be related to learner-related factors such as personality (Catalán, 2003; Wei, 2014). The participants were, perhaps, more inclined towards the less risk-taking strategy of using a dictionary to figure out the target words' meanings. Additionally, EFL learners at intermediate levels of proficiency might run into difficulty with unknown words when reading for comprehension (Ender, 2016). The participants might have felt the urgency to attend to the target words and assign meanings to them by using a dictionary or making inferences, rather than ignoring the word and attending to the global message.

Inferring was the second most frequently used lexical processing strategy and was employed more than the ignoring strategy. This issue can be viewed as a positive outcome because the implicit strategy of ignoring is not as effective as consulting a dictionary and inferring strategies in helping EFL readers for comprehending the text (Gu & Johnson, 1996; Örsdemir, 2017). That is, the strategy of ignoring might not have been helpful enough for the participants in understanding the global message of the whole text without conscious attention to most words. Based on the think-aloud data, ignoring was used when part of the



text was more or less understandable without much explicit attention. That is why implicit ignoring was used much less than the explicit strategies of consulting a dictionary and inferring but stood before the explicit strategies of consulting and inferring, in combination.

Inferring is effective only if readers find the surrounding words easy to understand. This, in turn, needs good cues and good background knowledge (Alahmadi & Foltz, 2020). The lower percentage of this top-down strategy type might be due to the insufficient number of good clues in the text, making the meanings of the unknown words so difficult to guess. Furthermore, implementing the strategies of inferring and consulting, in combination, could take so much time that the participants were less likely to use it as frequently as consulting a dictionary per se. Based on the think-aloud data, most of the within-text clues made the participants guess the meanings of the target words, but they were not motivating enough to get them to go further to both guess and check the meanings in a dictionary.

These findings are partially in line with previous studies (e.g., Bruen, 2017; Ender, 2016; Gu & Johnson, 1996; Örsdemir, 2017). For example, Bruen (2017) administered questionnaires to L2 learners of Japanese, German, Spanish, and Chinese to examine the relationship between language learning strategies and reading comprehension. She found that the strategies associated with reference materials, such as dictionaries, were frequently used strategies, followed by making inferences from context. Similarly, Ender (2016) found that consulting a dictionary and ignoring were the most frequently used lexical strategies by French learners of English when encountering unknown words in texts. In the current study, ignoring was the least used strategy type. This partial inconsistency can be justified on the basis of the differences between the two studies. The participants in Ender's (2016) study were advanced L2 learners. Also, they were multilingual, as opposed to the participants of the current study who were bilingual. Multilingualism and high proficiency of the French learners might have facilitated the comprehension of the texts in Ender's (2016) study, resulting in the frequent use of implicit lexical strategies. Another explanation for this partial inconsistency in results might be due to the topic or the text and the level of difficulty of the text.

Another finding is that the participants used bilingual dictionaries more often than monolingual ones. This can be justified in that bilingual dictionaries are more user-friendly. As Lew (2015) puts it, "a native language equivalent is normally far easier to understand and process than a definition in the foreign language, however skillfully worded" (p. 4). Also, it is possible that the participants were more familiar with bilingual than monolingual dictionary

use. This issue about dictionary-type use habits finds support from the literature. For example, Knežević et al. (2021) found that Serbian EFL learners preferred bilingual dictionaries over monolingual ones. Moreover, as Catalán (2003) points out, some students are impatient. They look for immediate ways to find the meanings of the words. Learner-related factors such as impatience can, thus, be another reason.

Concerning the subcategories of inferring strategies, the frequency of contextual strategies was found to outweigh the linguistic ones. The participants may have found the number of linguistic cues in the text insufficient to depend their inferences on. Another explanation might have to do with their approach. More likely, the majority of the participants used a top-down approach, such as using the context of the text or what they already knew about the topic of the text to derive the meaning of the words. They possibly preferred to hold the gist of the text or a part of the text in their heads as they tried to approach the details. Also, they might not have found a clear association between the unknown words in the L2 and their L1 due to a lack of cognates in the texts.

As to the second research question, it was found that the overall difference between the two genders regarding the distribution of the lexical strategies was significant. The male participants were found to be using inferring strategies more frequently. On the contrary, the frequency of ignoring for the females was much higher than that of the males. Also, concerning the type of dictionary, the males used more monolingual dictionaries. Presumably, social, affective, and biological factors may play a role in gender differences. These factors can have an impact on cognition and result in different learning preferences and vocabulary learning strategy choices (Wei, 2014).

As to the high frequency of the ignoring strategy on the part of female participants, males' and females' different learning styles might explain why the male learners could better relate to the texts, leading them not to ignore words so much. Perhaps, the males were more visual (Catalán, 2003; Wehrwein et al., 2007). The results of Wehrwein et al.'s (2007) study support this argument. They found that the female undergraduate psychology students at Michigan University were more kinesthetic and preferred unimodal learning, whereas the male students preferred multimodal learning, and they were more visual than the females. Being more visual on the part of the male participants in the current study could have made them more capable of relating to the written words. This could be a plausible reason why the male participants used monolingual dictionaries more. Monolingual dictionaries contain relatively multimodal information and richer storage of information in an entry. Moreover,

affective factors such as interest and motivation might be involved. Perhaps, the male participants were more interested in the topic of the text. They might have been keener on comprehending the texts, leading them not to ignore many new words. Catalán (2003) also reported similar results, that is, the male and female participants in her study were motivated to different degrees. Last but not least, as Wei (2014) argues, based on neurological networks and lateralization, males are more oriented toward the field-independent learning style whereas females' preference is more field-dependent. The results find support for this claim. Perhaps, because of the female learners' field-dependent learning preference, they have been more responsive to the context in which the novel words had appeared.

As to the effectiveness of explicit and implicit lexical strategies, when a retention test was administered, the recall rate was significantly higher for the words for which explicit lexical strategies were used. A significant difference in vocabulary retention for the implicit strategy of ignoring vs. the other three explicit strategies was observed. The reason might be that when L2 learners utilize explicit strategies, the form of the target word receives much attention. As Laufer (2005) argues, purely meaning-centered input cannot be as effective as a condition in which a focus on form component is incorporated. The strategy of ignoring lacks this feature. The ignoring strategy might have made the participants pay less attention to form-meaning associations which could have left better traces in the participants' minds for later recalls.

Additionally, based on the involvement load hypothesis (Laufer & Hulstijn, 2001), vocabulary recall depends on the degree of involvement that a task imposes on a learner and the three elements of need, search, and evaluation. The ignoring strategy usually has a very low involvement load because it primarily lacks the elements of need, search, and evaluation. The explicit strategy of consulting a dictionary, however, involves these three elements better. The reader, first, finds it necessary to know the meaning of a new word (need), then looks it up in a dictionary and tries to figure out its meaning (search) and, then, evaluates to see which meaning in the dictionary properly represents the meaning (evaluation). This issue can be justified in that all three elements of involvement load (need, search, and evaluation) were involved in all three explicit strategies and any difference in the degree of attention to the form between them did not make a significant change in the vocabulary retention.

## Conclusion and Implications

The findings of the study have led to several conclusions. First, consulting a dictionary was the most popular vocabulary learning strategy among the participants when being exposed incidentally to new words in reading the journalistic text. This popularity was explained by some characteristics such as dependability and ease of dictionary use. Second, the male and female learners were different as to how frequently they used lexical strategies for reading comprehension. This difference was attributed to different learning styles and cognitions. Third, explicit lexical strategies were found to be more effective than implicit lexical strategies in the retention of new words.

The findings, in general, support the importance of L2 vocabulary in L2 reading comprehension. Also, it accentuates the claim that reading comprehension is a good way for enhancing incidental L2 vocabulary learning. However, based on the findings, some EFL readers, on the whole, are not skillful users of cognitive lexical strategies in reading texts. For instance, the EFL participants utilized the strategy of consulting a dictionary more than the other types. The frequent use of such a strategy might reduce reading speed, hinder comprehension, and hamper joy. These findings suggest that Iranian EFL students need to be trained to use those lexical strategies which do not impede comprehension. The higher use of consulting a dictionary does not, however, indicate the participants' effective skill in using a dictionary because bilingual dictionaries are sometimes utilized more than monolingual ones due to convenience. L2 teachers, thus, need to teach their learners not only how to use other effective strategies, such as making inferences, but also how to use monolingual dictionaries effectively as an educational aid.

The findings theoretically support the noticing hypothesis (Schmidt, 2001) and the involvement load hypothesis (Laufer & Hulstijn, 2001) by indicating high retention rates for explicit strategies in comparison to the implicit strategy of ignoring. According to these hypotheses, the more attention is drawn to the item in question and the more L2 learners are involved with the form and the meaning, the more likely the word is to be recalled later. More likely, explicit strategies entail attention and concentration while the implicit strategy of ignoring lacks such elements. Teachers, then, should actively involve their L2 students in cognitively demanding vocabulary activities in the post-reading and engage their consciousness by using a fairly high number of challenging tasks.

The findings also suggest that male and female L2 learners could be different in terms of cognitive processing strategy use to figure out the meanings of unfamiliar L2 words. L2

teachers and materials developers should be aware of the differences between the two genders and use a variety of vocabulary reading for students of both genders.

Some limitations need to be taken into consideration. First, there was no formal estimation of the participants' vocabulary size. Vocabulary size might be an important factor in determining how well L2 learners can comprehend a text and what type of lexical strategies they employ. Second, during the COVID-19 era, it was very difficult to gather more participants at the upper-intermediate level. It was also very challenging to practice the think-aloud protocols and video-record the sessions. Hence, it is not clear how well these findings are generalizable to populations of both genders with similar characteristics. Finally, it was not known why some participants simply ignored figuring out the meaning of some unfamiliar words while reading for comprehension. Perhaps, it was better to interview them to find out about the reason. Other scholars can take all these limitations into account to carry out a more comprehensive study.

### Conflict of Interest

No conflict of interest is declared.

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## Appendix: VKS Categories and Scoring

Table A. VKS Scoring Categories

Categories	Scores	Score Meaning
I	1	The word is not familiar at all.
II	2	The word is familiar, but its meaning is not known.
III	3	A correct synonym or translation is given.
IV	4	The word is used with semantic appropriateness in a sentence.
V	5	The word is used with semantic appropriateness and grammatical accuracy in a sentence





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