Does the Morphological Structure of L1 Equivalents Influence the Processing of L2 Words? Evidence from Arabic-English Bilinguals

Чи впливає морфологічна структура рівня володіння мови L1-еквівалентів на обробку слів рівня L2? Докази арабсько-англійських білінгвів

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ABSTRACT

Objective. The current study aims at investigating if the morphological structure of the first language (L1) equivalents affects the processing of second language (L2) words.

Materials & Methods. To this end, 400 Arabic-English bilinguals of two levels of language proficiency completed a free recall task and a discrete word association task in their L2. The stimuli represented cases of lexical matches and mismatches.

Results. The results of the free recall task showed a facilitation effect for lexical matching in one comparison for the participants with lower proficiency while lexical matching led to an inhibitory effect in two comparisons for the participants with higher proficiency. Additionally, the participants with higher proficiency generally recalled more words than the participants with lower proficiency, and recalled monomorphemic words significantly differently than multi-morphemic words in one comparison. As for the results of the word association task, they failed to reveal significance for word type or language proficiency when association strength was considered. Only when the number of associations was considered, a facilitatory effect for lexical matching was observed in one comparison among the participants with lower proficiency.

Conclusions. The results generally support the claim that L2 learners exhibit sensitivity to the morphological structure of L1 words. The results also lend support to the interaction model of morphological processing and the bilingual lexicon models that highlight the influence of language proficiency on language processing.

Key words: lexicalization; morphology; bilingualism; language proficiency, mental lexicon.

Introduction

The interaction between a bilingual's first (L1) and second (L2) languages during L2 acquisition and processing has represented an intriguing area of research due to its important theoretical and practical implications (e.g., Bergmann, Sprenger & Schmid, 2015; Carrol, Conklin & Gyllstad, 2016; Hopp, 2017; Marian & Spivey, 2003; Türker, 2016). An interesting phenomenon that can well serve this line of research is how lexicalization patterns – the mappings between words and concepts – differ across languages. It is interesting that one and the same concept may be lexicalized in different ways across languages. For example, the German word *Tasche* is polysemous and is translated into two different words in English *bag* and *pocket* (Elston-Güttler & Williams, 2008). Similarly, the English monomorphemic word *pencil* is translated into an Arabic compound noun spelled as two separate words قلم رصاص. Such cross-linguistic variations in lexicalization patterns reflect language specificity in word-concept mappings (Elston-Güttler & Williams, 2008). It is intriguing to explore if such cross-linguistic variations can influence L2 acquisition and/or processing.

Relatively few studies have addressed the influence of lexicalization mismatches between a bilingual's L1 and L2 on L2 processing (see the literature review in the present paper). Two arguments have generally been proposed to account for this phenomenon. The first proposal suggests that a bilingual's L1 and L2 interfere with each other in case of processing lexicalization mismatches. This means that Arabic-English bilinguals, for example, may find it more challenging to process the monomorphemic word *pencil* than the monomorphemic word *table* because the translation equivalent of *pencil* is an Arabic compound noun (a case of lexicalization mismatch) while the translation equivalent of *table* is an Arabic monomorphemic noun (a case of lexicalization match). Proponents of this argument mainly rely on the premise that an L2 word automatically activates its L1 equivalent in its attempt to access its conceptual level (e.g., Chen & Leung, 1989; Hernandez, Li & MacWhinney, 2005; Kroll & Stewart, 1994). Hence, cross-linguistic matches of lexicalization patterns will prove easier to process than mismatches.

The second proposal assumes that differing lexicalization patterns in a bilingual's L1 and L2 are kept distinct. This means that *pencil*

and *table* will be processed similarly regardless of their L1 translation equivalents. This proposal argues that activation of the conceptual level is not mediated by a bilingual's L1, and that bilinguals have direct L2 form-to-meaning mappings. Evidence for the second proposal comes from studies supporting efficient conceptual access from L2 words (e.g., Altarriba & Mathis, 1997; Frenck-Mestre & Prince, 1997; Kroll & Tokowicz, 2001). In addition, Elston-Güttler K., and Williams J. (2008) argue that direct form-to-meaning mappings are essential to fully understand the meaning of words with cross-linguistic lexicalization mismatches, such as *bag* and *pocket* for German-English bilinguals. It must be noted here that the bilingual's L2 proficiency level may be a critical factor in assessing the two proposals as L1 interference may decrease with increasing proficiency. Hence, L1 interference may influence the performance of bilinguals with low proficiency while a highly proficient bilingual's L1 and L2 may remain distinct.

The current study contributes to this line of research by examining the processing of L2 words by Arabic-English bilinguals, an underrepresented population in this area of research. The main question is: Does the lexicalization of L1 equivalents influence the processing of L2 words? The current study addresses this question from a morphological perspective based on Levy E., Goral M., and Obler's L. (2007) claim that bilingual speakers show sensitivity to the morphological structure of the L1 translation equivalents – if the L1 equivalent is a bimorphemic compound or a monomorphemic word. They reported evidence that having a similar morphological structure in L1 and L2 (e.g., structured as compound nouns in L1 and L2) facilitates participants' identification of translation equivalents across the two languages. The current study tests this claim among Arabic-English bilinguals. For example, despite being lexicalized as monomorphemic words in English, the word *carpet* is translated into a monomorphemic word in Arabic while the word *ambulance* is translated into a compound noun in Arabic. Likewise, the English compound noun *bedroom* is translated into an Arabic compound noun whereas the compound noun *airport* is translated into a monomorphemic word in Arabic. The question is: will the words *carpet* and *bedroom* be processed differently than *ambulance* and *airport* respectively due to cross-linguistic variations in lexicalization patterns? According to Levy, Goral & Obler (2007), *carpet* and *bedroom*, which represent a case of L1-L2 lexical matching,

should be processed faster and/or easier than instances of L1-L2 lexical mismatching, such as *ambulance* and *airport*.

The current study will attempt to answer this important question through the use of two tasks; namely, the free recall task and the discrete word association task. The selection of the free recall task in the current study was purposeful. The free recall task is a memory task that tends to produce the kinds of responses that are most often activated in memory, those that are easily accessed and that easily move into short term memory. This is a useful way for cognitive researchers to understand the ways in which words are retained in memory and what words are most highly recognized and retained in memory, from a set of words that are presented to a participant. It is one way of measuring the saliency of words in memory whether activated in a given episode (episodic memory such as in a trial in the current study) or semantic memory (such as from a memory trace that has been well-rehearsed or practiced over time). In the current study, we predict that the participants will recall more L2 words that match with their L1 translation equivalents in morphological structure than the L2 words that represent instances of L1-L2 lexical mismatching. We also predict that learners with a higher level of proficiency will recall more words and will be more influenced by L1-L2 lexical mismatching than learners with a lower level of proficiency.

As for the discrete word association task, it determines the level of activation or mental connection between the representations of items. If we gather information on the first word that comes to mind from a target stimulus, we can presume that there is a strong interconnection between those two items that prompts a given response. Thus, word association tasks speak directly to the ways in which words are interconnected in memory in terms of a semantic network. In the current study, the data were used to examine the strength and the number of associations for each word type. Since research has shown that the more paths that are associated with a concept, the more difficult it is to retrieve information from any of these paths (Anderson, 1974), we predict that cases of L1-L2 lexical matching will generate fewer associations and produce higher association strength than cases of L1-L2 lexical mismatching. In other words, we predict that cases of lexical matching will be easier to retrieve. We also predict that Seniors will be less influenced by the predicted influence of L1-L2 lexical mismatching than PYPs.

The current study represents an important contribution to the literature for three reasons. First, research into cross-linguistic lexicalization mismatches has not addressed Arabic-English bilinguals yet. This may be particularly helpful because Arabic is typographically distant from English and uses a different orthographic system. Second, the findings of the current study will contribute to important theoretical debates, including the arguments for and against direct form-to-meaning mappings in L2 and the controversy over L1 activation during L2 processing. Finally, findings of the current study will contribute to the discussion in the language teaching field on how to best deal with cases of lexicalization mismatches in the L2 vocabulary classroom.

Theoretical Models of the Bilingual Lexicon and Morphological Structure

Models of the bilingual mental lexicon are important to the discussion of form-to-meaning mappings in bilinguals. Potter M., So K., Von Eckardt B., and Feldman L. (1984) proposed two alternative models: word association and concept mediation. The word association model assumes that L1 and L2 words share the same semantic representations. However, L2 words do not have direct links to their semantic representations. Access to the conceptual level for L2 words is always mediated by links to L1 words. The concept mediation model adopts a different perspective as it assumes the existence of direct links between L2 words and their semantic representations. That is, L2 words can be processed independently from L1 words. In order to test the two models, Potter et al. (1984) compared the participants' performance on an L2-to-L1 translation task versus a picture naming task. The results revealed similar performance for participants in the two tasks, which was interpreted as support for the concept mediation model. The rationale was that the two tasks were performed similarly because they both involved concept mediation. The word association model, however, would have predicted better performance in the translation task due to the direct L2-to-L1 links.

Later studies revealed an important role for language proficiency. A number of studies revealed that beginning L2 learners performed the L2-to-L1 translation task faster than the picture naming task (Chen & Ho, 1986; Chen & Leung, 1989; Kroll & Curley, 1988), and that they performed L2-to-L1 translation faster than L1-to-L2 translation (Kroll &

Stewart, 1994; Sholl, Shankaranarayanan & Kroll, 1995; Talams, Kroll & Dufour, 1999). These results called for Kroll and Stewart (1994) to propose their developmental Revised Hierarchical Model (RHM) that assigns an important role to language proficiency. The RHM assumes that beginning L2 learners do not possess direct links between L2 words and their semantic representations. L2 words, however, have strong links with L1 equivalents and access the conceptual level through these links. The L1-to-L2 links are relatively weaker at this stage. With increasing language proficiency, L2 words develop direct links to their concepts and the strength of all links becomes more balanced. In terms of the current study, the three models will make different predictions. The word association model predicts a facilitatory effect for lexical matches (i.e., instances of lexical matching will be processed easier and/or faster) while the concept mediation model assumes similar performance in cases of lexical matches and mismatches. The developmental RHM, however, predicts facilitation for lexical matches only at lower levels of proficiency where direct links between L2 words and their concepts are yet to be established.

Since the current study also addresses the morphological structure of words (e.g., monomorphemic versus compounds), models addressing the representation of morphological structure will be relevant. Three models are worth mentioning here. First, the full-listing model (e.g., Butterworth, 1983) postulates that multi-morphemic words (compound words in the current study) are represented as whole words, not as per their constituent morphemes. Hence, *airport* is stored and accessed as one word, not through *air* and *port*. Hence, no processing difference will be noted between monomorphemic and compound words. Second, the morphological decomposition model (e.g., Taft & Forster, 1975) considers the constituent morphemes of compound words as lexical storage and lexical access units. *Airport* is thus accessed through its constituent morphemes and is not represented as a whole word. This predicts a processing difference between monomorphemic and compound words. Third, the interaction model (e.g., Caramazza, Laudanna & Romani, 1988; Taft, 1994), which has recently gained increasing support (e.g., MacGregor & Shtyrov, 2013; Mankin, Thompson, Branigan & Simner, 2016; Nefs, Assink & Knuijt, 2003), assumes that compounds can be stored and accessed as whole words or through their constituent morphemes based on a number of variables,

including the frequency of the compound words and their constituents, their orthographic representation (i.e., spelled as one word *airport* or as two words *post office*) and their semantic transparency. It will be interesting to test how similar/different monomorphemic and compound words behave in the current study to test the predictions of these models.

The Influence of Lexicalization Mismatching

Studies examining the influence of lexicalization mismatches on L2 processing have employed different forms of mismatches. Jiang (2002), for example, focused on the phenomenon of homonymy. The participants, who were native speakers of English and Chinese learners of English, were asked to complete two semantic judgment tasks requiring that they determine the degree of semantic relatedness of English words (Experiment 1) or decide whether two English words were related in meaning (Experiment 2). Some of the English words (e.g., *problem* and *question*) were translated into one word in Chinese (e.g., *wenti*). The results revealed higher rating scores (Experiment 1) and faster responses to L2 word pairs (Experiment 2) when the English words shared the same Chinese translation for non-native speakers. This lent strong support to the presence of semantic content in L2 lexical entries. Elston-Güttler K., Paulman S., and Kotz S. (2005) also focused on the phenomenon of homonymy to examine the L1 activation during L2 processing considering the role of L2 proficiency level, the role of sentential context and the locus of L1 activation (orthographic versus semantic). Using three reaction time (RT) and event related potential (ERP) lexical decision experiments, they showed that German learners of English with lower proficiency levels showed an influence for L1 activation even in biasing sentential contexts while the participants with higher levels of proficiency did not. This seemed in support of the RHM (Kroll & Stewart, 1994) in that increasing L2 proficiency facilitates independent form-to-meaning mappings. The authors thus concluded that language proficiency modulates the cognitive control related to translational activation. They also specified an orthographic, rather than semantic, locus for L1 activation.

Other studies targeted different forms of lexicalization. For example, Elston-Güttler K., and Williams J. (2008) addressed the phenomenon of polysemy. Native speakers of English and advanced German learners of English were asked to complete an anomaly

detection task in English considering whether a target word formed an acceptable completion to a sentence. The critical condition was when the target word (e.g., *bubble*) shared the same German translation equivalent (e.g., the polysemous word *blasé*) with the correct word (e.g., *blister*) in the sentence (e.g., *His shoes were uncomfortable due to a *bubble*.). Relative to native speakers of English, the German learners produced significantly more errors and displayed longer reaction times in the critical condition to the control condition, suggesting L1 influence on L2 processing in cases of L1-L2 lexical mismatches. Another example is T. Paribakht (2005) who examined concepts that were represented through single words in L2 but had no lexical equivalents in L1. Examining the inferencing behavior of Persian high-intermediate learners of English while reading English texts, Paribakht T. (2005) showed that Persian learners knew fewer, and inferred the meaning for more, non-lexicalized target words than lexicalized words, and were less successful at decoding the meaning of the non-lexicalized words. The author thus concluded that lexicalization mismatches may influence L2 learners' success in L2 text comprehension and vocabulary development.

A number of studies followed Paribakht's T. (2005) focus on non-lexicalized items in L1. Chen C., and Truscott J. (2010) examined the effect of repeated encounters with target words and the effect of L1 lexicalization on the development of seven aspects of word knowledge during incidental vocabulary acquisition through reading. The results indicated that L2 words with no L1 lexical equivalents caused great difficulty for L2 learners and repeated encounters with these words were inefficient for learning in comparison with lexicalized words. In the same vein, Heidari-Shahreza M. (2014), and Heidari-Shahreza M., and Tavakoli M. (2016) also highlighted the special difficulty of non-lexicalized words for L2 learners. They pointed out that this difficulty is most evident in certain semantic aspects of vocabulary knowledge, such as the receptive knowledge of meaning and form and the receptive knowledge of associations. Their studies did not reveal significant differences for other aspects of vocabulary knowledge including the productive knowledge of orthography, parts of speech or associations. The authors thus concluded that non-lexicalized words caused extra difficulty for L2 learners in the semantic aspects of word knowledge. Likewise, Golaghaei and Sadighi (2013) recognized an advantage for lexicalized over non-lexicalized words in vocabulary development when

an instructional intervention comprising a combination of theoretical discussion of lexicalization mismatches, a matching activity including L1 glosses, a translation task and corrective feedback was applied. A similar advantage was noted when the treatment involved incidental vocabulary acquisition through inferencing.

Of more relevance to the current article are the studies that defined L1–L2 lexical mismatches in terms of morphological structure. Cheng C., Wang M., and Perfetti C. (2011) investigated compound processing and cross-language activation in a group of Chinese-English bilingual children. The participants performed a lexical decision task on a number transparent (e.g., *toothbrush*) and opaque (e.g., *deadline*) English compound nouns consisting of two free constituent morphemes. The translation of the constituent morphemes into Chinese either resulted in compound nouns or non-words. The results showed that children were more accurate in judging semantically transparent than opaque compound nouns in English. Additionally, a clear lexicalization effect was observed as the lexical judgment accuracy on English compound nouns was affected by the lexicalization of their Chinese translation regardless of semantic transparency or language proficiency.

Likewise, Ko I., Wang M., and Kim S. (2011) used the lexical decision task to investigate whether adult Korean-English bilingual readers activate the constituent morphemes of compound words in their L1 while processing compound words in their L2 via decomposition. The results showed a clear advantage in lexical decision for English compound words when the translated compounds (the combination of the translated equivalents of the constituents) were real words in Korean rather than non-words. Additionally, when the second constituent of the English compound was manipulated for frequency, the lexicalization effect of the Korean translation equivalent showed sensitivity to the frequency variation and had a greater influence on English compounds with highly frequent second constituents. This was interpreted in terms of support for morphological decomposition and cross-language activation in the bilingual reading of compound words.

In the same vein, Holmquist K. (2016) examined whether the recognition of translation equivalents that share the same morphological structure would be facilitated as compared to the recognition of translation equivalents with different morphological structures. To this end, a total of sixteen Swedish-English bilinguals performed a translation

recognition task that represented backward translation; that is, from the participants' L2 (=English) to their L1 (=Swedish). The English words were all transparent compound nouns while their Swedish equivalents were either compound nouns or monomorphemic nouns. Examining the reaction time and error rates of the translation recognition task showed a clear advantage in compound-to-compound recognition in terms of faster recognition and fewer errors. This was interpreted in terms of a greater degree of cross-linguistic activation for equivalents representing morphological matches, which facilitates recognition. It was assumed that morphologically mismatched cross-linguistic equivalents are not similarly associated.

The three studies of Cheng C., Wang M., and Perfetti C. (2011), Ko I., Wang M., and Kim S. (2011), and Holmquist K. (2016), which have examined the influence of cross-language lexicalization mismatches with a focus on the morphological structure, have thus supported the view that L2 lexical items that morphologically match with their L1 translation equivalents are processed faster, easier and/or more accurately than the L2 items that morphologically mismatch with their L1 translation equivalents. The current study aims to further assess this influence across a new population (i.e., Arab EFL learners) using new experimental tasks (i.e., free recall and discrete word association) while integrating language proficiency as an important variable. To this end, Arabic-English bilinguals, belonging to two different L2 proficiency levels, completed a free-recall task and a word association task using four types of stimuli: (1) English monomorphemic nouns with equivalent monomorphemic nouns in Arabic, (2) English monomorphemic nouns with equivalent compound nouns in Arabic, (3) English compound nouns with equivalent compound nouns in Arabic and (4) English compound nouns with equivalent monomorphemic nouns in Arabic. Cases (1) and (3) represented cases of lexical matches whereas cases and (4) represented cases of lexical mismatches. The comparison between cases of matches and mismatches was conducted to explore the potential effect of cross-language lexicalization mismatches on processing and how far bilinguals are sensitive to the morphological structure of L1 translation equivalents while processing L2 words.

Research Question

The current study addresses the following research question:

Does lexicalization (mis)matching in morphological structure of L1 and L2 translation equivalents influence the processing of L2 words?

In line with earlier studies (i.e., Cheng, Wang & Perfetti, 2011; Holmquest, 2016; Ko, Wang & Kim, 2011), we predict that L1-L2 lexical mismatching will hinder the processing of L2 words. That is, the L2 words whose morphological structure matches with the structure of their L1 translation equivalents will show a processing advantage over L2 words that exhibit lexical mismatching with their L1 translation equivalents. In terms of the study experiments, we predict a higher number of recalled words in the free recall task in case of L1-L2 lexical matching. As for the discrete word association task, we predict that L1-L2 lexical matching will lead to fewer yet stronger associations.

Regarding the participants' L2 proficiency level, we predict that this variable will modulate the processing advantage exhibited for the L1-L2 lexical matching. In other words, the participants with a lower proficiency level will show stronger sensitivity to L1-L2 lexical matching in line with the predictions of the Revised Hierarchical Model (Kroll & Stewart, 1994) and the interaction model of morphological processing (e.g., Caramazza, Laudanna & Romani, 1988; Taft, 1994). Hence, it is expected that response differences between cases of lexical matching and mismatching in terms of the number of words recalled, the number of associations, and strength of association will be more salient among the participants of lower proficiency.

Methodology

Study Context

The study was conducted in a private Saudi university that allows admission to Saudi as well as non-Saudi students. English is the medium of instruction, which requires applicants to pass through an admission test in English to join their majors. Students who score below B2 according to the Common European Framework or 5.5 in IELTS join a Preparatory Year Program (PYP) that offers students 20 hours of English training per week in order to prepare them to study their majors in English. The program comprises three levels equivalent to A2, B1 and B2 according to the Common European Framework. In accordance with the regulations of undergraduate education in Saudi

Arabia, female students study at a separate university campus than the male students. It was more feasible to us, being all female researchers, to collect data for the current study from the female campus. We, however, acknowledge that this may constitute a study limitation since some studies have indicated gender differences in word associations (Espinosa, 2010; Sökmen, 1993).

It is worth mentioning that the study received clearance from the Research Ethics Committee of the private Saudi university prior to the implementation of the experiments. The researchers sought the permission of instructors to visit their classrooms to recruit the study participants. During the class visits, the researchers explained to the students the purpose (i.e., examining students' vocabulary knowledge) and requirements of the study and the students who did not consent to participate were allowed to leave the classroom during the implementation of the experiments. The tasks were then implemented in intact classes among voluntary students who were clear that no rewards would be offered based on their participation.

Experiment (1) – Free Recall

Participants

A total of 200 undergraduates voluntarily participated in this experiment. They were all female native speakers of Arabic who learned English as part of their education in Saudi schools. Any students who spent more than six continuous months in an English-speaking country or whose parents were native speakers of English were excluded from the study. The participants can thus be classified as late bilinguals who learned English in a foreign language context. Half of the participants were studying at level B2 of the Preparatory Year Program and were aged between 18 and 21 (to be referred to as PYPs) while the other half were students at their last study year of their majors with an age range between 22 and 25 (to be referred to as Seniors). Seniors had completed their Preparatory Year Program and studied at least 3 more years in their majors in English, which reflects their higher level of English language proficiency.

Materials

In order to prepare the study stimuli, a total of 40 English words were selected from the most frequent 3,000-word list provided online

by Oxford Learners Dictionary. The words included monomorphemic and compound nouns. The selected words were embedded within a list of 120 English words and distributed among 60 PYPs to judge their familiarity with the words. The use of subjective assessment of familiarity was important, in addition to the objective frequency measure, because students in foreign language learning contexts may not be familiar with words that are considered frequent in natural language use. Only the words that scored 90%–100% in familiarity were selected for the study purpose.

The final list of stimuli consisted of 20 nouns, half of which were monomorphemic (e.g., pencil) while the other half were compounds (e.g., airport). Half the monomorphemic nouns translated into monomorphemic nouns in Arabic while the translation equivalents of the other half were compound nouns. Likewise, half the compound nouns were translated into monomorphemic nouns in Arabic whereas the other half had compound nouns as translation equivalents. The variation in translation equivalents aimed to create cases of cross-language lexical matches and mismatches in morphological structure for the sake of comparison.

Considering that transparent compound nouns (=the meaning of the compound word is consistent with the meanings of the constituents) are processed differently than opaque compound nouns (=the meaning cannot be constructed by directly combining the meanings of the individual constituents) (e.g., MacGregor & Shtyrov, 2013; Schmidtke, van Dyke & Kuperman, 2018), and that concatenated compounds are processed differently than hyphenated compounds (e.g., Häikiö, Bertram & Hyönä, 2011), all the English compound stimuli in the current study were transparent and concatenated. They also consisted of two nouns that represented two free morphemes. The list of 20 stimuli is provided in Table (1), and the four types of stimuli will be referred to as shown in Table (2).

Likewise, the Arabic translation equivalents of the study stimuli that were in the compound form were transparent and consisted of two free morphemes. As for concatenation, Arabic compounds are written as two separate words, with each free morpheme represented as one word.

Finally, it is worth noting that a one-way ANOVA comparison of mean log frequency (van Heuven, Mandera, Keuleers & Brysbaert, 2014) of each of the four types of stimuli proved insignificant

($F=1.182$; $P=0.348$). This shows that the words in each type did not differ with respect to frequency in L2.

Table 1. Experimental Stimuli

English compound nouns with monomorphemic Arabic equivalents	English compound nouns with compound Arabic equivalents	English monomorphemic nouns with monomorphemic Arabic equivalents	English monomorphemic nouns with compound Arabic equivalents
Airport	Bedroom	Carpet	Ambulance
Drugstore	Birthday	Medicine	Cousin
Headache	Cardboard	Picture	Diagram
Newspaper	Football	Salary	Pencil
Earthquake	Moonlight	Ticke	Nephew

Table 2. Types of stimuli

Term	Explanation	Example
Compound + Mono	English <i>compound</i> noun with Arabic <i>monomorphemic</i> equivalent	airport مطار
Compound + Compound	English <i>compound</i> noun with Arabic <i>compound</i> equivalent	bedroom غرفة نوم
Mono + Mono	English <i>monomorphemic</i> noun with Arabic <i>monomorphemic</i> equivalent	carpet سجادة
Mono + Compound	English <i>monomorphemic</i> noun with Arabic <i>compound</i> equivalent	ambulance سيارة إسعاف

Procedure

Experiment 1 included a free recall task through which 200 participants (100 PYPs and 100 Seniors) were auditorily presented with the target stimuli using VLC Media Player via the classroom computer (HP Elite 7100 Microtower PC with a Core 2.93 GHz Intel Core i3 CPU Processor). The participants listened to each stimulus once with a period of 5 seconds separating the presentation of each stimulus and another. The participants were tested in groups, but each participant completed the task individually. In order to counteract potential serial position effects and semantic proximity effects, the stimuli were randomized across groups of participants. The different lists of randomized stimuli were created by the researchers.

After listening to the list, the participants were requested to write down as many words as they could remember using the paper

and pencils provided. The students listened to the 20 target stimuli in addition to 2 buffer words at the beginning of the list and 2 other buffer words at the end of the list. Prior to the task, the participants were given clear instructions that they would be required to recall the target words after listening to the whole list. Additionally, a list of 10 words was used for practice prior to the experimental task and to adjust the adequate level of loudness the stimuli should be presented with as the stimuli were presented via loudspeakers. Upon the completion of the experiment, the answer sheets were collected. One point was assigned for every correctly recalled word while incorrect responses and buffer words were not scored. It must be noted that words with minor spelling deviations that did not affect their accurate interpretation were considered correct if they were truly part of the recall list.

It is important to note that we presented the stimuli auditorily in the both Experiments (1) and (2) in order to minimize or practically eliminate visual cues as a means of producing associations. We chose to present words auditorily so as to activate word meanings directly from their phonological representations rather than from visual cues. Given that our focus was on the morphology of items, auditory representations appeared to provide the most direct route towards understanding the role of meaning based on auditory cues.

Results

In order to answer the research question, Statistical Package for Social Sciences (SPSS) – version 25 was used for the necessary statistical comparisons. The results of these comparisons are presented in this section.

The dependent variable in Experiment (1) is the number of words that the participants were able to recall for different word types. Each participant was supposed to recall the 20 stimuli. That is, 2,000 words were supposed to be analyzed for every group of participants. Table (2) shows the number of correct and incorrect responses for each type of stimuli. The incorrect responses were phonologically similar to the target stimuli (e.g., *lecture* for *picture*) or shared some semantic features with the target stimuli (e.g., *party* for *birthday*).

A generalized linear mixed-effects analysis was conducted by subject (word type) and level of language proficiency (i.e., PYP and Seniors). A significant effect was found for language proficiency

($F=42.926$ and $P<0.001$) in favor of the seniors and for word type ($F=2.781$ and $P=0.040$). In addition, a significant effect of the interaction between language proficiency and word type was observed ($F=11.717$ and $P<0.001$).

Table 3. Responses and percentile scores in the *recall task*

Item Type	PYP ^a				Seniors ^b			
	Correct	%	Incorrect	%	Correct	%	Incorrect	%
Compound + mono	211	40.2	314	59.8	240	49.0	248	50.6
Compound + compound	213	40.6	312	59.4	181	36.9	306	62.4
Mono + mono	192	36.6	333	63.4	240	49.0	247	50.4
Mono + compound	172	32.8	353	67.2	268	54.7	221	45.1

^a Max score 525 = ($N= 105 \times K= 5$)

^b Max score 490 = ($N= 98 \times K= 5$)

Table 4. Generalized linear mixed-effect model of word types and language proficiency (free recall task)

Parameter	B	Std. Error	T	P
Intercept	.55	.02	24.76	.000
PYP	-.22	.03	-7.16	.000
Seniors	0a	.	.	.
Compound +mono	-.06	.03	-1.80	.073
Compound +compound	-.18	.03	-5.63	.000
Mono+ mono	-.06	.03	-1.76	.078
Mono+ compound	0a	.	.	.
PYP * compound +mono	.13	.04	3.00	.003
PYP * compound +compound	.25	.04	5.85	.000
PYP * mono+ mono	.09	.04	2.14	.032
PYP * mono+ compound	0a	.	.	.
Seniors * compound +mono	0a	.	.	.
Seniors * compound + compound	0a	.	.	.
Seniors * mono+ mono	0a	.	.	.
Seniors * mono+ compound	0a	.	.	.

a. This parameter is set to zero because it is redundant.

Based on these findings, Tukey HSD pairwise comparisons were conducted for the overall participants as shown in Table (4) and for

each group of participants separately as shown in Table (5). The PYP participants recalled a significantly higher number of English compound nouns with compound translation equivalents (a case of lexical match) than English monomorphemic nouns with compound translation equivalents (a case of lexical mismatch). As for Seniors, two instances of significance with a reverse pattern were noted. English compound nouns with compound translation equivalents (a case of lexical matching) were recalled significantly less than English monomorphemic nouns with compound translation equivalents (a case of lexical mismatch) and English compound nouns with monomorphemic translation equivalents (a case of lexical mismatch). Additionally, English monomorphemic nouns with monomorphemic translation equivalents were recalled better than English compound nouns with compound translation equivalents.

Table 5. Tukey HSD pairwise comparisons of word types for the overall participants

<i>Item Type</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>P</i>
Compound + mono* compound + compound	.06	.02	.050
Compound + mono * mono + mono	.02	.02	.834
Compound + mono * mono + compound	.01	.02	.955
Compound + compound * mono + mono	-.04	.02	.310
Compound + compound * mono + compound	-.04	.02	.170
Mono + mono * mono + compound	-.01	.02	.988

Table 6. Tukey HSD pairwise comparisons of word types for each group of participants

<i>Item Type</i>	<i>PYP</i>			<i>Seniors</i>		
	<i>Mean Difference</i>	<i>Std. Error</i>	<i>P</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>P</i>
Compound + mono *	-.00	.03	.999	.12*	.03	.001
compound + compound						
Compound + mono *	.04	.03	.619	-.00	.03	> .999
mono + mono						
Compound + mono *	.07	.03	.062	-.06	.03	.287
mono + compound						
Compound + compound *	.04	.03	.537	-.12*	.03	.001
mono + mono						
Compound + compound *	.08*	.03	.044	-.18*	.03	< .001
mono + compound						
Mono + mono *	.04	.03	.578	-.06	.03	.303
mono + compound						

Experiment (2) – Word Association

Participants

A total of 200 undergraduates voluntarily participated in the study. The participants, half of whom were PYPs while the other half were Seniors, had the same characteristics in Experiment 1. It is worth noting that different participants than those who participated in Experiment (1) performed Experiment (2) because both experiments used the same stimuli.

Materials

Experiment (2) used the same stimuli as Experiment (1).

Procedure

Experiment 2 was based on a discrete word association task that was completed by 100 PYPs and 100 Seniors. The students were auditorily presented with the experimental stimuli using VLA Media Player via the classroom computer (HP Elite 7100 Microtower PC with a Core 2.93 GHz Intel Core i3 CPU Processor) and were asked to write the first English word that comes to their mind in relation to each stimulus right after listening to it in the charted papers provided to them. The participants listened to each stimulus once with a period of 10 seconds separating the presentation of each stimulus and another. The participants were tested in groups, but each participant completed the task individually. Similar to experiment (1), the lists of stimuli were randomized across groups. The participants were not allowed to write Arabic words and were instructed to avoid proper nouns and abbreviations. Following a similar pattern to Experiment 1, the students listened to the 20 target stimuli in addition to 2 buffer words before the stimuli and 2 other buffer words after the stimuli. They had also practiced the task with 10 practice words prior to the task. After the task completion, the answer sheets were collected for analysis.

Results

In order to answer the research question, Statistical Package for Social Sciences (SPSS) – version 25 was used for the necessary statistical comparisons. The results of these comparisons are presented in this section.

In the word association task, each participant was supposed to write one word that is closely associated for each of the 20 stimuli. In other words, 2,000 words were supposed to be analyzed for every group of participants. However, the PYPs' responses stood at 1,466 and the Seniors' at 1,626 as the participants did not supply associations for some stimuli.

The discrete word association task was statistically analyzed at two levels. At one level, the mean of association strength was compared across word types within PYPs and Seniors. Association strength was defined in terms of the strength presented by the words most highly associated to the stimuli. The proportion associated with the word most often generated in response to the stimulus word is considered the highest association for a given stimulus word. For instance, if 38 out of 100 participants' first association with 'moonlight' is 'night', the word 'moonlight' gets a word association strength of 38, if no other words were mentioned more frequently. The mean highest association for each word type was computed. Misspelled words were corrected when the provided spelling was clear enough for accurate interpretation. Table (6) shows the mean and standard deviation for word association strength.

Table 7. Mean and standard deviation of association strength

<i>Word Types</i>	<i>PYP</i>		<i>Seniors</i>	
	<i>Mean</i>	<i>Standard Deviation</i>	<i>Mean</i>	<i>Standard Deviation</i>
Compound + mono	18.20	9.58	21.00	8.06
Compound + compound	17.00	11.00	17.80	13.65
Mono + mono	17.00	10.91	21.00	9.88
Mono + compound	12.60	9.40	16.40	6.80
Total	16.20	9.66	19.05	9.35

A linear mixed-effects analysis was conducted by subject (word type) and level of language proficiency (i.e., PYP and Seniors). No significant difference was noted for language proficiency ($F=0.797$ and $P=0.379$) or word type ($F=0.511$ and $P=0.678$). Additionally, the interaction between both variables failed to reach significance ($F=0.053$ and $P=0.984$).

At another level, the number of associations across word types was examined. In this case, the word 'moonlight,' for instance, would have a value of 40 if it yielded 40 different associations.

Table 8. Linear mixed-effect model of word type and language proficiency (association strength)

<i>Parameter</i>	<i>B</i>	<i>Std. Error</i>	<i>t</i>	<i>P</i>
Intercept	16.40	4.51	3.63	.001
PYP	-3.80	6.40	-0.60	.556
Seniors	0b	0	.	.
Compound + mono	4.60	6.39	0.72	.476
Compound + compound	1.40	6.39	0.22	.828
Mono + mono	4.60	6.39	0.72	.476
Mono + compound	0b	0	.	.
PYP * compound + mono	1.00	9.03	0.11	.912
PYP * compound + compound	3.00	9.03	0.33	.742
PYP * mono + mono	-0.20	9.03	-0.02	.982
PYP * mono + compound	0b	0	.	.
Seniors * compound + mono	0b	0	.	.
Seniors * compound + compound	0b	0	.	.
Seniors * mono + mono	0b	0	.	.
Seniors * mono + compound	0b	0	.	.

Table 9. Mean and standard deviation of number of associations

<i>Word Types</i>	<i>PYP</i>		<i>Seniors</i>	
	<i>Mean</i>	<i>Standard Deviation</i>	<i>Mean</i>	<i>Standard Deviation</i>
Compound + mono	35.00	5.96	30.60	1.82
Compound + compound	32.60	5.46	36.00	8.49
Mono + mono	38.00	5.34	33.40	3.85
Mono + compound	27.80	5.12	35.60	7.44
Total	33.35	6.32	33.90	5.96

A linear mixed-effect model of word types and language proficiency was conducted for the number of associations. Similar to association strength, no significant differences were noted for language proficiency ($F=0.091$ and $P=0.765$) or word type ($F=0.919$ and $P=0.443$) on the number of associations. As for the interaction between the two variables, the difference was on the verge of significance ($F=2.806$ and $P=.055$).

Because the difference in interaction was on the verge of significance, Tukey HSD pairwise comparisons were conducted as shown

in Tables (10) and (11). Similar to association strength, the pairwise comparisons for the number of associations did not reveal any significant differences. The only exception was for the PYPs who provided a significantly higher number of associations for English monomorphemic compounds with monomorphemic translation equivalents (a case of lexical matching) than the English monomorphemic nouns with compound translation equivalents (a case of lexical mismatching).

Table 10. Linear mixed-effect model of word type and language proficiency (number of association)

<i>Parameter</i>	<i>B</i>	<i>Std. Error</i>	<i>t</i>	<i>P</i>
Intercept	35.60	2.58	13.82	<.001
PYP	-7.80	3.64	-2.14	.040
Seniors	0b	0	.	.
CN + Single	-5.00	3.64	-1.37	.179
CN + Multi	.40	3.64	.11	.913
Mono + Single	-2.20	3.64	-.60	.550
Mono + multi	0b	0	.	.
PYP * CN + Single	12.20	5.15	2.37	.024
PYP * CN + Multi	4.40	5.15	.85	.399
PYP * Mono + Single	12.40	5.15	2.41	.022
PYP * Mono + multi	0b	0	.	.
Seniors * CN + Single	0b	0	.	.
Seniors * CN + Multi	0b	0	.	.
Seniors * Mono + Single	0b	0	.	.
Seniors * Mono + multi	0b	0	.	.

Table 11. Tukey HSD pairwise comparisons of word types for the overall participants

<i>Item Type</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>P</i>
Compound + mono * compound + compound	-1.50	2.73	.946
Compound + mono * mono + mono	-2.90	2.73	.715
Compound + mono * mono + compound	1.10	2.73	.978
Compound + compound * mono + mono	-1.40	2.73	.956
Compound + compound * mono + compound	2.60	2.73	.777
Mono + mono * mono + compound	4.00	2.73	.469

Table 12. Tukey HSD pairwise comparisons of word types for each group of participants

<i>Item Type</i>	<i>PYP</i>			<i>Seniors</i>		
	<i>Mean Difference</i>	<i>Std. Error</i>	<i>P</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>P</i>
Compound + mono *	2.40	3.46	.898	-5.40	3.81	.508
compound + compound						
Compound + mono *	-3.00	3.46	.822	-2.80	3.81	.882
mono + mono						
Compound + Single *	7.20	3.46	.202	-5.00	3.81	.569
mono + compound						
Compound + compound *	-5.40	3.46	.428	2.60	3.81	.902
mono + mono						
Compound + compound *	4.80	3.46	.526	.40	3.81	>.999
mono + compound						
Mono + mono *	10.20*	3.46	.043	-2.20	3.81	.938
mono + compound						

Discussion

The current study aimed to examine if the morphological structure of L1 translation equivalents influences the processing of L2 words. The Arabic-English participants, who were recruited from two levels of L2 proficiency, completed a free recall task and a discrete word association task using English monomorphemic and compound nouns that matched or mismatched the morphological structure of their Arabic equivalents. The statistical comparisons showed some influence for word type in the free recall task and the number of associations. Among the PYPs, a facilitatory effect was noted for English compound nouns with Arabic compound equivalents (a case of lexical matching) over English monomorphemic nouns with Arabic compound equivalents (a case of lexical mismatching) in the free recall task. Additionally, the PYPs provided a higher number of associations for the English monomorphemic nouns with monomorphemic translation equivalents (a case of lexical matching) than the English monomorphemic nouns with compound translation equivalents (a case of lexical mismatching) in the discrete word association task. As for Seniors, English compound nouns with Arabic compound equivalents (a case of lexical matching) exhibited a reverse pattern of results as they were recalled significantly

less than English monomorphemic nouns with Arabic compound equivalents (a case of lexical mismatching) and less than English compound nouns with Arabic monomorphemic equivalents (a case of lexical matching). Additionally, the Seniors recalled a significantly higher number of English monomorphemic nouns with monomorphemic translation equivalents (a case of lexical matching) than English compound nouns with Arabic compound translation equivalents.

The two cases of advantage for lexical matching over lexical mismatching among PYPs in the free recall task and the discrete word association task align with our predictions and with Levy, Goral, and Obler's (2007) claim that L2 learners are particularly sensitive to the morphological structure of L1 equivalents. This finding also supports earlier studies (e.g., Cheng, Wang & Perfetti, 2011; Holmquist, 2016; Ko, Wang & Kim, 2011) that showed a facilitatory effect for cases of lexical matching over cases of lexical mismatching. As for Seniors, the finding that two cases of lexical mismatching was recalled better than a case of lexical matching is not in line with our predictions although it could still be used to argue for a continued influence for L1 morphological structure (Levy, Goral & Obler, 2007).

Another interesting case of significant difference is the Seniors' recall of more English monomorphemic nouns with Arabic monomorphemic equivalents (a case of lexical matching) than English compound nouns with Arabic compound equivalents (a case of lexical matching). This finding can somehow be used to support the morphological decomposition model (e.g., Taft & Forster, 1975) since this is a case of compound nouns being processed differently than monomorphemic nouns. However, the fact that PYPs did not exhibit a similar pattern of results as compared to Seniors lends support to the interaction model of morphological processing (Caramazza, Laudanna & Romani, 1988; Taft, 1994) as the model allows for a number of variables to influence the processing of multi-morphemic items. It is possible that the fact that the PYPs have been enrolled in an intensive English program involving explicit instruction of formal features, including morphological structure, for three semesters has helped them process monomorphemic and compound nouns similarly. It is documented in the second language acquisition literature that English as a medium of instruction programs needs to be supplemented with some focus on form instruction (Lightbown & Spada, 2013).

In this context, it is important to discuss the influence of language proficiency on the results. First, the fact that only five cases of significant differences were observed in the results across the two groups of participants and the two tasks may reflect the participants' relatively high proficiency level. As explained earlier, the PYPs in the current study have passed B1 and are studying towards B2 according to the Common European Framework. The Seniors completed the B2 level and studied their majors for three more years in English. Perhaps, conducting the experiments with participants with a lower level of proficiency would have led to different results. Second, the fact that a facilitatory effect for lexical matching was noted only among the PYPs seems to lend support to the Revised Hierarchical Model (Kroll & Stewart, 1994) which postulates that increased L2 proficiency may reduce the bilinguals' reliance on the L1. This finding also seems to partially align with some earlier studies (e.g., Elston-Güttler, Paulman & Kotz, 2005) which support an L1 influence for learners of lower proficiency, not those of higher proficiency. Third, the finding that PYPs recalled more English compound nouns with Arabic compound equivalents than English monomorphemic nouns with Arabic compound equivalents while Seniors showed a reverse pattern could reveal a special sensitivity to the formal structure of words among participants of lower proficiency. Compound nouns seem to be particularly memorable among low-proficient language learners due to the fact that they have fewer competitors in memory and a smaller «fan» in terms of associated words as compared to those with higher levels of proficiency (Altarriba & Bauer, 2004).

As for the results of the word association task, no significant differences were noted for word type or language proficiency when association strength was considered and only one case of comparison reached significance among the PYPs when the number of associations was considered. Although these results are not in line with our predictions, they support Heidari-Shareza M., and Tavakoli M. (2016) who found an influence for lexical mismatches in certain tasks (e.g., receptive knowledge of meaning and form and of associations), but not in other tasks that involved the productive word association task. Heidari-Shareza M., and Tavakoli M. (2016) interpreted this finding in terms of the nature of the difference between the lexicalized and non-lexicalized stimuli they used. They explained that the difference between these two types of stimuli was mainly semantic as non-lexicalized

words incorporate more semantic components than lexicalized ones. This difference is likely to show more clearly in meaning-dependent tasks. Hence, the task type features as an important variable in lexicalization studies.

Interestingly, the results of the word association task can also be interpreted in terms of the difference in the organization of the mental lexicon in English and Arabic since the word association task directly taps into the associations in the mental lexicon. As proved earlier (Boudelea, 2014; Boudelea & Marslen-Wilson 2001, 2013, 2015), the Arabic mental lexicon is morphemic because Arabic, unlike English, is a nonconcatenative language that superimposes morphemic units upon each other in word formation processes, resulting in morphologically complex surface forms with discontinuous morphemes. Concatenative languages, like English, to the contrary, form morphologically complex words in a linear fashion, which preserves an influential impact for semantic variables, on the structure of the mental lexicon. Hence, the word association task may not be the best fit for studies examining the effect of lexicalization mismatching between a concatenative and a non-concatenative language, particularly when the focus is on morphological structure. It is worth noting that the finding that the word association task may behave differently in English (concatenative language) than Arabic (non-concatenative language) was recently pointed out in two studies on language and emotion (El-Dakhs & Altarriba, 2018; 2019).

While comparing the results of the current study with earlier ones, it is important to note two methodological differences. First, earlier studies (e.g., Jiang, 2002; Paribakht, 2005; Chen & Truscott, 2010; Chen, Wang & Perfetti, 2011) mainly relied on tasks that involved reading while the current study employed two tasks that presented the stimuli auditorily to the participants. The difference in modality may have affected the findings of the current study since K. Elston-Güttler, S. Paulman and S. Kotz (2005) suggested that the locus of activation for L1 equivalents is probably orthographic. Second, the current study focused on the morphological structure of L1 and L2 words and is thus more comparable to studies targeting the morphological aspects (i.e., Chen, Wang & Perfetti, 2011; Holmquist, 2016; Ko, Wang & Kim, 2011). In this regard, Chen C., Wang M., and Perfetti C. (2011) and Ko I., Wang M., and Kim S. (2011) used a different type of stimuli

than the current study as their L2 stimuli either had L1 equivalent words or were non-lexicalized in L1. This type of L1-L2 difference may trigger a stronger L1 influence than is the case in the current study where L2 words always mapped to L1 words. As for Holmquist K. (2016), the study involved a translation recognition task, a task that may boost the L1 influence by placing learners in a more bilingual mode where the two languages are active in the bilingual's mind (Grosjean, 2001).

Conclusion

The current study aimed to examine the influence of L1 translational activation on L2 processing with respect to morphological structure using a free recall task and a discrete word association task. The results showed some L1 influence on L2 processing. The influence was facilitatory in two comparisons among the participants of lower proficiency whereas it was inhibitory in two comparisons among the participants with higher proficiency. The results generally support Levy, Goral, and Obler's (2007) claim that L2 learners exhibit sensitivity to the morphological structure of L1 words. Additionally, the results of the current study are aligned with the Revised Hierarchical Model (Kroll & Stewart, 1994) and a number of earlier studies (e.g., Elston-Güttler, Paulman & Kotz, 2005) that predicted a stronger L1 facilitatory influence among participants with lower proficiency. Likewise, the results lend support to the interaction model of morphological processing (Caramazza, Laudanna & Romani, 1988) since the language proficiency seemed to serve as a strong determinant of the decomposition of compound nouns.

In addition to the influence of language proficiency, another important modulating factor to lexicalization studies turned out to be task type. Contrary to the free recall task, the word association task failed to show any significant differences for word type or language when association strength was considered and produced differential behavior for only one word type when the number of associations was examined. This finding aligned with Heidari-Shareza and Tavakoli's (2016) claim that different tasks can show varied effects in lexicalization studies. This finding was also interpreted in light of the different organizational structure of the mental lexicon in English and Arabic,

being a concatenative and a non-concatenative language respectively (Boudelea, 2014; Boudelea & Marslen-Wilson 2001, 2013, 2015).

Based on the study results, a number of recommendations can be proposed. Theoretically, the influence of translational activation may be task-dependent. Hence, it is recommended to use a variety of tasks before making any generalizations. Practically, it is highly recommended that language teachers pay special attention to L2 words that mismatch morphologically with their L1 translation equivalents at lower levels of proficiency since this type of words seems to cause special challenges for learners. As for future research directions, it is recommended to conduct more research into the effect of lexicalization mismatching on L2 word processing across populations of different levels of language proficiency and backgrounds. It is particularly recommended to examine the effect of lexical mismatching using a gender-balanced sample and a large number of stimuli to avoid the limitations of the current study.

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АНОТАЦІЯ

Мета. Дослідження спрямоване на вивчення відповідності впливу морфологічної структури першої мови (L1) на оперування словами другої мови (L2).

Матеріали & Методи. Задля досягнення вказаної мети досліджено виконання 400 двомовними арабсько-англійськими респондентами тестів на спонтанне згадування та вільні вербальні асоціації за допомогою мови L2. Відповідні стимули склали досліджувані випадки лексичних збігів та розбіжностей. **Результати.** Отримані результати тесту на спонтанні пригадування продемонстрували ефект сприяння щодо лексичної відповідності в одному порівнянні для респондентів з більш низьким рівнем володіння мовою. Водночас лексична відповідність призводила до гальмівного ефекту у двох інших порівняннях для учасників з більш високим рівнем володіння мовою. Крім того, учасники з більш високим рівнем мови, як правило, згадували більше слів, ніж учасники з нижчим рівнем, і згадували мономорфні слова за значно іншим сценарієм, ніж мультиморфні слова в межах одного порівняння. Що стосується результатів тесту на вільні вербальні асоціації, то вони не виявили статистичної достовірності для типів слів або рівнів володіння мовою з огляду на оцінку сили асоціативного зв'язку. Тільки коли при аналізі було враховано кількість асоціацій, сприятливий ефект щодо лексичної відповідності було виявлено в одному порівнянні на вибірці з числа учасників із низьким рівнем мови.

Висновки. Отримані результати, в цілому, підтверджують твердження, що студенти L2 демонструють чутливість до морфологічної структури слів з мови L1. Результати також свідчать на користь моделі щодо процесуальності морфології та моделі двомовного лексикону, які мають в центрі уваги вплив рівня володіння мовою на мовленнєве оперування.

Ключові слова: лексика, морфологія, білінгвізм, знання мови, ментальний лексикон.

Эль-Да Дина Абдель Салах, Аль-Ходар Марам, Алвазан Раван & Альтариба Жаннет. Влияет ли морфологическая структура уровня владения языком L1-эквивалентов на обработку слов уровня L2? Доказательства арабско-английских билингвов

АННОТАЦИЯ

Цель. Исследование направлено на изучение соотношения влияния морфологической структуры первого языка (L1) на оперирование словами второго языка (L2).

Материалы и методы. С этой целью 400 арабо-английских билингвов, которые владеют двумя уровнями языка, выполнили тесты на спонтанное воспоминание и свободные вербальные ассоциации на уровне владения языком (L2). Стимулы представляли собой случаи лексического совпадения и несовпадения. Результаты. Результаты теста на свободные воспоминания продемонстрировали эффект облегчения лексического сопоставления в одном сравнении для участников с более низким уровнем владения языком.

В то же время лексическое сопоставление привело к тормозящему эффекту в двух сравнениях для участников с более высоким уровнем владения языком. Кроме того, участники с более высоким уровнем владения языком, как правило, вспоминали больше слов, чем участники с более низким уровнем владения языком, и вспоминали мономорфные слова значительно иначе, чем мультиморфемные слова в рамках одного сравнения. Что касается результатов теста на свободные вербальные ассоциации, то они не выявили статистической достоверности для типов слов или уровня владения языком с точки зрения оценки силы ассоциативной связи. Только когда при анализе было учтено количество ассоциаций, был зафиксирован благоприятный эффект по отношению к лексическому соответствию в одном сравнении на выборке из числа участников с низким уровнем владения языком.

Выводы. Полученные результаты, в целом, подтверждают утверждение, что учащиеся с уровнем владения языком (L2) демонстрируют чувствительность к морфологической структуре слов (L1). Результаты также свидетельствуют в пользу модели процессуальности морфологической обработки и модели двуязычного лексикона, в центре внимания которых – влияние уровня владения языком на речевое оперирование.

Ключевые слова: лексика, морфология, билингвизм, знание языка, ментальный лексикон.