An Optimality Analysis of English Consonantal Adaptation in Standard Arabic

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Abstract:
The present study investigates the phonological processes involved in the nativization process of English consonants onto Standard Arabic and provides an account of such processes within Optimality Theory (OT). Specifically, the merits of the analysis shed light on the consonantal alterations attested in Standard Arabic loanword corpus by the examination of the adequate phonological adjustment mechanisms used in the integration process of English consonants within OT. The study reveals that several phonological processes are attested, namely: voicing, devoicing, emphazization, affrication and deaffrication, uvularization, fronting and metathesis. In addition, results have stressed the role of both markedness and the phonological distinctive features of natural classes on the integration process. The study reveals that the consonantal alterations attested are grounded on the domination of the markedness constraints, which condition rendering the output less marked in SA, over the faithfulness constraints, which exert effort in preserving the output faithful to the input.

Keywords: Consonantal Adaptation, Markedness, Optimality Theory (OT), Phonological Processes, Standard Arabic (SA).

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تحليل فونولوجي للأصوات الساكنة المستعارة من اللغة الإنجليزية إلى اللغة العربية الفصيحة في إطار النظرية الأمثلية

فاطمة زكي القضاة
أ. د. رضوان سالم محاذين

ملخص:
تهدف الدراسة إلى البحث في العمليات الفونولوجية المستخدمة في تعريب الأصوات الساكنة من اللغة الإنجليزية إلى اللغة العربية الفصيحة في إطار النظرية الأمثلية. تتناول التحليل تغيرات الأصوات الساكنة الموجودة في مجموعة من الكلمات المستعارة في اللغة العربية الفصيحة من خلال دراسة العمليات الفونولوجية التكيفية المستخدمة في ملاءمة الأصوات الساكنة الإنجليزية لِما يقابلها في اللغة العربية الفصيحة في إطار النظرية الأمثلية. توصلت الدراسة إلى وجود عدد من العمليات الفونولوجية الملائمة لمطابقة الأصوات الساكنة، وهي: الإجهار الصوتي، الهمس، التفخيم، (affrication)، (deaffrication)، (uvularization)، (fronting)، وال体制机制 والمميزة لمجموعات (markedness) عن ذلك أكدت الدراسة على دور محدودية الشيوع (natural classes) على عملية دمج الأصوات. أظهرت الدراسة أن التغيرات في الأصوات الساكنة التي وُجِّدت أساسًا من سيادة (markedness constraints)، والتي تقي الأصوات محدودية الشيوع الناجحة في اللغة العربية الفصيحة، على (faithfulness constraints)، والتي تضبط بدورها المحافظة على مطابقة المخرجات للمدخلات تمامًا.

الكلمات المفتاحية: العمليات الفونولوجية، اللغة العربية الفصيحة، النظرية الأمثلية، تكييف الأصوات الساكنة، محدودية الشيوع.

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1. Introduction

Loanword adaptation in the broader sense refers to the adjustments and changes that occur not only at the phonemic level, but also at the morphological and semantic levels of loanwords in the recipient language, i.e., borrowing language (McCarthy 1985; Danesi 1985; Poplack et al. 1988; Al Qinai 2000). Evidently, this study confines itself to the phonemic adaptation of borrowed words. Andersson et al. (2017) argued that when a language is confronted with a non-native phonological item, i.e., an item that contains a sound that does not occur in the native language inventory, or an item that is formed by a phonotactically forbidden sequence of sounds in the ‘Recipient Language’ (RL), then a conflict will arise between this new item and the phonological system of the native language (RL). This was proposed by LaCharite and Paradis (2002:71) who went on to say that loanword adaptation refers to “the sound changes that borrowed words often undergo when they are used in another language”.

Moreover, Kang (2009) maintained that once borrowed words, i.e., non-native words enter the borrowing language (RL), and get introduced to the RL society, they undergo certain adaptation processes to get integrated into the RL and conform to its phonological structure constraints. According to Kang (2009), this is referred to as the process of evolution of loanwords in the society. Andersson et al. (2017:3) highlighted that in such case, two scenarios will be available, viz. (a) either the loanword will stay as it is and will be imported with no alterations to its form and consequently, the native phonology changes, or (b) the loanword will alter its pattern to conform to the native phonology of the borrowing language. In the first case where no alterations happen to loanwords, the phonological inventory of the RL will expand at the various levels. For example, the emergence of voicing contrast in fricatives in English among /f, θ, s/ and /v, δ, z/, respectively. This is due to borrowing from Old French (OF) into Middle English (ME). Consequently, in Modern English, voicing is now phonemically contrastive which appears in minimal pairs like /ʃvr/ ‘ferry’- ‘very’, respectively. However, in the second stance where the loanword alters its pattern to conform to the constraints of L1 phonology, no changes are expected to the phonology of the RL (Van Coestem 1988; Matras 2009; Winford 2010). For instance, Smith (2007) (as cited in Andersson et al. 2017:5) gave an example from Hawaiian language for loanwords that got adapted from English into Hawaiian. The forms were changed to obey Hawaiian phonological constraints. English /b/, and /θ/ became Hawaiian /p/, while /v/
Kang (2009) noted that the modifications that borrowed words undergo are reflected into the various phonological structure, namely: (a) the segmental level (individual sound level which includes consonantal and vocalic elements), (b) the phonotactic or syllabic level, and (c) the suprasegmental level. It goes back to Paradis and LaCharite (1996:380) who hypothesized that “often loanwords enter the borrowing language L1 with structures, which are segments and sequences. These structures are from the point of view of L1 ‘ill-formed’”. Furthermore, Wells (2000) pointed out that in adapting words from an SL into an RL, different aspects may be involved, namely: (a) the sound segments, (b) the positions of those segments within the domain of the syllable, and (c) their suprasegmental features as stress and intonation. In order to repair the ill-formed structures of the borrowed words, specific phonological processes are used. Among these processes might be the following: epenthesis, metathesis, elision, voicing, devoicing, prothesis, syllabic disruption, and so on. By the application of such repair strategies, foreign sounds might either be dropped, modified, or replaced by the nearest equivalent counterparts found in the RL phonological inventory. Interestingly, this study limits itself to the phonological adaptation of English loanwords into Standard Arabic, at the segmental-consonantal level, within Optimality Theory.

1.1 Segmental Adaptation

Kang (2009) stated that segmental adaptation occurred in cases where the non-native pattern includes a non-native segment, i.e., a segment that does not exist in the native phonology of the RL, whether a consonant or a vowel. In such case, the segment will be substituted, i.e., repaired, by the ‘closest’ counterpart in the native language of the borrower by the universal phonological operations which are controlled by the L1 constraints. The result of such process is what we observe on the surface of changes that happen to loanwords. The various substitution mechanisms, that different languages employ searching for the so-called ‘closest counterpart’, cause problems (Kang 2009:8). The researcher elaborated more and noted that different languages behave differently in segmental adaptation and that “no universal metric of similarity that all languages follow in segmental adaptation” (p.8).

1.2 The Phonology of Standard Arabic (SA) and English (E)

For any attempt to study the adaptation of loanwords and its effect on the phonemic system, a description for the phonological systems of the
languages involved is required. Such comprehensive description may supply the researchers with a clear view of the phonological systems of the SL and the RL, which may suggest where borrowing will particularly occur. This can be achieved by setting the phonemic inventories of both languages involved in the adaptation process beside each other which obviously presents the similarities and differences between the two systems and clearly shows the presence and absence of any phoneme.

Such in advance description will facilitate any attempt to analyze the emergent patterns that result from the mapping of non-native terms from SL into RL (Weinreich 1953 (as cited in Hoffer 2002:7)). Haugen (1950:215) claimed that it has been frequently asserted that “only a complete analysis of the sound systems and the sequences in which sounds appear could give us grounds for predicting which sounds a speaker would be likely to substitute in each given case”.

Consequently, the current section concerns itself to provide a brief description for both the SL (donor language) phonological system, which is English in the present study, and for the RL one (target language), which is Standard Arabic (SA). The description covers the phonemic inventories (consonants only) of both languages involved. Finally, at the end of this section, a brief comparison between the two phonological systems is stated to highlight the major aspects that could help in the analysis of the current study data.

The phonemic inventory of Standard Arabic (SA) consists of 34 phonemes, of which 6 are vowels. SA consonants are classified into plain consonants and emphatic ones. SA emphatic consonants are: /tˤ, dˤ, ðˤ, sˤ/, whereas the rest are plain ones. The consonantal inventory of SA contains several phonemes that are not found in English, including the following: /tˤ, dˤ, ðˤ, sˤ, χ, ϱ, ϥ, ŋ/ and /ʔ/. Thus, SA consonantal inventory is rich, a fact of most Semitic Languages (Watson 2002; Holes 2004).

The present study aims to investigate and phonologically analyze the integration of a corpus of English loanwords into SA to discover how SA phonological system reacts to the presence of foreign elements. Precisely, this study seeks to explore the phonological processes that English borrowed words undergo to get accommodated with SA phonological constraints within an OT framework. The adaptation of English loans into SA is traced at the segmental (individual) sound level, including
consonantal elements.

2. Literature Review

Several studies have investigated linguistic borrowing in Modern Standard Arabic (MSA) and spotted light on different aspects related to the field of borrowing. However, the integration of English loanwords into MSA has been handled in a few studies of different phonological interests.

Among the earliest works that tackled loanword integration in MSA is the one carried out by Sa’id (1967). In his study, Sa’id (1967) investigates the process of lexical innovation through borrowing in MSA. The study, which is descriptive in nature, tackles not only the phonological integration of loanforms into MSA, but also the grammatical adaptation, including grammatical aspects like case, gender, number, the congruity of loanforms to Arabic patterns, and loan derivatives. Moreover, ‘loanshifts’ and ‘loanblends’ are examined. Data are collected from written sources related to different genres in Arabic and they are of European origins, such as English loans, French loans, and some Italians as well.

Concerning the results of the phonological structure adaptation, which are related to the core of the current study, they are found emphasizing the fact that borrowings phonologically are marked by transfer or substitution. In addition, Sa’id tackles the phonological integration at the segmental level, including consonantism and vocalism, and at the syllabic level, which the researcher refers to it in his study as ‘the distributional sequences of consonants and vowels’. Among the chief important results at the segmental level, the study revealed that in certain positions, English /p/ and /v/ have been preserved, leading for the introduction of a new phonemic contrast into MSA consonantal system. This was exemplified in English loans as /p/ in /parafi:n/ and /v/ as in /vi:za/ (Sa’id, 1967: 47). Surprisingly, /ʤ/, /Ʒ/, and /ɳ/ were found to be used in free variation. /p/ found vacillating between being transferred as in /po:lo/ or being substituted as in /banadu:l/ (p. 48).

Al-Athwary (2003), in his PhD thesis, conducts a comprehensive linguistic analysis of English loanwords in MSA. It aims at analyzing phonologically, morphologically, and semantically a corpus of English borrowed words collected from different written sources in various genres in Arabic. The study specifically discusses how the English loans are adapted to accommodate to MSA system. The researcher investigates the various adaptation mechanisms that occur at all the previous mentioned linguistic levels.
In relation to the findings at the phonological level, since it is our concern in the current study, the research is found tracing the phonological repair processes at two levels. They are (a) the segmental level, including consonantal and vocalic elements and (b) the syllabic level which involves sound patterns and sequences of both consonants and vowels. The researcher adopted the ‘Integrated Model of Loanword Nativization’ proposed by Danesi (1985).

At the segmental level, the results reveal that several phonological adaptation mechanisms are involved, like ‘phonetic substitution’ and ‘phonological repatterning’. To apply such mechanisms, certain phonological processes are attested in the assimilation process of loanwords. Among these are: epenthesis, metathesis, consonantal and vowel intrusion, elision, voicing, devoicing, and others.

Many studies have adopted an OT framework in their analysis of loanword adaptation in Arabic dialects. On Jordanian Arabic (JA), loanword adaptation studies have received a great and ongoing attention among linguists. For example, Abu Guba (2016) conducted a study seeking to investigate the phonological adaptation of English loanwords in Ammani Arabic (AA). The study traces the adaptation at two levels, viz. the segmental level and the suprasegmental prosodic level by the adoption of the Moraic Theory within an OT framework. 407 English loans are gathered and checked for pronunciation by 12 AA monolingual native speakers. Within OT, like other previous studies on the phonological adaptation of loanwords, the findings of this study confirm that the interaction between faithfulness and markedness constraints is what accounts for the adaptation process. Consequently, any violation to faithfulness constraints, which are ranked lower, is at the expense to satisfy a higher ranked markedness constraint; to render the output unmarked in AA. Moreover, at the segmental level, the researcher stresses that English loan segments are mapped into their phonological closest AA phonemes.

One more study is conducted by Kessar and Mahadin (2020) on Algerian Arabic. The study tackles the adaptation of French loanwords into Algerian spoken Arabic (ASA). It mainly sheds light on the phonological processes used in the adjustment of French loans to get integrated into ASA phonological system within an OT framework. Among these phonological processes are unpacking of nasal vowels, nasal place assimilation, vowel deletion, front vowel raising, voicing, devoicing, stopping, and lateral assimilation. The findings highlight the point that the adaptation process
within OT can be justified as a conflict that arises between faithfulness constraints from one hand, and markedness constraints from the other hand. For example, in the adaptation of the voiceless bilabial stop /p/, which is missing in the dialect under investigation, the study’s finding goes in line with Paradis’s (1996) claim. Paradis (1996) argued that in the adaptation process if the segment is not preserved, i.e., not mapped as is, then a substitution mechanism is activated leading for choosing the closest segment phoneme. In Algerian Arabic, /p/ > /b/, in other words /p/ is substituted with /b/ as in the French word [pᴐst] which is modified to /bosta/ (p. 178). Within OT, this can be captured by the interaction between the faithfulness constraint IDENT-IO [Voice], which does not allow changes, and two markedness constraints in ASA, viz. *p[-Voice], which prohibits voiceless bilabial stop, and ONSET, which disallows onsetless syllables. Thus, to account for the adaptation of /p/ > /b/, constraints should be ranked as follows: *p[-Voice] >> ONSET >> IDENT-IO [Voice]

By noting the absence of the studies on loanword adaptation into SA, particularly within OT, the original contribution of the current research stems from the fact that it comes to fill in gap in the literature of lexical borrowing in SA from an OT perspective. It is hoped to add to the rapidly ongoing literature on language contact by conducting a systematic analysis of the phonological repair strategies that are utilized in the integration of English loans into SA at the segmental consonantal level within OT.

3. Methods and Data Collection

A corpus of 316 English loanwords in SA is compiled from a previous study on English loanwords in MSA conducted by Al-Athwary (2003). Unlike Al-Athwary (2003), and for the sake of the analysis, the current study data is limited to nouns, or the so-called “borrowing proper” in Al-Athwary’s words (Al-Athwary, 2003:40). Consequently, the present study neglects the other indirect borrowings like, verbs, adjectives, adverbs, which are referred to in Al-Athwary (2003:40) as “productive forms”.

Two languages are involved in the analysis, viz. English, which is the donor, i.e., the source language (SL), and Standard Arabic (SA), which is the recipient language (RL). The English and the Arabic pronunciations are transcribed in IPA to be able to do the comparison between the Arabized form and the original form. The online Cambridge English Dictionary is consulted for English words transcription. On the other hand, The Hans Wehr Dictionary of Modern Written Arabic (Arabic-English) (1979) is checked to determine the occurrence of English loanwords in SA.
The loanword corpus is categorized and then tabulated to establish the analysis by describing the changes occurred to the adapted consonants in the face of SA phonological constraints. These changes are examined by looking at the different phonological processes involved in the nativization process of consonants within Optimality Theory.

4. Results and Discussion

4.1 Voicing

Voicing refers to the articulatory process which results from the vocal folds vibration. The voicing feature is considered contrastive in English, a fact that is missing in SA. For example, labial stops in English i.e., /p/ and /b/, which differ in voicing, have phonemic status, in other words, they constitute distinct phonemes. Thus, due to the mapping process of English labial stops onto SA, the voicing contrast is ignored, keeping the way open to modify all voiceless stop cases to become voiced ones /p/ > /b/, in all distributional positions. Many Arabic dialects demonstrate the voicing of the voiceless bilabial stop /p/ (AlOufi 2016; Abu Guba 2016; Alhoody 2019; Kessar and Mahadin 2020). Consequently, when an English loanword contains the voiceless labial stop /p/ gets introduced into SA, /p/ is substituted by its closer, i.e., closer in articulation, voiced counterpart /b/ to accommodate with SA phonological markedness constraint where *p is banned. Voicing of /p/ into its closest counterpart /b/ is demonstrated in the following examples:

<table>
<thead>
<tr>
<th>(1) Gloss</th>
<th>English Transcription</th>
<th>Arabized Loan Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrol</td>
<td>/ˈpet.rəl/</td>
<td>/bɪtrəl/</td>
</tr>
<tr>
<td>Pepsi</td>
<td>/ˈpep.sɪ/</td>
<td>/bɪbsɪ/</td>
</tr>
<tr>
<td>Pop</td>
<td>/ˈpɒp/</td>
<td>/bʌbb/</td>
</tr>
</tbody>
</table>

To evaluate the voicing of the English voiceless labial stop /p/ in SA, four constraints are required to account for the optimal form in SA, viz., the two markedness constraints *p, ONSET, and the two faithfulness constraints IDENT-IO [±voice] and MAX-IO. The markedness constraint *p states that a voiceless labial stop is not allowed, ONSET states that every syllable must have an onset whereas the faithfulness constraint IDENT-IO [±voice] states that an input segment and its output correspondent must be identical in voice and finally, MAX-IO states that every segment in the input must have a corresponding segment in the output, which implies that deletion is prohibited (McCarthy and Price, 1995). The following ranking of the four constraints, which are formulated below (1-4), accounts for the voicing of the labial stop /p/ when got mapped into SA: *p>> ONSET, MAX-IO>>
IDENT-IO [±voice], where the two markedness constrains outrank the faithfulness constraint and ONSET and MAX-IO are equally ranked to eliminate any deletion case.

1. *p
   A voiceless labial stop is not allowed.

2. ONSET
   Every syllable must have an onset.

3. IDENT-IO [±voice]
   An input segment and its output correspondent must be identical in voice.

4. MAX-IO
   Every segment in the input must have a corresponding segment in the output.

Tableau (4.1): Constraints Interaction for the adaptation of the English labial stop /p/

<table>
<thead>
<tr>
<th>Pepsi /ˈpepsi/</th>
<th>*p</th>
<th>ONSET</th>
<th>MAX-IO</th>
<th>IDENT-IO [±voice]</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ˈpepsi/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ˈpipsi/</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ˈibsí/</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>/ˈbisí/</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

As it is shown in tableau (4.1) the input ‘pepsi’ contains initially and medially the labial stop /p/. When this loan got adapted into SA, /p/ is encountered by three choices, viz., to keep as is and be faithfully mapped into SA, or to alter into its closest counterpart /b/, or to be deleted. The four potential candidates are evaluated by the four ranked constraints as shown in tableau (4.1), where the first choice, i.e., staying as /p/ as in /ˈpipsi/, is eliminated by incurring a higher ranked constraint *p and causing a fatal violation. For the deletion choice, which might result in an output with onsetless syllable, like /ˈibsí/, a structure which is banned in SA, it is ruled out by the second higher constraint ONSET and if deletion is elsewhere the faithfulness constraint MAX-IO is used to eliminate such case as appeared in /ˈbisí/. Finally, the optimal candidate /ˈbisí/ is the winning candidate since it satisfies the higher ranked markedness constraints *p and ONSET, and only incurs the lower ranked constraint IDENT-IO [±voice] for the change in voicing. Thus, the following ranking demonstrates the adaptation of the English labial stop /p/ in SA in all its distributional positions: *p>> ONSET, MAX-IO>> IDENT-IO [±voice].
4.2 Devoicing

The devoicing process is attested in the mapping of the English labial fricative /v/ into SA closest equivalent /f/. A flash back to the consonantal inventory of English and SA reveals the non-existence of the voiced labial fricative /v/ in SA, which implies an area of interference when got assimilated into SA phonological system due to borrowing. This predictable result is in line with what is found in other Arabic dialects regarding the mapping of English /v/ onto /f/ (e.g., Hafez 1996; Al-Saqq 2001; AlOufi 2016; Alhoody 2019; among others). The following examples in (2) illustrate the adaptation pattern of the English labial fricatives /v/, in all environments:

(2) Gloss                English Transcription            Arabized Loan Transcription
Visa                      /vi.ژə/                                    /fiziə/
Television               /ˈtel.ɪ.vɪʒ.ən/                              /tilifizyu:n/
Microwave                  /mɪə.kərə.wɜə/                                    /mikruwiːf/

To account for the devoicing of the labial fricative /v/ in the adaptation process within OT, three main constraints interact to evaluate this adaptation pattern, viz., *v, MAX-IO, and IDENT-IO [±voice]. The *v markedness constraint, appeared in 5 below, outranks the faithfulness constraints MAX-IO and IDENT-IO [±voice] and MAX-IO is ranked higher than IDENT-IO [±voice] as follows: *v>> MAX-IO>> IDENT-IO [±voice]. This constraints interaction clearly appears in the following tableau (4.2):

Tableau (4.2) clearly indicates that the voiced labial fricative /v/ surfaces as /f/ which is the optimal form that satisfies the highest ranked markedness constraint *v and incurs the least violations, thus, /ˈtel.ɪ.vɪʒ.ən/ is adapted as /tilifizyu:n/ in SA. However, the second potential candidate /tilivizyu:n/ fatally violates the highest ranked constraint *v and consequently ruled out. Finally, deletion of the /v/ segment results in fatally violating a higher ranked faithfulness constraint MAX-IO and thus is eliminated. The ranking *v>>MAX-IO>> IDENT-IO [±voice] can thus
account for the devoicing of the English labial fricative /v/ into /f/ when being adapted into SA.

4.3 Emphasization

Regarding the emphasis phenomenon, it is attested less frequently in the current study data corpus. Few English loanwords that contain the English phonemes /t/ and /s/ are adapted as emphatic consonants onto SA /t/ and /s/, as in /wɔt/> /waːt/ and /bʌs/> /baːs/, respectively. Al-Athwary (2003:84-86) clearly highlights this secondary articulation and emphasizes that it is part of Arabs tendency to substitute the emphatic consonants /t, ʃ, d, q/ for their non-emphatic counterparts /t, s, ð, k/, respectively. He added that it is a feature that distinguishes Arabs from others. Al-Qinai (2000:7) (as cited in Al-Athwary, 2003:86) elaborated on the emphasis phenomenon attested in loanword adaptation and goes on to say that Arabs tend to assign borrowed words an “Arabic characteristic”. Though, Al-Athwary (2003:86) argued that in recent times and due to technological advances witnessed, Arabs showed “less degree of tendency towards the substitution of emphatic consonants for the plain ones”. Phylogenically, Al-Athwary (2003:85) attributed the [+ Emphatic] feature to “tongue backness”, and that it is considered as a kind of substitution where /s/ substitutes /s/ due to change in one “differential” point of articulation (PA). However, Al-Bataineh (2019:1) referred to this process as “emphatic harmony”, precisely, a vowel-consonant harmony, which is found in Semitic languages.

Within OT, emphasis can be attributed to the interaction between the markedness constraint *EMPHATIC and the correspondent faithfulness constraint IDENT[F], which are demonstrated in 6 and 7 below. Specifically, since the emphatic alveolar fricative /s/ is attested in the current study data only in the presence of [+back] vowel as in the loanword /ˈsælɔn/> /saːlʊn/. Consequently, a specified markedness constraint, which appeared in 8, can be used in the analysis as [*EMPHATIC-+back]. The other required constraint, i.e., the faithfulness constraint IDENT[F], can be specified as IDENT[C] as formulated in 9 below. The presence of emphatic segments can be tolerated in OT by the interaction between the markedness constraint [*EMPHATIC-+back] and the faithfulness constraint IDENT[C] where the markedness constraint outranks the faithfulness constraint as can be demonstrated in the following tableau (4.3):

6. *EMPHATIC
   Emphatic consonants are not allowed.

7. IDENT[F]
The input segment and its output correspondent should be identical in the specific feature (F).

8. [*EMPHATIC- +Back]
   No emphatic consonant is allowed except [+back] domain.

9. IDENT[C]
   The input and output consonants must be identical.

Tableau (4.3): Constraints Interaction for the Adaptation of the E Alveolar Fricative /s/ into SA /ș/

<table>
<thead>
<tr>
<th>Saloon /ˈsæl.ən/</th>
<th>*EMPHATIC- + BACK</th>
<th>IDENT-IO [C]</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ˈsə:lu:n/</td>
<td>*</td>
<td>!</td>
</tr>
<tr>
<td>/sa:lu:n/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tableau (4.3) displays the adaptation of the English plain segment /s/ into its emphatic counterpart in SA. The input candidate /sa:lu:n/ is ruled out since it fatally violates a higher ranked constraint [*EMPHATIC- +Back]. However, the other potential candidate /șa:lu:n/ surfaces as the optimal candidate due to satisfying the higher ranked markedness constraint and incurs the least violations. Interestingly, Batais (2019:203-204) examined the adaptation of Arabic loanwords in Sundanese. The researcher spots light on the adaptation of Arabic emphatic consonants into Sundanese plain ones where emphatic consonants are not allowed there. This case is considered the reverse to what exists in this section, though the same constraints are utilized.

4.4 Uvularization

Another significant phonological process manifested in the nativization process of English consonants onto SA is uvularization. Specifically, uvularization clearly appears in the mapping of the English voiced velar stop /g/ into uvular /ɤ/ in SA. Apparently, the voiced velar stop /g/ which is alien to SA consonantal system, SA speakers do replace it by a familiar equivalent to their native language. This is in consistent with Paradis (1996) who hypothesized that in case of non-preserving a segment in the mapping process from SL into RL, then the best choice is to adapt its closest phoneme. The following examples explicate the point.

<table>
<thead>
<tr>
<th>Gloss</th>
<th>English Transcription</th>
<th>Arabized Loan Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorilla</td>
<td>/ɡəˈrɪl.ə/</td>
<td>/ˈvurilla/</td>
</tr>
<tr>
<td>Congress</td>
<td>/ˈkɒŋ.ɡres/</td>
<td>/ˈkʊnˌrɪs/</td>
</tr>
<tr>
<td>Monologue</td>
<td>/ˈmɒn.əˌl.ɒɡ/</td>
<td>/ˈmʊnˌuluːˈs/</td>
</tr>
</tbody>
</table>

The previous examples in (3) indicate the adaptation of the E voiced velar stop /g/ into SA uvular fricative /ɤ/, a kind of uvularization process.
The segment /ɡ/ differs from /ɤ/ in two main features, viz., place feature, where /ɡ/ is velar while /ɤ/ is uvular, and manner feature, where /ɡ/ is plosive but /ɤ/ is fricative. One distinctive feature can present the difference between /ɡ/ and /ɤ/, which is [± continuant], where plosives are [− continuant] while fricatives are [+ continuant]. Therefore, I assume two constraints are required to account for such emergent pattern in SA, viz., the markedness constraint *g, and the faithfulness constraint IDENT-IO[±Continuant], which are highlighted in 10 and 11 below. It requires the *g to outrank IDENT-IO[±Continuant]: *g>> IDENT-IO[±Continuant]. The following tableau (4.4) demonstrates the interaction of the two forces: *g and IDENT-IO[±Continuant] in accounting for the uvularization of /ɡ/ onto /ɤ/:

10. *g
   A voiced velar stop is not allowed.
11. IDENT-IO[±Continuant]
   The input segment and its output correspondent should be identical in the feature continuant.

Tableau (4.4): Constraints Interaction for the Adaptation of the E Velar Stop
 gag ’rɪl.ə/ /ɡɪ/ /ɤʊərɪl.ə/ /ɡɪrɪl.ə/ /ɡɪrɪl.ə/ /ɡɪrɪl.ə/ /ɡɪrɪl.ə/ /ɡɪrɪl.ə/ /ɡɪrɪl.ə/

The ranking of the markedness constraint *g higher than the faithfulness constraint IDENT-IO [±Continuant] is responsible for the realization of the form / yurilla/ in SA as the optimal, i.e., winning candidate. Whereas the second input candidate /gurilla/ is ruled out due to fatally incurring a higher ranked constraint *g, since it contains the illicit velar consonant /ɡ/ in SA. One more possible proposed markedness constraint might be added to rule out any other [+continuant] except /ɤ/ is *CONTINUANT-[ɤ], which is displayed in 12, and that it should be equally ranked with the other markedness constraint *g. Therefore, any other [+continuant] consonant rather than /ɤ/, whether a fricative or a lateral consonant, will be eliminated by fatally incurring a higher ranked constraint *CONTINUANT-[ɤ].

12. *CONTINUANT-[ɤ]
   No continuant consonant is allowed except /ɤ/.

4.5 Affrication
SA consonantal inventory has the voiceless palatal fricative /ʃ/, a fact that leads to predict its faithful importation into SA while incorporating
English loanwords that contain this consonant. However, its voiced counterpart /ʒ/ is missing from SA phonemic inventory though it exists in English and some Arabic dialects like Levantine Arabic, as Jordanian, Syrian, Palestinian, and Lebanese Arabic (Mustafawi, 2019). Consequently, any attempt of integrating new English borrowed words containing /ʒ/ into SA, a sort of adjustment is expected to accommodate to SA native phonological constraints. In what follows (4) exemplifies the nativization of English voiced fricative /ʒ/ onto SA /ʤ/.

(4) Gloss English Transcription Arabized Loan Transcription

| Bourgeoisie | /ˌbɔːʒ.wɔːˈziː/ | /burʤuwa:ziyyah/ |
| Massage     | /ˈmæs.aːʒ/ | /masa:ʤ/ |

To establish an OT analysis and account for the substitution, mainly affrication, where the fricative /ʒ/ becomes the voiced alveopalatal affricate /ʤ/, a call for two main forces, i.e., constraints, is required. These are the markedness constraint *Ʒ, which is shown in 13 below, along with the faithfulness constraint IDENT-IO [±Continuant]. The possible ranking that accounts for the affrication process of /ʒ/ to /ʤ/ is as follows, where the markedness constraint outranks the faithfulness one: *Ʒ>> IDENT-IO [±Continuant]. Tableau (4.5) demonstrates this adaptation pattern in OT:

13. *Ʒ

Any voiced palatal fricative is banned in SA.

**Tableau (4.5): Constraints Interaction for the Adaptation of the E Voiced Palatal Fricative /ʒ/ into SA /ʤ/**

<table>
<thead>
<tr>
<th>Massage</th>
<th>/ˈmæs.aːʒ/</th>
<th>*Ʒ</th>
<th>IDENT-IO [±Continuant]</th>
</tr>
</thead>
<tbody>
<tr>
<td>⇒ /masa:ʤ/</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/masa:Ʒ/</td>
<td>!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The optimal candidate, i.e., the one that wins and surfaces in SA after being adjusted to accommodate with SA native consonantal constraints, is the one that substitutes /ʒ/ with /ʤ/, as /masa:ʤ/. This is because it incurs a lower ranked constraint IDENT-IO [±Continuant]. However, /masa:Ʒ/, the input candidate which contains /ʒ/ is ruled out by fatally violating a higher constraint which is the markedness constraint *Ʒ.

**4.6 Deaffrication**

In SA consonantal inventory, only the voiced alveopalatal affricate /ʤ/ is found whereas its voiceless counterpart is missing. Evidently, /ʤ/ will be faithfully retained in SA while its voiceless correspondent will undergo adaptation for being an illicit segment to SA phonemic inventory. Results reveal as clear as crystal that English /ʧ/ normally adapts to SA as /ʃ/. In other words, it deaffricates and loses its stop part and causes the realization.
of /ʃ/, a palatal fricative consonant in SA, as in <cheque> /ʃi:k/. It is worth mentioning that deaffrication is a tendency among females than males (Al Wer, 2007). The following examples in (5) display the realizations of the affricates /ʧ/ in all distributional positions.

(5) Gloss | English Transcription | Arabized Loan Transcription
--- | --- | ---
Cheque | /ʧek/ | /ʃi:k/
Winch | /wɪntʃ/ | /winʃ/

To account for the deaffrication process within OT, two main constraints are required, the ones which are responsible for the recurrent realization of the English voiceless alveopalatal affricate /ʧ/ onto /ʃ/ in SA. They are the markedness constraint *ʧ, which appears in 14 below, and the faithfulness constraint IDENT-IO[±Continuant], which requires the input segment to be identical to the output segment in the feature[continuant]. The following ranking of the two constraints is responsible for the realization of E /ʧ/ as /ʃ/ in SA: *ʧ >> IDENT-IO[±Continuant]. It appears that the markedness constraint *ʧ, which bans the occurrence of any voiceless alveopalatal affricate in SA, outranks the faithfulness constraint IDENT-IO[±Continuant], which exerts force in the face of markedness constraint, to faithfully retain the input segment in the received language.

14. *ʧ

Voiceless alveopalatal affricate is not allowed in SA.

Tableau (4.6): Constraints Interaction for the Adaptation of the E Voiceless Alveopalatal Affricate /ʧ/ into SA /ʃ/

<table>
<thead>
<tr>
<th>Cheque</th>
<th>/ʧek/</th>
<th>*ʧ</th>
<th>IDENT-IO [±Continuant]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/ʃi:k/</td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

The two potential input candidates /ʧi:k/ and /ʃi:k/ are subject to evaluation by the two forces, the markedness constraint *ʧ and the faithfulness constraint IDENT-IO [±Continuant]. The winning candidate, i.e., the optimal or the one that surfaces as the most harmonic one, is the one that incurs the least violations and satisfies a higher ranked constraint. Consequently, in the current analysis, it appears that /ʃi:k/ is the optimal candidate since it satisfies the higher ranked constraint *ʧ and thus surfaces in SA. However, the second candidate /ʧi:k/ fatally violates the higher ranked constraint and thus is ruled out.

4.7 Metathesis

Metathesis refers to the process where the order of certain sounds is changed within the same syllable (Matthews, 1997). Two examples are attested demonstrating metathesis, viz., /ʃæn.əl/ > /fanillah/, and
Metathesis, within the same syllable, can be captured within OT by the interaction between two constraints, namely: the markedness constraint SyllCon (Urbancyzk, 2001:108) and the faithfulness constraint LINEARITY proposed by Lacy (2007:14), which are shown in 15 and 16 below. For the faithfulness constraint, LINEARITY, it states that for every pair of input segments x,y and their output correspondents x’, y’, incur a violation if x precedes y and y’ precedes x’. This implies that metathesis, i.e., the change in position within the syllable, is banned. However, the markedness constraint SyllCon is based on the sonority cycle which states that “within a syllable, a large sonority jump is preferred between onset and nucleus, while the preferred or, least marked, sonority profile from the nucleus on, is one of little or no decrease in sonority ((Coulter, 2014:50) as cited in AllahweisiAzar 2018:330)”. Accordingly, the best coda is to be of [+son] whereas the best onset is of [-son]. Based on this, and by comparing the case of the lateral consonant /l/ and the nasal /n/, /l/ is less sonorant than /n/ so /l/ is best to be in onset and /n/ in coda. For example, the E loanword <penalty> is transcribed as /ˈpen.əlti/ where the /n/ occupies the onset position and the /l/ originates in the coda of the same syllable. However, the Arabized loan /balanti/ demonstrates metathesis, the /l/ becomes onset whereas /n/ changes its position to coda of the same syllable, and thus, nasalizing the lateral /l/. Consequently, the LINEARITY constraint is violated on the expense of satisfying the markedness constraint SyllCon. Metathesis is best captured when the markedness constraint outranks the faithfulness constraint: SyllCon>> LINEARTY. Tableau (4.7) illustrates constraints interaction that accounts for metathesis in SA:

15. LINEARITY

Every pair of input segments x,y and their output correspondents x’, y’, incur a violation if x precedes y and y’ precedes x’. Lacy (2007:14)

16. SyllCon
Within a syllable, a large sonority jump is preferred between onset and nucleus, while the preferred or, least marked, sonority profile from the nucleus on, is one of little or no decrease in sonority. (Coulter, 2014:50)

Tableau (4.7): Constraints Interaction for the Adaptation of the E lateral /l/ into SA /n/: The Metathesis Case

<table>
<thead>
<tr>
<th>penalty /penəlti/</th>
<th>SyllCon</th>
<th>LINEARITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ˈbanalti/</td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>/balanti/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The two potential output candidates /balanti/ and /banalti/ are subject to evaluation by the two ranked constraints, viz., SyllCon and LINEARITY, where the former constraint outranks the latter. The emergent pattern /banalti/ is penalized by fatally incurring a higher ranked constraint SyllCon for placing a [+son] segment /n/ in onset position while a [-son] segment is in coda within the same syllable /-nal-/ . However, it satisfies the lower ranked constraint LINEARITY since it preserves the linear order of segments as it appears in the source word /penəlti/. Consequently, and as proposed by OT, the optimal candidate, i.e., the one that satisfies higher ranked constraints, is /balanti/. Though, /balanti/ violates the faithfulness constraint LINEARITY as appeared in tableau (4.7), still it satisfies the markedness constraint SyllCon by the change occurred to the segments /l/ and /n/ within the same syllable, where /l/ is nazalised. Thus, the following ranking of the required constraints that accounts for the attested metathesis process is as follows: SyllCon >> LINEARITY.

4.8. Fronting

Fronting process is demonstrated in the mapping of English velar nasal /ŋ/, which is missing from SA phonemic inventory, into alveolar nasal /n/ in SA. In line with this, Al-Athwary (2003:79) asserted that typically, /ŋ/ is adapted to /n/, its closest correspondent in SA, and that it might be optionally pronounced as is, i.e., /ŋ/ when followed by /k, ɣ, q/, where nasal homorganic assimilation is attested. The following examples in (6) display its adaptation pattern in SA.

(6) Gloss              English Transcription           Arabized Loan Transcription
Zink                 /zɪŋk/                                    /zin k/
Congress             /ˈkɒŋ.ɡres/                                /kunɤris/

An OT account for the fronting process, mainly velar fronting, which is responsible for the realization of the E velar nasal /ŋ/ as an alveolar nasal /n/ after being adapted into SA, is grounded on the interaction between two constraints. They are the markedness constraint *ŋ, which prohibits the occurrence of a velar nasal in SA, and the faithfulness constraint IDENT-
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IO[Place], which are presented in 17 and 18 below. Tableau (4.8) demonstrates the interaction between these two constraints:

17. *ŋ
A velar nasal is disallowed in SA.

18. IDENT-IO[Place]
The input and output should be identical in the place of articulation feature.

Tableau (4.8): Constraints Interaction for the Adaptation of the E Velar nasal /ŋ/ into SA /n/

<table>
<thead>
<tr>
<th>Zink /ziŋk/</th>
<th>*ŋ</th>
<th>IDENT-IO [Place]</th>
</tr>
</thead>
<tbody>
<tr>
<td>*/zιŋk/</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>*/znk/</td>
<td>!</td>
<td></td>
</tr>
</tbody>
</table>

As can be noticed from tableau (4.8), the ranking of the markedness constraint *ŋ higher than the faithfulness constraint IDENT-IO[Place] restricts any emergence of the illicit segment /ŋ/ in SA while nativizing English loanwords onto SA. Thus, the input candidate /ziŋk/, which includes the velar nasal /ŋ/ is eliminated due to fatally violating a higher ranked constraint while the other potential candidate wins as the optimal form since it satisfies the higher ranked markedness constraint. Thus, the following ranking is responsible for the adaptation of the E velar nasal /ŋ/ into alveolar nasal /n/, i.e., for fronting process: *ŋ>> IDENT-IO[Place].

5. Conclusion
The current study addressed English consonantal adaptation into SA within Optimality Theory. It shed light on the phonological processes responsible for accounting for the consonantal alterations attested in the mapping of English consonants into SA from an OT perspective. The study revealed that several phonological repair mechanisms are utilized, namely: voicing, devoicing, emphazization, affrication and deaffrication, fronting and finally, metathesis and uvularization.

By espousing OT for the analysis, the study stressed the role of markedness constraints which exert effort in rendering all the attested consonantal alterations less marked in SA. Moreover, the study supported how well OT accounts for the English consonantal adaptation into SA. It results from the mediation between two forces, viz., the markedness constraints and the faithfulness constraints, where the former condition rendering the output less marked in SA while the latter exert effort in preserving the output faithful to the input. Specifically, the adaptation is
grounded in the domination of the markedness constraints over the faithfulness ones, as appeared in the previous body of discussion.

Finally, the present study enhanced our understanding of how the English borrowed words are phonologically integrated into SA. This was accomplished by highlighting the potential consonantal adaptation that are found in SA, and how OT accounted for these changes, which therefore led to a better understanding of loanwords phonology. Furthermore, it contributed to OT in that it supported how well this theoretical framework predicted the actual attested consonantal changes and accounted for the various exhibited consonantal patterns.

References


