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| RESEARCH ARTICLE

EFL Lexical Knowledge Depth: Proficiency Level and Order of Acquisition Parameters

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| ABSTRACT
The study at hand attempts to trace the development of three EFL lexical knowledge depth aspects - meaning, synonymy and collocation- across three academic levels- high school, second and fourth-year university. It aims to trace any possible "order of development" for the three linguistic knowledge aspects. The second objective of the study is to determine whether proficiency level affects the development of the three lexical knowledge aspects. The linguistic tasks used for data collection are translation, acceptability judgment and multiple choice. The study has found that the connectivity between L1 and EFL mental lexicons affects the three lexical knowledge aspects and tends to decrease relatively as the academic level of the learners increases. Second, the research has revealed a noticeable "order" of acquisition between the three lexical aspects, though not a very strong one. Such findings are of pivotal importance for materials and syllabus designers as well as for L2/FL teachers.

| KEYWORDS
EFL lexical knowledge, lexical acquisition; mental lexicon; order of acquisition; academic level

| ARTICLE INFORMATION
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1. Introduction

Linguistic competence has been shown today to revolve around lexical competence (Singleton, 1999). As Gass (1988:94) observes, *"grammatical errors still result in understandable structures, whereas vocabulary errors may interfere with communication*". Early research on second language (SL) or foreign language (FL) vocabulary acquisition concerned itself with the size of the mental lexicons. Yet, it has not gained much understanding into how single words are stored in mind; how their knowledge is shallow or deep and how their organization develops; how fast SL lexical retrieval takes place compared to the first language (L1) mental lexicon, to mention but the major areas of SL/FL vocabulary acquisition research (see Ringbom, 2001).

Still in need of a general theory of SL vocabulary acquisition, much of published research has focused on vocabulary size and growth, but most of such research agrees that acquiring a good knowledge of a word is a complex process (Ellis, 1994, Singleton, 1999). However, there is still little insight into how individual words are acquired diachronically. The plethora of angles from which research looks at "transfer" or "interference" has led to various definitions. Cognitively, some researchers advance that "transfer" should be seen as a process of "transference": SL learners represent and connect the target language words with their L1 and ascribe the L1 characteristics (e.g. semantic, collocational, etc) to the latter. For other researchers, the transfer is a "constraint". SL learners create hypotheses about SL words that are themselves limited by the existence of the L1 system. Moreover, transfer is also considered "a strategy": learners consciously fill "voids" in their SL systems by resorting to L1 word knowledge. Finally, transfer has also been investigated as "*an inert outcome":* when the L1 and SL systems share significant properties, the L1 linguistic knowledge plays a major *automatic* role in the development of the SL linguistic system (Meara, 2002).

2. Literature Review

There is a general agreement among researchers today that lexical knowledge (see sections below) plays a central role in SL language development and comprehension. Investigating the processes and factors that contribute to lexical knowledge development in children and adults has gained considerable interest in recent years, be it in descriptive, applied or psycho-linguistics. The following section attempts to describe the confusion in terminology and present a brief summary of the main research findings, and methodologies related to lexical knowledge research in second and foreign language studies on lexical size, lexical knowledge depth with special focus on SL/FL research.

2.1. A Terminology issue

It is of primordial importance to consider the terms Vocabulary and Lexis in this theoretical review. Some online dictionaries such as the Merriam-Webster (2015) describe vocabulary as *"the words that make up a language; all of the words known and used by a person: words that are related to a particular subject."* Similarly, Cambridge (2016) presents it as *"The words that are known or used by a particular person, or that are used in a language or subject."* Finally, Macmillan (2009-2016) also defines it as *"all the words that a person knows; all the words in a particular language.*

Differentiating lexicon and vocabulary entails that the lexicon refers to the list of known words with their *related knowledge* on their linguistic significance and *proper* usage. Vocabulary is a general term for all the words one knows, using them or not, knowing their different semantic, contextual, collocational aspects, etc. (see Van Vlack, 2013).

The two terms are central terms in connection to lexical development studies. Both consist of words in a language. However, lexicon englobes a wider knowledge of words in a language along with their proper usage and is used more technically in addressing the transfer phenomenon from one language to another.

2.2. Lexical knowledge size

Research estimates that the number of word families in the English language is somewhere between 88.500 and 114.000 (Goulden, Nation, & Read, 1990). According to Nation (2006), 20.000-word families are the threshold that an educated adult can reach, and such a number increases by 1000 families a year depending on the text exposed to. According to other researchers, EFL students need a number of 5,000-word families for effective reading (Hirsh and Nation, 1992), between approximately 6,000 and 7,000 for effective listening comprehension and between 8,000 and 9,000 for successful reading (Nation, 2006). Others advance that around 10,000-word families are necessary for a student to deal with academic English at a university level (Hazenberg and Hulstun (1996)). Nevertheless, an interesting finding is that most foreign language learners can hardly add 250 of these word families in the same period of time of a native speaker (Nation, 2001).

From the studies advanced above, lexical breadth is what a learner knows and can do at a particular level of competence (Qian, 2002). Daller et al. (2007) describe it as "*…the number of words a learner knows regardless of how well he or she knows them*" (p.7) and Wang (2009) states that "*…breadth of vocabulary knowledge (or vocabulary size), means the estimated number of words that a learner knows*" (p.202).

Lexical knowledge breadth is mostly linked with the number of words (size) a person knows. Not much research, however, has been done about the quality of the lexical items learned, and the present study aims to contribute to this regard.

2.3. Lexical knowledge depth

Knowing a lexical item goes beyond the boundaries of mastering its spelling and pronunciation. This knowledge is not restricted to a single dimension but refers to a multidimensional construct. A series of definitions and analyses have been advanced in the literature. Read (1993) defines this depth as "*…the quality of the learner's vocabulary knowledge*" (p.357). Qian (1998) specifies these aspects: *"Pronunciation and spelling; morphological properties; syntactic properties; meaning; register, or discourse features and frequency of the word in the language*" (pp. 24-25). Shen (2008) claims that *"Depth of knowledge focuses on the idea that for useful higher-frequency words learners need to have more than just a superficial understanding of the meaning"* (p. 136). Moghadam et al. (2012) maintain that depth of lexical knowledge *"… is a network of links between words. It is about how they associate and interact with each other, and may be restricted in use according to register and context"* (p. 558).

However, the aforementioned definitions tend to lack the context where the lexical items can be used. The list of the most relevant aspects of knowing a lexical item made by the authors reflects a shallow understanding of the systemic linked network process activated when these items are in interaction with others. Moghadam et al's (2012), nevertheless, is much more inclusive and englobes most of the elements related to the mechanisms in action the lexical items interact when users retrieve them from their lexicon. According to Qian (1999), the depth of lexical knowledge is considered as one of the main dimensions because it strengthens reading comprehension.

Breadth and depth of lexical knowledge are central to communicative competence development, therefore, instructional policies should target lexical knowledge development explicitly providing ample opportunities for lexical growth and depth to ensure language development and learning (Qian, 1999). For lexical depth and breadth measurement, the Word Associates Test (WAT) has been widely utilized (Read, 1998).

2.4. Second Language Lexical Development

Not only in first language acquisition research but also in second language, lexical knowledge development research examined word learning strategies, vocabulary acquisition, and cross-linguistic influences. A plethora of factors, such as proficiency levels, age of acquisition, and the role of context, have gained much attention recently (Zhang & Koda, 2014). This study examined incidental vocabulary learning; it focused on the unplanned and indirect acquisition of words by EFL learners through extensive reading. The study utilized a corpus analysis to create learners' lexical profiles and shed much light on the benefits of extensive reading for vocabulary development. Webb (2008) examined the impact of repeated exposure to vocabulary items on the development of vocabulary knowledge in EFL learners. He found that repeated encounters with target words significantly enhanced learners' retention and recognition of those words.

3. Methodology

The study does not attempt to seek any cognitive process other than what "naturally" happens in the learners' mental lexicon throughout the EFL learning experience: the connectivity of L1 and EFL lexical knowledge; the influence of EFL proficiency on EFL lexical knowledge depth and the natural order of three lexical knowledge aspects and their relation to EFL proficiency level. The research tries to gain an insight into the roles of these variables in connection to the development of meaning, synonymy and collocation aspects of EFL content words by the learners.

3.1. Design

The study adopts a mixed design with a cross-sectional aspect; it does not try to change the linguistic behavior of the subjects in any way but tries to look into the interaction of the different parameters that lead to their EFL lexical knowledge status in their learning experience. The research aims to look into how EFL lexical meaning, synonymy and collocation (hence, 3LKAs) aspects are ordered, and whether the EFL academic level of the subjects contributes to such order.

It has tried to elicit its data from the subjects at different stages of their English language learning experience. Therefore, it has resorted to a cross-sectional design for two main reasons. In the first place, most Moroccan EFL learners in public institutions go through the same experience; after being exposed to the common three years of the English syllabus in high school, they usually join university English departments. There is at least a two-year academic distance between each group of subjects and the following one (see Table 1 below).

3.2. Subjects and procedure

In this connection, the subjects of the present research have been randomly chosen; they belong to three disparate levels of EFL proficiency: 50 Baccalaureate (3rd year, high school), 50 second-year university and 50 fourth-year university learners of English language and literature. The study has also resorted to a control group of eight native speakers of English.

Table 1 *The Subjects of the Study*

Groups	Repeaters		Academic level	Age
	Yes	No		
Group1	0	50	3rd Year Highschool	16-18
Group2	7	43	2nd year university	19-22
Group3	5	45	BA students	22-25
Group4		8		
Total	158			

3.3. Research questions

The following questions represent the two main objectives of the study.

A. How is the knowledge of the 3LKAs reflected in relation to the academic level of the learners?

B. What is the order of the Moroccan Learners' knowledge of EFL word meaning, synonymy and collocation in relation to academic level?

3.4. Hypotheses

The hypotheses advanced below are examinable forms of the abovementioned questions.

Hypothesis 1

The order of acquisition by EFL learners will be the following: meaning, then synonymy and finally collocation, across reception and production tasks.

Hypothesis 2

The EFL 3LKAs will develop toward more independence of L1 in the predictable order: synonymy, then polysemy, then collocation.

3.5. Instruments

The three groups of subjects have been asked to respond to three main tasks: Sentence Translation (a complete production task), Acceptability Judgment and Multiple Choice Tasks (reception tasks).

The adoption of reception/knowledge and production/use tasks is chosen to trace and measure the 3LKAs along the reception and production continuum. Each of the three tasks centers around eighteen main content items: six nouns, six adjectives and six verbs. All the tasks test the same lexical knowledge aspects in full sentences where the exact meaning, synonym or collocational use is controlled across the tasks. In other words, the same content words (18) have been used to assess the subjects' use and knowledge of meaning, synonymy and collocation across tasks and across academic levels.

3.6. Data Analysis

Each error, across tasks, was scored and represented on the SPSS software with a 1 point since the errors are the indicator of the L1 influence, hence L1/EFL mental lexical connectivity. Any correct answer is not scored to shed light on the L1/EFL connectivity errors. Hence, all the error scores for nouns, for example, are added to make up a total for this word category on each of the three tasks for the three groups of subjects. The SPSS software helped run a number of inferential statistical measures that made it possible to answer the different research questions. There has been a need to run Pearson correlation analyses as well as the MANOVA tests.

4. Results and Discussion

The present section presents the various statistical measures undertaken and how they answer the research questions.

4.1. EFL Lexical Knowledge Depth and the Learners' Academic Level

This part of the study comes as a logical step to confirm the statistical results that will lay the ground to discover the order of development of the three lexical knowledge aspects across academic levels. The recourse to MANOVA test comes, therefore, to reveal any implicational order of acquisition regarding the three lexical aspects in this study in connection with the subjects' study level.

Table 2 below shows the significant differences in the mean scores of each lexical knowledge aspect across the three groups of subjects. To further confirm the results therein, table 3 represents Sheffe's post hoc test of the MANOVA results in order to better show the nature of the significant relationships across groups.

Table 2: *Multiple Comparisons for Academic Level Effect on the EFL lexical knowledge aspects.*

		SUM OF SQUARES	*DF*	*MEAN SQUARE*	*F*	*SIG.*
MEANING in USE	Between Groups	17,227	2	8,614	34,774	,000(**)
	Total	53,639	149			
SYNONYMY in USE	Between Groups	5,618	2	2,809	13,088	,001(**)
	Total	37,167	149			
COLLOCATION in USE	Between Groups	4,446	2	2,223	6,923	,002(**)
	Total	51,650	149			
MEANING in KNWDG	Between Groups	121,926	2	60,963	143,881	,000(**)
	Total	184,210	149			
SYNONYMY in KNWDG	Between Groups	121,210	2	60,605	153,904	,000(**)
	Total	179,097	149			
COLLOCATION in KNWDG	Between Groups	127,264	2	63,632	143,303	,000(**)
	Total	192,537	149			

P set at .01**

Table 2 above shows that the error mean scores for the three lexical knowledge aspects, in language knowledge tasks and in use tasks, have turned out to be statistically highly significant across academic levels. The double-flagged figures in the rightmost column reflect a 99% degree of confidence in the significance of differences across academic levels.

Table 30 below shows the results of the Sheffe's Post hoc test academic level effect on the 3LKAs across subject groups. It is a detailed series of comparisons for each EFL lexical knowledge aspect, in Language knowledge or use tasks, that demarcates precisely where the significance of mean score difference resides. The MANOVA test results confirm that academic level does indeed play a positive role in the development of the 3LKAs. However, they do not signal any exceptions; the Sheffe's Post hoc test indicates in detail the significance or insignificance of all the comparisons for each pair of academic level comparison.

Table 3: *Sheffe's Post hoc Test Academic Level Effect on the three lexical knowledge aspects across Groups.*

DEPENDENT *VARIABLE*	*(I)ACADEMIC LEVEL*	*(J)ACADEMIC LEVEL*	*MEAN DIFFERENCE*	*STD. ERROR*	*SIG.*	*95% CONFIDENCE INTERVAL*	
						Lower Bound	Upper Bound
MEANING in USE	1	2	.4267(*)	.09954	.000	.1805	.6728
		3	.8300(*)	.09954	.000	.5839	1.0761
SYNONYMY in USE	1	2	.4533(*)	.09265	.000	.2242	.6825
		3	.3467(*)	.09265	.001	.1175	.5758
COLLOCATION	1	2	.4067(*)	.11333	.002	.1264	.6869

in USE							
		3	.1067	.11333	**.643**	**-.1736**	.3869
MEANING in KNWDG	1	2	.9333(*)	.13019	.000	.6114	1.2553
		3	2.2000(*)	.13019	.000	1.8781	2.5219
SYNONYMY in KNWDG	1	2	.3200(*)	.12550	**.042**	.0096	.6304
		3	2.0467(*)	.12550	.000	1.7363	2.3570
COLLOCATION in KNWDG	1	2	.4933(*)	.13327	.001	.1638	.8229
		3	2.1533(*)	.13327	.000	1.8238	2.4829

* The mean difference is significant at the .05 level.

To begin with, it should be noted in this connection that the table contains two columns to the left entitled academic level. The leftmost one (column 2) represents the group from which the comparisons have taken place towards the other two groups (column 3), hence the direction of the multiple comparisons. As can be seen above, all the comparisons have been determined to start from the academic level1 -the Baccalaureate students- towards the more advanced academic levels, to follow the logical and chronological exposure pattern of the subjects to EFL vocabulary. Hence, each test involves two simultaneous comparisons: from Group1 to Group2 and from Group 1 to Group 3, henceforth (2 comparisons).

The second essential observation is that the three lexical aspects always have a perfect positive relationship with academic level (Sig. = .000), be it in its knowledge or use tasks. Third, synonymy has also brought a perfect positive relationship with an academic level in lexical use (Sig. = .000 & .001 in both comparisons), and fairly weaker in the knowledge tasks, though still generally significant (.042 and .001 in 2 comparisons). However, this is the exceptional.

Moreover, and interestingly, the collocation aspect reveals an insignificant difference between the Baccalaureate and second-year university learners in use (Sig. = .643) but a very significant one in the knowledge tasks (Sig. = .001& .000) in both ascending directions of comparison across academic levels.

Based on the findings presented, and regardless of the few exceptions mentioned above, the fifth hypothesis of the thesis is confirmed. Academic level actually leads to a positive development in the EFL lexical knowledge aspects by the learners.

4.2. EFL Lexical Knowledge Developmental Order

L2/EFL syntax aspects have received considerable focus in relation to the order of development perspective; many aspects have been shown to follow a predetermined (or hierarchical) order in the process of acquisition. For the acquisition of some vocabulary aspects in L1, especially form, morphology, etc., scarce work has been undertaken regarding FL lexical knowledge depth and organization. To be more specific, researchers have agreed on the many aspects of lexical knowledge aspects, but no serious studies have attempted to trace the order of development of all those aspects; there are EFL learners who could be described as advanced users of English but who still do not differentiate the register or connotation or collocational behavior of content words. In this connection, the first hypothesis of the research predicts that the 3LKAs, investigated here at least, will follow a predetermined order in their process of acquisition by the learners.

The present section deals with the presentation of the correlation results that reflect the order of the 3LKAs development in reception and production across academic levels.

It is so crucial at this point to pay careful heed to the direction of the correlations carried out below before delving into any reading of the results. All the latter compare the lexical knowledge aspect errors in the use tasks *to* the knowledge tasks. This direction of correlation is of extreme importance to the interpretation of the results.

4.2.1. The Baccalaureate learners

First of all, a quick look at Table 4 below discerns that all Pearson's correlation coefficients are positive. This means that the lexical connectivity errors are higher in the lexical knowledge tasks than in the use tasks.

Table 4: *Pearson's Correlation Test Showing the Interaction among the 3LKAS between Use and Knowledge Tasks by the Baccalaureate Subjects*

		MEANING IN KWDG	*COLLOCATION IN KWDG*	*SYNONYMY IN KWDG*
MEANING in USE	Pearson Correlation	**,355(*)**		
	Sig. (2-tailed)	,011		
	N	50		
COLLOCATION in USE	Pearson Correlation		,150	
	Sig. (2-tailed)		,300	
	N		50	
SYNONYMY in USE	Pearson Correlation			,066
	Sig. (2-tailed)			,651
	N			50

* Correlation is significant at the 0.05 level (2-tailed).

Second, however, only one of the latter is statistically significant. Only the correlation coefficient of the meaning in use and knowledge is significant at the 95% level of confidence with a positively significant .355* coefficient value. The weakest correlation coefficient in the results above pertains to the synonymy aspect, being positively weak with a .066 value. Therefore, meaning is the only lexica knowledge aspect that shows a significant difference between the use and knowledge responses of the Baccalaureate students.

4.2.2. Second-year university learners

The results in Table5 below come in considerable variance compared to the Baccalaureate subjects' ones. First, two aspects are positive: meaning and collocation are positive.

Table 5: *Pearson's Correlation Test Showing the Interaction among the 3LKAS between Use and Recognition/knowledge Tasks by group2.*

		SYNONYMY IN KNWDG	*MEANING IN KNWDG*	*COLLOCATION IN KNWDG*
SYNONYMY in USE	Pearson Correlation	**,408(**)**		
	Sig. (2-tailed)	,003		
	N	50		
MEANING in USE	Pearson Correlation		-,**069**	

	Sig. (2-tailed)		,632	
	N		50	
COLLOCATION in USE	Pearson Correlation			,**238**
	Sig. (2-tailed)			,097
	N			50

* Significant at the 0.05 level (2-tailed). ** Significant at the 0.01 level (2-tailed).

Second, the only strongly positive one holds for the synonymy pair with a value equal to .408(**) with a 99% level of confidence. The negative correlation pertains to the meaning pair with an - .069 coefficient that is not statistically significant. The statistically positive but insignificant correlation relates to the collocation aspect with a .238 value. Therefore, synonymy is the only lexical knowledge aspect that reflects a significant positive difference between use and knowledge tasks by second-year university students.

4.2.3. Fourth-Year University Students

The results in Table 6 below, also different from the two antecedents, contain two negative correlation coefficients. One concerns collocation with a value equaling -.273 and the other synonymy with -.039. The only positive correlation regards the meaning pair with a .144 value but it is still not a significant one.

Table 6: *Pearson's Correlation Test Showing the Interaction among the 3LKAS between Use and Knowledge Tasks by the Fourth-Year University Students.*

		COLLOCATION IN KNWDG	*SYNONYMY IN KNWDG*	*MEANING IN KNWDG*
COLLOCATION in USE	Pearson Correlation	**-,273**		
	Sig. (2-tailed)	,055		
	N	50		
SYNONYMY in USE	Pearson Correlation		-,039	
	Sig. (2-tailed)		,787	
	N		50	
MEANING in USE	Pearson Correlation			,144
	Sig. (2-tailed)			,318
	N			50

**Correlation is significant at the 0.01 level (2-tailed);*Significant at the 0.05 level (2-tailed).

All in all, the general findings in this section refute the fourth hypothesis of the thesis to some extent. There are no generally significant differences in mean scores for the 3LKAs across language use and knowledge tasks by the three groups of subjects, respectively. EFL lexical meaning, synonymy and collocation do not reflect a significant gap along the knowledge and use ends of lexical use whatever the academic level of the learners. However, there is a significant and consistent order of development across the lexical knowledge aspects and within tasks, confirmed by the three academic levels: meaning is the lexical knowledge aspect that has shown the least L1/EFL mental connectivity. Then, synonymy holds a second position, and collocation is the EFL lexical knowledge aspect that has shown significantly higher L1/EFL mental connectivity error mean-scores within tasks. Thus, the three lexical knowledge aspects could be represented in the following ascending order that reflects the degree of L1 influence on their knowledge or use in English:

Meaning ⟶ synonymy ⟶ collocation.

Across tasks, the same order of development mentioned above is not affected by lexical knowledge or use tasks. The last essential remark is that three of the comparisons (from use to knowledge) are negative. This suggests that the lexical errors in knowledge tasks are lower than in use tasks *only* for university subjects. However, these negative correlations are not statistically significant. Does this mean that as the learners' academic level increases, their lexical depth and organization develop more in knowledge than in use?

The following section deals with the presentation of the MANOVA results that will pave the way to answer this question.

5. Conclusion

The present study has tried to discuss and interpret the findings in the light of the reviewed literature centering on the mental lexical knowledge depth aspects and their organization in relation to order and proficiency level. The learners' L1/EFL lexical errors in knowledge and use tasks, the Multiple Choice Task on the 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. This is central to the teaching of lexical knowledge; teachers need to be aware that such knowledge is not as "deep" as it should, and that it is significantly influenced by L1 lexical knowledge (conceptual mediation). Materials developers and syllabi designers need also to allocate ample space for lexical knowledge development activities, given the pivotal role of vocabulary in receptive and productive communication. EFL teachers have a crucial task in this connection; they need to plan for lexis to be continuously increasing through lessons, courses, and the curriculum with learner opportunities to explore the connections between lexical choices through communicative events, making evident the need to expand vocabulary size to match those purposes. Both written communication and oral communicative activities make learners feel the need to expand their lexis.

The learners from each of the three academic levels have shown that meaning is the least lexical knowledge aspect that reflects mental semantic connectivity. Synonymy comes in second place and collocation being the aspect where the learners do not significantly distinguish EFL from L1 collocation restraints. The overall order of development for the three EFL lexical knowledge aspects is as follows:

Meaning (then) Synonymy (then) Collocation.

In like manner, learners need to be exposed to vocabulary variety and complexity that deepens such knowledge along their academic curricula. The final finding of the study is that connectivity between L1 and EFL mental lexicons tends to decrease significantly as the study level of the learners increases. The MANOVA statistical procedure has shown significant differences across the three academic levels in the number of L1/EFL connectivity lexical knowledge errors. 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 EFL mental lexicon in general and into SL or FL lexical knowledge aspects development in particular. More authentic vocabulary activities, designed specifically around areas of lexical knowledge where L1 differs from L2/EFL, are needed to help develop L2/EFL lexical knowledge independence.

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