

Reaction Time of Semantic Unrelated Task of Arabic Language Lexical Units: A Cognitive Study

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Abstract: *Cognitive linguistics is the process of thinking. After the decoding of lexical units, memory has been responding swiftly for any stimulus in a short duration of time. The goal of the study was to investigate the relative time course of semantic unrelated of the lexical units from Arabic language into English language. The lexical units elicited by syntactically using anomalous words for 30 native subjects. Reaction Time (RT) was recorded by DMDX software while the subjects implemented the visual stimuli task in an alley environment. Reaction Time (RT) results from 400 to 2500 msec. were taken into consideration as they were the strongest results and valuable ones. Data has been subjected to statistical methods to gain accurate analysis. Based on one sample test, results have been shown that the standard measurement was of 850 msec. in the process of semantic unrelated of lexical units from Arabic language, the prime one, into English language, the target one.*

Keywords: Arabic Language, DMDX, Lexical units, Semantic unrelated, stimuli

1. Introduction

Cognitive linguistic is a branch of linguistics. It is the process of thinking. Based on background knowledge, coding, decoding, thinking, and feeding back, the subjects implemented the linguistic task swiftly within a short given duration of time. Within cognitive linguistics, the subject thinks divergently when he/she does see and / or hear the stimulus, i.e. if he/she has seen the concept stimulus "vehicle", the expectation will be multi comparisons for the subject. He/she may think about the other related features of the concept either in his/her native language as what does that concept mean as a denotative meaning or a connotative meaning by what is the nearest / closest word (network of the word) for the concept either in the native language or in the foreign language.

In semantic unrelated, the feature of Collin and Loftus's model for its enduring influence is that it provides an easy-to-understand explanation of semantic priming. Consider a lexical decision task in which a prime word and a target word are displayed on each trial. Subjects are instructed to read the prime silently and then to decide whether the target word is a correctly spelled word in English. Start with a trial in which the prime and the target are unrelated, such as "see-tiger". Reading the word "see" would cause activation to spread from the concept "see" to all its associate i.e, boat, river, fish, etc. The node corresponding to river would therefore be active, but very little if any activation would get to "tiger" because "see" and "tiger" are presumably very distant in the network. When the word "tiger" appeared, its node would be in a state of baseline activation. Lexical decision time would depend on the normal duration of the perceptual and the cognitive processes needed to decide whether or not the string of letters on the computer screen constituted a correctly spelled word in English. It is the same matter that goes in Arabic language, when the subjects implemented the current task from Arabic language into English language. The prime word was in Arabic language and the target language was in English language as well.

2. Methods

Participants:

30 native Arabic English bilingual candidates from M.A. and Ph.D. degree in English language participated in this study. With a high intermediate level of proficiency in their second language, all subjects had exposure to L2 as a medium of instructions at least for 5 years. They were provided information in the language they were capable of understanding and were explained about the aims, methods of the research and approximate duration of the testing.

Design

The study comprised on an experiment of a Lexical Decision Task (LDT) in which a condition of Translation Equivalence was presented. Hence it included different words stimuli which appeared in the middle of the screen. First, a prime word appeared during 500 msec. Second, there is a gap of a given time of 500 msec. between the prime and target words to think, and to be ready for the appearing of the coming up visual stimuli. Finally, the target English word took its place and emerged in the middle of the screen and vanished after a given 1,000 msec time duration. The whole duration of process was 2500 msec. The subject has to respond in this duration. When the time elapsed, the other stimuli emerged in the screen automatically. Though, the subjects would press the button or not, the lexical item takes its given time.

Procedures

- The subjects were selected in a comfortable position facing the 14 inches screen of HP laptop.
- The procedures were carried out on an alley environment.
- Participants instructed to be ready for the task, focused on the screen and focused on the buttons (1) and (0) on a keyboard. When the stimulus appeared on the screen, the subjects have to read the stimulus and they have to decide whether it is a word for an equivalent translation or a non-word. Words and non-words were matched in terms of lengthy and familiarity. If the word is equally fine, he/she has to press the button (1). Otherwise, the subject has to

press the button (0). After pressing any one of the keys, everything will record automatically in DMDX software program either positive or negative. Time taken, also, recorded for the process of taken a decision in each and every lexical unit in the study. The lexical decision, then, used to measure the RT in the test language.

3. Results and discussion:

Data subjected to Normal Distribution Test (NDT) in order to find either they are parametric or Non-parametric. While subjecting the data to SPSS package, it has been observed that they were parametric and NDT is the best statistical method suited for the use in this task. Therefore, the distribution of Reaction Time (RT) for Translation Equivalence (TE) in Arabic English language was analyzed statistically based on the program of SPSS and the results are as follows:

Figure 1

Semantic Un-Related Task in Arabic Language :

Reaction Time:

Reaction Time (RT) of Semantic Un-Related (SUR) in Arabic English language was analyzed as the following:

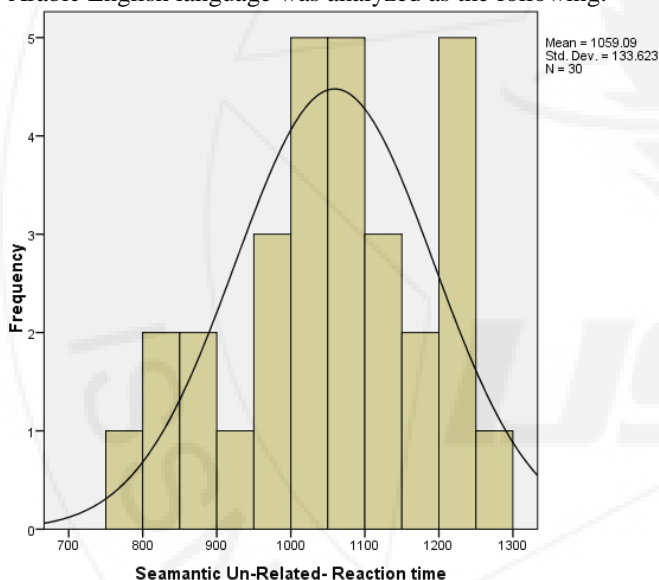


Figure 1: Histogram and frequency curve of RT of SUR in Arabic English Language.

Figure (1) represents the RT of SUR in Arabic English language and seems to be approximately normal with mean of 1059.085 and SD of 133.622.

Figure (1) ,also, has shown that the mean of the entire participants ranged in between 700 and 1300 msec. Therefore, it was noticed from the figure that the participants have spent most of the time in this task to give their feedback. The main reason behind that is the linguistic concept called non-word in both languages that might affect on the RT of the study. Representing the lexical units in the brain were more familiar as the historical and famous nouns that might affect on RT representation in the brain in this connection. The bilingual brain sees the familiar stimuli and does think more about the stimulus in many ways. The thinking, thus, goes beyond the topic in many divergent

areas. In this case, the subjects were late by responding on time. Though, the task is very easy, more time has been taken.

Table 1: test for normality using Kolmogorov Smirnov test

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
The distribution of Semantic Un-Related- Reaction time is normal with mean 1,059.09 and standard deviation 133.62.	One-Sample Kolmogorov-Smirnov Test	.852	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Due to Fig. (1), has shown the normality, it has been applied for KST for the confirmation of the normality. Hence, table (1) has shown that there was no significance because p value was .852, and that does mean there was normal distribution for the entire data of the third task of the study. Therefore, the decision was that H0 has to be remained.

Table 2: t-test between the standard measurement value and the Mean of RT in SUR of Arabic English language

One-Sample Test			
	Test Value = 1050		
	T	df	Sig. (2-tailed)
Semantic Un-Related- Reaction time	0.372	29	0.712

A hypothesis put up for the study was that the expected duration of time that the subjects have to catch the time for responding is (1050) msec. Based on the research hypothesis above, table (2), then, has shown that there was no significant among the participants in RT of SUR task in Arabic English language ($M= 1059.085$, $SD = 133.622$) condition; $t(29) = .372$, $p = .712$), and hence it may conclude that the RT of SUR task in Arabic English language was 1050 msec. Due to the reason that have mentioned earlier, the subjects have taken more much time to finalize this task comparing by the other tasks in Arabic language.

One- sample test, then, has been used for the above mentioned task using SPSS 17.6 . It was, then, one-sample test of RT in SUR of lexical items from Arabic language into English language which have been reported in table (1). The result reveals the measurement of the responding time has taken as 1059.085 msec. based on recognition type of RT experiment. Hence, there was statistically no significant emerged between the sample of RT either by the time that has taken or by the standard measurement value that has given for the study ($t(29) = -.372$, $p= .712$). In this regard, then , it is coming to the say that, the hypothesis has put up for this task in which the subject has to finalize the task in a given duration of responding time (1059.085 msec.) based on literature reviews, the task has been implemented properly and more accurately. Therefore, the predicted hypothesis has been accepted.

4. Finding

It was observed that subjects have been effected by given time to respond to the visual stimuli, because of the academic background that played a major issue. Though, most of them carried almost same degree. According to Fig.

(1), it has been observed that, the speed was slow and the task was implemented accurately in regards of the performance. This is due to the subjects compare and use the text from their own/ native language into foreign language.

5. Conclusion

The study matter concentrated on the major parameter, RT. RT is considered the central concept in SUR. Due to RT, the study focused on cognitive study as the process of thinking considered highly in this regard. Due to RT, also, there were many components including in the study such as coding the lexical units, storing, thinking, (comprehending) retrieving and / or calling the long term memory, and decoding (producing).

The current study has involved in two major factors: 1) the relative time course, and 2) the standard measurement time. In respect of relative time course, the results were ranged from 700 to 1300 msec. for the entire subjects and this has shown that the results were nearby from each other. There are some other results approached to 2500 msec. affirmatively but they were few comparing with the dense results ranged between 700-1300 msec. that emerged in NDT. Due to they were very few and they were distributed in values of 1300, 1400, 1500, till 2500 msec. they were not shown in NDT. They were shown very clear in another test called Principal Component Analysis (PCA), which will be mentioned in another paper.

In respect of measurement, there was a good measurement value by the average of 1059.085 msec. therefore, based on NDT and Test of value, it has been shown that there was a relative time course and there was a good standard measurement for the speed of the translation, in respect of translating lexical items from Arabic language into English language. The result reveals that the measurement of the responding time has taken as 1059.085 msec.

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