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Word Associations and FL Proficiency Levels: Evidence from Greek Learners of Spanish

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Abstract
Word associations are investigated to shed light on the structure of the bilingual mental lexicon. It has been found that the linguistic level in the foreign language (FL) affects the word association responses in lexical availability tasks. Additionally, according to the Revised Hierarchical Model (Kroll & Stewart, 1994), FL word association responses are mediated through the first language (L1), with stronger mediation observed in low proficiency learners compared to high proficiency learners. To explore these issues further, a semantic fluency task was conducted using the stimulus "Fruits and vegetables". This study examined and compared the word connections between the stimulus and the responses provided by 62 Greek learners of Spanish as a foreign language (SFL) of different proficiency levels according to CEFR (27 at the A level and 35 at the B level) in both their L1 and the FL. To analyze quantitative and qualitative aspects of the word associations found within each linguistic level in each language, the total number of responses and the total number of different responses in every set of responses were counted. Furthermore, the elicited answers were classified based on Precosky´s (2011) taxonomy of word associations. To find evidence of L1 mediation, common words produced in both the L1 and the FL were identified, indicating translation from the L1. The findings of this research primarily provide evidence of quantitative differences among the word associations of the two sets of answers and support the mediation of the L1 in both linguistic levels in the FL.

Keywords
Bilingual mental lexicon, Greek learners of Spanish as a foreign language, organization of mental lexicon, words associations

Introduction

The structure of the bilingual mental lexicon and the processing of all the information contained within it have been widely studied in the field of applied linguistics. Most of this research has focused on comparing various aspects of the bilingual mental lexicon with those

of native speakers' mental lexicons (Poulisse, 1999; Wolter, 2001; La Heij, 2005; Zareva, 2007; Precosky, 2011). However, little research has been conducted on the development and the reconstruction of this interconnected and dynamic network of words, which is stored in our memory and constantly changes as the lexical competence of the FL learners improves.

Furthermore, most of the research conducted on the bilingual mental lexicon has focused on learners with different L1s who are learning English as a FL (e.g., Wolter, 2001; Fitzpatrick, 2006; Zareva, 2007; Fitzpatrick and Izura, 2011; Zareva and Wolter, 2012; Jiang, 2019). Therefore, there is a need for research involving participants with less common linguistic profiles. This study aims to address this gap by examining a less common language combination, Greek as an L1 and Spanish as a FL. Indeed, bibliographic research has shown that there are only a few studies (Agust ń Llach and Palapanidi 2021; Agust ń Llach and Palapanidi, 2024) analyzing different aspects of the bilingual mental lexicon of Greek learners of SFL.

Therefore, in this study we aim to examine the associative behavior of Greek learners of SFL across different linguistic proficiency levels. We use a lexical availability task in both their FL and L1 in order to understand the influence of the FL proficiency level on their lexical network's structure and associative patterns. This research contributes to a deeper understanding of how the bilingual mental lexicon is shaped and reorganized throughout language learning.

Literature Review

Associative patterns at different levels of FL proficiency

The mental lexicon is a network of interconnected words organized for rapid and efficient functioning, enabling lifelong information storage and easy lexical access and retrieval (Aitchison, 1994; Libben and Jarema, 2002). Many researchers in the field of second language vocabulary acquisition have explored the structure of the bilingual mental lexicon by investigating the associative behavior of FL learners (cf. Meara, 1983; Zareva, 2007; Wolter, 2001).

Recent research in the associative organization of the bilingual mental lexicon has been based on tools used in L1 psychological and cognitive research. First, some authors (Zareva, 2007; Fitzpatrick and Izura, 2011) have used the word association tests, in which the participants have to elicit one to three responses to a given stimulus word. There is also the 'continuous association' approach (Singleton, 1999) whereby individuals are instructed to provide as many associations as possible within a given time limit. Another tool that has been used in the research on the organization of the bilingual lexicon is the semantic fluency test, in which participants are asked to recall words from a particular semantic category (e.g., flowers) (Friesen et al., 2015; Garc á Castro, 2022).

Research in FL associative organization has focused mostly on comparing the responses of groups of native speakers with groups of learners of a FL. Only a few attempts have been made to compare the associative patterns of learners of different linguistic levels in the FL analyzing their quantitative and qualitative features (e.g., Zareva, 2007; Zareva and Wolter, 2012). The quantitative features of the mental lexicon analyzed were the strength of the associative domain (total number of responses from a participant), the response commonality (absolute frequency of responses in a group), the heterogeneity of responses (absolute number of different responses from a participant in a group). Regarding the qualitative

features of the mental lexicon, they were analyzed in terms of the proportion of the different types of associations (syntagmatic, paradigmatic, phonological).

The findings of these studies have shown that FL proficiency level can be a determining factor in the quantitative (Zareva, 2007) but not in the qualitative (Zareva, 2007; Zareva and Wolter, 2012) features of associative patterns. Specifically, regarding the quantitative features of the associative patterns, it has been found that the less proficient learners of FL have developed a smaller and less diverse and heterogeneous repertoire of word associations than the more advanced learners (Zareva, 2007). Concerning the qualitative features of the participants' associative domains, the findings reveal that the type of word associations produced by FL learners is not affected by increased FL proficiency level (Zareva, 2007; Zareva and Wolter, 2012). Instead, there is evidence that as proficiency increases**,** development and generation of additional associations between the words are noted rather than a process by which one type of association is abandoned in favor of another (Meara, 2006; Zareva and Wolter, 2012).

Furthermore, it has been shown that other factors, apart from FL proficiency, can influence FL learners' associative behavior. Chronological age, culture and cognitive development are some factors that might influence association behaviors (cf. Fitzpatrick et al., 2013; Zareva, 2007), along with familiarity, word frequency, and specific word knowledge (cf. Precosky, 2011; Hernández Muñoz, 2014), and characteristics of the stimulus word, e.g., word class, abstract or concrete, cognate or non-cognate (Van Hell and de Groot, 1998; Hernández Muñoz, 2006; Tomé Cornejo, 2015; Sánchez-Saus, 2016; Palapanidi and Mavrou, 2024).

L1 mediation in word associations at different levels of FL proficiency

Another issue that has been investigated regarding the word association responses of FL learners is whether they are mediated by the L1 and if this mediation is affected by their linguistic level in the FL. According to the Revised Hierarchical Model (Kroll and Stewart, 1994), there is L1 mediation during lexical access, and this is dependent on the linguistic proficiency level in the FL displayed by the participants.

In the early stages of FL acquisition, the connections between the word forms of the FL and the conceptual store, which is shared between the L1 and the FL, are not very strong because individuals access them through the mediation of the L1 (cf. Jiang, 2019). Therefore, we can assume that when a beginner Greek learner of Spanish has to produce the concept "cucumber" in Spanish, they first access the word form in L1 (*αγγούρι*) and then translate this word into Spanish (*pepino*). Thus, the word forms of the FL are more strongly connected to their L1 translations than to their corresponding concepts. As proficiency in the FL increases, the connection between the concepts and the FL lexical representations strengthens; direct links between them are created and the mediation of the L1 is no longer necessary. Nevertheless, even for more proficient learners, the connections between the concepts and L1 word forms are stronger than those between the concepts and FL word forms. Thus, words in the L1 are retrieved from the conceptual store faster than words in the FL.

The results from different studies (cf. Sunderman and Kroll, 2006; Fitzpatrick and Izura, 2011; Hernández Muñoz, 2014; Clenton, 2015; Jiang, 2019) lend tentative support to Kroll and Stewart's model and show that as FL proficiency advances, learners mediate less. The tasks used to investigate L1 mediation are numerous: translation equivalent recognition tasks (Talamas, Kroll and Dufour, 1999), lexical decision tasks (Fitzpatrick and Izura, 2011), word association tasks (Clenton, 2015).

Considering these theories and the previous research-related results, our objective is to analyze the quantitative and qualitative features of word association responses from Greek learners of SFL at two different linguistic levels in a lexical availability task in Spanish and Greek. Furthermore, our objective is to compare the word association responses of Greek SFL learners in the FL with those in the L1 to find evidence of L1 mediation during this process. The common responses produced in both the L1 and the FL indicate translation from L1.

Thus, having stated the objectives of the present study, we set out to investigate the following research questions:

1. Does the linguistic level in the FL affect the quantitative features of word association responses produced by Greek SFL learners in terms of the size of the associative domain and the heterogeneity of responses?
2. Does the linguistic level in the FL affect the qualitative features of word association responses produced by Greek SFL learners in terms of the proportion of the different types of associations?
3. Are FL word association responses mediated through the L1 of Greek SFL learners? Is this potential mediation dependent on language proficiency in SFL?

Methods

Participants

The sample included 62 participants, all undergraduate students in the Department of Spanish Language and Literature at the National and Kapodistrian University of Athens in Greece. All participants were Greek adults aged between 18 and 25 years, with varying proficiency levels in SFL. We used a multiple-choice proficiency test (Gozalo Gómez and Martín Rodríguez, 2008) to classify them according to the Common European Framework of Reference (CEFR) standards (2001). The test results classified 27 participants at the A level and 35 at the B level.

Instruments

To obtain data on the associational behavior of our informants, we had them complete a lexical availability task. Despite the fact that this type of task had focused initially on French, in recent years it is used mostly in Spanish linguistics (e.g. Henríquez Guarín et al., 2016; Jiménez Catalán, 2017; Šifrar Kalan, 2017; Tomé Cornejo, 2015) and it is not widely used in other languages (Sánchez-Saus Laserna, 2024). However, recently it was used in order to examine different aspects of the vocabulary of English as a foreign language (e.g., Jiménez Catalán 2010; Jiménez Catalán and Ojeda, 2009; Ferreira and Echeverría, 2010; Jiménez Catalán, Agustín Llach, Fernández Fontecha and Canga Alonso 2014; Canga Alonso, 2017; Martínez Adrián and Gallardo del Puerto, 2017; Ferreira, Garrido, and Guerra, 2019; Jiménez Catalán and Fernández Fontecha, 2019; Jiménez Catalán and Canga Alonso, 2019; Agustín Llach, 2022).

The lexical availability task combines features of semantic fluency and word association tasks. It has characteristics of a semantic fluency task because the participants are instructed to generate as many words as possible related to a stimulus word in a specific semantic category. In this study, the stimulus "Fruits and vegetables" was used. On the other hand, it has characteristics of a word association task because the responses are not only thematic and do not necessarily belong to the same semantic field as the stimulus. Responses may be syntagmatic (e.g. "take – risk") or phonological (e.g. "boat – float"). Therefore, the task also exhibits characteristics of a word association task.

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Responses in this kind of task can be analyzed in two ways, depending on the study's objective. On the one hand, they can be analyzed in terms of relationships established between the responses (e.g., Goñi et al., 2010; Voorspoels et al., 2014; Tomé Cornejo, 2015; Palapanidi, 2019) in order to shed light on the process of activating, selecting, and producing a word. Alternatively, they can be analyzed for relationships between responses and the stimulus word (Meara, 1983; Wolter, 2001; Fitzpatrick, 2006; Precosky, 2011; Agustín Llach and Palapanidi, 2021) in order to examine participants' associative behavior. In this study, we focus solely on the associations between the stimulus and responses.

Procedure

Participants had two minutes to generate as many words as possible in response to the prompt "Fruits and vegetables" (cf. Borodkin et al., 2016; Tomé Cornejo, 2015). The task was initially completed in SFL, and after a few days, participants repeated it in their L1, Greek. The task was administered as a pen-and-paper activity. The data was carefully edited, spelling errors were corrected, and repetitions per informant were not allowed.

Scoring procedures

Taking into account the objectives of the present study, the quantitative and the qualitative features of the word association responses produced by Greek SFL learners were scored by measures used in similar studies (e.g., Zareva, 2007; Agustín Llach and Palapanidi, 2021). The quantitative features of word association responses were measured in terms of the size of the associative domain and the heterogeneity of responses. Specifically, the size of the associative domain was measured by the total number of responses, the response commonality was measured by the absolute frequency of responses in a group and the heterogeneity of responses was measured by the absolute number of different responses.

The qualitative features of the word association responses were measured in terms of the proportion of the different types of associations. Therefore, the responses were classified according to the associational taxonomy introduced by Precosky (2011). We distinguished between semantic, formal, and encyclopedic associations.

Semantic associations are based on meaning and are further divided into syntagmatic and paradigmatic. According to Precosky (2011), a syntagmatic association between a stimulus word and a response word is a left to right textual relationship, in other words, the stimulus word cannot replace the response word in a sentence and the two words belong to different word classes. In this type of associations, we include idioms (*bite - the bullet)*, restricted collocations (*blond - hair*), grammatical collocations (*to make - up*), or lexical collocations (*lions - roar*). On the other hand, a paradigmatic association between a stimulus word and a response word is a vertical textual relationship, since the two words normally belong to the same word class, so they may replace one another in a grammatically correct sentence. Categories within paradigmatic associations include synonyms (*huge - gigantic*), antonyms (*important - insignificant*), hypernyms (*bird – parrot*), hyponyms (*oak - tree*), meronyms (*leaf - tree*) and holonyms (*car – wheel*). Formal associations are based on word form (*word - world*), while encyclopedic associations are based on personal experiences (*summer - sun*).

Finally, in order to find evidence of L1 mediation during the process of lexical access we followed a method used in a previous study (Agustín Llach and Palapanidi, 2024), in which the authors compared the answers in the L1 and the FL to find the common responses produced, which indicates translation from the L1.

Data analysis

The data was analyzed via the program Dispolex, which automatically calculates the number and the mean of word tokens, the number of word types, the mean individual lexical availability index of the responses, and the cohesion index, which calculates the degree of heterogeneity of the responses in a group. Additionally, this tool offers the possibility of comparing two sets of answers by calculating the complement of the two sets (exclusive elements of each set), the intersection (elements in both sets), the union (all distinct elements of both sets), and the percentage of compatibility between the two sets of answers. In addition, we used Excel to calculate the number and mean of the different types of word associations.

Results and Discussion

Findings of the study

Table 1 presents the data for the descriptive measures of the lexical production of each group of participants. It shows the total production of words in SFL and the L1 for each group. We can clearly observe that both the total number of words in the FL and the different types of words in the FL generated by the participants increases with increasing proficiency in the FL. The Mann-Whitney U test indicated that scores in FL were significantly higher in the more advanced linguistic level (A1/A2: Median=7,41, U=61.500, Z=-5.551, p < 0,001, B1/B2: Median=9,31, U=81.500, Z=-5.132, p < 0,001). This same pattern was observed in the L1, where participants with higher FL proficiency also produced significantly more words (A1/A2: Median = 16.11, U = 83.500, Z = -4.505, p < 0.001; B1/B2: Median = 17.86, U = 86.000, Z = -4.344, p < 0.001). There was a great degree of similarity in the heterogeneity of the answers in the FL of participants of different linguistic levels, as the cohesion index is the same in both groups. These findings permit us to respond to the first research question.

Table 1

Total Production in SFL and L1 Per Group

	Spanish FL A1/A2		Spanish FL B1/B2	
	In FL	In L1	In FL	In L1
Word tokens	200	435	326	625
Types of words	74	133	96	125
Mean tokens	**7.41**	**16.11**	**9.31**	**17.86**
Cohesion Index	0.10	0.12	0.10	0.14

Table 2

Mean Associations Per Group and Subtype

Type of associations	Subtypes of associations	Categories of associations	Spanish FL A1/A2		Spanish FL B1/B2	
			FL	L1	FL	L1
Semantic	Syntagmatic	Restricted collocation	0.22	0	0.17	0
		Lexical collocation	0.37	0.55	0.31	0.34
	Paradigmatic	Synonym	0	0.03	0	0.03
		Hypernym	0.07	0	0.09	0
		Hyponym	**5.59**	**13.22**	**7.66**	**15.86**
		Cohyponym	0.22	0.07	0.09	0.03
Encyclopedic			0.93	2.41	0.97	1.54

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Furthermore, in order to answer the second research question regarding the qualitative features of the word associations, we calculated both the number and types of associations produced by the learners. Specifically, we calculated the raw production of the different types of associations and the mean number of these associations across our two groups of participants in the L1 and the FL. Table 2 offers the mean associations per group and subtype.

The results presented clearly show quantitative differences in the associations between learners of different linguistic levels. As the linguistic level increases, a greater number of associations are produced in the FL, and more varied ones. Regarding qualitative differences, the most dominant type of association at both linguistic levels is similar: most responses are hyponyms of the prompt.

To address the third research question, we explored the similarities and differences in the responses of the same individuals in Spanish (FL) and Greek (L1) across the two proficiency levels. We conducted a threefold comparison, between all the answers, between answers given at least by three informants, and between the ten most available responses. The most available responses are calculated by the lexical availability index, which results from the word's frequency, that is, the number of times the word appears with respect to the total number of units, its frequency of occurrence based on the percentage of informants who have mentioned this word during the task and the cumulative frequency, that is, the sum of all relative frequencies (Sánchez-Saus Laserna, 2024).

The results of the first comparison are presented in Table 3, and reveal a slightly higher percentage of compatibility at the B level.

Table 3
Contrast across Linguistic Levels

	Complement		Intersection	Union	Compatibility
	FL	L1			
Spanish FL A1/A2	30	89	44	163	26.99%
Spanish FL B1/B2	41	70	55	166	33.13%

To mitigate the impact of individual variability among Greek learners, we established contrasts between responses appearing with a frequency of 11.11% or higher (A level) and 8.57% or higher (B level), meaning responses given by at least three participants. The results of this analysis are presented in Table 4.

Table 4
Contrast of the Most Frequent Responses across Linguistic Level

	Complement		Intersection	Union	Compatibility
	FL	L1			
Spanish FL A1/A2	0	18	15	33	45.45%
Spanish FL B1/B2	3	33	25	61	43.1%

The contrast of the most frequent responses shows a notable increase in the compatibility between participants' answers in the FL and L1 at both linguistic levels, with a slightly higher compatibility observed at the A level.

Finally, to better understand the Greek learners' associative behavior, we compared the ten most available responses in the FL and L1 across linguistic levels. The responses are

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classified as exclusive or common. The results of this comparison are presented in Table 5, which includes the English translations of the responses along with the participants' responses in brackets. As shown, there are compatibility increases at both linguistic levels, seven of the ten responses are common in the FL and the L1 at level A, and six of the ten at level B.

Table 5
Contrast of the Ten Most Available Responses across Linguistic Level

	Exclusive responses		Common responses
	FL	L1	FL – L1
Spanish FL A1/A2	potato (patata), lemon (limón), onion (cebolla)	watermelon (καρπούζι), pear (αχλάδι), carrot (καρότο)	orange (naranja, πορτοκάλι), tomato (tomate, ντομάτα), apple (manzana, μήλο), melon (melon, πεπόνι), banana (plátano, μπανάνα), strawberry (fresa, φράουλα), lettuce (lechuga, μαρούλι)
Spanish FL B1/B2	potato (patata), lemon (limón), grapes (uvas), onion (cebolla)	watermelon (καρπούζι), melon (πεπόνι), pear (αχλάδι), cucumber (αγγούρι)	apple (manzana, μήλο), banana (plátano, μπανάνα), orange (naranja, πορτοκάλι), tomato (tomate, ντομάτα), strawberry (fresa, φράουλα), lettuce (lechuga, μαρούλι)

Discussion of the findings

The present study aimed to investigate the influence of linguistic level in the FL on the quantitative and qualitative features of word associations in the FL from Greek learners of SFL in a lexical availability task in the FL. Furthermore, we wanted to compare the word association responses of Greek SFL learners in the FL with those in the L1 to find evidence of L1 mediation during this process.

Our analysis revealed quantitative differences in the word associations made by Greek learners at different linguistic levels, but no qualitative differences. Specifically, lower-level participants produced fewer word associations with the stimulus word than those at more advanced levels. These results align with previous studies (e.g., Zareva, 2005; López González, 2010; Šifrar Kalan, 2014; Agustín Llach, 2022) and can be attributed to the positive relationship between vocabulary size and word associations production, as various researchers have claimed (Meara, 2006; Zareva and Wolter, 2012).

Additionally, the higher production of word associations in the FL of the more advanced learners of SFL could also be explained by Revised Hierarchical Model (Kroll and Stewart, 1994). As proficiency in the FL increases, the connection between the concepts and the FL lexical representations strengthens; direct links between them are created, and the mediation of the L1 is no longer necessary. Interestingly, our results also showed that advanced learners produced more associations in their L1 than lower-level learners. This suggests that the strengthening of conceptual–lexical connections in the FL does not weaken access to the L1; rather, it may enhance overall lexical accessibility in both languages, enabling faster and richer retrieval from the conceptual store.

Furthermore, the findings of the analysis show that lower-level individuals produced less heterogeneous and varied answers, which means that their lexical repertoire is less wide than that of the participants with a more advanced linguistic level in the FL. These findings are in line with similar studies (Sánchez-Saus, 2009; Agustín Llach, 2022). This result is not surprising, since it is logical to expect that more proficient learners have a more rich, varied, and heterogeneous vocabulary.

Despite the quantitative differences, there were no variations in the types of word associations produced; the dominant type at both levels was hyponyms of the stimulus word. Thus, linguistic level does not seem to affect the type of word association. This pattern is consistent with findings from other studies (Zareva, 2007; Tomé Cornejo, 2015) and suggests that the cognitive characteristics of the stimulus word determine the associative relations (Paredes, 2006; Hernández Muñoz, 2006; Tomé Cornejo, 2015; Sánchez-Saus, 2016; Palapanidi and Mavrou, 2024). In this case, the stimulus "Fruits and vegetables" consists of two hypernyms, so it is unsurprising that most responses are hyponyms.

Regarding L1 mediation in lexical processing, the threefold contrast (all responses, responses from at least three participants, and the ten most available responses) confirms its presence, as the compatibility between L1 and FL responses is high. This finding supports the Revised Hierarchical Model (Kroll and Stewart, 1994), which posits that FL associations are mediated by L1 translation equivalents. Additionally, the contrast between responses from at least three informants shows a slight increase in L1 mediation among lower proficiency participants. This observation is consistent with the model, which suggests stronger connections between L1 and FL lexicons in lower proficiency learners.

Conclusion

This study examined the influence of linguistic proficiency in the FL on the quantitative and qualitative features of word associations. The research analyzed the associative behavior of Greek learners of SFL at different proficiency levels using a lexical availability task. Additionally, it explored the extent to which FL associations might be mediated by the learners' L1 and whether this process varies depending on proficiency. This was done by comparing participants' responses in both the FL and their L1 for the same task.

The results show that linguistic level in the FL affects both the number of associations and their variety, with more associations and a more heterogeneous range of responses observed as language proficiency increases. This finding suggests that as proficiency in the FL increases, the lexical repertoire of the learners becomes wider, richer, and more diverse, with a greater number of associational links forming between the words within the lexical network.

However, no qualitative differences in the associative behavior of Greek learners of SFL were found across different proficiency levels, as the majority of the responses were hyponyms in relation to the stimulus word at both linguistic levels. Therefore, we can assume that linguistic proficiency in the FL is not a determining factor in the types of word associations within the bilingual mental lexicon, at least at the levels examined. It appears that other factors influence the nature of the association between the response given and the stimulus word. Our results may be related to variables such as the characteristics of the stimulus word, or the frequency or the commonality of the response.

The comparison of answers in the FL and L1 supports Kroll and Stewart's model, as the notable consistency among responses provides evidence of L1 mediation. In other words,

learners seem to access L2 words by translating from L1 equivalents at both linguistic levels with a slight increase in this tendency at the more advanced linguistic level. Thus, while the learners are completing the lexical availability task in the FL, it seems that they do not activate concepts; rather, they translate words from their L1.

Implications for FL vocabulary instruction

The present study has significant pedagogical implications for acquiring and teaching vocabulary in FLs. The findings of this study, along with those of similar studies, provide valuable insights into how words are stored and organized in the bilingual mental lexicon, as well as how this complex network develops as language proficiency in the target language increases.

Understanding these processes allows educators to adjust vocabulary instruction in a way that aligns with the brain's natural mechanisms for storing new words. By doing so, teaching strategies can be adapted to better accommodate the cognitive processes involved in vocabulary learning, ultimately leading to more efficient instruction and improved outcomes in vocabulary acquisition. By aligning teaching practices with our understanding of the bilingual lexicon, we can maximize the success of learners in acquiring new vocabulary and achieving greater language proficiency.

Additionally, examining the nature and the size of the lexical network in a FL and analyzing the cognitive structure of specific semantic fields in the FL, which are used in the lexical availability tasks, can facilitate FL vocabulary instruction for a number of reasons. First, it provides a quantitative measure of lexical knowledge within specific semantic fields for the tested informants. Furthermore, it offers qualitative insights by revealing the lexical organization in the informant's mental lexicon within those semantic fields. By comparing this information with native speaker response lists or lexical frequency repertoires, we can identify gaps in the lexical competence of the individuals tested. Consequently, we can adjust instruction according to the specific needs of each group.

Limitations and recommendations for future research

This study does not aim to be exhaustive but provides preliminary insights into FL learners' associative behavior based on a lexical availability task. The results of the present study revealed only tendencies, which merit further examination with larger groups of learners. Therefore, further research is needed in a larger sample size of learners of SFL from different linguistic backgrounds and across all linguistic levels in SFL. Additionally, future research should focus on using a variety of stimulus words with different characteristics and conducting a more qualitative analysis of chain associations, including how responses within a prompt are linked and what mechanisms trigger them.

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