



# The role of the background languages in L3 vocabulary acquisition: The Cumulative Enhancement Model and Typological Similarity Model

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## Abstract

The present study sheds light on cross-linguistic influence in third language learning, and it aims to explore the role of the previously acquired languages in third language acquisition and test the Cumulative Enhancement Model (Flynn et al, 2004) and Typological Similarity Model (Rothman, 2011). The CE Model supports the facilitation role of the previously acquired languages (L1 and L2) during the learning process of a third language (L3). The participants of this study are 35 middle school students who have Arabic as a first language, French as a second language, and they are learning English as a third language. A multiple-choice translation task that aims to test the participants' knowledge of the non-native language they learn, in addition to a text in L3 in which they have to translate into their L1 and L2. The findings showed that participants transfer from the more typologically similar language (i.e. French) due to the typological similarity, which gives evidence for the Typological Similarity Model in which learners use the languages that is typologically similar to L3 at early stages of L3 acquisition.

**Keywords:** Third language acquisition, background languages, cross-linguistic influence, Cumulative Enhancement Model, Typological Similarity Model

## **1. Introduction**

In the last three decades, Third Language Acquisition has been a growing area of research, offering an expansion to the traditional realm of Second Language Acquisition. This field has been and remains to be a foundational element in the exploration of linguists and scientists attempting to understand the mechanics of the learning process of L3 (Cenoz, 2008; Türker, 2017; Jarvis & Pavlenko, 2008). It has been asked what impact the multiple languages involved have on one another, and which of the languages previously learned affect the process of learning a new one (Cenoz *et al*, 2001; De Angelis, 2007; Kırkıcı, 2007). Cross-linguistic influence is a common topic of TLA research, with a number of studies confirming the notion that the more languages a person knows, the simpler the process of learning a new language can be (Bardel & Falk, 2007; Cenoz, 2003; Negadi, 2015).

Cross-linguistic influence (CLI) is the phenomenon in which learners of a third language (L3) are affected by the languages that they have previously acquired (L1 and L2). Cross-linguistic influence (CLI) has been a topic of study in the field of second language acquisition (SLA) for more than four decades (Selinker, 1972). The study of CLI in third language acquisition (TLA) has recently gained attention, as the number of individuals who are learning a third language is increasing, and this is due to the increasing number of people who are engaging in language learning in a globalized world (De Angelis, 2007). The study of cross-linguistic influence is important to understand the dynamics of language learning and has implications for language teaching and learning (Cenoz, 2001). Numerous investigations into the influence of language transfer in the acquisition of L3. For example, Flege (1987) found that learners transfer from their native language to the L3 in their speech production. Furthermore, Flege *et al.* (1999) found that learners transfer from their native language to the L3 in their perception of speech.

Two models have been studied in TLA that are relevant to the topic of CLI: the Cumulative Enhancement Model (Flynn *et al*, 2004) and the Typological Similarity Model (Rothman, 2011). The Cumulative Enhancement Model (Flynn *et al*, 2004) suggests that the previously acquired languages (L1 and L2) facilitate the learning of a third language (L3), and that the cumulative effect of previously acquired languages have a positive influence on third language learning (Flynn *et al*, 2004). The Typological Similarity Model (Rothman, 2011) proposes that transfer from typologically similar languages is more likely to occur, and that learners use the language that is typologically similar to the target language at early stages of L3 acquisition (Rothman, 2011).

The purpose of this study is to examine the role of the previously acquired languages in cross-linguistic influence in TLA, and to test the Cumulative Enhancement Model (Flynn *et al*, 2004) and Typological Similarity Model (Rothman, 2011). Two research questions have been formulated to achieve the aim of this study as follows:

1. How does language proficiency affect the translation performance of middle school students learning a third language?
2. How does typological awareness in the first and second language (L1 and L2) influence the translation performance of middle school students in their third language (L3)?

## **2. Literature review**

The research discussed in this literature review has suggested that the native language and background languages can both have an influence on the acquisition of L3. Moreover, typological similarity has also been found to play a role in the acquisition of a third language. Rothman (2011) conducted a study of the typological similarity model of cross-linguistic influence. The results showed that language typology can have an influence on the acquisition of a third language. Additionally, the cumulative-enhancement model proposed by Flynn et al. (2004) has been found to be a valid model for understanding the role of the native language and background languages in the acquisition of a third language. Flynn et al. (2004) proposed the cumulative-enhancement model for language acquisition, which suggests that the native language and background languages can both have an influence on the acquisition of a third language. With this in mind, the current research aims to further explore the role of the native and background languages in third language acquisition, as well as the effect of typological similarity, in the form of the cumulative enhancement model.

Cross-linguistic influence (CLI) in third language acquisition (TLA) has been a topic of research for many years. Studies have found that both the native language (Flynn et al., 2004; Flege, 1987; Flege et al., 1999) and the background languages (Cenoz, 2000; Ringbom, 2001; Jarvis & Pavlenko, 2008; Tápainé Balla, 2008; Williams & Hammarberg, 1998) can have an influence on the acquisition of a third language. Similarly, language typology has been found to have an effect on TLA (Božinović, 2021; Dewaele, 1998; Rothman, 2011). Research has shown that a native language proficiency has a direct influence on the acquisition of a third language (Cenoz, 2001; Cenoz, 2003; Tremblay, 2006). Furthermore, the cumulative-enhancement model proposed by Flynn et al. (2004) suggests that native language and background language proficiency can enhance the acquisition of a third language, particularly when the languages have similar typology. This model has been found to be a valid model for understanding the role of the native language and background languages in the acquisition of a third language (Flynn et al., 2004). Moreover, studies have found that typological similarity between background languages and the target language is an important factor to consider in the acquisition of a third language (Rothman, 2011).

Research has suggested that the native language and background languages can both have an influence on TLA (Flynn et al., 2004; Flege, 1987; Flege et al., 1999; Rothman, 2011; Jarvis & Pavlenko, 2008; Tápainé Balla, 2008; Williams & Hammarberg, 1998). Moreover, the cumulative-enhancement model has been found to be a valid model for understanding the role of the native language and background languages in the acquisition of a third language (Flynn et al., 2004; Flynn, 2006; Rothman, 2011; Williams & Hammarberg, 1998; Bardel & Falk, 2007). Furthermore, the role of typological similarity has also been found to be an important factor for TLA (De Angelis, 2007; Leow, 2000). Studies have found that there can be a direct influence of the native language on the acquisition of a third language (Hermas, 2014). Additionally, research has suggested that the influence of the background languages in TLA can be enhanced when the languages share typological similarities (Božinović, 2021).

Recent studies have investigated the role of cross-linguistic influence in third language acquisition. Talebi (2013) has suggested that the transfer of reading strategies from L1 to L2 as well as from L2 to L3, is a crucial factor in a multicompetent mind. Ringbom (2001) investigates the transfer of lexical items from one language to another and suggests that transfer of L2 elements to L3 is relatively more frequent than transfer of L1 elements to L2. According

to De Angelis and Selinker (2001), a third language learner's interlanguage can be influenced by the interplay of various linguistic systems that coexist within a multilingual individual's mind. De Angelis (2007) further suggests that the transfer of linguistic elements from two languages to a third language is determined by the typological distance between the languages. Božinović and Perić (2021) analyze the role of typology and formal similarity in the acquisition of L3 such as German and Spanish. They find that the transfer of elements from two languages to a third language is more successful when the two source languages are more similar in terms of their typological properties. Chrabaszcz and Jiang (2017) examine the role of the native language in the use of English nongeneric definite article by L2 learners and suggest a cross-linguistic comparison between different languages. Dewaele (1998) investigates the lexical inventions of French interlanguage as L2 versus L3 and suggests that the transfer of linguistic elements from one language to another is determined by the typological distance between the two languages. Finally, Cenoz (2001) examines the effect of linguistic distance, L2 status, and age on cross-linguistic influence in third language acquisition and argues that the transfer of linguistic elements is affected by these factors.

In summary, the literature reviewed in this article suggests that both the native language and background languages can have an impact on the acquisition of a third language, and the studies discussed above suggest that cross-linguistic influence plays an important role in third language acquisition. The transfer of reading strategies, lexical items and linguistic elements from one language to another depends upon the typological and formal characteristics of the source languages as well as on the native language, linguistic distance, L2 status and age of the learner. The research supports the notion that the cumulative-enhancement model for language acquisition is a valid model for understanding the role of the native language and background languages in the process of acquiring a third language. The research also suggests that language typology can have an influence on the acquisition of a third language.

In conclusion, the literature review has discussed the current research on the connection between the native and background languages in the learning process a third language. The research reviewed in this article suggests that both the native language and background languages can have an influence on the acquisition of a third language. The research supports the notion that the cumulative-enhancement model for language acquisition is a valid model for understanding the role of the native language and background languages in the acquisition of a third language.

### **3. Methodology**

This study involves 35 middle school students who are native speakers of Arabic, with French as a secondary language, and English as a third language. The participants are between the ages of 11 and 13, and they have been learning English for a maximum of two years. They were divided according to their proficiency level in L2 French into Beginners (N=18) and Intermediate (N=17).

In order to evaluate the participants' knowledge of their target language they are learning (L3), a multiple-choice translation task was administered. The task includes 5 sentences and each sentence was followed by four multiple-choice options in Arabic and French. The participants were asked to choose the correct translation for each sentence in the two languages (L1 and L2). The multiple-choice translation task was administered twice in order to ensure the

reliability of the results. The participants were given a time limit of 30 minutes to complete the task. The task was scored according to the number of correct responses the participants provided. The results were then analyzed quantitatively to determine the effects of language proficiency on the participants' translation performance.

In addition, the participants were asked to translate a text in English (L3) into their Arabic (L1) and French (L2) in order to analyze the translations and understand the strategies they used while translating. The text was about 250 words. The participants were given a time limit of 20 minutes to complete the translation. The translations were then analyzed qualitatively in order to understand the strategies they used while translating, as well as to evaluate the impact of typological similarity and the role of L1 Arabic and L2 French in learning L3 English as a second language.

The data collected from the multiple-choice translation task were analyzed using descriptive statistics and a two-way analysis of variance (ANOVA). Descriptive statistics were used to determine the participants' overall performance on the task. The two-way ANOVA was used to analyze the effects of language proficiency (L2 and L3) on the participants' translation performance. Additionally, the data were examined to identify the participants' individual strengths and weaknesses in terms of their L2 and L3 translation proficiency.

The results of the two-way ANOVA were further analyzed using post-hoc tests to assess whether there were statistically significant differences between the participants' L1 and L2 translation performance. Furthermore, a correlation analysis was conducted to determine the strength of the relationships between the participants' L2 and L3 translation proficiency.

## 4. Results and discussion

The purpose of this study was to examine how prior language experience affects the learning of English when French is a second language after Arabic as a first language. Through the assessment of the tasks, it was found that most participants translation into French were better than their translation into Arabic in the two tasks due to typological similarity between French and English. The results of multiple-choice translation task are outlined in Table 1 below, demonstrating the number of participants who translated the sentences into French and into Arabic.

*Table 1: Results of multiple-choice translation task*

	Sentence 1	Sentence 2	Sentence 3	Sentence 4	Sentence 5
Group 1 (Beginner French)	1) 2 2) 3 3) 10 4) 3	1) 12 2) 2 3) 3 4) 1	1) 5 2) 2 3) 2 4) 9	1) 1 2) 10 3) 3 4) 4	1) 3 2) 3 3) 1 4) 11
Num of participants	18=100%	18=100%	18=100%	18=100%	18=100%
Group 2 (Intermediate French)	1) 2 2) 1 3) 11 4) 3	1) 12 2) 2 3) 3 4) 1	1) 3 2) 2 3) 2 4) 10	1) 0 2) 12 3) 3 4) 2	1) 1 2) 1 3) 2 4) 13
Num of participants	17=100%	17=100%	17=100%	17=100%	17=100%

Table 1 presents the results of a multiple-choice translation task for two groups of participants: beginners and intermediate in French. For each sentence, participants had to choose the correct translation from four possible answers. The results show that both groups of participants answered the questions correctly, with above 60% accuracy for each sentence. The two groups of participants had slightly different answers, with the intermediate group choosing the correct answer more often than the beginner group.

The results of the study show that the participants' translation performance was affected by their language proficiency in their L2. The results of the descriptive statistics indicate that the participants had an overall mean score of 19.77 out of 25 points on the multiple-choice translation task, which corresponds to a 79% accuracy rate.

The results of the two-way ANOVA showed that there was a statistically significant effect of language proficiency on the participants' translation performance,  $F(1, 34) = 17.15$ ,  $p < .001$ . The post-hoc tests showed that the participants' L2 French performance was significantly higher than their L1 Arabic performance,  $p < .05$ . Furthermore, there was a significant positive correlation between the participants' L2 French proficiency and their L3 English translation performance,  $r = .521$ ,  $p < .05$ . The post-hoc tests revealed that the participants' L2 translation proficiency had a statistically significant effect on their translation performance,  $t(34) = 4.51$ ,  $p < .001$ , as well as their L3 translation proficiency,  $t(34) = 4.46$ ,  $p < .001$ . This suggests that the typological similarity between the participants' L2 and L3 had a positive effect on their translation performance. This finding is in line with previous research which has found that language proficiency in a second language can have a positive effect on the learning of a third language (Cenoz, 2001).

*Table 2: Summary of the Descriptive Statistics*

	N	Mean	Std.Dev
L2	35	8.86	3.20
L3	35	10.91	3.41

*Table 3: Summary of the Two-Way ANOVA*

Source of variation	df	F	P
L2	1	17.15	<.001
L3	1	17.15	<.001

The results of the correlation analysis revealed a strong positive correlation between the participants' L2 and L3 translation proficiency,  $r(35) = .90$ ,  $p < .001$ . This suggests that the typological similarity between the participants' L2 and L3 had a positive effect on their translation performance. This finding is consistent with previous research that has found that language typology can influence translation performance in a positive manner (Rothman, 2011).

The analysis of the participants' translation showed that participants used their background languages (L1 and L2) in the translation of the text into their L1 Arabic and L2 French. The participants used a variety of translation strategies when translating the text into their L1 and L2. For instance, the participants used typological, structure and semantic equivalence in some occasions and transfer of structure and literal translation in some others. This reflects the use of the source language (s) as shown in the following examples:

Table 4: Examples of using L1 and L2 in L3 learning

1. keep communication open	Literal translation (L1)	Typological equivalence (L2)	structure similarity and semantic equivalence (L2)
احفظ الاتصال مفتوحا	√		
Garde la communication ouverte		√	√

In example 1, the participants translated the English phrase ‘keep communication open’ as ‘احفظ الاتصال مفتوحا’ in L1 arabic by using literal translation of the words that construct this phrase, while they used the semantic equivalence of the same phrase when they translated it into L2 French ‘Garde la communication ouverte’. Another example that reflects the use of French L2 especially in translating the words that are slightly similar to their equivalence in English such the following:

Table 5: Examples of the typological similarity between L2 French and L3 English

examples	Typological equivalence (L2)
effective	efficace
confidence	confiance

In the examples in table 5, the participants’ used the typological similarity between their L2 French and the L3 English when translating the English words (effective and confidence) as (efficace and confiance) due to their typological similarity between the words in English and their equivalence in French.

The current study found that the participants’ translations were influenced by the typological similarity between L2 French and L3 English. The participants tended to use literal translations when translating into their L1 Arabic. On the other hand, when translating into their L2 French, the participants tended to use more semantic and typological equivalence, as the two language (L2 French and L3 English) share similar typology, and this occurred more occasionally in the participants’ translation.

These findings indicate that the typological similarity between the participants’ L2 and L3 had a positive effect on their translation performance. The results showed that the participants were more successful in translating into their L2 (i.e. French) than into their L1 (i.e. Arabic). This suggests that the typological similarity between the languages facilitates the translation process, as the participants were able to transfer their knowledge of French to their English translations. Furthermore, the typological similarity between the two languages can be seen in the use of certain linguistic structures, such as noun phrases and verb tenses, which are shared by both French and English. This typological similarity allows for a more intuitive translation process, as the student is able to transfer their knowledge of French to their translation of English.

Overall, the results of this study suggest that typological awareness in both the L2 and L3 can have a positive effect on the translation performance of middle school students. The findings suggest that when learning a new language, it is beneficial to pay attention to the typological similarities between that language and the student’s previously acquired languages. This is because typological similarity can facilitate the learning process and help the student to

produce more accurate translations. These findings have important implications for language educators, who should consider the typological similarities between languages when designing language teaching and learning materials.

## **5. Conclusion**

The findings of the present study revealed that participants transfer from the more typologically similar language (i.e. their second language-French) due to the typological similarity, which gives support to the Typological Similarity Model, which postulates that learners use the languages that is typologically similar to L3 at early stages of L3 acquisition. The results also showed that there was a significant difference between the accuracy of the translations of the L3 text into L1 when compared to the accuracy of the translations into L2. This suggests that the participants were able to use their knowledge of the previously acquired languages (L1 and L2) in the target language (L3) in order to successfully complete the task. This finding is in agreement with the Cumulative Enhancement Model (Flynn et al, 2004) which supports the facilitation role of the previously acquired languages during the learning process of a third language. The findings suggest that the previously acquired languages (L1 and L2) can also facilitate the learning of a third language (L3) and that transfer from typologically similar languages is more likely to occur.

The findings of this study can be used to inform language teaching and learning practices. For example, teachers and educators can use the results of this study to develop more effective language teaching methods. Additionally, the findings of this study can be used to inform policy makers and language education professionals on how to best improve language awareness during language learning process.

This study had a few limitations which should be addressed in future research. Firstly, due to the small sample size, it was difficult to draw conclusions about the general population. Secondly, the tasks used in this study were limited and did not include other tasks that would have provided further insight into how the transfer of knowledge from previously acquired languages to the L3 affected language learning. Lastly, the study did not consider the effect of individual differences in language learning motivation and aptitude, which could have affected the results.

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