



L1 Shapes L2 Auditory Representation

Elicited Imitation of Arabic-Speaking Learners of English

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Abstract

L1 interference plays a major role in second language acquisition, as evidenced by empirical studies (Kellerman & Sharwood Smith, 1986). The interference could result from a learner's conscious or unconscious judgment that some linguistic features in L1 and L2 are similar (Odlin, 1989), particularly in phonology (MacKain, Best, & Strange, 1981). This paper reports on two experiments using Elicited Imitation and Reading Tasks to investigate whether L1, Cairene Arabic prosodic strategy of epenthesis to break up consonant clusters is transferred to the participants' English output. Results of Experiment A showed that epenthesis took place more in reading than in repetition, as tested by the Elicited Imitation and Reading Tasks. Mimicking was suspected to be behind the results. To control for mimicking, a second experiment (Experiment B) was conducted following the same design, but with the addition of a familiarity task to ensure that the participants knew and understood the words of an utterance and did not just mimic them. Results of Experiment B showed that epenthesis instances were the same in repetition as in reading. Epenthesis of a vowel to break consonant clusters suggests that participants of the study reconstructed the utterances based not only on how English words are stored in their mental representation, but also on Cairene Arabic syllable structure rules. This study, through the usage of Elicited Imitation Task, is able to tap into L2 Arabic speaking learners' auditory mental representation of L2 input and demonstrate the influence of L1 transfer.

Key words: Elicited imitation, L1 transfer, epenthesis, L2 listening, auditory mental representation

1. Introduction

First language interference plays a major role in Second Language Acquisition. Empirical studies conducted provide evidence that elements from one language could be incorporated into another (Kellerman & Sharwood Smith, 1986) and that the transfer of these elements was in all levels of the language, especially in the level of the sound system (Ellis, 1994, 1997).

Odlin (1989) investigated cross-linguistic influence in language learning. Agreeing with the original Contrastive Analysis Hypothesis (Lado, 1957), Odlin adds that there are two types of transfer, negative and positive, and that both types of transfer involve similarities present between L1 and L2. Contrary to how similarities initially were viewed (cf. Lado, 1957), Oldin considers similarities as facilitators at times and inhibitors at other times. Positive transfer occurs when similarities between L1 and L2 help in the acquisition process. As an example, Odlin refers to similarity and cognates in vocabulary between L1 and L2 and in phonemic systems, which can reduce the time needed in the acquisition process (see Scholes, 1969 reported in Odlin, 1989).

The other type of transfer, according to Oldin (1989), is negative transfer, which involves divergences from norms in the target language. Negative transfer, as manifested in learners' errors, occurs either due to similarities or differences between the native and target language. It can take the form of: (a) substitutions, which involve the use of a native language structure in the target language, (b) calques, errors which reflect native language structure as evident in idiomatic and word order errors, and (c) alternations of structures, and hypercorrections, cases of overreactions to a particular influence from L1.



L1 influence results from a learner’s conscious or unconscious judgment that linguistic elements in the native and target language are similar (Odlin, 1989). Native language phonology can influence the interpretation of the target language. For example, misperceptions of the sounds of the target language are likely to be categorized in terms of the native language phonology (See Goto, 1971; MacKain, Best, & Strange, 1981 ; Miyawaki et al., 1975; Mochizuki, 1981) on Japanese speakers’ difficulty in perceiving English /l/ and /r/.

Although there is widespread recognition that transfer takes place more at the level of the sound system, specifically production and pronunciation, cross-linguistic studies that investigated language transfer on word order have shown that acquisition of morphemes, and other higher-order syntactic structures, are actually more frequent than phonology-related transfer studies. Only in the last two decades has the influence of phonology and prosody of L1 into L2 been examined (Best, 1994; Best, McRoberts, & Sithole, 1988; Broselow, 1987a, 1987b, 1988, 1993; Brown, 2000; Eckman, 1987; Flege & MacKay, 2004; Ioup & Weinberger, 1987; Kim & Jung, 1998; Lotz, Abramson, Gerstman, Ingemann, & Nemser, 1960; Mitleb, 1984a, 1984b; Ostrom, 1998; Tak, 1996; Tarone, 1987).

The present paper reports on two experiments that employed Elicited Imitation as a psycholinguistic technique to investigate whether L1 prosody transfer occurs, as manifested in the repair strategy of epenthesis which Arabic-speaking participants of English resort to when they hear or read an utterance that has a string of three consonants as a result of morpheme and word concatenation in English.

The remaining sections of this paper are organized as follows. Section 2 gives an overview of syllable structures in Cairene Arabic. Section 3 discusses Elicited Imitation as psycholinguistic methodology in studying L2 acquisition. Section 4 reports on the experiments.

2. Overview of syllable structure of Cairene Arabic

English and Cairene Arabic (henceforth referred to as CA) are both classified as stress-timed languages (Hayes, 1995; McCarthy, 1979; Watson, 2002). Rhythmically, languages can be classified as stress-timed or syllable-timed languages (Pike, 1945). Stress-timed means that stress occurs at approximately equal intervals, which can contain different numbers of syllables. In order for stress to occur at equal intervals, languages take different measures to fulfill this requirement. In some languages, the time allotted to syllables is reduced or shortened; whereas, in other languages, time that is allotted to syllables is spread out. In the case of English, the former applies, but with CA the latter apparently takes place. In Arabic in general, and CA in particular, when word concatenation takes place, it usually occurs in a way that would not result in an illicit syllable. That is, postlexical resyllabification always preserves the original segmental content by inducing insertion instead of deletion. CA has strong limitations on well-formed syllables, which can only be drawn from the following set: CV, CVV, CVC or phrase-final CVVC or CVCC. CA does not allow a cluster of three consonants; therefore, if through concatenating and connecting words, such a cluster is generated, an epenthetic vowel is inserted (Broselow, 1979, 1988) as the following examples demonstrate.

- 1) a. kalb ‘dog’
kalbína ‘our dog’ / kalb-na/
dog-our
- b. katáb-t ‘you wrote’
katábítí gawááb ‘you wrote a letter’ / katab-t/
wrote-2 m. sg.

Epenthesis is an active process in the phonology of CA. As seen above, to avoid a sequencing of CCC, syllable modification is triggered through the repair strategy of epenthesis when a string of three consonants is created because of morpheme and word concatenation. The epenthesis strategy is systematic and can be observed across the board. As a consequence, I expect that CA native speakers, upon reading and repeating English utterances (e.g., words and phrases) that contain three- and four-consonant clusters, will transfer their own prosodic strategy of epenthesis and insert a vowel to break up a cluster of these consonants.

Transfer of prosodic strategies, especially vowel epenthesis, from L1 to L2 has been studied in the SLA literature, and it has been found that L2 speakers often resort to these strategies as repair tactics to simplify and modify L2 syllable structures (Alber, 2000; Alber & Plag, 1999; Alsin & Pisoni, 1980; Asci, 1996; Broselow, 1979, 1987a, 1987b, 1988, 1993; Carlisle, 1991; Hansen, 2001, 2004; Kim & Jung, 1998; Tarone, 1978, 1980, 1987; Weinberger, 1987). See (Broselow, 1979, 1987a, 1987b, 1988, 1992, 1993) for Arabic and (Dupoux, Kakehi, Hirose, Pallier, & Mehler, 1999) for Japanese.

To check whether vowel epenthesis as a repair strategy plays a role in processing English spoken language, data were collected from CA native speakers in two experiments (i.e., Experiments A and B). The expectation in both



studies was that CA speakers would insert a vowel to break up a consonant cluster in onset and medial positions when heard in English auditory input. In both studies, the method of Elicited Imitation was used to investigate whether or not CA learners of English would resort to the English pool of utterances stored in their mental representation when asked to immediately repeat an English auditory input and also whether they would insert a vowel to break up a consonant cluster as the syllable structure rules of their language specify. From this point on, the terms “imitate” and “repeat” are interchangeably used to mean the participants’ immediate production and repetition of an utterance just heard on the headphones.

3. Elicited Imitation

Elicited Imitation has been used to evaluate language proficiency in three areas: i) child language research (Dailey & Boxx, 1979; Fraser, Bellugi, & Brown, 1963; Lust, Flynn, & Foley, 1996; Slobin & Welsh, 1973), ii) neuropsychological research (Menyuk, 1964), and iii) second language research (Bley-Vroman & Chaudron, 1994; Gallimore & Tharp, 1981; Hamayan, Saegert, & Larudee, 1977; Munnich, Flynn, & Martohardjono, 1994; Naiman, 1974).

In Elicited Imitation (henceforth referred to as EI) a participant is usually presented with a spoken string and is asked to repeat the utterance as exactly as possible. The repetition is mostly oral, especially in child language acquisition; but some researchers have made use of written imitation in L2 acquisition (Savignon, 1982; Scheibner-Herzig, Sauerbrey, & Kokoschka, 1991; Spitze & Fischer, 1981). For example, Scheibner-Herzig et al. (1991) used written imitation as a means to predict foreign language oral proficiency.

In the field of L2 research, EI has been used mainly in assessing grammar proficiency. Based on the degree of similarity between the learner’s repetition and the original utterance, researchers have evaluated learners’ grammatical competence of L2 (Bley-Vroman & Chaudron, 1994; Hamayan et al., 1977; Naiman, 1974; Schimke, 2011). The underlying assumption is that the accuracy of repetition reflects the learners’ grammatical competence of L2, while failure to imitate accurately shows that the structure was beyond the level of complexity of the participants’ L2 grammar. EI’s usage has also been extended to measuring oral competence among adult L2 learners (Hameyer, 1980), as well as to gauging communicative competence (Savignon, 1982). It has also been employed as a tool to evaluate L2 learners’ implicit knowledge of L2 grammar (Ellis, 2005; Erlam, 2006). Additionally, it has been used in listening comprehension. For example, Jensen and Vinther (2003) used EI primarily as a tool in assessing listening comprehension on the assumption that, if the participants understood the stimulus sentence, they would be able to repeat it by reconstructing it based on its meaning. On the other hand, if participants did not understand the sentence, they would not be able to imitate it correctly.

EI is considered to be reconstructive in nature, which requires the learner to process the stimulus. In an EI task, participants go through some cognitive processes. For example: 1) processing a sentence or an utterance-stimulus, 2) reconstructing the stimulus with their own grammar and mental representation, and 3) reproducing it. It is argued that the utterance elicited reflects the degree to which a learner is able to assimilate the stimulus into an internal grammar (Munnich et al. 1994). For example, according to Eisenstein, Bailey and Madden (1982) participants when imitating have to reconstruct someone else’s grammar and meaning, which is sometimes beyond their productive capacities. He or she has to form a hypothesis about what is said, passing the actual utterance through a filter of existing grammatical knowledge. The resulting “imitation” constitutes the learner’s best guess about grammar, which may or may not have been completely mastered (p. 391). However, when sentences are not understood, they can only be imitated accurately if they are short enough to be retained in immediate memory as an acoustic image; and therefore, reproduced by mimicking or “parroting” (Lee, 1970; Munnich et al., 1994). Actually, mimicking or parroting is the most challenging aspect of using EI. It has been maintained that in assessing linguistic skills by means of EI it is difficult to tell whether the participants really understand the utterance they are repeating, or whether they are simply imitating a chain or stream of sounds without knowing the meaning.

In the present study, mimicking is a very important aspect because it indicates that the subject does not tap into his or her auditory mental representation or grammar -- a grammar that is expected to be influenced by L1 (i.e., Cairene Arabic) prosody and, accordingly, includes an epenthetic vowel between consonant clusters. Participants of the present study have learned English through the grammar translation method and have not had enough exposure and experience with spoken English. In addition, unlike stimuli used in most EI studies, the stimulus-string in the present study does not contain the recommended number of syllables (i.e., 12-16) (Chaudron, in press). The reason for its shortness is that the purpose of the study is not to assess the participants’ grammar or competence but to examine the epenthetic vowel that is expected to appear in their production. EI is employed here to tap on the participants’ auditory mental representation of English. It is applied based on the assumption that participants process the utterance, reconstruct it with the input in their own mental representation and



accordingly reproduce it. Although an imitation that is exact in accuracy and matching to the original utterance has been the norm in the experiments using EI as a methodology, in the experiments of this study exact pronunciation is not the focus of the study. EI is chosen because production here is considered a reflection of the participants' internalization of the target utterance (Munnich et al., 1994). Listeners' repetition or production of the utterance is constrained by time (the pause between a target utterance and the follow-up was only 30 seconds); and therefore, a production that has epenthesis between consonant clusters could point to the interfering role a listener's stored input in his mental representation may have in processing the auditory input. The assumption here is that the presence of epenthesis in the participants' output could reflect how the English utterance is stored in the learner's mental representation. On the other hand, if epenthesis is not observed, this will be suggestive of other processes; mimicking could be one of them.

To address the hypothesis that CA native speakers upon processing L2 auditory text will transfer their L1 constraints of prosody (e.g., vowel epenthesis to break up consonant clusters), two experiments were conducted. Both experiments followed a one-shot, repeated measures design, where the independent variable is L1 (i.e., CA) prosody and the dependent variable is epenthesis of a default vowel to break up a cluster of three or more consonants.

4. Experiments: Transfer of epenthesis while repeating and reading L2 input

4.1 Method: Experiment A

Twenty participants, 16 males and four females, voluntarily participated in the study. Of the 20, thirteen were students in AID/AUC English courses. The remaining seven were not enrolled in any English language program; two were students of architecture at Cairo University, and the remaining five were professionals in banks and engineering companies whose English proficiency level ranged from beginning to intermediate. At Egyptian schools, English instruction starts in the seventh grade and is mainly taught explicitly through grammar rules and translation.

4.1.1 Materials

An instrument of 37 items was constructed. The test items contained English target utterances (e.g., lexical compounds and noun phrases) that contained three-consonant clusters within and between words of the utterance. Five of the test items were distractors. These distractors did not include clusters of more than two consonants. In CA, clusters of two consonants are permissible in word medial and final positions because they are considered syllable-abutting consonants. The instrument was read by a 25-year-old American male whose accent was Midwestern. He was instructed to read the items at a natural speaking rate. His reading was recorded and used as the experiment stimulus. A Tascam 302 was used to record both the American native speaker's reading of the test items and the participants' responses. The test vocabulary consisted of simple and high-frequency words (see Appendix A).

4.1.2 Procedure

The procedure included three tasks: repetition, writing, and reading. In the first task, participants listened and immediately repeated the target words and phrases. Immediately after the Elicited Imitation, participants were asked to perform the second task, which was writing the target word or phrase. In the third task, participants were asked to read out loud the sentences that included the target words and phrases.

To carry out the repetition and writing tasks, participants were given sheets of paper that contained all 37 utterances, but the target words and phrases were missing and represented as blanks. As participants listened, they immediately repeated the word or the phrase that was missing in the sentence. Repetition of the missing word or phrase was recorded on a tape recorder for analysis. After repeating the target utterance, participants wrote the word or phrase on the provided blanks. However, to control for participants' resorting to reading what they wrote on the blanks instead of repeating the target utterance, an emphasis was made that they attempt the writing only after having repeated and pronounced the target word or phrase out loud. The purpose of the writing task was to have a written record of what the participants were trying to say, in case their repetition was incomprehensible. In the reading task, participants were given sheets that contained the same 37 utterances in full (with no blanks representing the target words and phrases). Here, participants were instructed to read the target words and phrases, which in turn were also recorded.

4.1.3 Coding and analysis

The collected data was analyzed for epenthesis and a score of "1" was given each time epenthesis was found. Epenthesis was checked in reading as well as in repetition. Articulation was also transcribed and analyzed by SpeechStation2 software (Sensimetrics, 1997-1998).



The percentage of occurrences of epenthesis in Elicited Imitation versus that in reading was run, and the means were calculated, using SPSS software. Analysis of variance, using task and epenthesis as factors, was carried out to check whether there was an interaction between epenthesis in Elicited Imitation versus that in reading.

4.1.4 Results

Results showed that epenthesis took place more in the reading task than in the repetition task. As illustrated in Table 1 and Figure 1, epenthesis took place 62% of the time in the reading task, but only 38% of the time in repetition.

Table 1: Percentage of Epenthesis in Reading vs. Repetition Tasks

	Cases of epenthesis	Total of epenthesis	Percentage
Percentage of Epenthesis in Reading	668	1,078	0.6197
Percentage of Epenthesis in Repetition	410	1,078	0.3803

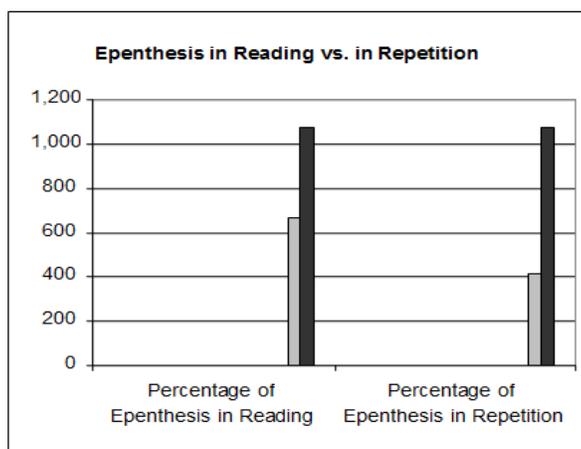


Figure 1: Epenthesis in Reading vs. Repetition

The difference between epenthesis in reading, compared with that in repetition, was found to be statistically significant. The following table illustrates the *t* value for each of the mean percentages of epenthesis in reading versus that of repetition.

Table 2: Difference in Epenthesis between Reading and Repetition

Pair	Mean Read	Mean Rept.	Paired Differences				t	df	Sig. (2-tailed)	
			Std. Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
						Lower				Upper
1	.10702	.19962	.03645	.03248	.18156	2.936	29	.006		

Epenthesis of a vowel was investigated phrase internally (between word 1 and word 2) and word internally, that is, in words that have consonant clusters in the medial position – *translation*, *sixteen* and *mystery*.

Table 3: Percentage of Epenthesis in Reading vs. Repetition Task

	Cases on epenthesis	Total	Percentage
Epenthesis in reading word internally	428	668	0.641
Epenthesis in reading phrase internally	240	668	0.359
Epenthesis in repetition word internally	274	410	0.668
Epenthesis in repetition phrase internally	136	410	0.332

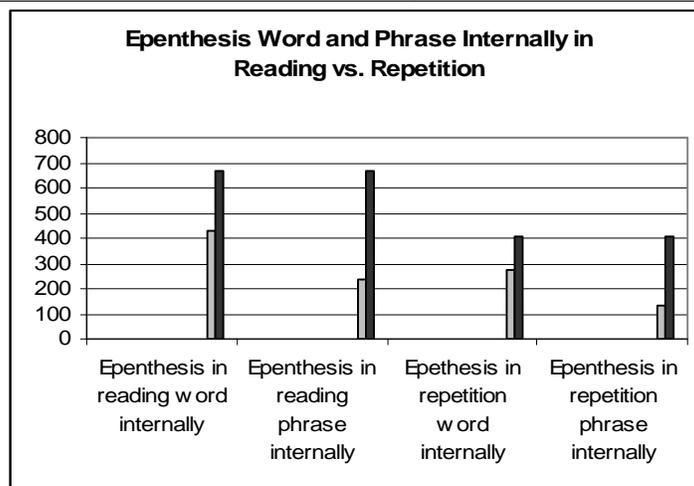


Figure 2: Epenthesis of a Vowel Word and Phrase Internal in Reading vs. Repetition Tasks

Although epenthesis happened between the words of a phrase more in reading than in repetition, further analysis of data showed that there were cases when epenthesis did not happen at all. These cases were intriguing because the expectation was that epenthesis should happen in reading every time the participants saw a cluster of three or four consonants, either word internally or phrase internally. The following words or phrases were used:

2) English	Predicted output	CA output (reading)
wall clock	wa [lik]lək	[wal.klək]/ [wal.kilək]
top floor	to[pif]lɔr	[tɔp.flɔr]/[tɔp.filɔr]
farm fresh	far[mif]rɛʃ	[fɑr.mi:fɛʃ]
spring camps	sprin[gis]kɑmp[s]	[ʔisprɪŋg.kɑmpis]
handbook	hɑn[dɪ]bʊk	[hɑnd.bʊk]
guest room	gɛst [ti]ru:m	[gɛst.ru:m]
strong proof	strɔŋg[i]pru:f	[ʔɪstrɔŋg.pru:f]
strong dislike	strɔŋg[gi]dislaɪk	[ʔɪstrɔŋg.dislaɪk]
ends meet	ɛn[dɪz]mi:t	[ʔɛndz.mi:t]

In addition, the epenthetic vowel was not regularly inserted between the words of a phrase. For example, it was inserted word internally in *top floor*, *spring camps*, *strong proof*, and *strong dislike*. In *wall clock* and *top floor*, some participants inserted a vowel to break up the initial cluster of the second word, as seen in the given examples. As for the other words, because they all started with an [s] followed by two consonants, a vowel got inserted before the [s] and after the second consonant, as illustrated above. The insertion of a vowel after the second consonant in a sequence of three consonants CiCC has been attested to in other studies (Broselow, 1979, 1992; Watson, 2002).

In repetition, on the other hand, epenthesis did not occur as consistently as it did in reading. This led to further investigation, which indicated that participants' responses in the repetition task could be divided into i) utterances that were not recognized at all and no elicitation was given, that is, participants either uttered one word, part of the word or skipped the item altogether, ii) utterances that were produced incorrectly, and iii) utterances that were faithfully mimicked. The following examples illustrate the last two categories.

3) Some Elicited Imitations	Eng. input	Predicted output	CA output (repetition)
	wɔl klɔk	[wɔlɪlək]	[wɔk kiɔk] [wɔrk lɔt] [wɔrk lɔk]
	hændbɔk	[hændibɔk]	[hiirin bɔk] [hɛnbark] [hɛnbɔk]



stænstɪl	[ʔɪstændɪstɪl]	[ʔɪstansiʔof] [ʔɪstændɪtɪd] [ʔɪstændʔɪstɔr]
kɒlkɪrɪm	[kɒldɪdɪkri:m]	[kɒldɪkri:m] [kuul gre:f] [kɒt reɪn]

An item analysis of the categories mentioned above showed that 50% of the participants produced the target phrase *wall clock* incorrectly, 40% produced *handbook* differently; whereas, 44% of the participants produced the utterance *standstill* incorrectly. This was in addition to the items that were unrecognized or recognized partially. For example, the target utterances *kind landlord*, and *cold cream*, were either incompletely repeated, as participants missed a part of the phrase, or utterly missed when participants failed to repeat the entire phrase. Such total or partial non-elicitation occurred 75% of the time for *kind landlord* and 80% of the time for *cold cream*. Moreover, parts or words of the target phrases *spring camps*, *standstill*, *old tennis ball*, and *strong proof*, were also not repeated by the participants 50% to 65% of the time.

4.1.5 Discussion

Based on CA syllable structure rules and on the premise that CA listeners would transfer their L1 prosodic constraints, epenthesis was expected to occur within and between words to break up clusters of more than two consonants in the participants' elicited production in both the repetition and reading tasks. CA speaking participants in this experiment did transfer their prosodic strategy of vowel epenthesis mostly in the output elicited in the reading task, but inconsistently in repetition. In reading, participants regularly inserted a default vowel when they saw more than two consonants clustering together within and between words. However, in repetition, epenthesis took place in some cases, but not others.

This inconsistency in the presence of epenthesis in the elicited output from the repetition task could be attributed to the following possible factors: i) mimicking the auditory input, ii) abstaining from production due to the incomplete or partial match between the English auditory input and a CA speaking learner's corresponding mental representation of the input, and finally ii) unfamiliarity with the real life English pronunciation of the target utterance.

Utterances of the American speaker's output, such as *handbook*, *standstill*, *kind landlord*, lack the coda consonant of the cluster in the first, second and third words of the string, and are actually pronounced as [hænbʊk], [stænstɪl] and [kainlənlɔr] respectively. The absence of [d] in the American English native speaker's pronunciation reflects a pronunciation rule, which states that alveolar stops are reduced and deleted when they occur between two consonants (Ladefoged, 2001, p. 59). In fact, it could be regarded as a postlexical rule and unspecified in the lexicon. It could be considered an automatic process, which the speaker is not consciously controlling. Some acoustic studies indicate that, although the tongue takes the position to pronounce the consonant, the consonant is not released (Zsiga, 2003).

Nevertheless, the participants' production, in the repetition task, which was similar to the American English native speaker's pronunciation, could not indicate with certainty whether the participants produced the utterance that way because they were aware of the rule or because they were just mimicking.

Mimicking is considered to be a potential reason behind the participants not resorting to epenthesis in the output elicited from the repetition task. Participants might have faithfully mimicked and repeated the target utterance exactly the way it was uttered on the tape. Therefore, the assumption here is that, by mimicking, the subject just repeated the utterance without tapping on the stored lexical representation for the utterance, and the absence of the epenthetic vowel is an indication that such tapping did not take place.

In addition to mimicking, there were cases with no elicited repetitions; participants remained silent, or participants repeated only part of the target utterances. This occurred with certain target words and phrases, which added to the observed inconsistency of epenthesis in the Elicited Imitation task.

A strong possibility behind abstinence from repeating, or just giving partial production, could be unfamiliarity with the components of the string. Unfamiliar words and utterances might have been entirely nonexistent in the listener's mental representation. Perhaps, participants refrained from repeating the phrase, or repeated only a fragment, because the target utterances were both semantically and auditorily unfamiliar. Since familiarity was not controlled for in this study, it could be a confounding factor that interfered with the results. Had participants been made familiar with the way American English native speakers produce such strings, would they have still



inserted an epenthetic vowel to break up the consonant cluster in the output elicited from the repetition task, as well as in the reading task?

To control for familiarity, a second experiment was conducted. The procedure is the same as that of the first experiment, except for the inclusion of a familiarity task. This task was incorporated to familiarize the participants with the sound of the utterance, and to serve as a checkpoint as to how well they knew the utterance, which was operationalized as: how they understood it and could translate it into Arabic. A description of the task is given below.

4.2 Method: Experiment B

4.2.1 Participants

A different CA population sample participated in this study. They were 25 participants between the ages of 25 and 45 from different vocational backgrounds studying at the American University, Center for Adult and Continuing Education. However, due to recording problems, data from 10 participants had to be disregarded. Out of the 15 remaining participants, 11 were female and four were male participants. Their level of English ranged from beginner to advanced. Only three advanced students were able to participate. Most of the participants started learning English at age 12 in middle school. They learned English through the grammar translation method, characterized mainly by emphasis on reading and grammar, rather than on listening and communication.

4.2.2 Materials

An instrument similar to the one in Experiment A was devised, but with more distractors to control for training transfer effect. Fifty utterances were constructed, out of which 30 were experimental utterances containing consonant clusters, 15 were distractors, and five were practice items. These sentences and questions were recorded at a normal speech rate by a 23-year-old male native speaker of American English with a Midwestern accent. As in Experiment A, oral and written instructions were given to the native speaker to read the sentences in “real life” English as naturally as possible (in one breath group) using a rapid, educated American accent.

As with the stimulus in Experiment A, target words and phrases were English lexical compounds and phrases (mainly noun phrases) that contained more than two consonant clusters. Also, as in the previous study, the target utterances’ position in the utterance varied; that is, some of the target utterances appeared sentence initial, some medial and some final. The vocabulary of the test items consisted of simple words. The instrument data was carefully analyzed phonetically. The Test Instrument is in Appendix B.

4.2.3 Procedure

The same procedure was used as in Experiment A. Participants listened and repeated the English target words and phrases, and then immediately wrote them on the provided blanks. After they completed the elicited imitation and writing tasks, the sheets were collected and subsequently analyzed for the written data they contained. The reading task followed the writing one and was performed in the same way as in the previous experiment. The participants’ oral elicitations in the repetition and reading tasks were collected on a tape recorder for analysis. Based on the collected elicitations, the writer checked whether epenthesis of a vowel occurred to break up the consonant clusters in the participants’ elicitation in repetition and reading.

As pointed out earlier, this experiment differs from the previous one in controlling for familiarity. To factor out the effect, or lack of effect, of familiarity of the utterances, a point was made, prior to the experiment, to make the participants familiar with the meaning of the target utterance as well as with how it sounded in “real life” English. To accomplish this, participants were given a training phase before the actual experiment. During this phase they listened and read the experimental target words and phrases. These utterances were previously sliced out of the original sound track and copied onto a separate tape, to which the participants listened during the training phase. Participants were instructed that they would hear a target word or phrase twice, and then read the same word or phrase, which was inserted and underlined on the sheet that was in front of them. To control for transfer of training, the sentences that carried the target words and phrases in the training session were different from the original sentences of the instrument. Upon reading the sentence, participants were asked to choose a corresponding Arabic translation out of two translations given, for the underlined segment of the sentence that corresponded to the target word or phrase. Participants received no feedback to the responses they made. Please see Appendix C.

So that possible fatigue and boredom would not interfere with the familiarity training phase and the subsequent tasks, not all of the 50 utterances were included; only the 30 experimental- target- utterances were. Also, to manage the progress of the task and make sure that the participants focused on the utterance being uttered, each example of the 30 experimental utterances was presented on a separate page in a bound booklet. The sheets were devised so that each utterance in a sentence, and its corresponding translation, was displayed on a single page and separated from the other sentences. The participants were instructed to flip the page when they finished



listening, reading and translating. To ensure that the participants focused on listening to the utterance, and were not distracted by being in the middle of reading and translating the previous utterance, the tape was controlled by the writer. A point was made that the new utterance would not be heard until all the participants finished reading and choosing the corresponding translation. Actually, the tape was turned on only when all the participants flipped the page they worked on. Participants completed this training phase in groups of two or four. The training phase lasted for 20 minutes.

After the familiarity training phase, participants, individually in a quiet room, performed the first, second and third tasks. From this point on, the procedure was the same as that in the first experiment, where participants were given sheets that contained blanks corresponding to the target words and phrases and were asked to listen and immediately repeat into the recorder the target words and phrases and then immediately wrote what they heard on the provided blanks. The reading task followed that of the repetition and writing. Participants' written and oral elicitations were collected and analyzed. The written data was used as a reference in case their elicited imitation was incomprehensible, while their oral elicitations in the repetition and reading tasks were recorded and analyzed to check for the absence or presence of the epenthetic default vowel [i] within and between words that contained clusters of more than two consonants.

4.2.4 Coding and analysis

The same coding system of Experiment A was used in Experiment B, except for the one additional aspect of familiarity. Since familiarity was added here, a score of "1" was given to the subject if he or she knew the meaning of the utterance by choosing the correct Arabic translation and a score of "0" was given if they chose the wrong translation.

The data was analyzed for epenthesis and, as in Experiment (A), the mean percentage of epenthesis was calculated, and an analysis of variance using task and epenthesis as factors was carried out to check whether there was an interaction between epenthesis and elicited imitation or reading. In addition, cases where a vowel was epenthesized were compared and checked against cases of the participants' familiarity of the target utterance. This was in order to check whether there was a relationship between inserting a vowel to break up consonant clusters abundant in English connected speech, and participants' familiarity of that particular utterance which had the consonant clusters.

4.2.5 Results

Participants' elicitations in elicited imitation and reading tasks were analyzed for epenthesis. The mean percentage for epenthesis in repetition was found to be slightly higher than the mean percentage for epenthesis in reading. Table 4 and **Error! Reference source not found.** illustrate the mean percentage in repetition versus that in reading.

Table 4: Percentage of Epenthesis in Repetition vs. Reading Participants as a Factor

Epenthesis Percentage	N	Minimum	Maximum	Mean	Std. Deviation
Repetition	15	.00	100.00	50.1819	24.54834
Reading	15	.00	100.00	49.8181	24.54834
Valid N (listwise)	15				

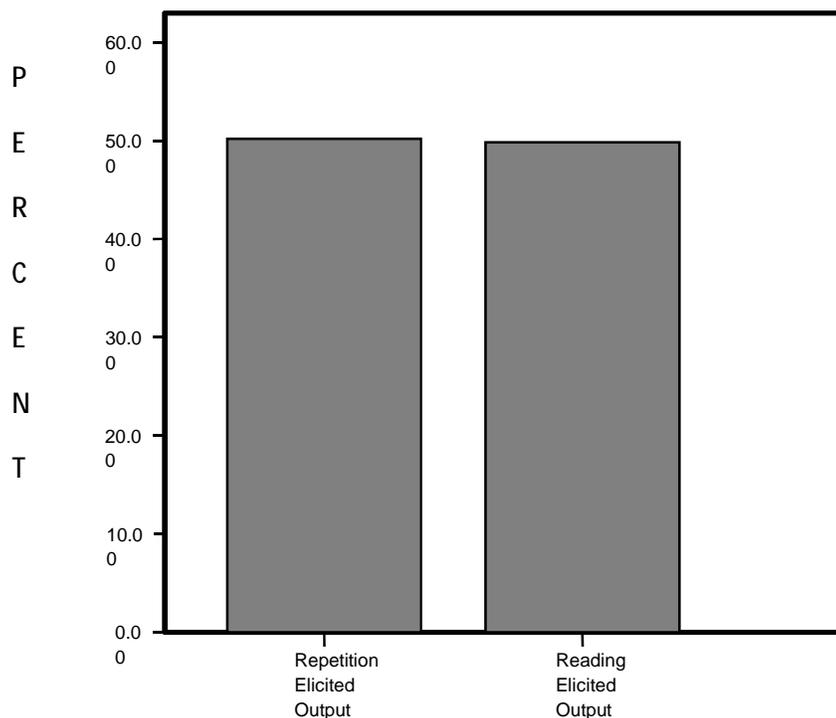


Figure 3: Percentage of Epenthesis in Repetition and Reading Elicited Output

A t-test showed no statistical significance between the mean of epenthesis in the elicited output of repetition versus that in reading.

Analysis of epenthesis of items as a factor showed that epenthesis took place more in repetition than in reading, as illustrated in Table 5 and Figure 4 below.

Table 5: Mean of Epenthesis in Repetition vs. Reading items as a factor

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Mean Epen Rep	.4981	30	.23101	.04218
Epen Read Mean	.4217	30	.17327	.03163

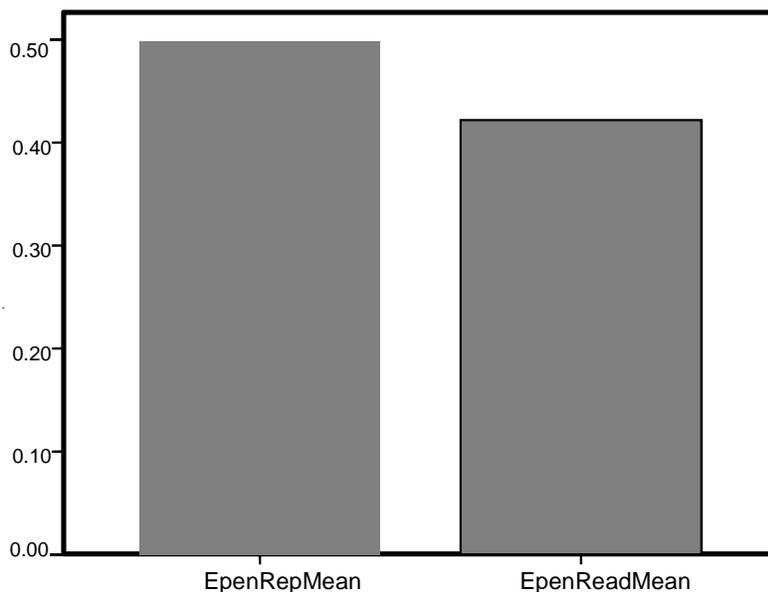


Figure 4: Mean of Epenthesis in Repetition vs. Reading

A t-test showed there is a statistical difference between epenthesis in repetition and in reading ($t(29) = 2.625, p = 0.14$).

To improve on the first experiment, I decided that verification for the presence of an epenthetic vowel between consonant clusters was warranted. Therefore, I conducted a spectral analysis on the epenthetic vowel utilized in the repetition and reading tasks and measured the formants as evidence for the presence of the epenthetic vowel.

An epenthetic vowel was found in the spectral analysis. This vowel was utilized in repetition and in reading, and was found to have the same first formant in both reading and repeating the stimulus utterance. The vowel is found to be in a similar range for the second format. Frequencies of the first and second formants illustrate that the vowel used was a closed front vowel. As for duration, vowel duration in the output from reading the stimulus utterance was longer. The following tables (Table 6 and Table 7) and Figure 5 illustrate the epenthetic vowel's formants and duration in repetition and reading tasks.

Table 6: Epenthetic Vowel First and Second Formants and Duration in Repetition

	N	Minimum	Maximum	Mean
Rep F1	29	667.00	895.00	756.1671
Rep F2	29	1,220.00	2,686.00	1,682.3845
Rep Dur	29	30.00	56.75	44.1931
Valid N (listwise)	29			

Table 7: Epenthetic Vowel First and Second Formants and Duration in Reading

	N	Minimum	Maximum	Mean
Rd F1	29	655.75	854.00	748.3122
Rd F2	29	1,189.60	2,240.50	1,835.1401
Rd Dur	29	34.00	766.86	69.8564
Valid N (listwise)	29			

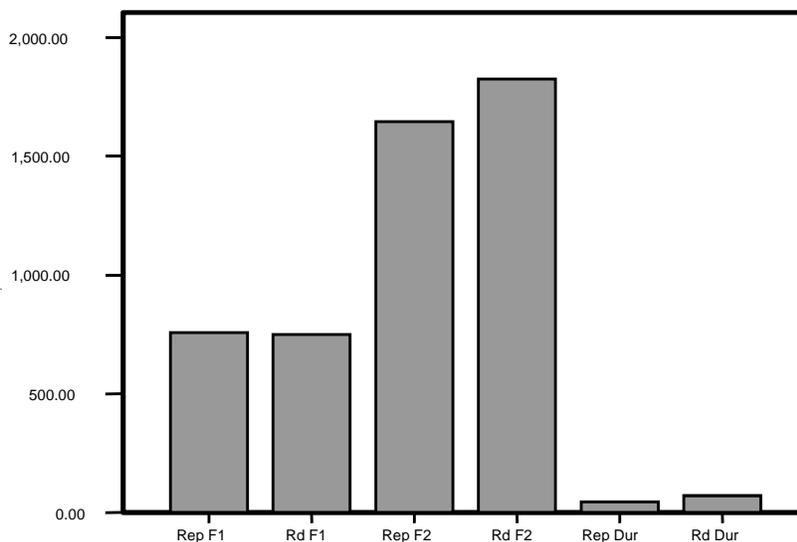


Figure 5: Epenthetic Vowels' Formants and Duration in Repetition and Reading

No statistical significance was found in the difference between the mean for the first formant and vowel duration in repetition and reading; $t(27) = .695$, $p = .493$ for the first formant; $t(27) = 1.000$, $p = .326$ for vowel duration. An analysis on the relation between familiarity of the utterance and epenthesis showed that there is a correlation between epenthesis in repetition and familiarity of utterance, as illustrated below in Table 8 and Figure 7.

Table 8: Correlation Between Familiarity and Epenthesis

		Epen Read Mean	Fam Mean
Epen Read Mean	Pearson Correlation	1	.207
	Sig. (2-tailed)	.	.272
	N	30	30
Fam Mean	Pearson Correlation	.207	1
	Sig. (2-tailed)	.272	.
	N	30	30

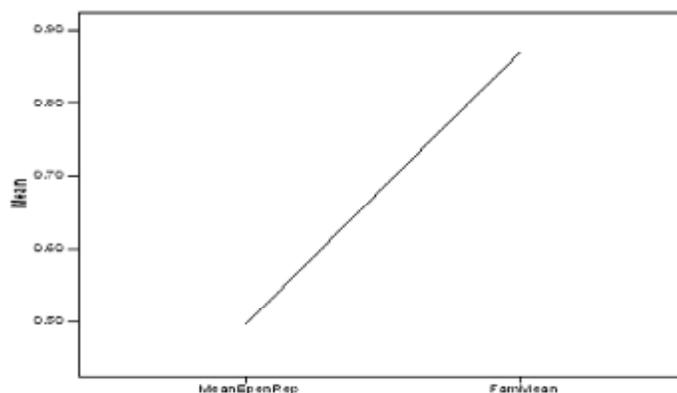


Figure 6: Relation between Familiarity and Epenthesis in Repetition

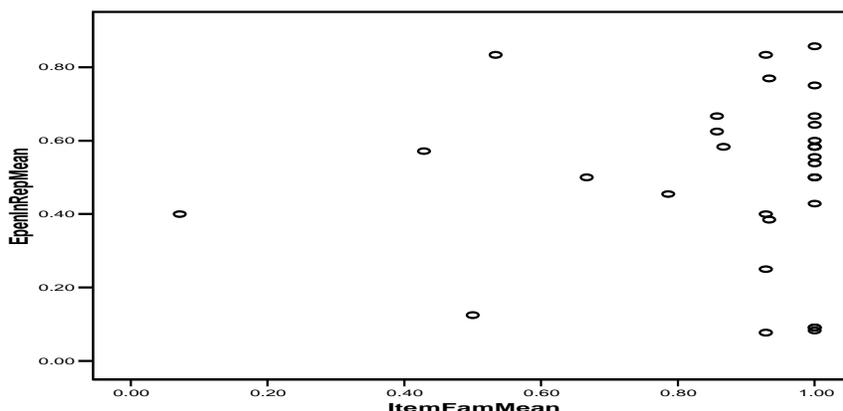


Figure 7: Scatter Plot of Correlation between Epenthesis in Repetition and Familiarity of Item

Upon analyzing participants' data per level and condition (i.e., repetition versus reading) a general tendency for inserting an epenthetic vowel is found to be related to proficiency level and condition. See the figures below.

Epenthesis & Lack of Epenthesis & No Elicitation in Elementary participants' Repetition & Reading

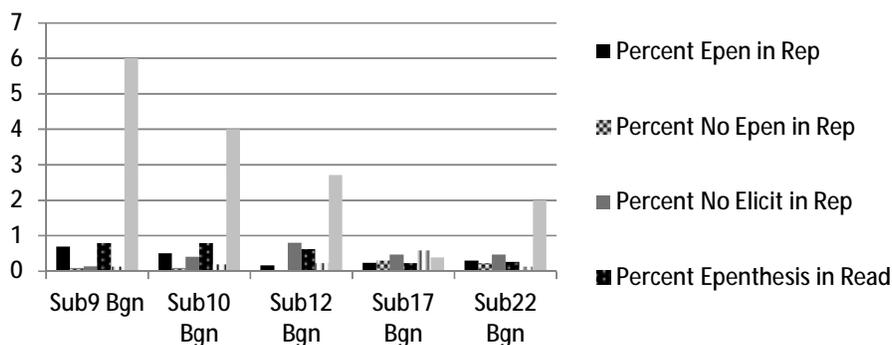


Figure 8: Epenthesis and Lack of in Elementary Participants' Repetition and Reading

Epenthesis & Lack of Epenthesis & No Elicitation in Intermediate Participants' Repetition & Reading

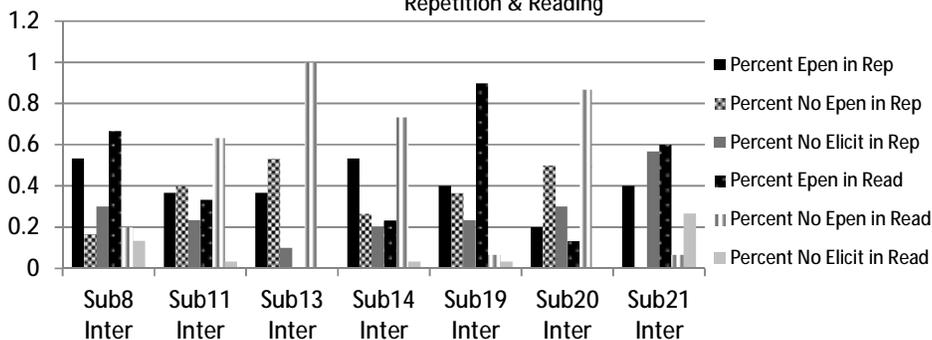


Figure 9: Epenthesis and Lack of in Intermediate Participants' Repetition and Reading

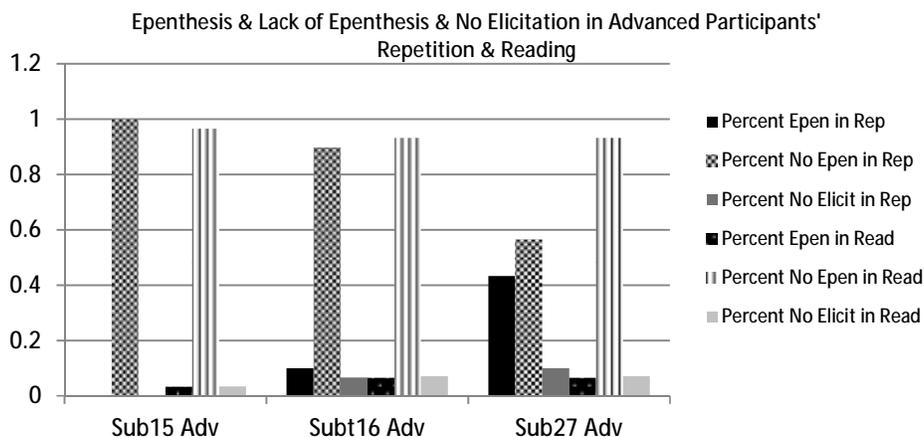


Figure 10: Epenthesis and Lack of in Advanced Participants' Repetition and Reading

As observed, there is an overall tendency for epenthesis to increase in reading more than in repetition among elementary participants, except for participant 22, whose epenthesis decreased contrary to expectation. However, upon analyzing and comparing the no elicitation cases of this participant with the no elicitation cases of the other participants of the same group, we find that it increased, not decreased, in reading, as demonstrated by the other participants' performance. Fatigue is expected to be behind the increase of no elicitation with participant 22, hence, the variation in epenthesis in reading.

As seen in the charts of the intermediate and advanced groups, we find that there is more variability among intermediate participants than among the advanced ones in using epenthesis in repetition versus that in reading. In some cases it increased in reading, e.g., participants 8, 19 and 21, while it decreased in other participants, e.g., participants 14 and 20. Epenthesis disappeared completely with participant 13 (see Figures 9 and 10). The variability could be related to two aspects; one is that mimicking is still at play among intermediate participants and the other is that L1 interference may be playing a role. This performance illustrates the U shape of learning that is taking place among intermediate participants. As for the advanced participants, we see that epenthesis did not show up in their repetition or in their reading, suggesting that experience and exposure to spoken language is at play. In fact, one of the advanced participants, participant 27, decreased using epenthesis in her reading to a great extent.

The data show that there is a relation between the proficiency level of the participants and the use or lack of use of an epenthetic vowel in breaking up consonant clusters in the two tasks investigated, repetition and reading. The higher the level, the less use of epenthetic vowel in both tasks. See Figures 11, 12, and 13 below.

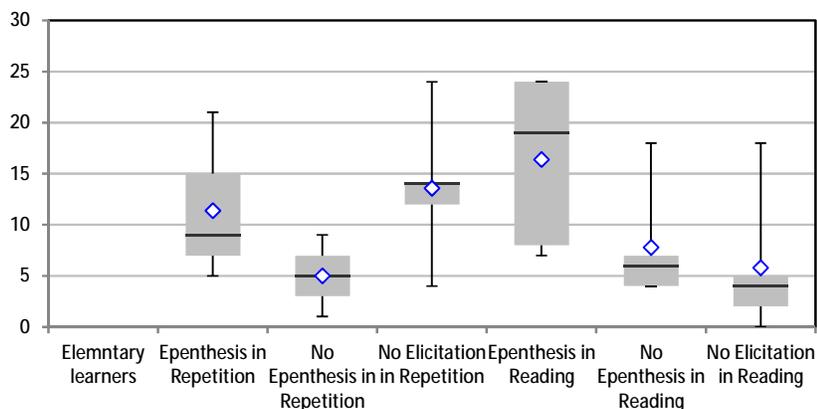


Figure 11: Repetition and Reading by Elementary Learners Illustrating Epenthesis, Lack of Epenthesis and No Elicitation in Repetition and Readings Tasks

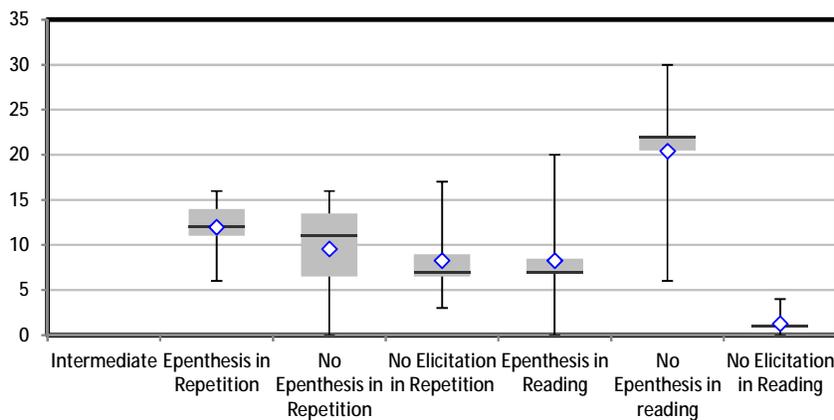


Figure 12: Repetition and Reading by Intermediate Learners Illustrating Epenthesis, Lack of Epenthesis and No Elicitation in Repetition and Readings Tasks

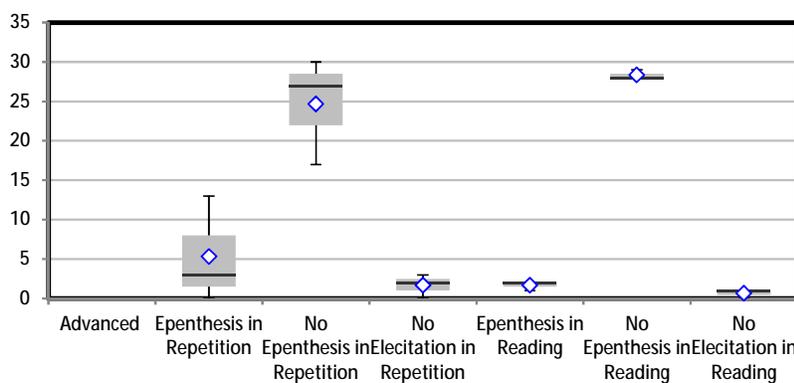


Figure 13: Repetition and Reading by Advanced Learners Illustrating Epenthesis, Lack of Epenthesis and No Elicitation in Repetition and Readings Tasks

By comparing the three charts we find that no epenthesis cases occur more among advanced participants in repetition and reading conditions than among intermediate and elementary participants. No elicitation cases decrease to a greater extent in repetition among intermediate participants than among elementary-level ones. The most interesting aspect in the data is the no epenthesis cases increase in reading among intermediate participants. This is contrary to the expectation of the study. It was expected that epenthesis would take place every time a participant encountered a consonant cluster visually and was asked to read it. This finding suggests that some implicit learning may have taken place.

On the whole, cases of no elicitation decreased in comparison to those in Experiment A of the study. However, the utterances that were the least elicited, as a whole or partially, were the same as those that were missed in Experiment A, such as *kind landlord*, *alarm clock*, *standstill*, *spring trees*, *ends meet*, and *work place*. Some of these items had a very low percentage in terms of familiarity, like *stand still*, *ends meet* and *work place*, as illustrated in.

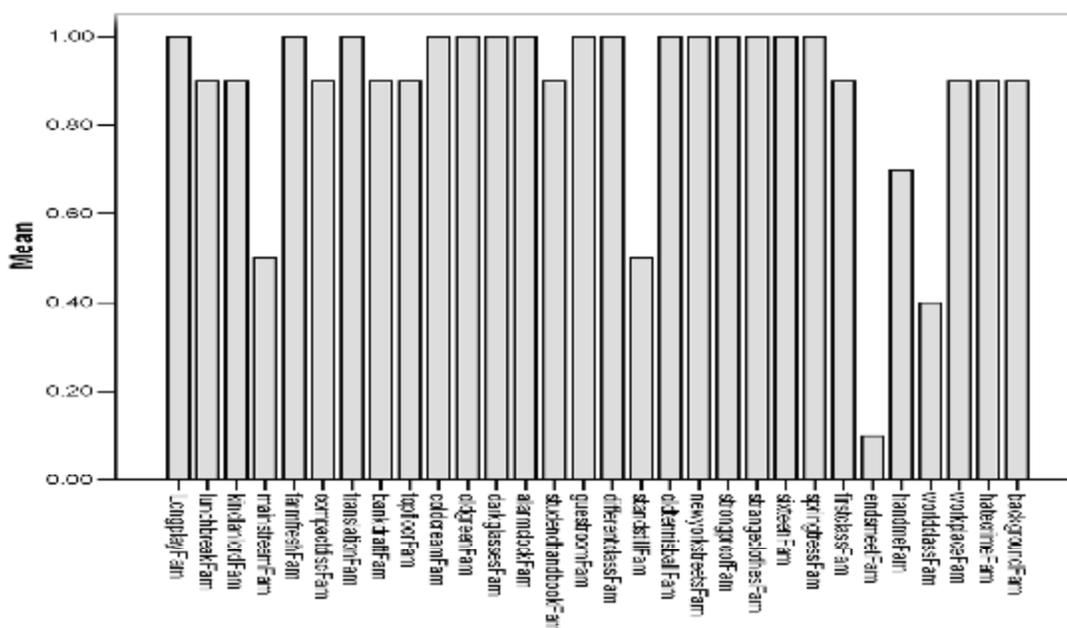


Figure 14: Familiarity of Utterance

The items, their familiarity percentage, miss rate and spoken and written elicitations are illustrated in (Appendix D).

4.2.6 Discussion

The conducted study has two main findings. The first is that CA speaking learners of English transfer their prosodic strategy of vowel epenthesis in elicited imitation or repetition and reading tasks. The second is that familiarity training helped the learners match the English input (citation forms) stored in their mental representation with the spoken input they heard on the tape. By going through the familiarity phase, participants had the opportunity to correspond and associate the auditory stimulus with the stored mental representation.

Contrary to the findings of Experiment A, epenthesis in the output of the elicited imitation task in Experiment B has increased, and is even slightly higher in repetition than in reading. The difference is statistically significant when items are a factor in the analysis. This directs one’s attention to the hypothesis that CA-speaking learners of low and intermediate proficiency of English in this study may have tapped into the stored mental representation in repeating a heard target utterance only when the utterance is both auditorily and semantically familiar to them. The evidence is inferred from the epenthetic vowel used in their elicited output, especially in the repetition task. The presence of an epenthetic vowel in the learner’s repetition and reading indicates that L1 phonological rules still affect learners’ processing of L2 input. However, as demonstrated by the findings in the box plot charts, the epenthetic vowel disappears as proficiency level increases.

Participants’ translation choices for the target utterances in the familiarity phase did not show that semantics was a problem. In fact, participants chose the correct translation most of the time in the familiarity training session. Yet, being auditorily familiar with the target utterance seems to be a completely different issue. This is in line with the argument raised in Experiment A, i.e., for listeners to process a sequence of auditory segments or words, they most likely need to match what they hear to the corresponding match stored in their mental lexicon.

Familiarity with the auditory aspect of the input (i.e., spoken form) is shown to have an effect. As demonstrated in the results, it is indirectly related to the presence of an epenthetic vowel in participants’ elicited output. More participants in Experiment B inserted a vowel to break up consonant clusters they thought they had heard in the utterance. As discussed above, this epenthetic vowel suggests that the participants had tapped into the stored English in their mental representation.



I argue that, the mental representation of the learners of English in this study is not only shaped by the input the learners have been exposed to in learning English throughout the years, but also by L1 prosodic and phonological structures and constraints. The participants in this study, upon listening to the input, construct a phonological representation of the utterance, provided that they are familiar with the pronunciation and meaning of the utterance. The constructed phonological representation is mapped with the representation they have in their mental lexicon. If the mapping matches, the utterance is reproduced. Whether or not the utterance has an epenthetic vowel between the consonant clusters, depends on two factors whether i) L1 phonological rules are at play, ii) L2 phonological rules are inactive or lacking because there is not enough positive input of, exposure to and experience with the spoken form of the utterances.

In Experiment B, the intermediate learners as well as the advanced ones inserted a vowel in repetition, but not in reading. I consider this quite interesting. Naturally, one would expect the absence of an epenthetic vowel in the repetition due to mimicking the auditory input (i.e. American English connected spoken language) where such an epenthetic vowel between consonant clusters is not present in the stimulus. Whereas in reading, due to the presence of the letter graphemes corresponding to the consonant cluster, epenthesis of a vowel is expected and is in fact inevitable. As shown, this was not the case -- suggesting that exposure to and experience with a spoken form of the input play a major role.

Studies in L2 speech perception consider experience to be of great importance. According to them, it plays a major role because it can profoundly change not only how speech is perceived (Kuhl, 1992: 294), but also can alter the mechanisms which underlie speech perception and, accordingly, the listener's mind (Kuhl & Iverson, 1995, p. 121). Empirical studies have found that experience has a role in learning L2 consonant clusters, as experienced learners performed better than inexperienced ones in learning to identify consonant clusters (Guiona, Flege, Yamada, & Pruitt, 2000). Flege (1984) also found that experienced Arab learners of English responded much like the Americans in identifying the /s/ and /z/ phonemes as in the words "piece" or "peas" of English, whereas the relatively inexperienced Arab learners, on the other hand, were inconsistent in labeling the stimuli.

Returning to the decrease of an epenthetic vowel among intermediate and advanced learners, two related issues are worth mentioning. The first is EI as a psycholinguistic methodology, and the second is the role of implicit learning.

The study suggests that EI could be a valid methodology in examining whether or not L2 learners tap into their mental representation in processing L2 spoken input, and the second is that learning of a linguistic feature might take place even if participants were not explicitly instructed on the given linguistic feature. Whether this learning is temporary or permanent is an open question that should be addressed in further studies.

More evidence that L2 listeners resort to their stored L1 mental representation is found in a study conducted by (Dupoux, Pallier, Kakehi, & Mehler, 2001). The authors found that Japanese listeners, upon listening to stimuli that contained illicit consonant clusters, tend to hear an imaginary vowel to conform to the phonotactics and syllable structures of their language, demonstrating the impact that knowledge of phonotactics and syllable structures has on speech perception. It would be interesting to find out whether CA speakers would tend to hear an imaginary vowel as well.

EI can help researchers investigate the mental representation of L2 learners. This is because time is constrained in EI as the participants are asked to immediately repeat the target utterance. Consequently, there is not enough time to first meta-linguistically check whether the utterance to be uttered follows the phonological rules of L2; therefore, what controls the nature of the elicited production should be the subject's grammar, as stored in his mental representation.

5. Conclusion

Through Elicited Imitation Task this study was able to examine the mental representation of spoken English by CA-speaking learners of English. The study investigated whether CA speaking learners of varied proficiency levels would insert an epenthetic vowel to break up consonant clusters when asked to repeat an utterance of English that had consonant clusters. Consonant clusters in certain positions of the word are illicit in Cairene Arabic because their presence produces illicit syllable structures. The study demonstrated that presence of an epenthetic vowel correlated with the familiarity of the spoken form, and with the proficiency level of the learners. The higher the proficiency level was, the less the epenthetic vowel appeared in the learners' output. Finally, the study also showed that Elicited Imitation as a methodology could be used to examine L2 learners' mental representation of spoken L2 input.



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Appendix A

Test instrument Experiment A

1. Spring camps are my favorite.
2. What a nice wall clock!
3. That was a long play.
4. Lunch break is for an hour.
5. I didn't like the end of this movie.
6. Your kind landlord has given us a year's lease.
7. Our office is on Main Street.
8. These eggs are farm fresh.
9. I'm not so good at translation.
10. I forgot to bring the bank draft.
11. His office is on top floor.
12. Do we have a guest in the house?
13. These strawberries will taste better with cold cream.
14. I want to buy pink blouses.
15. I want the old green chair over there.
16. I can't make both ends meet!
17. I hate dark glasses.
18. Long distance calls cost a lot.
19. What do you usually do for a work out?
20. I don't have the student handbook.
21. Is this the only guest room?
22. They put me in a different class.
23. The storm finally came to a stand still.
24. This is an old tennis ball.
25. New York streets are very crowded
26. Rafter won many grand slams.
27. I told my son "don't flunk tests."
28. This is strong proof she did it.
29. These days, young people wear strange clothes.
30. I love hearing the birds sing.
31. I developed a strong dislike to ice cream.
32. These tomatoes are very fresh, aren't they?
33. I have only sixteen dollars left
34. Spring trees are splendid in this town
35. How do you want to fly, first class or coach?
36. The second exam wasn't easy to pass.
37. I love to read mystery novels.



Appendix B

Test Instrument and Stimulus Experiment B

1. This apple is very sweet.
2. I need to go to the supermarket.
3. I am so tired.
4. This bag is very heavy.
5. Do you like coffee or tea?
6. My typewriter is broken.
7. That was a long play.
8. Lunch break is for an hour.
9. I like this movie.
10. Your kind landlord has given us a year's lease.
11. He is Polish not German.
12. Our office is on Main Street.
13. I am allergic to peanuts.
14. These eggs are farm fresh.
15. There is a virus on this compact disc.
16. I'm not so good at translation.
17. Your sister is very nice.
18. I forgot to bring the bank draft.
19. His office is on top floor.
20. Do we have a guest in the house?
21. These strawberries will taste better with cold cream.
22. I know how to type very well.
23. I want the old green chair over there.
24. I hate dark glasses.
25. These tomatoes are very fresh, aren't they?
26. Could you set the alarm clock at 7?
27. Italy is my choice for summer holiday.
28. I don't have the student handbook.
29. Is this the only guest room?
30. They put me in a different class.
31. The storm finally came to a stand still.
32. My teacher lives in London.
33. This is an old tennis ball.
34. New York streets are very crowded.
35. This is strong proof she did it.
36. I like your bag.
37. These days, young people wear strange clothes.
38. I have only sixteen dollars left.
39. Spring trees are nice in this town.
40. Please call me when you have time.
41. How do you want to fly, first class or coach?
42. I can't make both ends meet!
43. Hand me the book, please.
44. Do you like this white sofa?
45. I mean the yellow book, not the green.
46. Pete Sampras is a world class athlete.
47. This is a good work place to be at.
48. The international community fights all kinds of hate crime.
49. What is your educational background?
50. Again, my computer is down.



Appendix C

Familiarity Task Booklet

Name: _____

Age: (Approximately) _____

Class and level: _____

Profession: _____

How many courses did you take at this institute? _____

How many years of English at school? _____

At what age did you start learning English? _____

Familiarity Task

You will find in front of you a small booklet. On each page you will find an English utterance, either a sentence or a question. Please read the sentence or question and pay attention to the underlined part of the sentence or the question. Then, choose the corresponding Arabic translation for the underlined part. Do this by checking either (1) or (2). Please note that the given translation is only of the underlined part. In choosing your answer, you should check one answer only; it cannot be both. So please make sure that you check one answer only. If you check, for example, (1) and then want to change your mind and check (2), please make sure that you cross out the first checked number completely, as in the example given.

Example:

This apple is very sweet.

مرة جداً (2) ✓

لذيذة جداً (1)

And then you want to change your mind, so please cross out the checked translation like that and choose the other one.

~~مرة جداً (2) ✓~~

لذيذة جداً (1) ✓

After checking the Arabic translation, you will hear the utterance (only the underlined part) through your headphones said only one time. After hearing the utterance you will be asked to turn the page to do the following item.

If you have any questions, please make sure to ask them before the task begins. Thank you for your participation.

1. In summer I like to eat strawberries with cold cream.
كريمة باردة (2) سكر محروق (1)
2. This house belongs to this kind landlord
صاحب البيت الطيب (2) السيدة الجميلة (1)
3. Farm fresh eggs are the best to eat.
فاسدة (2) طازجة (1)
4. My apartment is not on top floor.
الطابق الأول (2) الطابق العلوي (1)
5. I am hungry when are we going to take our lunch break?
التوقف عن الأكل (2) راحة الغذاء (1)
6. Sixteen dollars is too much for this bag.
عشر (2) ستة عشر (1)
7. The old green chair over there is broken.
الأخضر الجديد (2) الأخضر القديم (1)
8. It's very quiet now. It is like a storm stand still.
توقع (2) توقف (1)
9. A different class is better for this student.



English Sentence	Arabic Translation	Points	English Sentence	Arabic Translation	Points
	فصل مختلف	(2)	فصل كبير		(1)
10. This is a <u>world class</u> movie.	فصل عالمي	(2)	من أحسن الموجدین		(1)
11. Don't play with an <u>old tennis ball</u>	كرة تنس قديمة	(2)	كرة قدم قديمة		(1)
12. They both work to make <u>ends meet!</u>	كل من الطرفين متفقين	(2)	الانفاق بما لا يزيد على الدخل		(1)
13. My <u>student handbook</u> is in my bag.	حقيبة الطالب	(2)	كراسة الطالب		(1)
13. Does the company require a <u>bank draft?</u>	ورقة نقدية	(2)	حوالة سحب		(1)
14. <u>Spring trees</u> are very green in March in this city.	أشجار الزيتون	(2)	أشجار الربيع		(1)
15. <u>First class</u> tickets are much more expensive than coach.	أول الفصل	(2)	درجة أولى		(1)
16. In this city boys wear <u>strange clothes.</u>	ملابس قديمة	(2)	ملابس غريبة		(1)
17. <u>New York streets</u> are as noisy as Cairo streets.	شوارع جديدة	(2)	شوارع نيويورك		(1)
18. Can you <u>hand me</u> the salt, please.	خذ مني	(2)	أعطني		(1)
20. Don't use this <u>compact disc</u> , it is broken.	أسطوانة مدمجة	(2)	امبوبة بوتاجاز		(1)
21. The <u>alarm clock</u> did not go off this morning.	المنبه	(2)	التليفزيون		(1)
22. The <u>guest room</u> is on the first floor.	غرفة النوم	(2)	غرفة الضيوف		(1)
23. A healthy <u>work place</u> is very important to me.	طريقة عمل	(2)	مكان عمل		(1)
24. Any kind of <u>hate crime</u> should be stopped in all countries of the world.	جريمة سرقة	(2)	جريمة حقد		(1)
25. Although my <u>background</u> is very solid, I did not get the job.	شارع خلفي	(2)	خلفية		(1)
26. Al za 'iim is a <u>long play</u> by 'Adel Imam.	رحلة طويل	(2)	مسرحية طويلة		(1)
27. I live on <u>Main Street</u> .	الشارع الرئيسي	(2)	اسم الشارع		(1)



-
28. Translation is important in language studies.
قراءة (2) ترجمة (1)
-
29. Dark glasses are good when your eyes hurt.
قمصان غامقة (2) نظارات غامقة (1)
-
30. Give me a strong proof that she stole your wallet.
دليل التليفون (2) دليل قوي (1)
-

Appendix D

Participants familiarity of the utterance

Stimulus

		Phonetic Transcription	Familiarity		
1	Long play	lɔŋplei	15	15	100
2	lunch break	lʌŋfbrek	13	15	86.7
3	kind land lord	kainlænlor	14	15	93.3
4	main street	meinstri	5	15	33.3
5	farm fresh	farmfrɛʃ	14	15	93.3
6	compact disc	kɔmpækdɪs	14	15	93.3
7	translation	trænzleɪʃən	15	15	100
8	bank draft	bæŋdræft	13	15	86.7
9	top floor	tɒpflɔː	13	15	86.7
10	cold cream	kɒldrɪm	15	15	100
11	old green	ɒlgrɪn	15	15	100
12	dark glasses	dɑːrglɑːsɪz	15	15	100
13	alarm clock	alɑːmkɒk	15	15	100
14	student handbook	stjuːdnt hændbʊk	13	15	86.7
15	guest room	ɡɛstrʊm	15	15	100
16	different class	dɪfrɛnkɪlɑːs	15	15	100
17	stand still	stændstɪl	11	15	73.3
8	old tennis ball	ɒltenɪsbɔːl	14	15	93.3
19	New York streets	njuːjɔːkstriːts	15	15	100
20	strong proof	strɔŋpruːf	15	15	100
21	strange clothes	strændʒkləʊz	15	15	100
22	sixteen	sɪksˈtiːn	15	15	100
23	spring trees	sprɪŋtriːz	15	15	100
24	first class	fɜːstklɑːs	14	15	93.3
25	ends meet	ɛnzmiːt	4	15	26.7
26	hand me	hændmiː	10	15	66.7
27	world class	wɜːrldklɑːs	4	15	26.7
28	work place	wɜːkpleɪs	15	15	100
29	hate crime	heɪkraɪm	14	15	93.3
30	background	bækraʊnd	13	15	86.7