

EFL Lexical Knowledge and Mental Lexical Connectivity: The Case of Moroccan Learners

Dr. Khalid Soussi

Abstract: *The study at hand has attempted to describe the acquisition of three EFL lexical knowledge aspects-meaning, synonymy and collocation – across three academic levels: Baccalaureate, second year and fourth year university levels in Morocco. The research also compares the development of the three lexical knowledge aspects between knowledge (reception) and use (production) and attempts to trace their order of acquisition. This has led to the use of three main data collection tasks: translation, acceptability judgment and multiple choices. The study has revealed the following findings. First, L1 and EFL mental lexicons are connected at the lexical knowledge depth. Second, such connection is active whether in language reception or use. Third, the connectivity between L1 and EFL mental lexicons tends to relatively decrease as the academic level of the learners increases. Finally, the research has revealed a significant “order” of acquisition between the three lexical aspects, though not a very strong one.*

Keywords: vocabulary acquisition; EFL lexical knowledge; mental lexicon; lexical development.

1. Introduction

Contemporary researchers advance that lexical competence is at the center of linguistic competence (Conway, 1999; Singleton, 1999). As Gass (1988:94) observes, “*grammatical errors still result in understandable structures, whereas vocabulary errors may interfere with communication*”. Most early research on second language (SL) or foreign language (FL) vocabulary acquisition centred on the size of the mental lexicons. However, it has not generated much insight into how single words are represented in the mind, how their depth of knowledge and organisation develop, how fast they are retrieved compared to the first language (L1) mental lexicon, to mention but the major areas of SL/FL vocabulary development research.

2. Objectives of the Study

The present research set the goal of attaining five main research objectives.

The first empirical objective is to show the dependence of the foreign language mental lexicon on the first language one in its multi-faceted development. Moreover, the thesis tries to show that the L1 and FL mental lexicons are connected at all levels of lexical knowledge. Lexical meaning, synonymy and collocation are the aspects studied in relation to three content word categories: nouns, verbs and adjectives.

Second, the research mounts to reveal the relationship between the nature of the linguistic task and the connectivity of the L1 and EFL mental lexical knowledge. In other words, the study attempts to define the relationship between the connectivity of the L1 and EFL mental lexicons and the knowledge/use tasks. The thesis at hand tries to define the nature of L1/EFL lexical knowledge connectivity and the linguistic tasks.

3. Literature Review and Rationale

The present study enterprises to investigate the development of the foreign language mental lexicon within a connectionist framework (Butt and Geuder, 1998; Cook, 1992). This is to

say that the foreign language lexical knowledge is viewed to develop depending on the already existing L1 mental lexicon. It tries to show that the already acquired L1 lexical knowledge mediates and hampers the native-like development of the lexical knowledge depth and organization by Moroccan learners of English as a foreign language (EFL).

The study at hand purports to trace the development of three EFL lexical knowledge aspects by Moroccan learners belonging to three different academic levels: Baccalaureate, second-year university and fourth-year university levels. These aspects are: EFL lexical meaning, synonymy and collocation. The acquisition of these lexical knowledge aspects is traced across three content word categories: nouns, verbs and adjectives. The best examples could be the following:

- He did not hear you. He is hearing* some good music now (listening to/verb).
- I always go the oven* to by some bread in the morning (bakery/noun).
- He is a long*, handsome actor (tall/adjective).

Lexico-semantic transfer has been given considerable importance recently. However, the ultimate motive behind the objectives of the present research is to show that the EFL mental lexicon develops as a whole in connection to the L1 mental lexicon (Butt and Geuder, 1998). This is to say that all lexical knowledge aspects are, at least in the first stages of EFL vocabulary learning, connected to their “equivalents” in L1.

The examples above show that EFL content words are not only assigned the same “semantic” scope (meaning) that their ‘perceived translations’ in L1 have but they are also used as equivalent “synonyms”. “Oven” is taken to mean the same thing as “bakery” because the translation /fəRa:n/ in Moroccan Arabic includes both concepts, for example. As a result of this connection, the EFL content words are also used in inadequate “collocations”. Referring again to the examples above, the adjective ‘long’ does not collocate with the noun ‘actor’ because, in English, “tall” and “long”

are not the same concept (De Groot and Keijzer (2000); Ellis, (2000).

Given the importance given to the second and foreign language lexical knowledge depth and organization in recent research, the present study aims to meet the need of understanding how EFL lexical knowledge is developed by Moroccan learners. Moreover, there is still a need to carry out extensive, inter-disciplinary research in this field of research.

As far as the first hypothesis is concerned, there exist two main theories in the field. One claims that the L1 and FL mental lexicons develop independently and that they are related only at the conceptual level. However, there is much clash of opinion among researchers as to what conceptual knowledge is and semantic knowledge is. The second theory maintains that the two mental lexicons are connected at the semantic level (Ellis, 2000; Gass & Selinker, 2001; Pal, 2001). There has also been a significant number of comparative studies on the different natures of content word representation across languages (e.g. Ellis 2000).

There have been many studies that advance that the linguistic tasks lead to varying degrees of L1/EFL mental lexical knowledge. In language knowledge (reception) and use (production) tasks, the access and retrieval of EFL lexical knowledge has been claimed to take place through the activation of the L1 vocabulary first (e.g. Selinker, 2001 and Pal, 2001).

The second hypothesis in the research, therefore, aspires to trace the relationship between the nature of the linguistic task and L1/EFL lexical connectivity in the acquisition of EFL lexical knowledge aspects. At this stage, it is seen noteworthy to mention that recent research has revealed that the learners access lexical knowledge using two different 'routes' depending on the linguistic task. When producing a second/foreign language, the learners activate their conceptual knowledge then retrieve the L1 lexical items related to that knowledge. After that, they look for EFL translations. The present study attempts to find whether the same route explained is followed also when receiving and producing EFL (Selinker, 2001 and Pal, 2001).

4. Methodology

The study has not purported to seek any cognitive process other than what "naturally" happens in the learners' mental lexicon throughout the EFL learning experience: mental connectivity at the conceptual and lexical levels.

It tries to gain an insight into the different variables and their respective roles in connection to the acquisition of meaning, synonymy and collocation aspects of content words by the learners.

4.1. Design

The design adopted in the study at hand is a post facto design adopting a cross-sectional aspect; it does not seek to alter the linguistic behavior of the subjects in any possible way but aspires to look into the interaction of the different variables

leading to the latter at different stages along the learning experience. The research aspires to see how EFL lexical meaning, synonymy and collocation knowledge is first constructed in connection to L1 and the EFL linguistic task reflects such connectivity or independence.

The study also adopts a cross-sectional design. It attempts to elicit its data from the subjects at different stages of their English language learning experience. Therefore, the present research has resorted to a cross-sectional design for two prominent reasons. First, most Moroccan EFL learners in public institutions go through the same experience. After being exposed to a common high school English syllabus, they usually join university English departments. This guarantees that most of them undergo the same language experience that any learner chosen for a longitudinal study would have almost gone through. In the second place, the large number of subjects who are usually available at the time of data collection reflects clearly and concretely the general trends, learning processes and general linguistic behaviors of the learners.

4.2. Subjects & procedure

Deemed deserving primordial attention in this connection, the subjects of the present research belong to three disparate levels of EFL proficiency:

Group1: Baccalaureate students from LallaAicha high school, Rabat,

Group2: Second-year Mohammed V University students of English language and literature.

Group3: Fourth-year Mohamed V university students of English language and literature.

A control group of eight native speakers of English from the American language center in Rabat also constitutes part of the participants in the study.

Table 1: Subjects

Groups	Repeaters		Age	Subject's Number
	Yes	No	N	N
Group 1	0	50	16- 18	50
Group 2	7	43	19- 22	50
Group 3	5	45	22- 25	50

Table 1: Description of the subjects in the study

4.3. Data collection

The subjects have been asked to respond to three main tasks: Sentence Translation, Acceptability Judgment and Multiple Choice Tasks. The variation of tasks purports to test both the subjects' knowledge and use of the lexical knowledge aspects: Meaning, synonymy and collocation. Each of the three tasks centers around eighteen main target items: six nouns, six adjectives and six verbs.

Statistically, each error was scored one point. Any correct answer is scored one point. Hence, all the error scores for nouns, for example, are added to make up a total for this word category in one of the three tasks for one of the three

academic levels. The SPSS software helped run a number of inferential statistical measures that made it possible to answer the different research questions.

4.4. Research questions & hypotheses

The following questions try to empirically represent the preceding objectives.

- 1) What is the nature of the Moroccan learners' EFL lexical knowledge in relation to L1 lexical knowledge?
- 2) What is the role of tasks (both knowledge and use) and connectivity in the acquisition of EFL lexical meaning, synonymy and collocation by Moroccan learners?

The hypotheses advanced below are empirically examined reformulations of the research questions.

Hypothesis 1: When learning new EFL content words, Moroccan EFL Learners will resort to their already existing L1 "translation equivalents".

Hypothesis 2: Moroccan learners will exhibit more L1/EFL lexical connectivity in EFL lexical knowledge 'use' than in 'knowledge' tasks.

5. Results and Analysis

In tandem with the major trend in reviewed research, the study has yielded important findings. The first one is that

Moroccan learners relate EFL vocabulary, and all its knowledge aspects, to their L1 lexical knowledge.

5.1. L1/EFL Mental Lexical Knowledge Connectivity

The first question that the thesis tries to answer revolves around the connectivity at the conceptual level between the L1 and EFL mental lexicons. The descriptive statistics aspire to show that only the lexical errors in EFL lexical meaning, synonymy and collocation due to L1 lexical knowledge reflect that mental lexical knowledge connectivity is indeed an unavoidable step in the creation of EFL mental lexicon.

5.1.1. Descriptive Statistics

Across the board, the lexical error mean scores show that the three independent groups of subjects have manifested palpable connectivity of the L1/EFL mental lexicons across the three content word categories and in the three linguistic tasks. The descriptive statistics will be presented in relation to tasks.

The Sentence Translation Task

The mean scores of all the subjects for their lexical errors in the three main tasks and across the three word categories and lexical knowledge aspects are listed below in tables 2, 3 and 4 below. It is manifest in table 2 below that the Baccalaureate students (group 1), second-year university students (group2) and fourth-year university students (group 3) have all made L1 connectivity errors across the three word categories and in terms of the three lexical knowledge aspects.

Table II: Meflls' Lexical Connectivity Errors Mean Scores In The Sentence Translation Task.

	academic level		Static mean (subjects errors)	Std. Error
Sum errors adjs synonymy task2	1	Mean	2,90	,138
	2	Mean	2,24	,158
	3	Mean	1,85	,119
Sum errors adjs collocation task2	1	Mean	2,70	,135
	2	Mean	2,64	,139
	3	Mean	2,35	,130
Sum errors adjs meaning task2	1	Mean	2,44	,122
	2	Mean	2,88	,145
	3	Mean	2,85	,125
Sum errors nouns meaning task2	1	Mean	2,10	,141
	2	Mean	2,05	,135
	3	Mean	4,00	,288
Sum errors nouns synonymy task2	1	Mean	2,24	,144
	2	Mean	2,45	,165
	3	Mean	4,00	,288
Sum errors nouns collocation task2	1	Mean	2,40	,176
	2	Mean	2,16	,165
	3	Mean	3,24	,180
Sum errors verbs meaning task2	1	Mean	2,44	,162
	2	Mean	1,94	,147
	3	Mean	1,85	,134
Sum errors verbs meaning task2	1	Mean	2,88	,177
	2	Mean	1,88	,127
	3	Mean	1,24	,120
Sum errors verbs synonymy task2	1	Mean	2,98	,170
	2	Mean	2,38	,169
	3	Mean	2,52	,194

It is also interesting to note that, at the outset, the mean-scores do vary in a descending way as the academic level increases, with almost all the highest scores belonging to group1. Another point worthy of mention is that Group 3 (fourth year university students) scored higher with regard to synonymy in the noun category than the other two groups, contrarily to the assumptions of the present study. If this score turns out to statistically represent a significant

relationship, this result will run counter to the last hypothesis of the present study.

The Acceptability Judgement Task

Table III comprises a statistical representation of the learners' responses in the Acceptability Judgement Task (task 3).

Table III: The learners' error mean-scores in the acceptability judgment

	Academic level		Statistics	Std. Error
Sum errors Adjectives meaning task3	1	Mean	2,74	,180
	2	Mean	2,36	,161
	3	Mean	,64	,106
Sum errors Adjectives Synonymy task3	1	Mean	2,40	,143
	2	Mean	2,50	,165
	3	Mean	1,48	,132
Sum errors Adjectives collocation task3	1	Mean	2,92	,198
	2	Mean	2,20	,162
	3	Mean	1,84	,072
Sum errors nouns meaning task3	1	Mean	2,64	,191
	2	Mean	2,24	,158
	3	Mean	2,56	,246
Sum errors nouns Synonymy task3	1	Mean	2,72	,179
	2	Mean	2,28	,179
	3	Mean	2,92	,204
Sum errors nouns collocation task3	1	Mean	2,86	,185
	2	Mean	2,22	,146
	3	Mean	3,68	,307
Sum errors verbs meaning task3	1	Mean	2,58	,174
	2	Mean	1,66	,166
	3	Mean	1,38	,124
Sum errors verbs Synonymy task3	1	Mean	3,16	,184
	2	Mean	1,82	,189
	3	Mean	1,72	,081
Sum errors verbs collocation task3	1	Mean	2,76	,158
	2	Mean	2,26	,171
	3	Mean	2,02	,097

The Multiple Choice Task

Table IV below represents the mean scores for the subject's mental connectivity lexical errors in the Multiple Choice Task.

Table IV: The Learners' Lexical Connectivity Errors Mean Scores in the Multiple Choice Task

	Academic level		Statistics	Std. Error
Sum errors adjs meaning task4	1	Mean	2.72	.179
	2	Mean	1.48	.157
	3	Mean	.84	.207
Sum errors adjs synonymy task4	1	Mean	2.76	.153
	2	Mean	2.28	.154
	3	Mean	.54	.125
sum errors adjs collocation task4	1	Mean	2.78	.167
	2	Mean	1.98	.158
	3	Mean	.54	.108
Sum errors nouns meaning task4	1	Mean	2.72	.149
	2	Mean	1.80	.159
	3	Mean	.28	.076
Sum errors nouns synonymy task4	1	Mean	2.70	.152
	2	Mean	1.92	.159
	3	Mean	1.12	.147
Sum errors nouns collocation task4	1	Mean	2.88	.156
	2	Mean	2.28	.174
	3	Mean	.78	.119
Sum errors verbs meaning task4	1	Mean	2.72	.157
	2	Mean	2.08	.178
	3	Mean	.44	.111
Sum errors verbs synonymy task4	1	Mean	2.66	.145
	2	Mean	2.96	.181
	3	Mean	.58	.128
Sum errors verbs collocation task4	1	Mean	2.82	.166
	2	Mean	2.74	.159
	3	Mean	.80	.137

The table above shows that the learners' responses in the Acceptability Judgment Task embrace no significant differences from their counterparts in the Sentence Translation Task. That is to say, Group1 have had most of the highest scores, followed by the second year university group noticeably scoring midway between the Baccalaureate and the fourth year university subjects. More interesting, the three groups scored almost closely in this task. A look at the means of the three groups' scores – second column to the right-shows that the latter are not so different from the learners' scores in Task II, with the highest score being 3.68 and the lowest .64. The last outstanding observation to be made at this stage is that the highest scores, even in this task, are related to the word category of nouns at the outset. Table IV below represents the learners' responses in the Acceptability judgment task.

Three main assets of the learners' responses in this task are worth mentioning. First, across the three word categories and three lexical knowledge aspects, the Baccalaureate students scored consistently higher than the other two groups. This result generally goes hand in hand with their responses in the previous tasks. The Baccalaureate learners have made more lexical connectivity errors than the other more advanced groups. The second finding is that a simple look at even the university students' responses suggests that there is a general decrease in their mean scores in this task. The last important result in connection to the Multiple Choice Task is that there

is no obvious difference between the three groups' responses in relation to any word category or lexical knowledge aspect, but there is a general decrease across the three levels.

B. EFL Lexical Knowledge and the Linguistic Task

There is a need to trail any relationship between the three lexical knowledge aspects in the knowledge as well as in the use tasks. This is of particularly crucial importance since a considerable clash of opinion still pertains to the active/passive development continuum of FL lexical knowledge. However, the word category variable is always present in the computed mean scores, and there is also a need to discern the interaction of word category and the 3LKAs within each of the knowledge and use tasks. In other words, the statistical software made it possible for the researcher to represent only the learners' errors for each lexical knowledge aspect in the knowledge and use tasks "disentangled" from the independent variables such as academic level or word category. Table V below summarizes these results.

Table V: Statistical Summary of the learners' Lexical Error Mean Scores in the Use Versus Knowledge Tasks across the Three Word Categories

		MEAN	N	Std DEVIATION	Std ERROR MEAN
Pair 1	Nouns USE	2,7111	150	,70755	,05777
	Nouns KWGE	<u>,9156</u>	150	,52447	,04282
Pair 2	Verbs USE	2,1889	150	,71358	,05826
	Verbs KWGE	<u>1,7689</u>	150	1,12589	,09193
Pair 3	Adjectives USE	2,2667	150	,58441	,04772
	Adjectives KWGE	<u>,9889</u>	150	,56880	,04889

The results in table 8 above reveal an important statistical result. Not only are all the learners' lexical knowledge error mean-scores lower in the knowledge tasks than in the use ones, but they are also so regardless of word category. The underlined means represent the mental lexical connectivity errors in the knowledge tasks, remarkably lower than in the use tasks. Here, the word category effect is tracked in conjunction with task effect within each academic level to better discern any interaction of the two variables throughout the EFL acquisition process by the learners.

Having carried out all the t-tests within groups, academic level has been disposed of as an independent variable that could intervene in these comparisons. Having also merged the passive and active tasks together respectively, the lexical knowledge aspect and task effects have also been

dispensed with. Now that the word category variable is the main focus here, all the ensuing t-test comparisons will be run between the three word categories either in the passive tasks or in the active ones. Hence, the effect of the linguistic task is "filtered" as much as possible from the aforementioned amalgamation of variables. The results are presented in the following tables below and are all commented concurrently since they all present the pair-wise comparisons of the second year university errors for word categories across vocabulary knowledge and use tasks and have all yielded almost the same findings.

1) The Baccalaureate Subjects

The statistical results below represent the task effect on the three lexical knowledge aspects in each word category for Group1.

Table VI: Paired Samples Test for Task Effect on the Lexical Knowledge Aspects by Group1.

		PAIRED DIFFERENCES				T	DF	SIG. 2-TAILED	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	NCUN USE - NCUN KWNG	1,1667	,53875	,07619	1,0136	1,3198	15,312	49	,000*
Pair 2	ADJ USE - ADJ KWNG	-,0000	,90173	,13177	-,2948	2348	-,228	49	,821
Pair 3	VERB USE - VERB KWGE	1,3833	,52191	,07361	1,2360	1,5317	18,742	49	,000*

** p<.01

The first look at table 6 above is enough to claim that the L1/EFL lexical knowledge connectivity errors are significantly lower in the use tasks than in the knowledge ones by the Moroccan Baccalaureate learners. The only content word category that has shown no significant difference is the adjective category.

2) The Second-year University Subjects

Table VII below shows the statistical results of the task effect on the three lexical knowledge aspects in each word category for Group 2.

Table VII: Paired Samples Test for Task Effect on the Three Lexical Knowledge Aspects by Group2

		PAIRED DIFFERENCES				T	DF	SIG. (2-TAILED)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
PAIR 1	ADJ KNOW - ADJ USE	,3003	,96338	,13633	,1180	,6640	2,861 49	,005**
PAIR 2	VERB KNOW - VERB USE	,7633	,33629	,06998	,5625	,3442	8,482 49	,000**
PAIR 3	NOUN KNOW - NOUN USE	1,3733	,58793	,08310	1,208	1,5433	16,528 49	,000**

Moroccan Second-year university learners show a significant difference of L1/EFL lexical connectivity error mean scores between the knowledge and use tasks across the three content word categories respectively.

3) The Fourth-year University Subjects

Table VIII below displays the statistical results of the task effects on the three lexical knowledge aspects in each word category by the fourth-year university students.

Table VIII: Paired Samples Test for Task Effect on the Lexical Knowledge Aspects By Group 3

		PAIRED DIFFERENCES				T	DF	SIG. (2-TAILED)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	NOUN USE - NOUN KNOW	2,8467	,91525	,12944	2,5866	3,106	21,99 49	,000**
Pair 2	ADJECT USE - ADJEC KNOW	,9000	,74333	,10519	,6886	1,111	8,556 49	,000**
Pair 3	VERB USE - VERB KNOW	1,6967	,48198	,09812	1,5498	1,823	24,75 49	,000**

** p<.01

In a similar manner, Group3 lexical knowledge connectivity error mean scores are significantly lower in the knowledge tasks than in the EFL lexical use. Hence, all the comparisons of the errors mean scores of each lexical knowledge aspect evidence significant differences of the errors pertaining to each word category between the knowledge and use tasks, with probability degrees ranging from p=.000 to .001. Having yielded these probability values lays the ground for 99% of confidence to claim that learners actually make more connectivity errors in the use tasks than in the knowledge ones at each lexical knowledge aspect and in each content word category, as predicted by the third hypothesis of the present research. This finding is more extensively explained and interpreted in the next chapter.

Now that the learners' lexical knowledge is measured across language knowledge and use tasks, it is of pivotal importance in the study to discover the order or "route" that the 3LKAs follow in their acquisition by the learners. Here there will be recourse to correlation analyses within task and between the active and passive tasks respectively to determine any relationships among the lexical aspects for each academic level along the knowledge and use continuum. Hence, these results can provide a clear picture of the order of the 3LKAs acquisition within each academic level. Such an order will

help in itself establish another order that each academic level follows in the acquisition of the 3LKAs along the passive active continuum. Finally, if any asymmetry ensues across the three academic levels, this will lay the ground for further research to anticipate the general order of acquisition of the three lexical aspects by the learners in general.

6. Conclusion

The present study has tried to discuss and interpret the findings of the thesis in the light of the most prominent hypotheses in the reviewed literature centering on the mental lexical knowledge depth aspects and their organization.

L1/EFL mental lexical connectivity has been shown to exist and persist in the EFL lexical knowledge. The three EFL lexical knowledge aspects focused on in the study – meaning, synonymy and collocation – were influenced by the learners' association of EFL vocabulary with their L1 lexical knowledge.

The learners' L1/EFL lexical errors in knowledge and use tasks-the Multiple Choice Task on one hand and the Sentence translation and Acceptability Judgement task on the

other hand, have shown that the lexical knowledge aspects follow a consistent, if not predetermined order of acquisition.

The soundness of the general approach to the analysis of EFL lexical knowledge depth and organization stems from the cognitive insight it has provided as to the development of the FL mental lexicon and into SL or FL acquisition in general.

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