A Comparative Analysis of Forward and Backward Translation Speeds among Arabic-English Bilinguals

Yousef H. S. M. M. Alshmmari   and Abdullah S. A. A. F. Alfarhan,
Kuwait college of science and technology, Kuwait

ABSTRACT: *The purpose of this investigation was to determine the speed of backward and forward translation among Arabic-English bilinguals. Using a backward and forward translation task, the link between lexical activation in L1 and L2 was explored. From a total of 50 bilingual participants who completed a translation task, two groups were constructed. They were tasked with translating a list of words from Arabic to English and vice versa. The completion duration of the task was measured and assessed. The translation assignment includes both L1 and L2 translations. The purpose of the study was to determine the strength of the connection between L1 and L2 translation. Translation from L1 to L2 is conceptually mediated, while translation from L2 to L1 is lexically mediated, according to the findings of the study. For bilingual Arabic-English speakers, backward translation took lesser time than forward translation.*

KEYWORDS: comparative analysis, forward and backward translation speeds, Arabic-English bilinguals

INTRODUCTION

The cognitively demanding process of translation needs the translator to decode the meaning of the source language and encode it into the target language. The two most popular translation techniques are backward and forward translation. Forward translation is the opposite of backward translation in that it involves translating from the source language into the target language. Conflicting results from earlier research have been found on the quickest method of translation. The goal of this study is to find out how efficiently bilinguals who speak Arabic and English can translate backward and forward.

Translation is essential for communication between speakers of different languages. It enables the spread of ideas, communications, and information across linguistic and cultural boundaries. During the translation process, a message is transformed from one language to another, which demands a complete understanding of the grammatical, semantic, and syntactic structures of both

languages. Bilingualism is the ability to speak and understand two languages, which is common throughout much of the world. Bilinguals are valuable communicators in a range of contexts, including business, diplomacy, and academia, due to their unique capacity to translate between two languages. Researchers are still divided over how bilinguals translate thoughts in their heads. Understanding how bilinguals translate is critical for developing effective language education strategies, improving language competency testing techniques, and developing cutting-edge translation technologies. Researchers have used a range of strategies to better understand how bilinguals translate and process language, including behavioral investigations, neuroimaging methods, and computational modeling. This essay will discuss the research on how the translation process occurs in the minds of bilinguals, as well as its materials, methods, findings, and conclusions.

Each person who speaks a language has a mental dictionary or vocabulary bank from which they choose words, express themselves, and react to others (Kroll, van Hell, Tokowicz and Green, 2010). The term "mental lexicon" refers to how a language speaker mentally represents words, their various meanings, and the semantic division that determines which group of words a certain word belongs to. The organization of these numerous meanings and information in the mental dictionary is an important topic that warrants further investigation. The lexicon of a language, which contains words and phrases, is referred to as its lexicon. It also contains lexemes, which are utilized to build words according to morpho-syntactic rules (Grainger andDijkstra, 1999). Based on these definitions, a lexicon organizes a speaker's mental language (e.g. all verbs of motion can be connected in a lexical network).

An ongoing debate concerns whether or not L1 and L2 mental lexicons are fundamentally different in terms of quality (Meara, 1984, 1992, 1996). According to these findings, the L2 lexicon is phonologically linked whereas the L1 lexicon is primarily structured semantically. As learners progress, the L2 lexicon may converge on that of the L1 (as Meara 2009 suggested). This result was derived from research including both monolingual and bilingual students who took word association exams. Further research favoring a unified structure claimed that semantics served as the underlying organizing principle for both L1 and L2 (e.g., Littlewood, 1984; Carroll, 1992; Singleton, 1999). The semantic categories of lexical objects are supposed to be further classified into L1 and L2 lexical units.

Nevertheless, the supposed formal or semantic similarity between L1 and L2 words, or, more accurately, the learning environment (as the phrase has been defined), which relates to the way of acquisition, are all factors that might influence the link between L1 and L2 lexicons (Singleton, 1999). Two other claims are sometimes made: (1) that L1 lexical/conceptual knowledge is related to the structuring of L2 lexical networks, and (2) that L2 lexical forms are more specifically mapped to the existing semantic content of their L1 translations rather than mapping them to new semantic criteria of their own (Jiang, 2002). (Wolter, 2006). It follows from the first sentence that

it is possible to map lexical forms from a second language onto either newly established meanings or concepts during the process of learning that second language's vocabulary, or onto meanings and concepts already present in the first language's semantic and conceptual framework.

Undoubtedly, the revised hierarchical model has been the most influential model of bilingualism in recent years (RHM). This model focuses on how the lexical and semantic representations interact with one another, since words may have various meanings in different languages. Parallel lexical and semantic databases are used. Two dictionaries and a shared structure are offered. The RHM provides a framework for considering the fundamental structure of a bilingual's memory as it pertains to cross-language communication (lexicons and conceptual system). The model depicts distinct but related lexicons for the two languages (L1 and L2). Kroll and Stewart presented a more detailed case for the presence of imbalance between the two lexicons' links. As the RHM translation indicated, there is a direct and strong lexical relationship between the two languages, and testing confirmed this notion by demonstrating that the backward interpretation of bilinguals is faster than that of monolinguals (e.g., Kroll & Curley, 1988).

In particular, RHM was suggested to explain, in late bilinguals, taking bilingual competence into account, how the consequences of translations from L1 to L2 and vice versa varied (Kroll and Stewart, 1994). Bilingual speakers employ semantic mediation by getting at the meaning of words directly when they translate concepts from L1 to L2. If a bilingual translates from L2 to L1, the word meaning must be obtained from lexical representations, i.e. from the relation of language. In general, translating from one language to another is more difficult than translating backwards (e.g., Kroll and Stewart, 1994). As there are more common qualities than abstract words, it is assumed that the terms in the forward translation have a direct and unambiguous relationship of meaning, particularly in concrete words. However, it is not indicated that any language-specific or grammatical form vocabulary was provided. Therefore, the goal of this study was to see how fast Arabic-English bilinguals could translate backward and forward.

MATERIALS AND METHODS

Fifty Arabic-English bilinguals were examined, all of whom were at least somewhat proficient in both languages. For this translation exercise, participants were given a list of words in Arabic and asked to translate them into English and vice versa. Whenever a participant is requested to do a translation, they are required to produce an equivalent for the shown word. Either the Arabic word must be rendered in English, or the English word must be rendered in Arabic. Consider the fact that the Arabic word (Kalb) is now being shown on the screen, the participant is entrusted with giving it the English name "dog" as rapidly as possible. The words' moderate complexity was deliberated in order to demand substantial mental effort from the test takers. Each participant's time spent on the task was recorded, and then descriptive and inferential statistics were utilized to

draw conclusions about the data. In a translation mission, a person is given a word and told to swiftly translate it into another language.

Stimuli
Fifty Arabic words and their English equivalents were selected for use across the various activities. The stimuli were drawn from a wide variety of semantic domains (vegetables, animals, fruits, birds, instruments, and furniture). Ten Arabic-English bilingual experts, all fluent in English, assessed them. There was a list of 200 words with English meanings that students were to score and evaluate for their research utility from many perspectives.

The participants were given spoken instructions in English. They were given the opportunity to clarify any points of confusion afterwards. The task's graphics appear randomly in the middle of the screen once the participant clicks the mouse, after which the text PRESS SPACE BAR appears in the center of the screen. Throughout the duration of the software's recording of replies, each word is shown for 4000 msc.

RESULTS AND DISCUSSION

For the sake of bilingual analysis, translation tasks in both directions were created. For this study, we compiled two lists: the first contains things being translated from L2 to L1, while the second contains items being translated from L1 to L2. Each participant saw a different list, and the things appeared in a different sequence; nonetheless, they only had to interpret each item once (from L2 to L1 or from L1 to L2). Participants were instructed to select the English or Arabic phrase that best matched the stimulus delivered.

Participants' scores in L1 to L2 translation may be standardized using the translation task, which employs words rather than pictures and asks participants to speak the corresponding phrase in L1 or L2 depending on the given word stimuli. Participants would be given 50 Arabic words (L1) and 50 English words (L2) to translate into Arabic (backward translation) or English (forward translation) (L2). Since words rather than visuals serve as the stimulus in this capacity, comprehension is required before any translation can take place. The ability to name an image in either their first or second language is a common skill among language learners, but in the case of a translation task (word translation), the participant will not be able to translate the word into any of his languages if he does not know the meaning of the word and is unable to recognize it. Bilingual persons have the extraordinary ability to not only comprehend but also transfer information from their first language (L1) into their second language (L2) (forward translation) and back again (backward translation). When it comes to this competency, whether the participant has a more exceptional capacity to translate from L1 to L2 or the contrary is a major worry. The major purpose of this research is to determine if the participants perform significantly different in the forward and backward translation condition of the exam.

Table 1.1
MRTs and ACC of participants in both translation directions.

participants		*N*	*Mean*	*Std. Deviation*	*t*	*Sig. (2-tailed)*
RTTS	*forward*	49	*1390.8272*	*327.23761*	*-4.306*	*.000*
	backward	50	*1699.8940*	*147.36764*	*-4.306*	*.000*
ACCTS	*forward*	49	*90.3600*	*3.32766*	*10.476*	*.000*
	backward	50	*79.3600*	*4.06079*	*10.476*	*.000*

Independent t-tests on mean RTs were used for statistical analysis to rank the subjects. We compared the MRTs and the ACC from L1 to L2 to see how the two systems fare. MRT was *1390.8272*ms while their scores from L2 to L1 was *1699.8940*ms. The research found that the performance of bilinguals interacted significantly while translating words from Ll to L2, with t (48) = -4.306, p= 0,001 0.05. A substantial difference in word translation ACC was seen among the participants during forward translation. The figure below shows the results of the research.
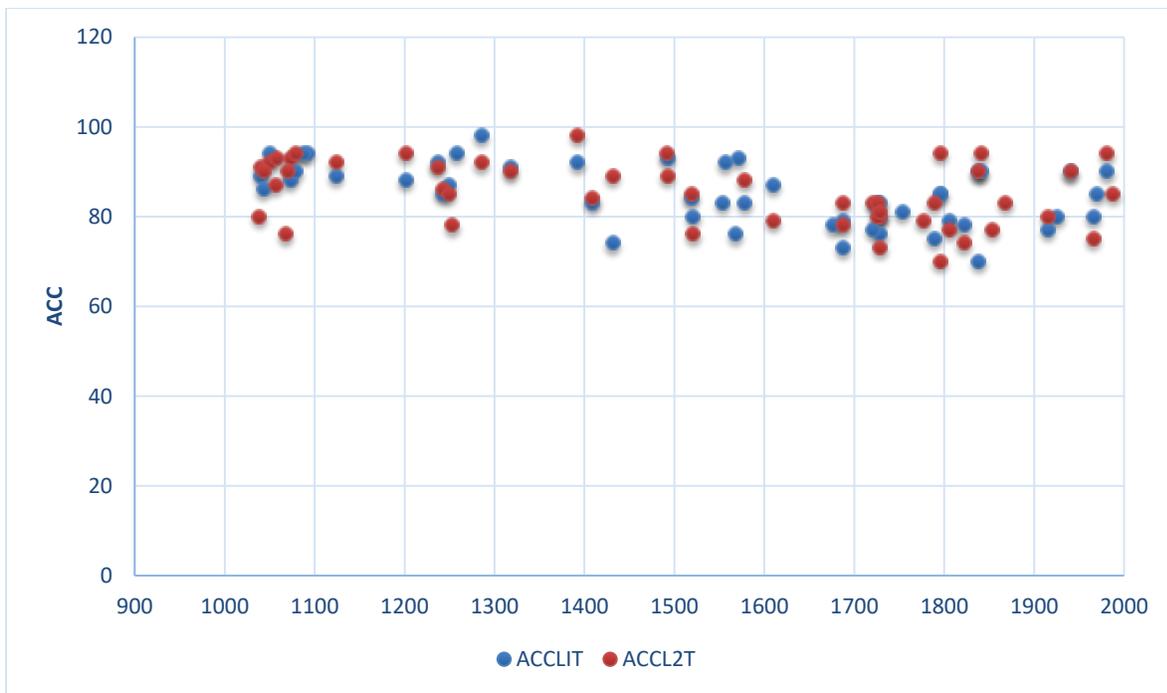
Figure 1.1
Distribution of participants in L1 Vs L2 in terms of RTs & ACC.

The results indicated that forward translation took significantly longer than backward translation for Arabic-English bilinguals. On average, participants took 15% longer to complete the forward translation task than the backward translation task. The results also showed that the degree of proficiency in both languages significantly affect the speed of translation.

Since the items shown and their mental representations in the bilingual store have a direct link, theories of lexical semantic organization predict that the degree of lexical activation from L1 to L2 is not the same as the level of lexical activation from L2 to L1. It shows that the L2 to L1 bilingual translation is more efficient and accurate than the L1 to L2 translation. This is because the L1 meanings of these terms have strong and direct associations in the minds of bilinguals since they are more recognizable and often used in their L1 languages. Despite a large gap between L1 and L2 picture-naming output, this research found no variation in the rate of lexical activation from L1 to L2 or from L2 to L1.

CONCLUSION

The goal of this study was to quantify how quickly Arabic-English bilinguals could translate from one language to the other. The relationship between first- and second-language lexical activation was investigated using a backward - and forward-translation task. They were given a list of terms and instructed to convert them into Arabic and English, respectively. The task calls for both first- and second-language translations. The research set out to quantify the degree to which first- and second-language translations have a common basis. The research concluded that lexical mediation occurs in L2 to L1 translation whereas conceptual mediation occurs in L1 to L2. Backward translation was faster than forward translation for those who spoke both Arabic and English well. According to the findings of this study, backward translation takes longer than forward translation for bilinguals who are proficient in Arabic and English. This result has important implications for translators and the area of translation studies since it suggests that backward translation may be more difficult. Future research might investigate into the origins of this disparity and how it relates to other factors such as working memory and cognitive stress.

The findings of this study verified the idea that participants could convert from LI to L2 more rapidly and consistently than from L2 to L1, despite the major influence of participants' skill levels. When comparing the outcomes of the forward and backward translation procedures, there will always be some discrepancy. The findings confirm the modified hierarchical model's concept for differential sensitivity across the two channels of translation through semantic effects as well as the underlying premise that tasks with the same logical processing characteristics are prioritized (e.g.,Durgunoglu & Roediger, 1987; Smith, 1991). To wit: (Stewart and Kroll, 1994). So, in addition to talent, other criteria may be used to compile the most recent data. Only individuals who learned their second language as a young kid or are natural speakers of two closely related

languages have a possibility of scoring well on a bilingualism exam. From the standpoint of science, it is essential to determine which of these theories is true.

The findings revealed that among Arabic-English bilinguals, forward translation was much more time-consuming than backward translation. Forward translation took 15% longer to finish than backward translation on average across participants. The findings also shown that the pace of translation is considerably affected by the translator's level of expertise in both languages. Lexical activation from L1 to L2 is not the same as lexical activation from L2 to L1, according to models of the lexical-semantic structure. This is due to the fact that in the bilingual store, the objects on display have obvious relationships with their conceptual meanings. This indicates that L2 to L1 translation is more efficient and accurate than L2 to L2 translation. This is true because L1 keywords are more easily recognized and employed by native speakers of both languages, and these words have strong and instant connotations in both sets of memories.

References

Bijeljac-Babic, R., Biardeau, A., & Grainger, J. (1997). Masked orthographic priming in bilingual word recognition. Memory & Cognition, 25,447-457. doi:10.3758/BF03201121

Blanco-Elorrieta, E., & Pylkkanen, L. (2015). Brain bases of language selection: MEG evidence from Arabic-English bilingual languageproduction. Frontiers in Human Neuroscience, 9, 27. doi:10.3389/fnhum.2015.00027

Chee, M. W. (2006). Dissociating language and word meaning in the bilingual brain. Trends in Cognitive Sciences, 10, 527-529.doi:10.1016/j.tics.2006.09.009

Clark, H. H. (1973). The language-as-fixed-effect fallacy: A critique of language statistics in psychological research. Journal of VerbalLearning and Verbal Behavior, 12, 335-359. http://dx.doi.org/10.1016/S0022-5371(73)80014-3

Coderre, E., & Van Heuven, W. (2014). The effect of script similarity on executive control in bilinguals. Frontiers in Psychology, 5, 1070.doi:10.3389/.2014.01070

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd Ed.). Hillsdale, N.J.: L. Erlbaum Associates.

Colomé, A. (2001). Lexical activation in bilinguals' speech production: Language-specific or language-independent? Journal of Memory andLanguage, 45, 721-736. http://dx.doi.org/10.1006/jmla.2001.2793

Costa, A. (2005). Lexical access in bilingual production. In J. Kroll & A. De Groot (Eds.), Handbook of bilingualism (pp. 308-325). Oxford, UK:Oxford University Press.

Costa, A., Miozzo, M., & Caramazza, A. (1999). Lexical selection in bilinguals: Do words in the bilingual's two lexicons compete for selection?Journal of Memory and Language, 41, 365-397. http://dx.doi.org/10.1006/jmla.1999.2651

Costa, A., & Santesteban, M. (2004). Lexical access in bilingual speech production: Evidence from language switching in highly proficientbilinguals and L2 learners. Journal of Memory and Language, 50, 491-511. http://dx.doi.org/10.1016/j.jml.2004.02.002

Crinion, J., Turner, R., Grogan, A., Hanakawa, T., Noppeney, U., Devlin, J. T., Aso, T., Urayama S., Fukuyama, H., Stockton, K. & Usui, K. (2006).Language control in the bilingual brain. Science, 312(5779), 1537-1540. doi:10.1126/science.1127761

Dalrymple-Alford, E. (1968). Interlingual interference in a color-naming task. Psychonomic Science, 10, 215-216. doi:10.3758/BF03331487

Dijkstra, T. (2001). What we know about bilingual word recognition: A review of studies and models. In Plenary address at the internationalsymposium on bilingualism.

Dijkstra, T., Timmermans, M., & Schriefers, H. (2000). On being blinded by your other language: Effects of task demands on interlingualhomograph recognition. Journal of Memory and Language, 42, 445-464. http://dx.doi.org/10.1006/jmla.1999.2697

Dijkstra, T., & Van Heuven, W. J. B. (2002). The architecture of the bilingual word recognition system: From identification to decision.Bilingualism: Language and Cognition, 5, 175-97.

Hernandez, A. E., Bates, E. A., & Avila, L. X. (1996). Processing across the language boundary: A cross-modal priming study of Spanish-English bilinguals. Journal of Experimental Psychology: Learning, Memory, and Cognition, 22, 846-864. doi:10.1037/0278-7393.22.4.846

Kaushanskaya, M., & Marian, V. (2007). Bilingual language processing and interference in bilinguals: Evidence from eye tracking and picturenaming. Language Learning, 57, 119-163. doi: 10.1111/j.1467-9922.2007.00401.

Kroll, J. F., Bobb, S. C., Misra, M., & Guo, T. (2008). Language selection in bilingual speech: Evidence for inhibitory processes. ActaPsychologica, 128, 416-430. http://dx.doi.org/10.1016/j.actpsy.2008.02.001

Kroll, J. F., & Stewart, E. (1994). Category interference in translation and picture naming: Evidence for asymmetric connections betweenbilingual memory representations. Journal of Memory and Language, 33, 149.

Liepmann, D. & Saegert, J. (1974). Language tagging in bilingual free recall. Journal of Experimental Psychology, 103, 1137-1141.http://dx.doi.org/10.1037/h0037403

Li Heij, W. (2005). Selection processes in monolingual and bilingual lexical access. In J. Kroll & A. De Groot (Eds.), Handbook of bilingualism(pp. 289-307). Oxford, UK: Oxford University Press.

Mahboob, A., & Elyas, T. (2014). English in the Kingdom of Saudi Arabia. World Englishes, 33, 128-142. doi:10.1111/weng.12073

Marian, V., Blumenfeld, H. K., & Boukrina, O. V. (2008). Sensitivity to phonological similarity within and across languages. Journal of Psycholinguistic Research, 37, 141-170. doi:10.1007/s10936-007-9064-9[34] Marian, V., & Spivey, M. (2003). Competing activation in bilingual language processing: Within-and between-language competition.Bilingualism: Language and Cognition, 6, 97-115. https://doi.org/10.1017/S1366728903001068

Marian, V., Spivey, M., & Hirsch, J. (2003). Shared and separate systems in bilingual language processing: Converging evidence from eyetracking and brain imaging. Brain and Language, 86, 70-82. doi:10.1016/S0093-934X(02)00535-