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### **An Analysis of Phonological Processes of some English Lexemes produced by Egyptian Arabic Speakers: A Constraint-based Analysis**

#### **Abstract**

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The current study is an analysis of some phonological processes of twenty-two English lexemes settling into Egyptian Arabic (EA). This linguistic analysis is built upon the notion that each language has its distinctive constraints with reference to its segmental organizations and syllabic structures. The mechanisms, utilized by EA phonotactic constraints, are configured within Prince and Smolensky's (1993) optimality Theory (OT) which is a linguistic approach composed of markedness and faithfulness constraints. Data are comprised of 22 English lexemes; the participants are Egyptian speakers. The study reveals that these English lexemes undergo certain phonological processes: gemination, epenthesis, and substitution. Gemination occurs in word mid position to compensate for the absence of CV; in other words, it adapts to CVC/CVC syllabic structures. Epenthesis is apparently explicit in the glottal /ʔ/ to repair the violated syllabic structure of VC. Substitution is existent in /p/, /v/, and /dʒ/. The study concludes that EA's phonological processes dominate the twenty-two English lexemes in geminating, substituting, and adding EA's native segments.

*Keywords:* Egyptian Arabic, Optimality Theory, Gemination, Substitution, Epenthesis, Phonology



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تحليل لغوي على بعض العمليات الصوتية لبعض المفردات اللغوية من الإنجليزية إلى  
ناطقى اللغة العامية المصرية: تحليل بنيوي مقيد  
مستخلص البحث

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يقوم هذا البحث باستطلاع بعض العمليات الصوتية الناتجة عن التداخل اللغوي بين اللغة الانجليزية و العامية المصرية. تقوم فكرته على أن كلا من اللغتين لهما القيود اللغوية الخاصة بهما بالإشارة إلى الأصوات و المقاطع البنائية. هذا البحث يطبق نظرية المفاضلة، لقائمة على أساس من الصراع بين القيود البنائية للغة و قيود التشابه ما بين الكلمات الأصلية في اللغة و مدى تعديل هذه الكلمات في اللغة الجديدة الواردة إليها. تم تجميع هذه البيانات من حوالي 22 كلمة من المفردات الانجليزية. استنتج البحث أن هناك عمليات صوتية تحدث لهذه الكلمات : التشديد و الاقحامات الصوتية و الابدال. بالنسبة للتشديد فإنه يحدث كنتيجة للتتابع الاملائي نظرا لغياب المقطع (ساكن/متحرك) في البنية اللغوية العامية المصرية. و تظهر الاقحامات الصوتية في وضع الهمزة في أول الكلمات التي لا تبدأ بصوت ساكن في اللغة الانجليزية و إعادة تشكيل المقاطع. و تتمثل الابدالات في حذف بعض الأصوات و استبدالها بالأصوات المتواجدة في اللغة العامية المصرية كحرف الباء , و الفاء , و الجيم. و توصل البحث إلى أن اللغة العامية المصرية تفرض قيودها اللغوية من أجل التطويرات الصوتية.

*الكلمات الرئيسية: العامية المصرية , نظرية المفاضلة , تشديد , اقحامات , ابدالات*

Jihan Hassan Mohamed Ali

## **An Analysis of Phonological Processes of some English lexemes produced by Egyptian Arabic Speakers: A Constraint-based Analysis**

### **1.1 Introduction**

In mastering a foreign language/a second language, learners cannot be isolated from the effect of their mother tongue. When they communicate, their first language structural patterns dominate their language output leading to what is known as interference. In Egypt, English, a standard language, is studied as a foreign language, from primary schools to universities. The English linguistic system contains phonological, morphological, and grammatical patterns rendered through learning the four skills: Speaking, Listening, Writing, and Reading.

Learning English takes a long period; it is, generally, monitored that the students lack speaking full sentences without committing lots of mistakes; nonetheless, they, apparently, have the potential to speak well in English. These mistakes are entailed by the first language intervention on speaking English; there are some errors that are not caused by interference. The term "interference" is defined as rearranging the patterns which result from introducing the foreign elements into the more highly-structured linguistic aspects i.e., the phonemic system lexicon, the morphosyntax part, and the lexical area (Weinreich, 2011).

### **1.2 Orthography and Language**

One of the most difficult areas is the orthographic system of the foreign language. In other words, there is a strong influence of the orthographical system over the phonological acquisition of second language in six domains (Hayes-Harb & Barrios, 2021). They are second language phonological awareness, second language phonemic perception, second language phonological processes, second language syllabic structures, second language pronunciation, and recognition words.

Hayes-Harb & Barrios (2021) point out that phonographic orthographies express what written forms can introduce; in addition, they represent alphabets (phonemes) and syllables. The direct parallelisms pertaining to graphemes and phonemes are recognized as transparency;

Jihan Hassan Mohamed Ali

in other words, the congruent consistency associated with graphemes and phonemes is known as alphabetical transparency (Hayes-Harb & Barrios, 2021). Ziegler & Ferrand (2008) observe that there are some languages in which there is a bidirectional equivalent congruent relationship between letters and segments (Consistency): Serbia and Spanish. However, there are many languages that demonstrate lots of discrepancies between their grapheme-phoneme and/or phoneme- grapheme correspondences (Inconsistency) e.g., French and English.

According to Ellis et al. (2004), the writing system involves some ongoing conflicts and some discrepancies for those who want to learn two languages; in addition, there are some incessant modifications in the accommodation of the disparate requirements each language imposes (Koda, 2007). Such modifications demonstrate lots of differences between the two languages in the domain of script type, transparency, and script direction. Script type is pertinent either to logographic or phonographic patterns, including alphabetic and syllabic scripts. Broadly, transparent orthographies include equivalent bidirectional demarcations between phonemes and graphemes, which demonstrate more many-to-one and one-to-many demarcations. Script directions specify the orthographic orientations either left/right or right/left.

Hayes-Harb & Barrios (2021) state that Arabic native speakers, learning Mandarin, are faced with its newly-scripted category and direction; nevertheless, Spanish native speakers, studying English, are confronted with some challenges pertaining to transparency divergences; that is, in Spanish, letters and phonemes demonstrate an equivalent relationship; nonetheless, in English, letters and phonemes introduce divergent grapheme-phonemic correspondences.

Distinctive demarcations, between phonemes and graphemes in the first and second languages, lead to many challenges for language learners. That is to say, there are congruent and incongruent mappings. Congruent mappings identify what the first and second languages employ in the same grapheme-phonemic correspondences as in both English and Spanish for

Jihan Hassan Mohamed Ali

the letter and the phoneme /m/; on the contrary, incongruent mappings express the differences between two languages in grapheme-phonemic correspondences as in the English glottal /h/ to the Russian nasal /n/ (Hayes-Harb & Barrios, 2021).

English Learners, a foreign or a second language, are required to attain the phonological acquisition of the target language, which, in turn, contributes to building specific and determined phonological demarcations (Park, 2011). According to Gass & Selinker (1994), Odlin (1989) and Schwartz (1998), interferences, among languages, affect many domains of acquiring a second language; such a linguistic process is named as first language transfer which acts as principal barrier to second language acquisition. These domains are represented in how the first language orthographic, phonological, and phonology-orthographic demarcated structural transfer to second language spelling acquisition.

Park (2011) points out that second language acquisition, mainly, includes the differential domains of the linguistic systems allotted to two languages. Comparing and contrasting the two linguistic systems help learners to overcome difficulties; such a linguistic approach is known as contrastive analysis hypothesis (CAH) (Lado, 1964). Generally, the orthographic errors occur owing to incongruent segments between the first language and second language. Ibrahim (1978) collects some undergraduate students' examinations and reports; the allocated differences between the two phonological systems (Arabic and English) influence Arab students who study English as a second language. That is, students substitute the voiceless bilabial plosive /p/ with the voiced bilabial plosive /b/ since Arabic includes no /p/.

More clearly, orthographic errors lead to a semantic shift, frequent in "pin" /pin/ to "bin" /bin/, "pan" /pæn/ to "ban" /bæn/, and "pie" /pai/ to "buy" /bai/. Furthermore, Arabic learners commit errors especially in consonantal clusters as many Arabic dialects prevent final consonantal clusters. In other words, Egyptian Arabic is restricted to five syllabic typologies:

Jihan Hassan Mohamed Ali

CV, CV:, CVC, CV:C, and CVCC. However, English syllabic typologies vary to fourteen patterns (Sung, 2010); the five syllabic typologies of EA are part of English. For example, the lexemes, in "text" /tekst/, contain three consonantal clusters in the coda. To repair such a linguistic violation, learners intrude a vowel before the last consonantal segment; this process is known as epenthesis. That is, the mono-syllabic word /tekst/ is transformed into the di-syllabic synthesized word /tiksit/.

### 1.3 Limitations of the Study

Although there are phonological, morphological, and grammatical interferences (Azzouz, 2013), the current study is limited to phonological interference of some English lexemes acquired and introduced into Egyptian Arabic (EA). These phonological analyses are introduced in gemination, substitution, and epenthesis leading to the re-syllabification process. The current study is, furthermore, associated with segmental and supra-segmental levels. These segmental transformations are demonstrated in terms of (Prince and Smolensky, 1993) optimality theory (OT). The OT is composed of two types of constraints. The first type is the markedness constraints which are pertinent to language well-formed structures; however, the second type is the faithfulness constraints, associated with the degree of similarities between the input and the nonfinite outputs.

### 1.4 Statement of the Problem

The phonological acquisition of English lexemes is an explicit phenomenon pertinent to most languages (Shafeek, 2019). To clarify, all languages include certain phonotactic restrictions forming and governing their syllabic structures within their words. Within the process of pronouncing some lexemes, the recipient language (RL) dictates some diverse structures to conform to its syllabic structures. Furthermore, languages get diversity in accordance with their segments and syllabification principles. In other words, both English and EA have a lot of restrictions with regard to phonemes and syllabification processes. Owing to

Jihan Hassan Mohamed Ali

some diversities between English and EA, some lexemes are, mechanically, adapted into EA's phonological system. So, how are English lexemes reshaped in EA?

This study highlights an analysis of how English lexemes are adapted to EA's structures. Syllable is, phonologically, realized as a unit that has an essential role in the phonological organizations of any language. Thereupon, any language syllabic structures always nominate some phonological transformations accompanied by the incoming phonemes. Therefore, the current study demonstrates the essential role of the phonological processes: segmental and supra-segmental structures according to the realization of the phonological processes occurring to these English lexemes into EA's phonological system.

Applying Optimal Theory (OT) (Prince and Smolensky, 1993) demonstrates how these English segments, syllabic typologies, and patterns are acquired, reshaped, and adapted to EA's phonological patterns with reference to certain constraints.

### **1.5 Research Objectives and Questions (ROQs):**

The research targets the following points:

- To identify the role of /i/ and /a/ in the re-syllabification process in EA.
- To compare and contrast mutual phonemes of English and EA.

The current research answers the following:

- How can epenthesis contribute to reshaping the phonological restrictions of the English lexemes?
- What are the most notable substituted phonemes within the current research?

### **2.1 Previous Studies Related to OT and Gemination**

Some studies, which are pertinent to the current research, are highlighted.

Kar (2008) conducts a linguistic analysis gemination in Bangla which is the main language spoken both in Bangladesh and in the West India. The study concentrates on the

Jihan Hassan Mohamed Ali

phonologically-represented combinatorial phonemes shaping some valid geminates in Bangla. The study adopts the framework of Prince and Smolensky's OT (1997) through a threefold arranged-argumentative structure associated with each stratum and their relevant lexical lexemes based upon their origin. Data is collected from some words in Bangla. In addition, the study is pertinent to the gemination of liquids, glides, and nasals. The study follows a descriptive-qualitative analysis. The study reveals that there are three strata of borrowings: Sanskrit Borrowing (SB), Native Bangla (NB), and Other Borrowing (OB). The Sanskrit Borrowing and Native Bangla strata of the lexical constraints are associated with plosive-nasal restrictions. However, OB stratum is, only, associated with gemination of obstruent-liquid clusters. The study concludes that DEP-IO, MAX-IO, and IDENT-NAS (velar/m) dominate both \*Plosive-/m/ and UNIFORMITY.

Noamane (2020) conducts a linguistic analysis of consonantal gemination in Moroccan Arabic through the use of optimality theory (OT). OT is a linguistic approach, set up by Prince and Smolensky (1993); it sheds light on two constraints: faithfulness and markedness. Markedness constraints indicate the well-formedness of the output; however, faithfulness constraints indicate similarities between the output and the input in some particular ways. The study is associated with the three categories of phonological gemination. Kenstowicz & Pyle (1973) define gemination as a sequence of two similar consonants. Data is collected from some words through the dependence upon similar phonemes in manner, place, or voicing. The study adopts a descriptive-analytic approach. The study reveals that gemination can be derived from total assimilation in two respects. The first respect is attained both between the definite article and the initial coronals pertaining to nouns. The second is associated with the final coronal-stop verbal consonant. The study concludes that prosodic length is entailed through a phonologically-derived gemination which occurs at the beginning of the word, at the middle of the word, and at the end of the word. Furthermore, gemination comes mainly from major class

features.

Al-Solami (2022) conducts a phonological analysis of geminated words of a Bedouin tribe named Bani Sulaim Dialect (BSD), in Saudi Arabia. The study adopts the framework of the optimality theory. The study investigates lexical and phonemically-derived geminations nominated within assimilations in addition to gemination as a compensative style of compensatory vowel lengthening for truncated mora owing to deleting vowel. The main issue is explored in the conflict between deleting vowel assimilation and compensatory vowel lengthening. Data is collected from four native speakers' speech of Bani Sulaim Dialect. Consequently, a list, including geminates in diverse placements of the word, is compiled from the first step. The list validity is confirmed through consulting with the speakers. Data analysis is accomplished through the optimality theory, including a set of constraints: faithfulness and markedness. The study reveals that lexical geminates contrast singletons on the phonemic levels; nonetheless, phonologically-derived gemination is explored in onset and coda positions through assimilation. The study concludes that BSD prohibits consonantal clusters as avoidance from total assimilation that results in gemination.

To sum up, the above-mentioned studies show the potential of some recipient languages to modify and reshape some lexemes so as to conform to their linguistic constraints. Furthermore, these analyses are attained within the OT which facilitates the analytic process within the current research. More clearly, the current study illustrates the effect of the orthographic system of English over foreign/second language learners.

## **2.2 Theoretical Framework**

This section sheds light on the phonological systems and syllabic structures of English and EA.

### **2.2.1 The Phonological Systems**

Both English and EA have some similarities and differences in their phonological

Jihan Hassan Mohamed Ali

systems which contain vowels and consonants. In other words, there are some mutual phonemes; nonetheless, there are some different phonemes.

### 2.2.2 English and EA's Vowels

Vowels are segments that are pronounced without any obstructions to or modifications of the airstream passing within the vocal tract (Ladefoged, 2000). Vowels are categorized into monothongs and diphthongs. Abercrombie (1967) observes that there are three criteria used to describe vowels: the height of the tongue, the position of the tongue, and the shapes of lips.

Roach (2010) defines monothongs as vowels of one sound. He divides monothongs into two categories. The first category is the short ones which include seven sounds introduced as /i/, /e/, /ə/, /ɔ/, /ʊ/, /æ/ and /ʌ/. The second category is the long ones, including /i:/, /ɑ:/, /ɔ:/, /ɜ:/, and /u:/. Thus, English monothongs cover twelve sounds involved in seven short and five long monothongs. Roach (2010) states that diphthongs are vowels of two sounds. They are divided into centering and closing. There are eight diphthongs which are represented in /iə/, /eə/, /ʊə/, /aɪ/, /eɪ/, /ɔɪ/, /aʊ/, and /əʊ/.

Youssef (2010) points out that EA has eight monothongs introduced in /i/, /ɑ/, /ʊ/, /ɑʔ/, /i:/, /ɑ:/, /u:/, and /ɑ:ʔ/. Furthermore, there are two diphthongs /aʊ/ and /aɪ/.

### 2.2.3 English and EA's Consonantal Systems

Ladefoged (2000) defines consonants as segments that are pronounced with a severe stricture through flowing into the airstream within the vocal tract. Consonants are divided into stops, fricatives, affricates, nasals, and glides (Roach, 2010). There are four basic criteria describing consonants: the manner of articulation, the place of articulation, the airstream mechanism, and the glottis state (Abercrombie, 1967; Katamba, 1989). The following figure, adapted from Roach (2010), covers English consonants.

Jihan Hassan Mohamed Ali

Manner of Articulation	Place of Articulation											
	Bilabial		Alveolar		Velar		Labiodental	Dental	Post-alveolar	Palatal	Glottal	
Stops	b	p	d	t	g	k						
Fricatives			z	s		v	f	ð	θ	ʒ	ʃ	h
Affricates									ʤ	ʧ		
Nasals	m		n		ŋ							
Lateral			l									
Glides	w		r							j		

Figure 1 English Consonants (Roach, 2010)

According to the former figure, there are twenty four consonantal phonemes in English.

As for EA's consonantal system, the following table identifies its phonemes:

Manner	Labial	Alveolar		Emphatic		Palatal	Velar	Uvular	Pharyngeal	Glottal	
Stops	b	d	t	d'	t'		g	k	q	ʕ	ʔ
Fricatives	f	z	s	z'	s'	ʃ		χ	ħ		h
Nasals	m	n									
Lateral		l									
Approximants	w	r				j					

Figure 2 EA's Consonants (Watson, 2002; Youssef, 2006).

According to the above-mentioned figure, there are twenty six phonemes; to clarify, there are some mutual phonemes between the two phonological systems; however, there are some different phonemes between the two linguistic systems, also.

To conclude, English and EA have some exchangeable phonemes; however, they have other different phonemes. In terms of vowels, /i/, /i:/, /ɑ:/, /ʊ/, /u:/, /ai/, and /aʊ/ are found in English and EA. However, in EA, there are /ɑʔ/ and /ɑ:ʔ/, English has /e/, /æ/, /ɒ/, /ʌ/, /ɔ:/, /ə/, and /ɜ:/. In terms of consonants, /d/, /b/, /g/, /t/, /f/, /k/, /h/, /ʃ/, /r/, /w/, /l/, and /j/ are found in English and EA. Although EA includes /dʔ/, /tʔ/, /q/, /ʕ/, /ʔ/, /sʔ/, /zʔ/, /χ/, /ħ/, and /x/, English

Jihan Hassan Mohamed Ali

covers /p/, /v/, /ð/, /θ/, /ʒ/, /ʃ/, /dʒ/ and /j/. Therefore, each language has its own distinctive phonemes which characterize its features from the other language.

#### 2.2.4 EA and English Syllabic Structures

Syllable is defined as a part of a word containing a nucleus (vowel) (Roach, 2010). Pike (1967) divides the syllable internal structure into three main parts (Onset + Peak + Coda). Roach (2002) divides the structure into two parts: the onset and the rhyme (the peak + coda). He identifies the onset as the consonants preceding the nucleus; however, the consonants, following the peak, compose the coda. The main component of the syllable is the nucleus (the peak).

Clark and Yallop (1990) state that there are fourteen syllabic typologies in English. They include CV, CV:, CCV:, CCCV:, CV:C, CV:CC, CCV:CC, CVCCCC, CCVCCCC, etc. According to Fujimura and Lovins (1977), there are some restrictions of co-occurrence across the peak and the coda rather than the restrictions found between the onset and the coda. In EA, only five syllabic typologies are existent all of which are existent in English: CV, CVC, CV:, CV:C, and CVCC (Watson, 2002).

#### 2.2.5 An Overview of Optimality Theory

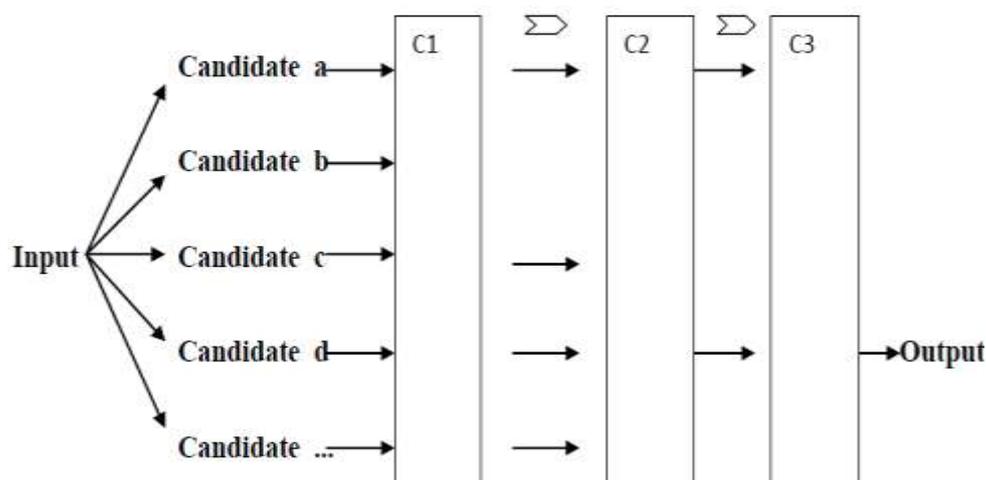
It is a restricted-based theory which operates on the interaction of constraints. In the 1990s, Alan Prince and Paul Smolensky set up this linguistic theory. Consequently, this theory is broadly known by John McCarthy. These constraints are explored in all languages since they shape a fundamental component of universal grammar (UG) which sheds light on the innate linguistic knowledge allocated within the human brain.

Chomsky's Generative Grammar (1965) and the OT are pertinent to some universal tenets. Notwithstanding, the OT is different in lots of respect. The OT asserts that universal constraints are can be violated. Thus, every constraint is an indispensable component of the UG; on sharp contrast, these constraints are not equally activated and triggered in all languages. Therefore,

Jihan Hassan Mohamed Ali

in never-violated certain language, constraints may be violated in another (Kager, 1999).

In optimality theory, the apparent linguistic structures originate from linguistic conflicts among competing constraints (Prince and Smolensky, 1993). These structures attain their appropriateness as they have the least violations of some violable constraints ranked hierarchically. There are two important functions monitored in optimality theory: the Generator (GEN) and the Evaluator (EVAL). Universally, the GEN generates endless candidates pertaining to a determined input. These candidates are passed onto EVAL; the hierarchical constraints are evaluated. Then, the winner candidate, the optimal output, violates the least high-ranking constraint. The entire process is summarized and schematized in the following figure:



**Figure 3 Input-Output Mechanisms in OT (Kager, 1999, p.8)**

To illustrate the evaluation in the OT, it is observed that a grammar consists of tri-columned constraints namely  $C^1$ ,  $C^2$  and  $C^3$ , in CON, which are ranked in the way that  $C^1$  and  $C^2$  dominate  $C^3$  ( $C^1, C^2 \gg C^3$ ). The GEN aims to provide three possible candidates (cand<sup>1</sup>, cand<sup>2</sup>, and cand<sup>3</sup>) which undergo the evaluation process operated by the EVAL. The evaluation process is, usually, explored and rendered in a tableau form. The optimal candidate is to be indicated by a pointing hand after evaluation ( $\curvearrowright$ ). Clearly, the following tableau exemplifies how a constraint-based analysis is represented in the OT.

INPUT	C <sup>1</sup>	C <sup>2</sup>	C <sup>3</sup>
1) Candidate <sup>1</sup>			*
2) Candidate <sup>2</sup>	*!		
3) Candidate <sup>3</sup>		*!	

**Figure 4 Value Ranking and the Optimal Output Choice**

There are three relevant universal constraints which are introduced and explored in an order which starts from left to right. This order follows hierarchically-ranked constraints. Furthermore, the violation is identified by the asterisk (\*) if a candidate violates such a constraint. When a violation is characterized by its fatality, an exclamation mark, neighbored by the asterisk (\*!), indicates such a fatal violation. The configuration of the three candidates indicates that both candidates (b) and (c) violate constraint C<sup>1</sup> and C<sup>2</sup> which are the dominant highly-ranked constraints. Accordingly, these two candidates have fatal violations (\*!) of the two highly-ranked constraints. Nonetheless, candidate (a) is the winner for representing the optimal output for the hierarchically-demonstrated constraint. It satisfies none of the three constraints; however, candidate (a) expresses the most appropriate output as it retains the violation to the minimum through violating the bottom-ranked constraint C<sup>3</sup> during the satisfaction of the higher-ranked constraints C<sup>1</sup> and C<sup>2</sup>.

### 2.2.6 The Constraints of Optimality Theory

Constraints are universal; on sharp contrast, the constraints ranking is, linguistically, determined. There are two constraints; in addition, each family contains indefinite sub-constraints. These are the faithfulness and the markedness engaged in a fundamental conflict

Jihan Hassan Mohamed Ali

in every grammar (Kager, 1999). The markedness constraints integrates the OT into the markedness differential hypothesis (MDH); second language aspects, different and marked, are confronted by notable difficulties for learners of a second language rather than aspects which are diverse but less marked (Eckman, 1977).

Markedness is notably featured by some structures, within a language, which are more remarkable than others. Notwithstanding, they are impermissible to appear onto surface. For instance, a commonest markedness constraint, associated with EA, is **ONSET** which necessitates the beginning of a consonant. Languages either accept or reject some certain structures in case of getting their optimality; however, various phonological systems of diverse languages rank these constraints. That is, to certain processes such as epenthesis, deletion, or alternation may mark structures however, they may be avoided in the structures of other languages.

The constraints of faithfulness, however, necessitate resemblances between the input and the output (Kager, 1999). Thereupon, the output resembles the vocalic features of its base. Three major constraints are monitored: dependence, identity, and maximality (Kager, 1999).

- **DEPENDENCE (DEP)** states that insertion (epenthesis) is forbidden.
- **IDENTITY (IDENT)** states that deletion, insertion, and vocalic changes of any segments are not permitted in the output.
- **MAXIMALITY (MAX)** states that deletion (syncope) is forbidden.

The OT is associated with syllabic structures (McCarthy, 2008). That is, the OT provides an assigned framework of a restricted-based analysis and the fundamental representative evaluations as part of any theory of syllabic structures.

### 3.1 Methodology

This section is associated with research design, data collection, and data analysis

Jihan Hassan Mohamed Ali

procedures. The current study follows a descriptive–analytic approach to analyze the phonological processes associated with English lexemes in the EA’s phonological system. A descriptive approach allocates reporting for the method which things should be (Mugenda and Mugenda, 1999). That is, the descriptive–analytic design conforms to the current research since its concentration is on some phonological processes: gemination, substitution, and epenthesis. These phonological processes are accomplished within the framework of the OT (Prince and Smolensky, 1993).

The researcher targets twenty-two lexemes which are featured by reduplicated letters. All of them are poly-syllabic. The researcher acknowledges how the Source Text (ST) lexemes vary from the neo-versioned forms. The researcher transcribes all the ST lexemes in addition to dividing them into syllables (Ashby, 2000) shown below:

**Table 1 Transcription and Syllabic Typologies of the ST's lexemes**

The ST's Lexemes	Transcription	Syllabic Typologies
1) Addition	/ədiʃən/	V/CV/CVC
2) Annual	/ænjʊəl/	VC/CV/VC
3) Assimilation	/əsɪməleɪʃən/	V/CV/CV/CV/CVC
4) Association	/əsəʊsɪeɪʃən/	V/CV/CV/V/CVC
5) Attend	/ətend/	V/CVCC
6) Attitude	/ætətjʊ:d/	VC/VC/CV:C
7) Collect	/kəlekt/	CV/CVCC
8) Comment	/kɒment/	CV/CVCC
9) Connect	/kənekt/	CV/CVCC
10) Correct	/kərekt/	CV/CVCC
11) Dissatisfy	/dɪsætɪsfɑɪ/	CV/CV/CVC/CV
12) Dissimilation	/dɪsɪməleɪʃən/	CV/CV/CV/CV/CVC

Jihan Hassan Mohamed Ali

13) Illegal	/ilɪgəl/	V/CVC/VC
14) Illegitimate	/ɪlɪdʒɪtəmət/	V/CVC/V/CV/CVC
15) Illicit	/ɪlɪsɪt/	V/CVC/VC
16) Immoral	/ɪmɔːrəl/	V/CV:C/VC
17) Immutable	/ɪmjʊːtəbl̩/	V/CCV:C/VCC
18) Irregular	/ɪrɛɡjələ/	V/CVC/CV/CV
19) Irrespective	/ɪrɪspektɪv/	V/CVC/CVC/CVC
20) Suggest	/sədʒest/	CV/CVCC
21) Suppose	/səpəʊz/	CV/CVC
22) Syllabic	/sɪləbɪk/	CV/CVC/VC

In the current study, the participants are students at Beni Suef University, Faculty of Alsun, translation program who study English as a foreign language. The current study investigates the phonological interferences from Arabic into English. Therefore, it is essential to nominate the selected participants to be representatives of the entire population who are examined. The choice is allotted to fifteen participants whose ages range from 20 to 22, males and females. After transcribing the ST's lexemes, the researcher asks the participants to pronounce them on a paper. Then, she gives her participants some minutes to acquire the SL's lexemes. Consequently, she listens to their neo-versioned pronunciations which demonstrate partial and total alternations of the ST's lexemes as shown hereby:

**Table 2 Neo-versioned Pronunciations between English and EA**

ST	Typologies	EA	Typologies
/ədɪʃən/	V/CV/CVC	/ʔaddɪʃən/	CVC/CV/CVC
/ænɟʊəl/	VC/CV/VC	/ʔannajawal/	CVC/CV/CV/CVC
/əsɪməleɪʃən/	V/CV/CV/CV/CVC	/ʔassimileɪʃən/	CVC/CV/CV/CV/CVC

Jihan Hassan Mohamed Ali

/əsəʊsiɛfən/	V/CV/CV/V/CVC	/ʔassosjeifən/	CVC/CVC/CV/CVC
/ətend/	V/CVCC	/ʔattind/	CVC/CVCC
/ætətjʊ:d/	VC/VC/CV:C	/ʔattitjʊ:d/	CVC/CVC/CV:C
/kələkt/	CV/CVCC	/kʊllikt/	CVC/CVC
/kɒment/	CV/CVCC	/kʊmmint/	CVC/CVC
/kənəkt/	CV/CVCC	/kʊnnikt/	CVC/CVC
/kərekt/	CV/CVCC	/kʊrrikt/	CVC/CVC
/dɪsætɪsfɑɪ/	CV/CV/CVC/CV	/dɪssatɪzfaɪ/	CVC/CV/CVC/CV
/dɪsɪməleɪfən/	CV/CV/CV/CV/CVC	/dɪssɪmɪleɪfən/	CVC/CV/CV/CV/CVC
/ɪlɪgəl/	V/CVC/VC	/ʔilli:gal/	CVC/CV:/CVC
/ɪlɪdʒɪtəmət/	V/CVC/V/CV/CVC	/ʔillɪdʒɪtɪmeɪt/	CVC/CV/CV/CV/CVC
/ɪlɪsɪt/	V/CVC/VC	/ʔillɪsɪt/	CVC/CV/CVC
/ɪmɔ:rəl/	V/CV:C/VC	/ʔɪmɔ:rəl/	CVC/CV:/CVC
/ɪmjʊ:təbl/	V/CCV:C/VCC	/ʔɪmmɪjʊ:tɪbəl/	CVC/CV/CV:/CV/CVC
/ɪrɛgʲələ/	V/CVC/CV/CV	/ʔɪrrɪgʲɔlar/	CVC/CVC/CV/CVC
/ɪrɪspektrɪv/	V/CVC/CVC/CVC	/ʔɪrrɪsbɪktɪf/	CVC/CVC/CVC/CVC
/sədʒest/	CV/CVCC	/sʔɑʔʒɪsʔtʔ/	CVC/CVCC
/səpəʊz/	CV/CVC	/sʔɑʔbʔbʔɔ:z/	CVC/CV:C
/sɪləbɪk/	CV/CVC/VC	/sɪllabɪk/	CVC/CV/CVC

Regarding the aforementioned table, it is clear that the ST's lexemes undergo some phonological transformations including epenthesis, gemination, and substitution. The researcher records these phonological transformations according to the participants' performance since the research is, mainly, pertinent to a phonological domain. The researcher attains such a phonological task through recording the required material on her own mobile









Jihan Hassan Mohamed Ali

This tableau assesses candidates for a trilateral consonantal input. Candidate (b) loses since it lacks any coda. To illustrate, the partial similarity between the input and the output in the bare onset is prohibited in EA since EA's five syllabic typologies allow onsets. The same structure is applied to candidate (c) which lacks onset. Accordingly, candidate (A) is the winner since it satisfies the markedness constraints ONS and \*COMPLEX.

#### 4.2.2 Gemination

Gemination is a sequence of two similar consonants (Kenstowicz & Pyle, 1973).

**Tableau 2 Gemination in OT**

/kɔment/	ONSET	C-CODA	MAX	DEP
a) $\text{☞}$ /kɔm-mint/			*	*
b) /kɔmm-int/	!*	!*	*	*
c) /kɔ-mint/	!*	!*	*	*

Candidate (b) loses as it lacks any coda. To illustrate, geminated patterns include identical segments which shape both coda and the onset. As for the faithful candidate (c), it loses for violating the markedness ONSET and C-CODA. In other words, the syllabic structures of /-int/ is an impermissible syllabic structure in EA since it lacks onset. Furthermore, the complex coda of /kɔmm/ is not conformable to EA's phonological parallelisms. Accordingly, candidate (a) is the winner since it satisfies ONSET and C-CODA; nonetheless, it violates the faithfulness constraints MAX and DEP which require strict similarities between the input and the output.

#### 4.2.3 Substitution

Substitution is a phonological process in which a segment is replaced by another segment (Pater, 1999). Certain consonantal phonemes, accompanied by the English lexemes, are replaced; they are /p/, /v/, and /dʒ/. As for vowels, they are /ɔ:/, /e/, /æ/, and /ə/. They are substituted by the closest phonemes as shown below:

Jihan Hassan Mohamed Ali

**Tableau 3 Substitution in OT**

/səpəʊz/ /p/ to /b/	IDENT	MAX	DEP
a) $\text{☞} /s^?a^?b^?b^?ʊ:z/$		*	*
b) $/s^?ap^?p^?ʊ:z/$	*	*	*

This tableau assesses candidates for a phonological substitution of the bilabials /p/ to /b/. Candidate (b) loses since it deactivates the phonological replacements of the /p/; in other words, EA lacks the voiceless bilabial plosive /b/. Accordingly, candidate (A) is the winner since it satisfies the faithfulness constraint IDENT as it shares a partial similarity in the place of articulation.

### 5.1 Conclusions

The study shows that certain English lexemes undergo some phonological processes which are included in epenthesis, substitution, and gemination. EA is featured by the marginal parallelisms of CVC/CVC syllabic structures which dominate its syllabic typologies in accordance with adapting English lexemes. In complex clusters, epenthesis is required to break such violated forms. Substitution is explicit in the phonemes /p/, /v/, /dʒ/, /ə/, /ʌ/, /e/, /ɔ/, /əʊ/, and /ʊə/ since they are not a part of EA's phonological system. Gemination occurs with reference to orthographic–phonemic correspondence; in other words, reduplicated orthographic letters are geminated.

In terms of the OT, it is clear that the markedness constraint ONSET is the most appropriate constraint since it forbids consonantal clusters to conform to CVC/CVC syllabic structures. Furthermore, \*COMPLEX and C-CODA are required since CVC is the most conformable syllabic structure to conform to gemination in EA. In accordance with faithfulness constraints, no constraints are required since there are no similarities between the input and the output owing to the vast discrepancies between English and EA. As for substitution, the IDENT is the optimal constraint as it shares a partial similarity in the place of articulation between the

Jihan Hassan Mohamed Ali

input and the output.

As for the first question, the anaptyctic phonemes /i/ and /a/ influence the process of re-syllabification process of the EA. In the lexemes "annual" and "immutable", the epenthesis of /i/ and /a/ is required to reshape the re-syllabification process of the EA; in other words, both words include complex onsets, CCV, which are impermissible in EA; accordingly, breaking such consonantal clusters is resolved by the epenthesis of /i/ and /a/. As for the second question, there are some substituted phonemes which are not included in the phonological system of the EA: /p/, /v/, /dʒ/, /ə/, /ʌ/, /e/, /ɔ/, /əʊ/, and /ʊə/. The voiceless /p/ is replaced by the voiced /b/, /v/ by /f/, /dʒ/ by /ʒ/, /ə/ and /e/ by /a/, and /ɔ/, /əʊ/, and /ʊə/ by /u/.

Jihan Hassan Mohamed Ali

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Jihan Hassan Mohamed Ali

**Appendix****Appendix of English and EA's Phonemes**

<b>English</b>	<b>➤ Vowels</b>	<b>Mutual Phonemes</b>
<b>➤ Consonants</b>		<b>➤ Consonants</b>
1. /p/	1. /ʊ/	1. /b/
2. /v/	2. /e/	2. /d/
3. /ð/	3. /æ/	3. /t/
4. /θ/	4. /ʌ/	4. /g/
5. /ʒ/	5. /ɜ:/	5. /k/
6. /ʃ/	6. /ɔ:/	6. /z/
7. /dʒ/	7. /iə/	7. /s/
8. /ŋ/	8. /eə/	8. /f/
	9. /uə/	9. /ʃ/
	10. /ei/	10. /h/
	11. /ɔi/	11. /m/
	12. /əu/	12. /n/
<b>Egyptian Arabic</b>		13. /r/
<b>➤ Consonants</b>		14. /l/
1. /dʔ/		15. /w/
2. /tʔ/		16. /j/
3. /q/		<b>➤ Vowels</b>
4. /ʕ/		1. /i/-/i:/
5. /ʔ/		2. /u/-/u:/
6. /ʁ/		3. /ɑ:/
7. /x/		4. /ai/
8. /ħ/		5. /au/
9. /zʔ/		
10. /sʔ/		
<b>➤ Vowels</b>		
1. /ɑ:ʔ/ - /ɑʔ/		
2. /ɑ/		