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**Cross-Language Phonetic Interference: Egyptian Arabic and Libyan Arabic to
English**

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1 introduction

There is a substantial body of empirical evidence indicating that early language experience can impede the acquisition of non-native phonemes during adulthood. Sometimes, learners need extensive training in order to speak languages other than their native tongue to some degree of intelligibility. It has been hypothesized that there is a critical period for language acquisition that extends into late childhood and possibly until puberty (Lenneberg, 1967). Adult learners tend to experience first language (L1) interference. L1 interference, also known as language transfer and linguistic interference, refers to speakers applying knowledge from their native language to a second language. Dulay, Burt and Krashen (1982) define interference as the automatic transfer of the surface structure of the first language onto the surface of the target language.

What we know about language interference, or more specifically phonetic interference, is largely based upon empirical studies that analyze speech produced by second language (L2) learners, and observations of how the mother tongue interferes in the learning of a second language (Flege, 1980; Flege & Port, 1981; Port & Mitleb, 1983). Several previous studies have compared native and accented productions, in terms of a variety of acoustic properties, and found that adult L2 learners often do not produce English native-like voice onset times in their L2 speech, even if they have extensive experience with it (Caramazza, Yeni-Komshian, Zurif, & Carbone, 1973; Flege, 1987; Flege, & Port, 1981, Williams, 1980). The phonemic vowel length in L2 speech has also been investigated by a number of researchers (Crowther & Mann, 1992; Flege, Munro, & Skelton, 1992; Port and Mitleb, 1983; Mack, 1982). These studies have shown that L2 learners of English frequently produce only very small voicing-conditioned vowel duration differences before stops.

Arabic with all its varying dialects is an interesting language to investigate. Dialect-specific differences raised the opportunity to assess how differences in phonological inventory would affect the production of foreign language speech sounds by adult language learners. However, far too little attention has been paid to how dialect-specific variations of Arabic dialects exhibit different forms of phonetic interference in English speech. As opposed to previous studies, this paper will not focus on interference from one Arabic dialect, but it will analyze and compare the forms of interference that occur in English speech produced by native speakers of two varieties of Arabic. Moreover, while previous studies have mainly conducted detailed research on a single phonetic feature, the purpose of this study is to present multiple phonetic features that can be subject to interference and test these.

In this study, Libyan Arabic (LA) and Egyptian Arabic (EA) are examined as native languages and English as the target language. I chose LA as one of the two dialects because previous studies are limited and do not give an overarching view of the linguistic situation of LA (Al-Fituri, 1976; Mitchell 1952; Owens, 1980). In addition, most of these studies' authors are non-native, and this might impede an accurate and complete linguistics research as apposed to research by native speakers. Although extensive research has been carried out on Arabic language transfer, no single study exists on LA interference into English speech. Furthermore, the reason why EA was chosen as a second dialect is the prestigious position that EA enjoys among all regional dialects of Arabic. It has always been the most widely spread of all dialects and, overall, all speakers of Arabic have no difficulty understanding EA.

The aim of the current study is a) to determine whether there is phonetic interference into English speech produced by highly educated native speakers of Egyptian Arabic and Libyan Arabic, b) in case interference is present, to evaluate whether it is dialect-specific.

This paper is structured as follows: the second section introduces the dialects to be discussed, and sets out the relevant phonetic features for this study. The third section details the experimental methodology. Section four presents and discusses results from the collected data. Section five concludes by discussing limitations, implications and suggestions for further research.

2 Theoretical Background

2.1 Interference in Second Language Acquisition

Lenneberg's (1967) critical period hypothesis concerned only first language (L1) acquisition; he left open the question of whether this critical period extended to second language (L2) acquisition. This prediction was tested by a number of studies since the time of Lenneberg's book, focusing particularly on the acquisition of phonology and grammar of the L2. Most results clearly showed a strong advantage for subjects who began learning in childhood (Seliger, Krashen, & Ladefoged, 1975; Oyama, 1976; Oyama, 1978; Patkowski, 1980). Exposure to speech during childhood alters neural organization in such a way that individuals, born capable of learning any language, develop perceptual and cognitive processes that are specialized for their native language (Iverson et al., 2003).

Recent evidence and experimental findings claim that interference is the prime cause of L2 learners' errors (Bahns, 1993; Gabrys-Biskup, 1992). Overall, far less has been written on errors by learners, categorized on the basis of their L1, than one might expect: this can be attributed to a temporary eclipse of contrastive studies and error analysis (James, 1998; Mohammed, 2000; Odlin, 1989). In brief, the dominant view in L2 acquisition research was, for many years, that L2 and L1 acquisition were fundamentally similar. Several studies confirmed this view (Brown, 1973; Dulay & Burt, 1974; White, 1977). However, approaches to analysis of learner language which anticipated and looked for errors arising from L1 influence now enjoys renewed acceptance as a crucial component in modern L2 learning theories (James, 1998).

Interference has been a major topic in phonology and phonetics over the last few decades. Many linguists argue that, when a second language user falls back on the first language for filling up the lack created by insufficient knowledge of the second language, they are likely to make errors especially when the native language of the speaker and the second language are very different (d'Anglejan, 1990; Hubbard, Jones, Thornton, & Wheeler, 1983; Odlin, 1989). It has been noted by linguists that the higher the degree of similarity between the phonological categories of the native language and the target language, the easier it is for the speaker to learn the phonological categories of the target language, and the converse has been held to be true (Brière, 1966). For example, in two languages with some very different characteristics, English speakers use mainly stress to parse words in the speech stream, while French speakers rely more on syllable cues (Saigh & Schmitt 2012). A number of researchers have reported that both French and English speakers used their L1 cue processing strategies when learning the other language as a L2, causing problems for both groups (Cutler et al., 1986; Cutler & Norris, 1988).

Because the Arabic and English vowel and consonant systems are different in various ways, Arabic is an interesting counterpoint to English. A considerable amount of literature has been published on English article errors made by native speakers of Arabic (Bataineh, 2005; Kharma, 1981; Scott & Tucker, 1974; Smith, 2001). Scott and Tucker (1974) found article errors performed by L1 Arabic learners among the top four types of error among high school graduates. Kharma (1981) looked at tertiary level students' errors in a cloze test and found a mean error rate of over 25% for all articles. Bataineh (2005) looked at errors associated with *a* in a corpus of tertiary essays. Focusing only on

the 319 syntactic/semantic errors in her data she found that 61% of errors were instances of underuse:- “Ø-for-a” (46%), “the-for-a” (15%). Overuse counted for the remainder, with the largest types of error being “a-for-the” (27%) and “a-for-Ø” (8%).

In addition, English vowels produced by Arabic speakers have been investigated by a number of researchers. Mitleb (1981) analyzed Jordanian English and found that Arabic long-short vowel duration patterns were transferred to English tense and lax vowel pairs. Also, Fledge and Port (1981) analyzed Saudi English speech and found a smaller effect of consonant voicing on preceding vowel duration in comparison to native English speech. Some researchers observed significant movement in English diphthongs and in the English /ɪ/, /ɛ/ and /æ/ (Nearey & Assman, 1986; Andruski & Nearey, 1992; Mitchell, 1990).

As opposed to previous studies, this paper will deal with interference in English speech produced by native speakers of two varieties of Arabic. Moreover, this study will set out and test multiple phonetic features that can be subject to interference. Since no previous studies provide data concerning how dialect-specific differences of different Arabic dialects exhibit different forms of phonetic interference in English speech, it was first necessary to introduce the language and the dialects to be dealt with and set out the relevant phonetic features for this study.

2.2 Classical Arabic

Arabic is the official language of more than 20 countries in the Middle East and North Africa. It is spoken by approximately 280 million native speakers. Arabic plays an important role for more than 1 billion Muslims worldwide, because it is the language of the Holy Quran (Procházka, 2006). The linguistic situation in the Arabic-speaking countries is a diglossic one. The two varieties of the language, in this case the high (H) Modern Standard Arabic (MSA) and the low (L) dialects, are in complementary distribution with each other (Freeman, 1996). Modern Standard Arabic is, grammatically, virtually identical with the Arabic of the Quran (Mustafa, 2004). Because, nowadays, MSA is the H variety of the language and the form of Arabic that is taught in schools, the terms Classical Arabic (CA) and Modern Standard Arabic will be used interchangeably throughout this paper. The H variety is used in formal settings like news bulletins, university lectures, courts of law, religious ceremonies and formal reports. The L variety, on the other hand, is used informally as the everyday means of communication and in spoken media. While the L variety is essentially spoken, it is sometimes encountered in written form in novels, plays, poems (vernacular literature), as well as in comics, advertising, some newspapers, and transcriptions of popular songs. In most other written media and in television news reporting, the H variety is used.

This paper will discuss two of the many Arabic dialects, namely Egyptian Arabic (EA) and Libyan Arabic (LA). In the upcoming section these two dialects will be elaborated on, their consonantal phoneme inventories will be set out and interesting differences between the two will be discussed briefly.

2.2.1 Egyptian Arabic

The term Egyptian usually refers to Cairene Arabic, spoken in Cairo, the capital of Egypt (Thompson, 2013). It is estimated that, in Egypt alone, Egyptian Arabic is spoken today by over 44 million people. The total number of speakers of Egyptian Arabic is estimated to be over 46 million.

Prior to the Arab conquest of Egypt in the 7th century AD, the Egyptians spoke Coptic (Thompson, 2013). Egyptian Arabic, a simplified version of CA, is thought to have developed in Cairo, the first Islamic capital of Egypt that is now part of the capital of Egypt. There is evidence that Coptic Egyptian continued to be spoken until the 17th century AD, but eventually EA replaced Coptic. Like LA and other varieties of Arabic, Egyptian Arabic derives most of its vocabulary by applying various vowel insertion patterns and templates to CA consonant roots. Egyptian Arabic is also more open to borrowing words from other languages than CA. EA has borrowed words from diverse sources, which played a critical role in forming its sound system (Wilmsen, 2011). Earlier loanwords came from Coptic. Later loanwords also came from Greek, Italian, French, and English. Nowadays, the primary source of borrowing is English (Thompson, 2013). Unlike LA, EA is understood throughout the Arab world due to the predominance of Egyptian media and film. Consequently, EA is usually used as the spoken dialect taught to students of Arabic as a foreign language.

As a native speaker of Arabic, I have used my knowledge of EA to create my own examples for the discussed literature throughout this paper. Whenever I was in doubt, I consulted native speakers of this dialect to provide me of a correct articulation or example.

2.2.1.1 Egyptian Arabic consonants

Table 1 (Woidich, 2004) gives a clear illustration of the consonantal phoneme inventory of Egyptian Arabic.

Table 1 the consonantal phoneme inventory of Egyptian Arabic

		Bilabial		labio-dental	Apico-dental-alveolar		Palatal	Velar or Post-velar	Uvular	Pharyngeal	Laryngeal
		3	4		3	4					
Plosive	1				t	t ^ɕ		k	q		ʔ
	2	b	b ^ɕ		d	d ^ɕ		g			
Fricative	1			f	s	s ^ɕ	ʃ	χ		ħ	h
	2			v	z	z ^ɕ	ʒ	ʁ		ʕ	
Nasal		m	m ^ɕ		n						
Lateral					l	l ^ɕ					
Trill					r	r ^ɕ					
Approximant		w					j				

Legend

1 = voiceless; 2 = voiced; 3 = plain; 4 = emphatic

There is little difference between the Libyan and the Egyptian system. The most interesting characteristics of EA can be summarized in the next few points:

- Pharyngealized (emphatic) [r^ɕ, b^ɕ, m^ɕ] are additional consonants in Egyptian Arabic with marginal status (Watson, 2002).
- /d^ɕ, q/ are pronounced only in Literary Arabic loanwords. /q/ is usually realized as either [ʔ] or [k]. CA words having /d^ɕ/ are normally substituted with [d]] (Mitchell, 1978).

- Loanwords containing interdental consonants /θ/ and /ð/ are always assimilated to sibilants [s] and [z] (Habib, 2011).
- The CA interdental consonants /θ, ð, ðˤ/ correspond to the EA alveolar consonants /t, d, dˤ/ but they may also correspond to the sibilant consonants /s, z, zˤ/.
According to Habib (2011), highly frequent words are produced with the stops, whereas less frequent words are produced with the fricatives. This phenomenon will be further discussed in the section ‘sound substitutions’.
- /v/ is a foreign consonant with marginal status. In educated speech, this foreign sound occurs in words borrowed from modern European languages (Salib, 1985).

2.2.2 Libyan Arabic

LA is a dialect spoken in Libya and neighboring regions and can be divided into two major dialect areas, namely the eastern and the western. This paper will focus on the western dialect, which is centered in the Libyan capital, Tripoli, and the region surrounding the third largest city of Libya, Misrata. The analysis and examples used in this paper will mainly be based on the variety spoken in Tripoli. The western Libyan dialect is my mother tongue, so I relied mainly on my knowledge as a native speaker and, for the most part, used my own examples. In addition, I have consulted other native speakers for verification of the articulation of the words used in the examples.

LA is mainly used in verbal communication and in spoken media in Libya. The written register in the country is usually Modern Standard Arabic. Because of the colonization of Libya by the Ottoman Empire and later by Italy, LA contains many Turkish, and even more Italian loanwords. In some smaller towns and villages, Berber is

spoken alongside Arabic and, therefore, LA has some Berber loanwords as well.

Although most of the vocabulary in LA is of CA origin, usually with a modified interconsonantal vowel structure, the nativization of loanwords contributed in forming the LA sound system (Wilmsen, 2011).

2.2.2.1 Libyan Arabic consonants

Table 2 (Elramli, 2012) gives a clear illustration of the consonantal phoneme inventory of Libyan Arabic.

Table 2 the consonantal phoneme inventory of Libyan Arabic

		L a b i a l	Inter- dental		dental		Post- alveolar or palatal	V e l a r	Uvular	Pharyn- geal	Glottal	Laryn- geal
			3	4	3	4						
Plosive	1				t	t ^ɕ		k	q		ʔ	
	2	b			d	d ^ɕ		g				
Fricative	1	f	θ		s	s ^ɕ	ʃ		χ	ħ		h
	2	v	ð	ð ^ɕ	z	z ^ɕ	ʒ		ʁ	ʕ		
Nasal		m			n							
Lateral					l	l ^ɕ						
Trill					r							
Approximant		w					J					

Legend

1 = voiceless; 2 = voiced; 3 = plain; 4 = emphatic

The most interesting characteristics of LA are:

- The labiodental fricative /v/ occurs only in loanwords and is frequently replaced by its voiceless counterpart /f/ (Abumdas, 1985).

- /q/ and /ʔ/ are often replaced or omitted. Uvular [q] is usually replaced by velar [g], and [ʔ] is often dropped, especially in word-medial and final positions (Elramli, 2012).
- The interdental fricatives /θ ð ðˢ/ have merged with the corresponding dental stops /t d dˢ/ in the western Libyan dialect (Abumdas, 1985).

2.3 Sound Substitutions in EA and LA

The most obvious form of phonological interference in L2 acquisition is sound substitution. When no comparable sound exists in the phonemic inventory of a language, native speakers of that language fail in distinguishing units in the second language that are not matched by corresponding distinctions in the first or native language. L2 learners then tend to use the closest sound available in their native repertoire. The linguistic term for this phenomenon is ‘differentiation’ (Matthews, 2007). There are multiple forms of differentiation but the two forms that are relevant to sound substitutions are:

‘overdifferentiation’, which is the failure, in acquiring a second or foreign language, to suppress distinctions that are made in one's first or native language and

‘underdifferentiation’, which is the failure, in acquiring a second or foreign language, to distinguish units that are not matched by corresponding distinctions in the first or native language (Matthews, 2007). These two terms will be further discussed in the upcoming sections and at the end of each section expectations related to the discussed phonetic features will be set out.

2.3.1 Underdifferentiation

2.3.1.1 The labiodental fricative /v/

The fricatives /f/ and /v/ are phonemes in English, but /v/ is absent from the phonemic inventory of CA. In EA and LA /v/ is a sound with marginal status and occurs only in loanwords (Abumdas, 1985; Salib, 1985). Because many EA and LA speakers find some difficulty articulating this sound, they tend to substitute this foreign sound with its supposed equivalent in the first language. Since /f/ occurs in both languages it is not expected to cause any noticeable interference, but /v/ may be confused with its voiceless counterpart. This is a clear form of ‘underdifferentiation’ (West, 2011). Moreover, confusion between the two phonemes interferes with lexical contrasts, as illustrated by the pronunciation of minimal pairs, e.g. /van/ and /fan/.

Popular wisdom has it that borrowers, not being native speakers of the L2, often fail to perceive and/or interpret foreign words in accordance with L2 norms. Some phonologists believe that during the process of loanword nativization, L2 sounds are made to conform to, among other things, the phonological requirements of L1, which is why borrowers adapt them (LaCharité & Paradis, 2005). Comparing the L1 and L2 forms of borrowed words provides a snapshot of the L1 phonological adaptation process (LaCharité & Paradis, 2005). European loanwords containing /v/ are historically lexicalized and nativized in different ways in EA. *Villa*, for example, is realized as /vella/ or /fella/, *vitamin* is rendered as either /vetami:n/ or /fetami:n/, and *seven up* as /sevenab/ or /sefenab/. Another realization of /v/ in integrated loanwords is as /w/ or /b/, e.g. *veranda* rendered as /varanda/ or /baranda/, *manoeuvre* pronounced as /monawra/. In

some loanwords, however, it is nativized with no adaptation as in /vi:tou/ for *veto* and /vi:zə/ for *visa*.

Variation in the adaptation process of loanwords containing /v/ is also evident in LA. For example, the Italian word *vite* ‘screw’ is pronounced mainly as /fi:ti/ while the /v/ in *Avvocato* ‘lawyer’ is realized as /b/ in /ʔabu:ka:ti/. Some loanwords, however, were lexicalized with no phonological changes, e.g. the Italian word *vaniglia* ‘vanilla’ is always pronounced as /vʌni:lə/.

It is expected that:

- English words, containing /v/, produced by EA speakers and LA speakers will go through the same phonological adaptation process as previous nativized loanwords.
- /v/ will be replaced by /f/, /b/ or /w/ or it will be produced with no adaptations at all.

2.3.1.2 The dental fricatives /θ/ and /ð/

The English voiceless dental fricative /θ/ and voiced fricative /ð/ both exist in the MSA phonemic inventory, e.g. ثعلب ‘fox’ /θæʃlab/ and إذاعة ‘broadcasting’ /iða:ʕa/. In general, all Arabic speakers who can read and write MSA are capable of producing both sounds. In Arabic dialects, however, words containing these phonemes are adapted during their nativization process. The MSA interdental consonants /θ, ð/ correspond to the EA alveolar consonants /t, d/ but they may also correspond to the sibilant consonants /s, z/. The MSA word ثعلب ‘fox’, for example, is adapted to the consonantal system of EA in which /θ/ and /ð/ are absent. Some Egyptians pronounce it as [sæʃlab] and others as [tæʃlab]. /θ/ in English nativized loanwords in this dialect is transformed into /t/, e.g.

thermos is pronounced as [tɒrmɒs] and *thermometer* as [tɜrmɒmɪtr]. The voiced /ð/ is always approximated to /z/. ‘Broadcasting’ is [ʔɪza:ʕa] as opposed to MSA /ʔiða:ʕa/.

The LA dialect generally still distinguishes between /θ/ and /ð/, but there is a tendency to replace them with the dental-alveolar plosives /t/ and /d/ respectively.

[tæʕlab] and [ʔɪda:ʕa] are the LA versions of ثعلب ‘fox’ /θæʕlab/ and بثاعة ‘broadcasting’ /ʔiða:ʕa/. Both the phonemes /t/ and /d/ that replace the /θ/ and /ð/ exist in English and Arabic, but in English they are alveolar while in Arabic they are dental-alveolar.

Therefore the realizations of these two phonemes may sound slightly different from their counterparts in English. Though this may not impede LA speakers being understood when speaking English, it is a noticeable form of interference.

It is expected that:

- English words, containing /θ/ and /ð/, produced by EA speakers and LA speakers will go through the same phonological adaptation process as previous nativized loanwords.
- /θ/ will be replaced by:
 - /s/ or /t/ in English speech produced by EA speakers
 - /t/ in English speech produced by LA speakers
- /ð/ will be replaced by:
 - /z/ in English speech produced by EA speakers
 - /d/ in English speech produced by LA speakers
- The English alveolar /t/ and /d/ will be replaced by:
 - The Arabic dental-alveolar /t/ and /d/ by EA speakers and LA speakers.

2.3.1.3 The Bilabial Stops /p/ and /b/

/p/ and /b/ in English are two independent phonemes. /p/ is absent from the phonemic inventory of CA. /b/ occurs in both languages and therefore it is not expected to cause any noticeable interference but /p/ may be confused with its voiced counterpart due to underdifferentiation.

Voicing of the voiceless plosive /p/ can be found in the EA and LA dialects for purposes of loanword integration. As shown in Table 3, in both dialects we come across words in which /p/ is replaced by /b/. The transcriptions of the original words in Table 3, as well as the words in the rest of the tables throughout this paper, were retrieved from different dictionaries (Collins, 2014). The phonetic transcriptions of the nativized versions of the words were performed by native speakers of EA and by me according to the International Phonetic Alphabet (IPA) of the Arabic language.

Word	Transcription in native language	EA	LA
<i>Pantalon</i> 'pants'	French /pɑ̃talɔ̃/	[bantʕal o:n]	[bantʕalo:n]
<i>Police</i>	/pøli:s/	[buli:s]	[buli:s]
<i>Passport</i>	/pæspɔ:rt/	[basbo:r]	[basbo:r] or [basabort]
<i>Diploma</i> 'diploma certificate'	French /diplom/	[dablo:m]	[deblo:ma]
<i>Attaccapanni</i> 'hanger'	Italian /attakkapanni/	-	[takaba:nni]

Table 3 Loanwords containing bilabial stops

It is expected that:

- English words, containing /p/, produced by EA speakers and LA speakers will go through the same phonological adaptation process as previous nativized loanwords.
- /p/ will be replaced by /b/ in English speech produced by EA speakers and LA speakers.

2.3.2 Overdifferentiation

2.3.2.1 Phoneme pharyngealization

Overdifferentiation occurs when a speaker employs phonemes of the first language which are absent in the second language in the context of the second language (West, 2011). Due to overdifferentiation in EA and LA, the consonants /s/, /d/, /t/, /ð/, /k/ and /g/ may be subject to sound change in the borrowing process. CA is known for its emphatic coronal sounds /s^h/, /d^h/, /t^h/, /ð^h/, the voiceless uvular plosive /q/ and the voiced velar fricative /ɣ/. Due to dialectal influences, /s/, /d/, /t/, /ð/, /k/ and /g/ become pharyngealized in some environments and change into their emphatic counterparts. To gain insight into the L1 phonological adaptation process of loanwords containing non-emphatic sounds, some of the nativized loanwords are set out and compared in Table 4.

Word	Transcription in native language	EA	LA
<i>Tante</i>	French	/t ^h ant/	-

‘aunt’	/t̥ɑt/		
<i>Battery</i> / <i>Batteria</i>	English /bætəri/ Italian / batteria	English loanword /batʔʔari:jə/	Italian loanword /bætæri:jə/
<i>Captain</i>	/kæptɪn/	/qobʔʔa:n/	/qobʔʔa:n/
<i>Shoot</i>	/ʃu:t/	/ʃu:ʔʔ/	/ʃu:ʔʔ/
<i>Moda</i> ‘fashion’	Italian /mɔda/	/mɔ:dʔʔΛ/	/mɔ:dʔʔΛ/
<i>Salone</i> ‘living room’	Italian /salone/	/sʔʔalo:n/	/sʔʔalo:n/
<i>Telegraph</i>	/telɪgra:f/	/tələɣra:f/	/tələɣra:f/
<i>Magnet</i>	/mæɡnɪt/	/maynatʔʔi:s/	/maynatʔʔi:s/

Table 4 Nativized loanword in which overdifferentiation occurs

This phenomenon may be subsumed under the controversial principle of ‘ease of articulation’. According to Salib (1985), in MSA words it is not possible to differentiate clearly between emphatic and non-emphatic consonants when they are followed by a back vowel, e.g.:

- (1) a. تيار [təjjær] ‘current’ vs طيار [ʔʔəjjær] ‘a pilot’
 b. سَفَر [saffær] ‘He sent someone away on a journey’ vs صَفَر [sʔʔaffær] ‘He whistled’

Because it is hard to differentiate between emphatic and non-emphatic sounds, many CA words containing these sounds are changed by dialect speakers without changing the meaning of these words. The correct meaning of the word can usually be extracted from the context. Examples 2a-d illustrate how some words undergo a consonant change in one dialect and remain the same in the other:

(2) a - CA:	صفر [sʕifr] ‘zero’	→	LA:	سفر [sɪfər]
b - CA:	سورة [su:rə] ‘chapter’	→	LA & EA:	صورة [sʕu:rə]
c - CA:	بساطة [bæsaʔætʕə] ‘simplicity’	→	EA & EA:	بساطة [bæsaʔtʕə]
d - CA:	قرآن [qərʔæn] ‘Quran’	→	EA:	كرآن [kərʔæn]

It is expected that:

- Due to overdifferentiation, some English words containing the non-emphatic consonants in question produced by EA speakers and LA speakers will go through the same phonological adaptation process as previous nativized loanwords. This process can be summarized as follows:

(3) a.	/s/	is realized as	/sʕ/
b.	/d/	→	/dʕ/
c.	/t/	→	/tʕ/
d.	/ð/	→	/ðʕ/
e.	/k/	→	/q/
f.	/g/	→	/ɣ/

2.3.3 Consonant clusters

Consonant clusters are very common in English. The longest possible initial cluster in English consists of three consonant sounds (CCC), such as /spl/ in *split*. In CA three-segment initial consonant clusters are entirely absent. Whereas Cairene also disallows three-segment initial consonant clusters, LA has no restrictions on them (Mitchell, 1978). The word شجرة ‘tree’ for example, /ʔaʒarah/ in MSA, remains the same in EA but transforms into [ʒrah] in LA. It is expected that when an EA speaker is faced with the problem of pronouncing English CCC-words, the speaker will insert short vowels between consonant sounds while LA speakers will pronounce the same words native-like.

According to Elramli (2012), LA has some restriction on consonant clusters in medial- and word-final positions. He explains that “[e]penthesis is frequently resorted to by speakers of the [Libyan] dialect in avoidance of coda consonant clusters with rising sonority” (Elramli, 2012). An example of this is the CA word قسم ‘department’ /qism/ which is pronounced in the same manner in EA, but changes into [qisim], with the insertion of an extra vowel, in LA.

Furthermore, as noted by Woidich (2004) in his analysis of EA, “when more than two consonants occur in succession in a sentence, a /ə/ will be added between the second and third consonant” (p. 27). Example 4a illustrates this form of epenthesis.

(4) a. بنت /bint/ ‘girl’ + وحدة /waḥda/ ‘one’ → [bintə waḥda]

This type of addition is typical for the speech of the inhabitants of Cairo (Mitchell, 1978). In contrast, LA has no restrictions on consonant clusters across word boundary (Abumdas, 1985).

It is expected that vowel epenthesis is resorted to when:

- English speech, containing three-segment initial consonant clusters, is produced by EA speakers.
- Coda consonant clusters in English speech are produced by LA speakers as well as by EA speakers.
- Consonant clusters across word boundary in English speech are produced by EA speakers.

3 Methodology

By setting out the phonetic features that can be subject to interference in the previous sections, the first part of the purpose of this study is achieved. In this section, the methodology of the experiment that was conducted to test whether there is phonetic interference in English speech produced by EA speakers and LA speakers will be discussed.

3.1 Participants

Ten Egyptian and ten Libyan physicians, graduated from local universities, residing in their home countries and all between the age of 25 to 45 years old, served as subjects. Before the main test was presented, a pre-test had to be passed in order to qualify for this experiment.

The pre-test aimed to confirm that the subjects had no impairments in articulating MSA consonant phonemes. During this phase of the experiment, the subjects were tested on their capability of pronouncing all Arabic consonants flawlessly. It is important that any interference in the collected data is due to the speakers' dialect and not a result of any speech impediment, therefore, the EA and LA consonant phonemes which have different realizations from their underlying MSA form received special attention. These are phonemes like /θ/ and /ð/. The subjects were asked to read out some Quran verses that contained all the consonants that had to be tested. If they had no trouble in reciting these verses fluently, they had passed the pre-test and were provided with the main pronunciation test.

The main requirement for the selected target group was having an English proficiency level of intermediate or higher (IELTS score of 4-5). Since the curricula of

the Faculties of Medicine in the local Universities of Cairo and Tripoli are taught in English, this proficiency level is guaranteed with graduated physicians as subjects. Another relevant factor was the age of the tested speakers. Because of changes in the educational system of public schools in the two countries, the age range of the subjects was kept as small as possible. By taking this into consideration, chances of significant differences in the proficiency level of English are minimal. For this same reason, it was fundamental that all members of the tested group were resident in their home countries and not in any English-speaking environment.

3.2 Material

The main test consisted of two separate sheets (Appendix I). The two sheets were handed out successively in order to build up the subject's self-confidence and decrease the pressure they might feel when being tested. The test was taken individually and the results were recorded.

The words on the first test sheet were divided into seven different groups. The ordering was based on some of the linguistic characteristics that distinguish English from Arabic. All words in the first group, for example, had either the phoneme /f/ or /v/ in it. The six other groups are characterized by aspiration, the dental fricatives /θ/ and /ð/, the Modern English *-ing* ending, consonant clusters, the *-ed* suffix and the bilabial plosives /p/ and /b/, respectively.

The second half of the test was composed of longer sentences with more polymorphemic words than the first half. The purpose was to observe any modifications in articulation when changing the phoneme environment from single words to full sentences. It is known that, across word boundaries, some phonemes behave differently.

According to Woidich (2004), for instance, epenthesis occurs when more than two consonants occur in succession in a sentence. To test such forms of interference, it was necessary to include various environments in the test.

3.4 Analysis

Due to time restraints, there was only an auditory analysis of the collected data. The data was analyzed by multiple native speakers of LA and EA.

4 Results and Discussion

In this section, the key results of the experiment will be objectively presented, using both text and illustrative materials. The results will be ordered in the same logical sequence as in which the theoretical background was ordered. The experiment results of the first half of the test (first paper sheet) will be presented in exact numbers and percentages. The results of the second half of the test (second paper sheet) will be used to either confirm the findings of the first half or to point out new test findings. Only the most conclusive analyzed data of this part will be presented. At the end of each subsection the results will be interpreted in light of what was already known from the theoretical background and, where possible, an explanation will be given of the new findings.

4.1 Sound Substitutions: Underdifferentiation

4.1.1 The labiodental fricative /v/

Only a few instances of interference on the /v/ → /f/ sound substitution were detected in the first part (see figure 1) and second part of the test. The frequency in the figures throughout the paper represents the number of tokens and the numbers in the data table are absolute numbers. There were two LA speakers who substituted /f/ for /v/. The first speaker made a single error in the second part of the test by pronouncing *very* as /feri/. The second speaker replaced /v/ twice in the first part and once in the second part of the test; *vision* was pronounced as [fiʒən], *voucher* as [fu:ʃɛər] in the first half and *services* as [serfais] in the second half. This is a 2% substitution (2 out of 100 tokens) for LA speakers and 0% for EA speakers in the first part of the test.

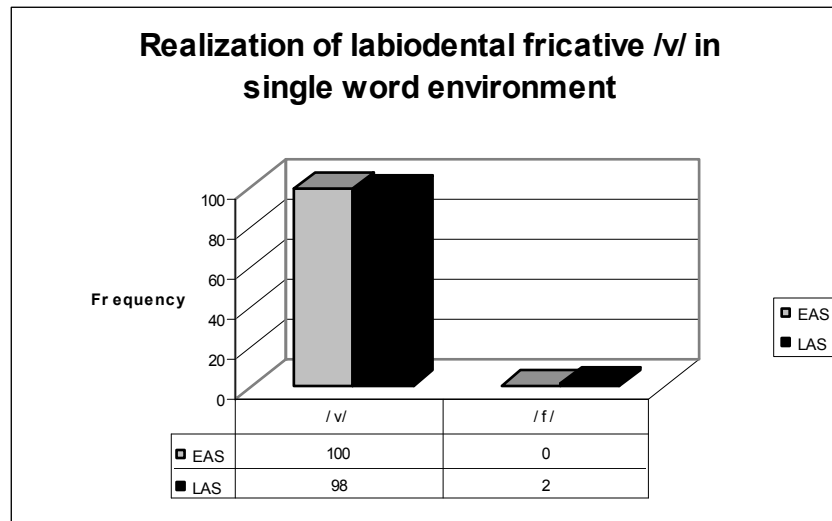


Figure 1 labiodental fricative substitutions

The detected 2% interference could either be explained as individual pronunciation mistakes or as very limited underdifferentiation in this group of speakers. Contrary to expectations, the marginal status that the voiced labiodental fricative /v/ occupies in the phonemic inventory of the two dialects did only cause limited confusion between /v/ and its voiceless counterpart. In addition, the phonological adaptation process of previous nativized loanwords also had a very limited effect on the produced speech of one group and no effect at all on the other group.

4.1.2 The dental fricatives /θ/ and /ð/

During the first half of the test, the phoneme /θ/ was realized in six different ways. The most prominent replacements of /θ/ were /t/ by LA speakers and /s/ by EA subjects (figure 2). 30% (30 out of 100 tokens) of all /θ/ sounds were pronounced as /s/ by EA speakers and 67% (67 out of 100 tokens) were articulated as /t/ by LA speakers.

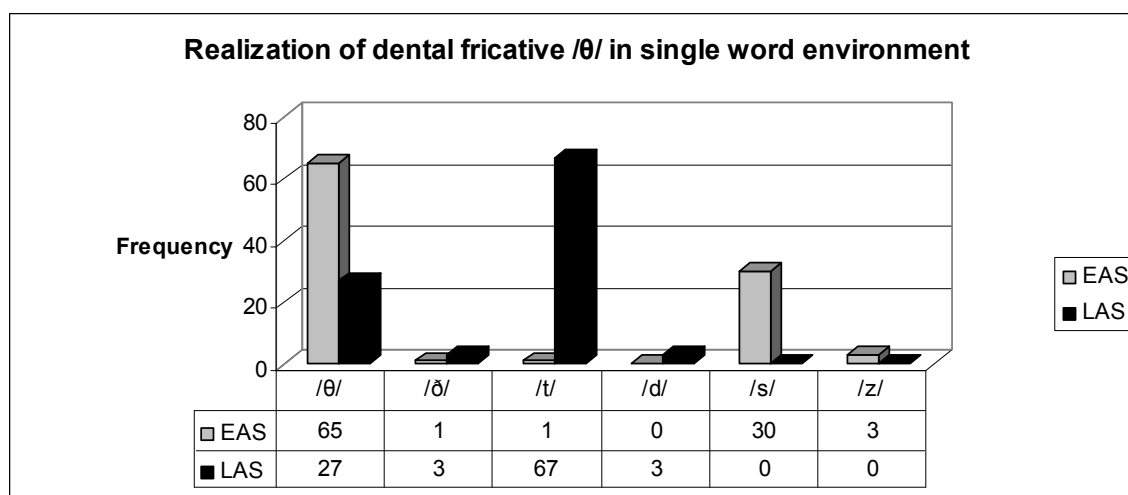


Figure 2 fricative substitutions

Among the words that were tested, there is one word that deserves special attention, namely the word *thirteenth*. Unlike the rest of the words, it contains an initial and a final /θ/ sound. This resulted in combinations as [tirti:nt], [θirti:nt] and sometimes even [tirti:n] with elimination of the final phoneme. Figure 3 displays the proportional relationships of the two phoneme positions articulated by LA speakers and figure 4 illustrates the results of EA speakers.

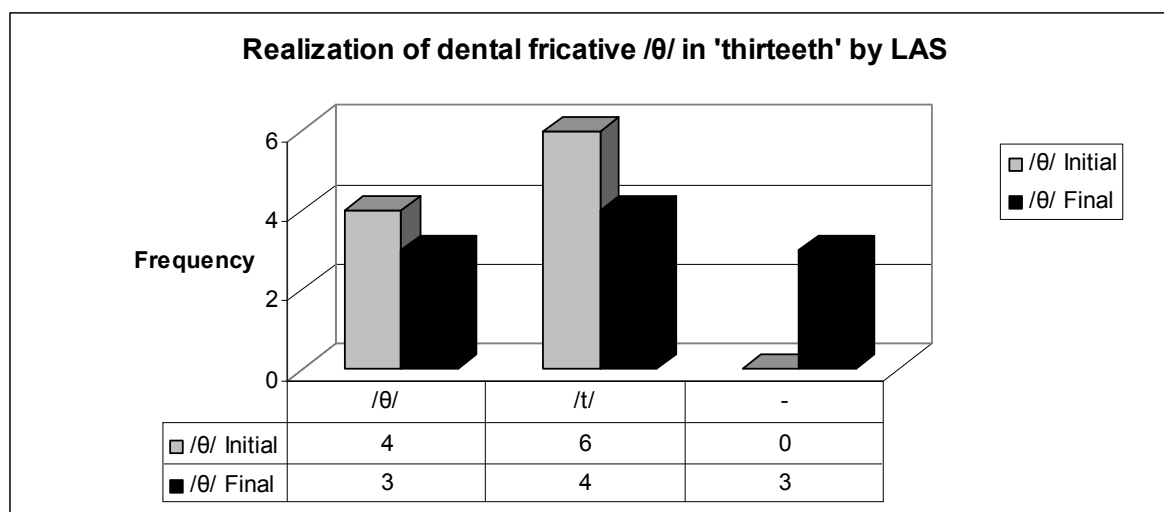


Figure 3 substitutions of /θ/ in 'thirteenth' by LA speakers

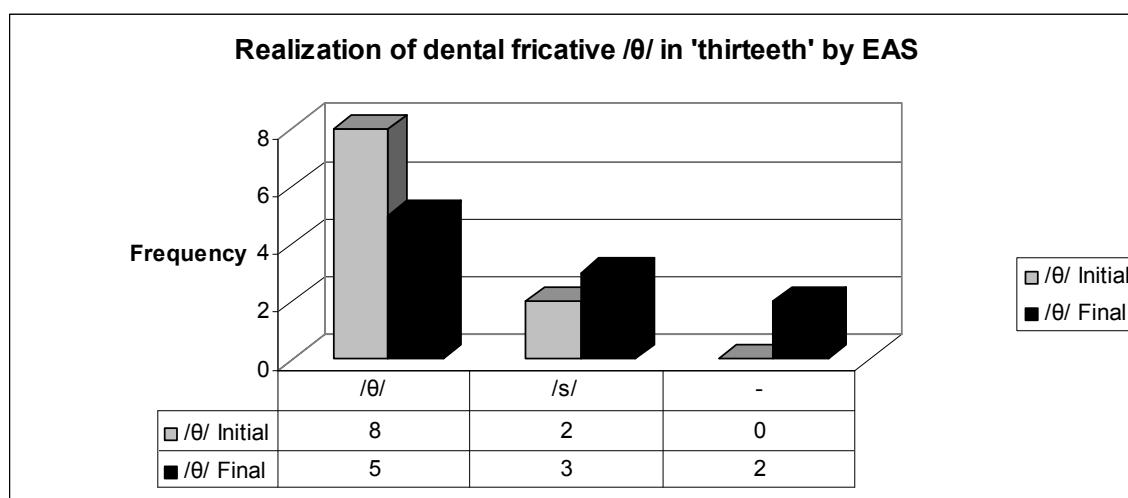


Figure 4 substitutions of /θ/ in 'thirteenth' by EA speakers

In the second part of the test, the same types of substitutions were examined. This was evident in the pronunciation of multiple words and sometimes even with remarkable high proportions of substitutions. For example, 60% (6 out of 10 speakers) of all EA speakers pronounced *length* as [lɛŋs].

The realizations of /ð/ were as varied as the realizations of the voiceless /θ/. As illustrated in figure 5, the most common replacements were the phoneme /z/ with 57% (17 out of 30 tokens) among EA speakers and /d/ with 53% (16 out of 30 tokens) for the LA speakers. The option /tʃ/ is noteworthy since it only appeared in the word *clothes* pronounced by LA speakers (a more detailed analyses of the word *clothes* can be found under the heading '4.1.2.1 Phoneme pharyngealization').

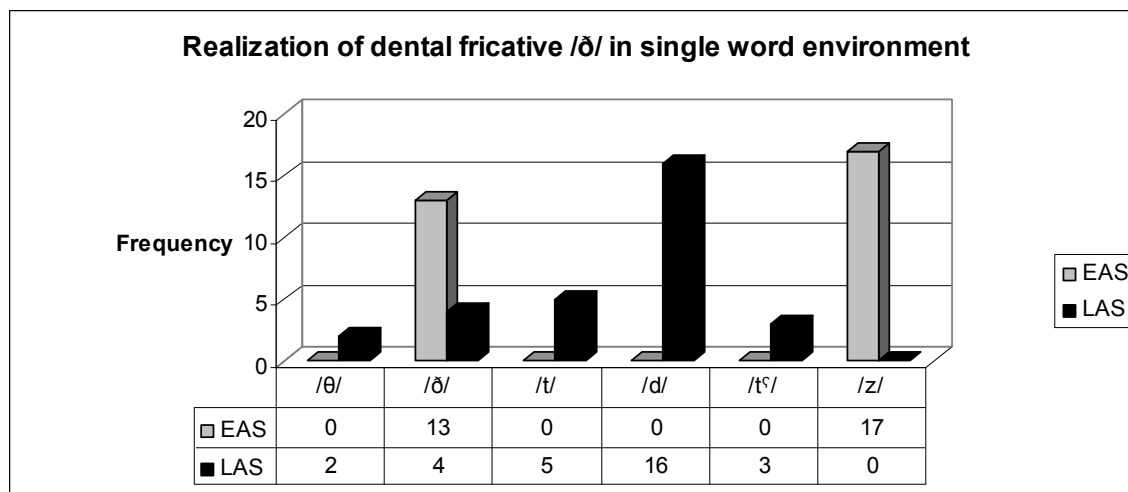


Figure 5 dental fricative substitutions

In a sentence environment, high proportions of /ð/ replacement were evident, especially in the articulation of the definite article *the* by EA speakers. The highest attained substitution rates were found in the contexts described in example 5a-d.

(5) a. ‘**the** sunlight’

b. ‘supply **the** blood’

c. ‘**the** reason’

d. ‘cheaper at **the** other place’

In the contexts that are described in examples 5a and 5b, 8 out of 10 EA speakers replaced the definite article by [zə]. 7 out of 10 EA speakers substituted /ð/ in examples 5c and 5d. A different but interesting change in substitutions was found in the articulation of the word ‘clothes’ when it appears in a sentence. Whereas only three EA speakers maintained /ð/ in a single word environment, this number was twice as high in a sentence environment. All 6 subjects pronounced it as [klɔ:ðəz] instead of its correct articulation,

[klooðz]. A vowel change as well as epenthesis is evident. The context in which this word is mentioned is the phrase: “buy new clothes every year”.

Example 6a illustrates the context in which 7 out of 10 LA speakers replaced /ð/ by /d/. Example 6b received the second highest score with 6 out of 10 subjects making the same error. These high numbers confirm the results of the single word environment.

(6) a. ‘**This** video’

b. ‘since **then**’

The aim of this study was to determine whether there is phonetic interference in English speech and to evaluate whether it is dialect-specific. In the current study, comparing English speech produced by EA speakers with speech produced by LA speakers shows that the Egyptian and Libyan dialects have a direct influence on the realization of the dental fricatives /θ/ and /ð/. The realizations /t, d/ (LA) and /s, z/ (EA) were the most favored replacements among these groups. Contrary to expectations, /θ/ was not only replaced by /s/ or /t/; it was replaced multiple times by /z/ or /d/. Equally, against expectations, /ð/ was replaced a few times by /t/. A possible explanation for these results may be the confusion between the two realizations of *th* in different words. For example, *theme* was read out as [zem] and not as [zi:m] by some EA speakers. The vowel change in their articulation is proof of their confusion between *theme* and *them*, which explains the presence of /z/ instead of /s/ or /t/. Furthermore, the two test environments showed the same results. The results confirmed the presence of L1 interference and also confirmed the difference in interference between the speakers of the two dialects. Also, it was hypothesized that the English alveolar /t/ and /d/ would be replaced by the Arabic

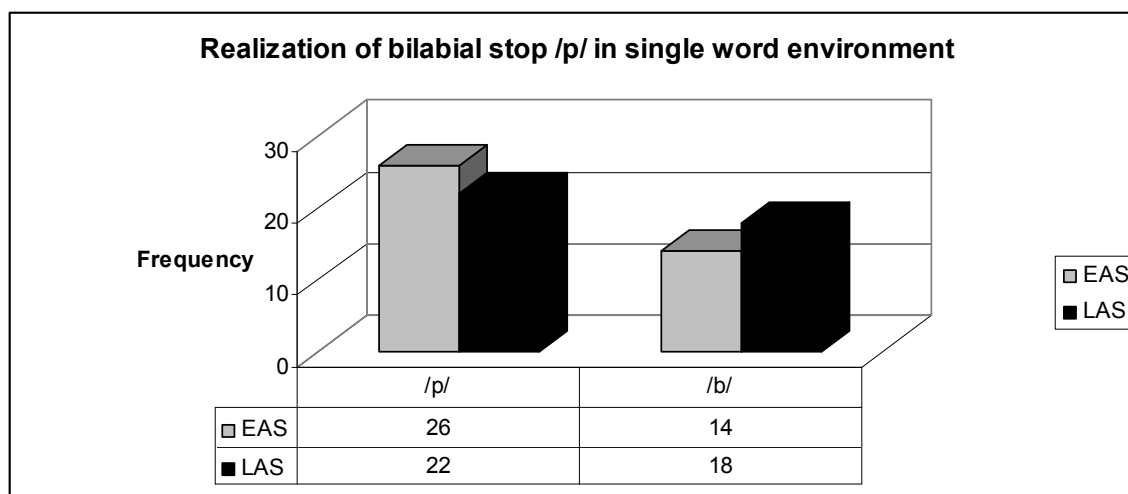
dental-alveolar /t/ and /d/ by EA speakers and LA speakers. However, this experiment did not find any evidence for this form of interference.

4.1.3 The Bilabial Stops /p/ and /b/

The tested words of this section can be divided into three groups: words with one bilabial stop, words with two or more bilabial stops and compound words containing bilabial stops. The results are organized in this way to test whether the position and frequency of the phonemes in the tested words have any effect on the frequency of speech interference. The results will be presented in the same order.

Out of the 16 words that were tested in a single-word environment there were 4 in which /p/ occurred once, all in word-initial position. The frequency of substitutions and native like realizations are illustrated in figure 6. These numbers show that /p/ replacement occurred in 35% (14 out of 40 tokens) of all cases by EA speakers and 45% (18 out of 40 tokens) by LA speakers. With a substitution rate of 46% (23 out of 50 tokens), the results barely show any change for LA speakers in sentence environment (Figure 7). This contrasts with the 9% (13 out of 50 instead of 14 out of 40) drop difference found with the EA group when changing the context.

Figure 6 single bilabial stop substitutions in single-word environment



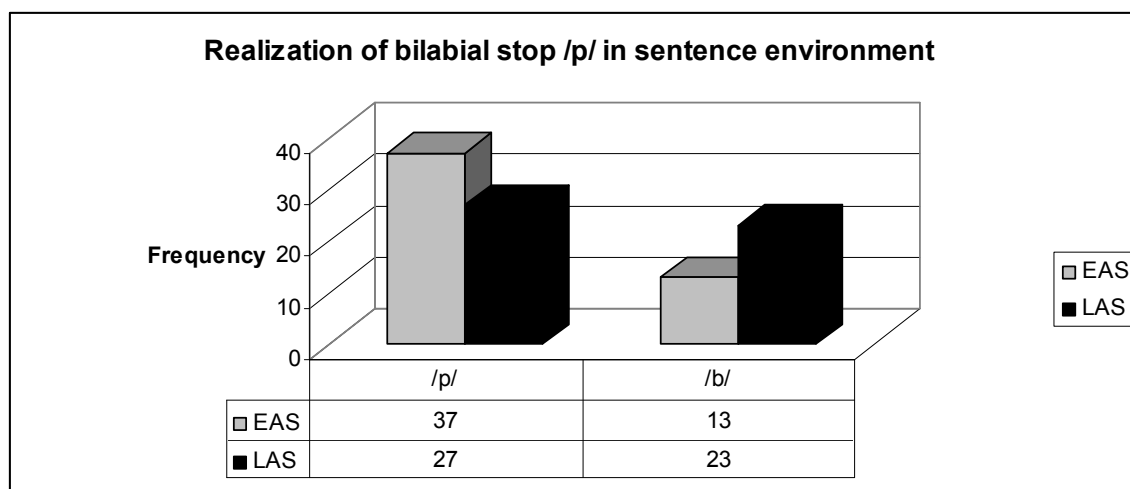


Figure 7 single bilabial stop substitutions in sentence environment

The group of words containing two or more bilabial stops consisted of 8 test items. One of the words will be handled separately because it contains two /b/ phonemes and no /p/ phonemes. The seven words of which the results are presented in figure 8 have either two /p/ phonemes, e.g. *Pepsi*, or one /p/ and one or more /b/ phonemes in it, such as *responsible*. As can be read from the chart, there is an average of 50% (70 out of 140 tokens) interference in both groups. This is divided over three different types of errors. Remarkably, there was little difference in interference between the two groups. The word *responsible* was pronounced correctly by all 20 subjects, while *perhaps* was only uttered correctly once. In figure 8 it is noticeable that more LA speakers than EA speakers chose to substitute all occurrences of /p/ in a word, but this is a difference of merely 5.5%.

The word *basketball* was pronounced correctly by 8 subjects of each group (16 out of 20 tokens). The two variations in utterance were [pa:skitbɔ:l] (3 times) and [pa:skitpɔ:l] (once).

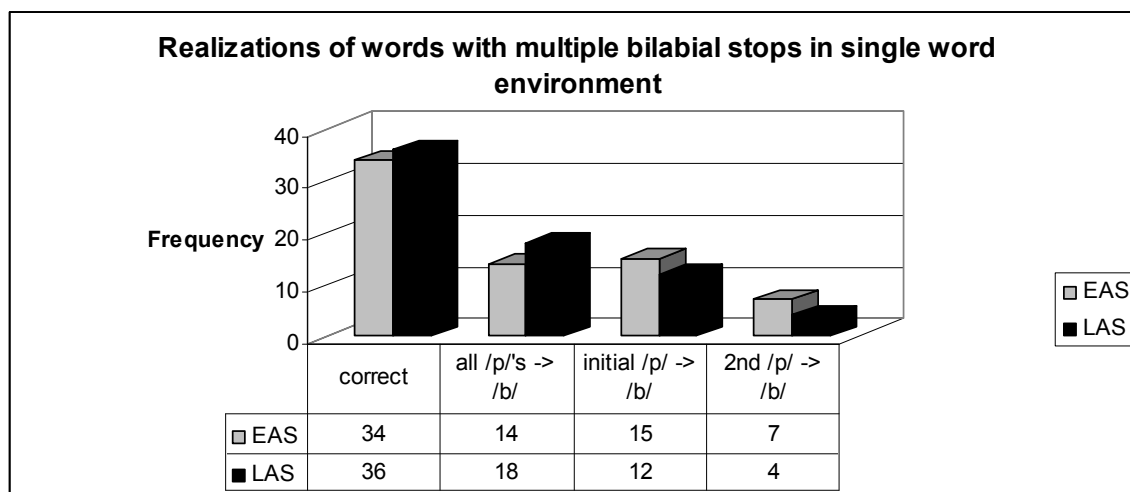


Figure 8 Realizations of words with multiple bilabial stops in single-word environment

The results of sentence environment confirm the presence of interference in both groups. Table 5 describes the environment and frequency of the words that were mispronounced the most in the tested sentences. An average of 60% of all speakers substituted every instance of /p/ in *people*. In *proper*, 40% showed initial /p/ substitution and 10% showed replacement of both /p/'s.

Words	Transcription with interference by LA speakers	Frequency (out of 10 LA speakers)	Transcription with interference by EA speakers	Frequency (out of 10 EA speakers)
<i>why people</i>	[waɪ bi:bəl]	7	[waɪ bi:bəl]	5
<i>The proper</i>	[ðə prɒbər]	6	[ðə prɒbər] - [ðə brɒbər]	2 – 2

Table 5 Realizations of words with multiple bilabial stops in single-word environment

The subgroup of compound words contains 4 words which were tested in single-word environment only. The sequence in which the two bilabial stops occurred in the first three words was initial /b/ in the first part of word and initial /p/ in the second part of the word, e.g. **back pack**. Figure 9 illustrates the realizations of the two sounds in these words. The maintenance of /b/ in the first part of the compound word and substitution of /p/ by /b/ in the second part of the word was observed in 33,3% (20 out of 60 tokens) of all realizations. The second most common realization was /p/ in the first part of word and /p/ in the second part of the word, observed in 20% (12 out of 60) of all cases. The voiced stop /b/ was replaced 12 times by the unvoiced /p/ in the compound words. *Bus pass* was uttered mainly as [pʌs pæs] by speakers of both groups.

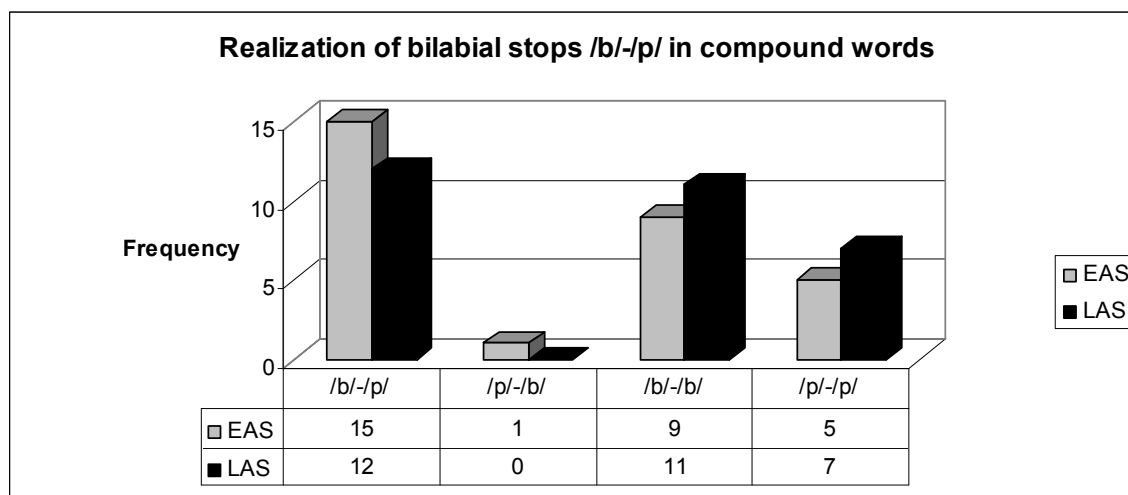


Figure 9 bilabial stop substitutions in compound words

The fourth word of this subgroup contains the two stops in opposite order, *paddle boat*. It is remarkable that the frequency of errors is higher than the frequency of correct utterances (see table 6). 55% (11 out of 20) of all speakers pronounced the word as [bædəl boot]. Some LA speakers tended to go for /p/ instead of /b/ in all four words of

this subsection, while there was one EA speakers who preferred exchanging the two phonemes instead of unifying them.

Realizations of <i>paddle</i> <i>boat</i>	Frequency (out of 10 EA speakers)	Frequency (out of 10 LA speakers)
[pædəl boot] - /pb/	3	4
[bædəl boot] - /bb/	6	5
[pædəl poot] - /pp/	-	1
[bædəl poot] - /bp/	1	-

Table 6 transcriptions of ‘paddle boat’

Underdifferentiation is evident in the results presented here. Speech interference caused by /p/ and /b/ substitution is detected in all environments and word positions. Not only the phoneme /p/ but also its voiced counterpart caused speech interference. This finding is unexpected and suggests that the subjects are aware of this phoneme pair but they are still not in control of their articulation. A possible explanation for these results may be that whenever the two bilabial stops occur together in one word, Arabic speakers start confusing them with each other, which sometimes results in hypercorrection. It may be for this reason that compound words caused the highest percentage of interference among both groups. The differences in frequency are insufficient to state that the evident sound substitutions are due to dialectal influence.

4.2 Sound substitutions: Overdifferentiation

4.2.1 Phoneme pharyngealization

All detected forms of overdifferentiation in the analyzed data are presented in table 7.

The consonant sounds that are substituted by their empathic counterparts are /s/, /d/, /ð/ and /t/. As can be seen in table 7, all substituted consonants are either preceded or followed by a back vowel. Overall there is no significant difference in frequency between the two groups, but there is one consonant that does not go through this form of interference among EA speakers. The last two examples in table 7 illustrate how /ð/, which became /t/ or /d/ when pronounced by LA speakers, transformed into either /t^ɕ/ or /d^ɕ/.

Words	Transcription	Preceded by	Followed by	Frequency (out of 10 LA speakers)	Frequency (out of 10 EA speakers)
<i>but I</i>	[bʌt ^ɕ aɪ]	/ʌ/	/aɪ/	1	2
<i>to supply</i>	[tʊ s ^ɕ əplaɪ]	/ʊ/	/ə/	-	1
<i>Don't slip</i>	[dɒnt ^ɕ slɪp]	/ɒn/	/s/	2	2
<i>they sold</i>	[ðeɪ s ^ɕ ɒld]	/eɪ/	/ɒ/	3	2
<i>bottle</i>	[bɒt ^ɕ əl]	/ɒ/	/ə/	2	3
<i>those hills</i>	[ð ^ɕ əz s ^ɕ]	- - /ɒ/	/ɒ/ - /h/	2	-
<i>clothes</i>	[klɒt ^ɕ s]	/ɒ/	/s/	3	-

Table 7 Overdifferentiation and the environment of occurrence

The presented results confirm that a significant proportion of LA speakers as well as EA speakers failed to suppress distinctions that are made in their native language in acquiring correct English speech. These results match those observed in earlier studies.

Difference in interference between EA and LA can be detected in the last two items in table 7, *those hills* and *clothes*. As confirmed in the literature review in this study, phoneme pharyngealization is due to dialectal influences. The difference in frequency in one form of substitution suggests that there is a dialectal difference between the two groups that causes this variation in results. This is illustrated in the following schema:

- | | | | | | | |
|-----|----|---------------------|---|---------------------|----|----------------|
| (1) | a. | /ð/ | → | LA: /ð/, /d/ or /t/ | vs | EA: /ð/ or /z/ |
| | b. | <i>those</i> | → | LA: [dɔs] | vs | EA: [zoʊz] |
| | c. | overdifferentiation | → | LA: [dʕsʕ] | vs | EA: x |

Because /ð/ is realized differently by the speakers of the two dialects (1a), the subjects who represent the Libyan dialect will have the option to use the emphatic counterparts of /d/ and /s/ while the Egyptian speakers only have /z/ as an option since it has no emphatic realization (1b). This leads to pharyngealization among LA speakers (1c). It should be noted that the two LA speakers who showed overdifferentiation in this word also mispronounced the vowel and final consonant of the word. If that is not the case, they most likely would not have had [dʕ] and [sʕ] as outcome. The same explanation is applicable to the word *clothes*.

4.3 Consonant clusters

Of the nine words tested in single-word environment, there were two words that caused pronunciation difficulties for both groups. Both words contained three-segment clusters, [rld] and [nθr]. 11 subjects in total pronounced *world* as [wɔ:rləd]. 8 of them were EA speakers and 3 LA speakers. The word *anthropology* is the second word that caused some trouble for both groups. It was realized as [ənsɜpələʒi] by 2 EA speakers and as [ənʌθrəpələdʒi] by a single LA speaker. Moreover, the word ‘split’ was also uttered incorrectly twice by EA speakers; once with an extra /ə/ between /p/ and /l/, [spəlɪt], and once with an extra /i/ in the same place, [spɪlɪt]. The consonant clusters /kl/, /bl/, /fr/ and /str/ in word initial position did not cause any interference for either group. Overall, there seemed to be fewer issues with consonant clusters in all positions within word boundaries for LA speakers than for EA speakers.

More forms of epenthesis were found in sentence environment. In addition to the traditional vowel addition within word boundaries, a new form of insertion across word boundaries occurred. In five different phrases, [ə] was added between words by EA speakers (see table 8). There were two EA speakers who did not show any interference of this form. The instances listed in table 8 were randomly distributed over the 8 speakers in total.

Phrases	Transcription with epenthesis	Frequency (out of 10 subjects)
‘ <u>tend to</u> grow’	[tendətu]	6
‘since then’	[sɪnsəzen]	3

‘act as a <u>prism</u> and <u>form</u> a rainbow’	[prizməʔəndəfɔ:rm]	2
‘ <u>its</u> <u>two</u> ends’	[itsətu:]	2
‘the prize of the <u>film</u> <u>was</u> ’	[filməwʌz]	1

Table 8 Epenthesis in phrases by EA speakers

LA speakers were not subject to interference of this form of epenthesis, but they did show the traditional vowel addition within word boundaries in this environment. It is noteworthy that different vowel phonemes were inserted by the two groups. Table 9 lists the differences in articulation. LA speakers mainly inserted /i/ or /ɪ/, whereas /ə/ was primarily added by EA speakers. It is difficult to determine the phonological status of inserted vowels because the MSA IPA does not distinguish between /i/, /ɪ/, /e/ and /ə/.

Words	Transcription with epenthesis by LA speakers	Frequency (out of 10 LA speakers)	Transcription with epenthesis by EA speakers	Frequency (out of 10 EA speakers)
‘ends’	[endɪs]	2	[endəs]	3
‘parts’	[pɑ:rtɪs]	2	[pɑ:rtɪs]	3
‘clothes’	-	-	[klɔ:ðəz]- [klɔ:zəs]	6 – 1
‘colors’	[kʌləɪz]	3	[kʌləɹəz]	1

Table 9 Epenthesis within word boundaries

This study confirms that consonant clusters can cause speech problems for L2 learners whose first language is descendant from CA. The results are partially in line with the findings of previous studies, which stated that EA speakers will show interference

when producing three-segment initial consonant clusters. Not all, but just 2 out of 10 EA speakers showed interference in *split*, while not a single speaker mispronounced *strip*. In addition, it was expected that coda consonant clusters would be subject to interference when produced by LA as well as by EA speakers. The results of this study show that epenthesis is resorted to by some speakers of Libyan and Egyptian in avoidance of coda consonant clusters, e.g. *world* (11 out of 20 speakers) and *parts* (5 out of 20 speakers). It is noteworthy that the two groups inserted different vowel phonemes. Likewise, consonant clusters across word boundaries were dealt with by adding /ə/ between the second and third consonant when articulated by some EA speakers, e.g. *tend to* [tendəto] (6 out of 10 speakers). One unanticipated and dialect-specific finding was that different vowel phonemes were inserted by the two groups. Whereas LA speakers mainly inserted /i/ or /ɪ/, EA speakers primarily added /ə/.

5 Conclusion

The purpose of this study was a) to determine whether there is phonetic interference into English speech produced by highly educated native speakers of Egyptian Arabic and Libyan Arabic, b) in case interference is present, to evaluate whether it is dialect-specific. This study succeeded in a) detecting multiple forms of phonetic interference and b) determined to what extent they can be considered dialectal interference. The results partially confirmed the predictions regarding phonetic interference in sound substitutions and consonant clusters. Contrary to expectations, there was only limited confusion between /v/ and its voiceless counterpart /f/. In addition, the phonological adaptation process of previously nativized loanwords also had very limited effect on the produced speech, containing /v/, of one group and no effect at all on the other. The investigation of /θ/ and /ð/ has shown that the Egyptian and Libyan dialects have a direct influence on the realization of these dental fricatives. Also, the presence of L1 interference was confirmed. /θ/ and /ð/ were sometimes replaced by unexpected phonemes, like /z/ for /θ/ and /d/ or /t/ for /ð/. Also, evidence for the articulation of /t/ in a different manner by Arabic speakers was not detected. Strong evidence of underdifferentiation caused by /p/ and /b/ substitution was found in all environments and word positions, but the differences in frequency are insufficient to state that the evident sound substitutions are dialect-specific. The results of phoneme pharyngealization match those observed in earlier studies. Overdifferentiation was confirmed, but differences between speakers of the two dialects were linked to mispronunciations of the vowels and final consonants of the words in question and not directly linked to dialect-specific features. The results of interference in consonant clusters were also partially in line with

the findings of previous studies. Only some EA speakers showed interference when producing three-segment initial consonant clusters. In addition, the results show that epenthesis, /i/ or /ɪ/ by LA speakers and /ə/ by EA speakers, is resorted to by some speakers of Libyan and Egyptian in avoidance of coda consonant clusters. Inserting different vowel phonemes was unexpected and can be considered dialect-specific. Likewise, only EA speakers showed epenthesis in consonant clusters across word boundaries. The key strengths of this study are its variety in tested words and its different environments in which the phonetic features were tested.

Several limitations to this pilot study need to be acknowledged. First, the number of subjects was relatively small. Secondly, the data was analyzed only by one person. Having a second assessor or reviewer might have increased accuracy for certain outcomes. Thirdly, the set-up of the first part of the test may have influenced the results. Lastly, the study is limited by the lack of information on Libyan phonetics.

Further research might explore more forms of phonetic interference. Having a larger group of participants, an adapted test-design and more information about the phonetic system of the dialects would help to achieve a greater degree of accuracy on this matter. A greater focus on vowels could produce interesting findings that account for the environment in which sound substitutions occur. Using more accurate measuring tools, like computer software, can provide future studies with a more accurate and credible assessment of the outcomes.

Although further research is required and many areas remain to be explored, the findings reveal a number of error patterns that yield some practical benefits. The analyzed results introduce the differences and similarities in interference with respect to particular

phonetic features between speakers of the Egyptian and speakers of the Libyan dialect.

These results provide researchers investigating the phenomenon of cross-language phonetic interference in general with useful information. In addition, because errors were analyzed in terms of performance mistakes, specialized teaching programs could be developed and introduced to tackle the specific phonetic interference problems between the two dialects of Arabic and English.

References

- Abumdas, A. (1985). *Libyan Arabic Phonology*. (UMI No. 300 N. Zeeb Road, Ann Arbor, Michigan 48106)
- Al-Fituri, A. (1976). *A descriptive grammar of Libyan Arabic*. Unpublished doctoral dissertation, Georgetown University.
- Andruski, J.E., & Nearey, T.M. (1992). On the sufficiency of compound target specification of isolated vowels in /bVb/ syllables. *Journal of the Acoustical Society of America*, 91(1). Retrieved from <http://dx.doi.org.proxy.library.uu.nl/10.1121/1.402781>
- d' Anglejan, A. (1990). The role of context and age in the development of bilingual proficiency. In Birgit Harley et al (Eds.), *The Development of Second Language Proficiency* (pp. 146-157). Cambridge: Cambridge University Press.
- Bahns, J., & Eldaw, M. (1993). Should we teach EFL students collocations? *System*, 21(1), 101-114. doi:10.1016/0346-251X(93)90010-E
- Bataineh, R. F. (2005). Jordanian undergraduate EFL students' errors in the use of the indefinite article. *Asian EFL Journal*, 7(1). Retrieved from http://70-40-196-162.bluehost.com/March_2005_EBook_editions.pdf#page=56
- Brière, E.J. (1966). An investigation of phonological interference. *Language*, 42(4), 768-796. doi: 10.2307/411832
- Brown, R. (1973). *A first language: The early stages*. Oxford: Harvard University Press.
- Caramazza, A., Yeni-Komshian, G., Zurif, E., & Carbone, E. (1973). The acquisition of a new phonological contrast: The case of stop consonants in French-English bilinguals. *Journal of the acoustical society of America*. 54(2). Retrieved from

- http://www.wjh.harvard.edu/~caram/PDFs/PDFs/1973_Caramazza_Yeni_Zurif_Carbonate_ASOA.pdf
- Collins Dictionary Online (2014). From <http://www.collinsdictionary.com/>
- Crowther, C.S., & Mann, V. (1992). Native language factors affecting use of vocalic cues to final consonant voicing in English. *Journal of the Acoustical Society of America*, 92, 711–722.
- Cutler, A., Mehler, J., Norris, D., & Segui, J. (1986). The syllable's differing role in the segmentation of French and English. *Journal of Memory and Language*, 25(4), 385-400. doi:10.1016/0749-596X(86)90033-1
- Cutler, A., & Norris, D. (1988). The role of strong syllables in segmentation for lexical access. *Journal of Experimental Psychology: Human Perception and Performance*, 14(1), 113-121. doi:10.1037/0096-1523.14.1.113
- Dulay, H. & Burt, M. (1974). Errors and strategies in child language acquisition. *TESOL Quarterly* 8(2). Retrieved from http://tesol.aua.am/tqd_2000/TQD_2000/TQ_D2000/VOL_08_2.PDF#page=22
- Dulay, H., Burt, M. & Krashen, S. (1982). *Language Two*, Oxford University Press, New York.
- Elramli, Y. M. (2012). Assimilation in the Phonology of a Libyan Arabic Dialect: a Constraint-Based Approach. Unpublished doctoral dissertation, Newcastle University.
- Flege, J.E. (1980). Phonetic approximation in second language acquisition. *Language Learning*, 30(1). Retrieved from http://jimflege.com/files/Flege_phonetic_approximation_LL_1980.pdf

- Flege, J.E. (1987). The production of 'new' and 'similar' phones in a foreign language: evidence for the effect of equivalence classification. *Journal of Phonetics*, 15. Retrieved from http://www.jimflege.com/files/Flege_new_similar_JP_1987.pdf
- Flege, J.E., Munro, M., & Skelton, L. (1992). Production of the word-final English /t/-/d/ contrast by native speakers of English, Mandarin and Spanish. *Journal of the acoustical society of America*, 92(1). Retrieved from http://jimflege.com/files/Flege_Munro_word-final_contrast_JASA_1992.pdf
- Flege, J.E., & Port, R.F. (1981). Cross-language phonetic interference: Arabic to English, *Language and Speech*, 24(2). Retrieved from http://jimflege.com/files/Flege_Port_phonetic_interference_L_S_1981.pdf
- Freeman, A. (1996). *Andrew Freeman's Perspectives on Arabic Diglossia*. Lonely Planet Publications.
- Gabyrs-Biskup, D. (1992). L1 influence on learners' renderings of English collocation. A Polish/German empirical study. In P.J. Arnauld & H. Benjoint (Eds.), *Vocabulary and applied linguistics* (pp. 85-93). London: Macmillan.
- Habib, R. (2011). Frequency effects and the lexical split in the use of [t] and [s] and [d] and [z] in the Syrian Arabic of Christian rural migrants. *Journal of Historical Linguistics*, 1(1), 77–105. doi:10.1075/jhl.1.1.04hab
- Hubbarb, P. Jones, H. Thornton, B., & Wheeler, R. (1983). *A Training course for TEFL*. Oxford: Oxford University Press.
- Iverson, P., Kuhl, P. K., Akahane-Yamada, R., Diesch, E., Tohkura, Y. i., Kettermann, A., et al. (2003). A perceptual interference account of acquisition difficulties for

non-native phonemes. *Cognition*, 87(1), B47-B57. doi:10.1016/S0010-0277(02)00198-1

James, K. (1998). *Errors in language learning and use: Exploring error analysis*. London: Longman.

Kharma, N. (1981). Analysis of the errors committed by Arab university students in the use of English definite-indefinite articles. *International Review of Applied Linguistics*, 19(4), 331-345. doi:10.1515/iral.1981.19.1-4.333

La Charité, D., Paradis, C. (2005). Category preservation and proximity vs. phonetic approximation in loanword adaptation. *Linguistic Inquiry*, 36(2). Retrieved from <http://www.jstor.org/stable/4179319>

Lenneberg, E. (1967). *Biological foundations of language*. New York: Wiley.

Mack, M. (1982). Voicing-dependent vowel duration in English and French: monolingual and bilingual production. *Journal of the acoustical society of America*, 71(1). Retrieved from <http://scitation.aip.org.proxy.library.uu.nl/docserver/fulltext/asa/journal/jasa/71/1/1.387344.pdf?expires=1406872759&id=id&accname=2090971&checksum=BF3016DC6CEE48C0AFCDEC87BF5F1EEF>

Matthews, P. H. (2007). *The concise Oxford dictionary of linguistics*. Oxford England: Oxford University Press.

Mitchell, T. (1990). *Pronouncing Arabic 1*. Oxford: Oxford University Press.

Mitchell, T. F. (1978). *An Introduction to Egyptians Colloquial Arabic*. Oxford: Oxford University Press.

- Mitchell, T.F. (1952). The Active Participle in an Arabic Dialect of Cyrenaica. *Bulletin of the School of Oriental and African Studies, University of London*, 14(1).
Retrieved from <http://www.jstor.org/stable/608504>
- Mitleb, F. (1981). Segmental and non-segmental structure in phonetics: Evidence from foreign accent. Unpublished doctoral dissertation, Indiana University.
- Mohammed, A. M. (2000). Modern standard Arabic vs.non-standard Arabic: Where do Arab students of EFL transfer from? *Language, Culture and Curriculum* 13(2), 126-136.
- Mustafa, M. (2004). Norms for the Arabic International Outcome Inventory for Hearing Aids. *The Internet Journal of Otorhinolaryngology*, 4(1). Retrieved from:
<http://ispub.com/IJORL/4/1/11274>
- Nearey, T., & Assman, P. (1986). Modeling the role of inherent spectral change in vowel identification. *Journal of the Acoustical Society of America*, 80(5). Retrieved from
<http://dx.doi.org.proxy.library.uu.nl/10.1121/1.394433>
- Odlin, T. (1989). *Language transfer: Cross-linguistic influence in language learning*. Cambridge: Cambridge University Press.
- Owens, J. (1980). The Syllable as Prosody: A Re-Analysis of Syllabification in Eastern Libyan Arabic. *Bulletin of the School of Oriental and African Studies, University of London*, 43(2). Retrieved from <http://www.jstor.org/stable/616042>
- Oyama, S. (1976). A sensitive period for the acquisition of a nonnative phonological system. *Journal of Psycholinguistic Research*, 5(3). Retrieved from
<http://link.springer.com.proxy.library.uu.nl/article/10.1007/BF01067377>

- Oyama, S. (1978). The sensitive period and comprehension of speech. *Working Papers on Bilingualism*, 3(1), 1-17. doi:10.1080/08855072.1978.10668342
- Patkowski, M. (1980). The sensitive period for the acquisition of syntax in a second language. *Language Learning*, 30(2). Retrieved from <http://academic.brooklyn.cuny.edu/english/patkowski/PATKOWSKI-03.pdf>
- Port, R.F., & Mitleb, F.M. (1983). Segmental features and implementation in acquisition of English by Arabic speakers. *Journal of Phonetics* 11(3), 219–229.
- Procházka, S. (2006). Arabic. In K. Brown (Ed.), *Encyclopedia of language and linguistics* (pp. 423-431). Boston, MA: Elsevier.
- Saigh, K., & Schmitt, N. (2012). Difficulties with vocabulary word form: The case of Arabic ESL learners. *System*, 40(1), 24–36. doi:10.1016/j.system.2012.01.005
- Salib, M. B. (1985). *Spoken Arabic of Cairo*. Cairo: The American University in Cairo Press.
- Scott, M. S., & Tucker, G. R. (1974). Error analysis and English language strategies of Arabic students. *Language Learning* 24(1), 69-97. doi:10.1111/j.1467-1770.1974.tb00236.x
- Seliger, H., Krashen, S., & Ladefoged, P. (1975). Maturational constraints in the acquisition of a native-like accent in second language learning. *Language Sciences*, 36, 20–22.
- Smith, B. (2001). Arabic speakers. In M. Swan & B. Smith (Eds.), *Learner English: A teacher's guide to interference and other problems* (2nd ed.) (pp. 195-213). Cambridge: Cambridge University Press.

- Thompson, I. (2013). Arabic (Egyptian). *About world languages*. Retrieved from <http://awl-demo.com/arabic-egyptian>
- Watson, J. (2002). *The Phonology and Morphology of Arabic*. New York: Oxford University Press.
- West, J. (2011). Language Attitudes and Communicative Realities of Code-Mixing in Contemporary Nigerian Gospel Music. *The 3rd International Conference on Language and Communication 2011*. Retrieved from http://iclc.nida.ac.th/main/images/proceeding_iclc2011.pdf
- White, L. (1977). Error analysis and error correction in adult learners of English as a second language. *Working Papers in Bilingualism*, 13, 42-58.
- Williams, L. (1980). Phonetic variation as a function of second-language learning. In G. Yeni-Komshian, J. Kavanagh, & C. Ferguson (Eds.), *Child phonology: Volume 2. Perception* (pp. 185-215). New York: Academic Press.
- Wilmsen, D. (2011). Interference. In *Encyclopedia of Arabic Language and Linguistics*. Retrieved July 15, 2014, from http://referenceworks.brillonline.com.proxy.library.uu.nl/entries/encyclopedia-of-arabic-language-and-linguistics/interference-EALL_SIM_vol2_0026
- Woidich, M.A. (2004). *Kullu Tamam: Inleiding tot de Egyptische Omgangstaal*. Cairo: American University in Cairo Press.

Appendix I

Phonetic Test

Test Part I

Vision	Blood
Fish	Class
Flavor	Climb
Value	Strip
Fall	Shrimp
Valley	Split
Fanta	World
Voucher	Child
Comfortable	Anthropology
Aftershave	

Neglect	Finished
Tennis	Moved
Tent	Walked
Pit	Stopped
Pet	Covered

Think	Pepsi
Tenth	Park
Those	Back pack
Through	Passport
Thanks	Bus pass
That's it	Back up
Theme	Paddle boat
Therapy	Password
Thick	Picture
Thirteenth	Probably
Thorn	Perfect
Birth	Prepare
Clothes	Population
Prebirth	Perhaps
	Basketball
	Responsible

Swimming
Starting
Coming
Closing
Getting
Driving
Flying
Beginning

Test Part II

The Backpacker provides quality gear and quality service to outdoor enthusiasts.

I was a bit sad when it was finished, but I didn't watch any episodes since then.

The primary function of the respiratory system is to supply the blood with oxygen in order for the blood to deliver oxygen to all parts of the body.

The reason why people buy new clothes every year during the “back to school” season, is because kids tend to grow very quickly.

This video is about: how to split wood to the proper length for firewood.

When the sunlight strikes raindrops in the air, they act as a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon.

The price of this film was cheaper at the other place.

Teenagers often show quite mixed attitudes through their ever-changing behaviors.

Test Part III

Don't slip on the floor.

They sold the ship right away.

Isn't she going to leave?

Those hills are quite high.

I want you to fill this dish.

I asked him to take the lead.

First you must heat it.

I'll buy the meat tomorrow.

The pen fell on the floor.

The bottle was lost two weeks ago.

Don't sleep on the floor.

They sold the sheep right away.

Isn't she going to live?

Those heels are quite high.

I want you to feel this dish.

I asked him to take the lid.

First you must hit it.

I'll buy the mitt tomorrow.

The pan fell on the floor.

The battle was lost two weeks ago.