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Emphatic Consonants in the Adaptation of English Loanwords into Hasawi Arabic

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Abstract

Loanword adaptation contributes to a better understanding of how phonology functions universally and cross-linguistically. The present study sheds light on the consonantal adaptation of English loanwords into Hasawi Arabic. It specifically investigates the occurrence of emphatic consonants in the adapted Hasawi forms. Although /tˤ/ and /sˤ/ are not part of the source (English) language inventory, it is an interesting phenomenon that they have emerged in the adapted forms of English loanwords by Hasawi speakers. The results revealed that the adjacency of a back vowel to the consonants /s/ or /t/ in the adapted forms triggered the emphasis of these consonants to their emphatic counterparts. The emphasis effect surfaced whether the vowel in the English loanword was a back vowel already and just triggered the emphasis effect, or the vowel was not attested in Hasawi Arabic vowel inventory and was mapped to a back vowel which, in turn, triggered the emphasis effect.

1. INTRODUCTION

Borrowing from one language into another is a natural language contact behavior (Paradis & LaCharité, 2011). When loanwords are borrowed, they usually undergo processes of adaptation in order to conform to the phonology of the borrowing language. The phonological adaptation of a loanword into another language's phonological system unveils the various processes that may modify the borrowed words. The influence of this adaptation reflects on different segmental, syllabic, and suprasegmental aspects of phonology, as well as other restrictions of the borrowing language (Kang, 2011).

The study of loanword adaptation contributes to a better understanding of how phonology functions universally and cross-linguistically (Paradis & LaCharité, 2011). It provides a direct window for studying the phonological processes triggered by the native language and " the ways in which unfamiliar sounds and sound sequences are adapted to converge with the sound pattern of the native language" (Calabrese & Wetzels, 2009, p. 1). With the advent of constraint-based theories, the interest in studying loanword adaptation has intensified as the adaptation processes are motivated by language constraints (Kang, 2011). Following language constraints can lead to the emergence of adaptation patterns. These patterns provide evidence and reveal a lot about the phonology of that language by the constraints placed on the output forms (Paradis & LaCharité, 2011).

Data collected on loanword adaptation can be informative in the analysis of native phonology by enabling the examination of the knowledge of speakers in ways that native data alone cannot (Kang, 2011; Mohammed & Samad, 2020). When a word is borrowed into a language, it may undergo some modifications to comply with the phonological structure of the borrowing language (Batais, 2013).

The present study contributes to the body of research on Arabic language and dialectology and, more specifically, Arabic loanword phonology. It investigates the occurrence of emphatic consonants in the adapted forms of English loanwords that were borrowed into Hasawi Arabic (henceforth, HA). Arabic dialects are well known for their emphatic consonants; a group of pharyngealized coronal consonants 'produced with a primary articulation at the dental/alveolar region and with a secondary articulation that involves the constriction of the upper pharynx' (Davis, 1995, p.465). Modern Standard Arabic inventory includes the emphatics /tˤ/, /dˤ/, /sˤ/ and /ðˤ/. However, in the current study, the emphatic sounds /sˤ/ and /tˤ/ are the ones that surface in the adapted forms of English loanwords by Hasawi speakers and, thus, will be examined in this paper.

2. LITERATURE REVIEW

This section first provides a brief background on the research on loanword adaptation. Next, it surveys the literature on the linguistics of Hasawi Arabic.

2.1. Loanword Phonology

The phenomenon of loanword adaptation has been investigated in many different languages and within different theoretical frameworks due to its significance for the study of language in general and, particularly, its phonological aspects. Examples of studies on loanword adaptation include studies on Burmese (Chang, 2003), Cantonese (Yeung, 2020; Silverman 1992; Yip, 1993), French (Paradis and LaCharité, 2001), Indonesian (Aryanti, 2021; Batais, 2013), Italian (Brozbă & Ungureanu, 2018; Morandini, 2007), Japanese (Aisyah & Ahmad, 2017; Kay, 1995; Smith, 2006; Kubozono, 2006), Korean (Kim,2021; Kenstowicz, 2005; Ito, Kang & Kenstowicz, 2006), and Thai (Phetkla, 2020; Kenstowicz & Suchato, 2006). Because the present study is concerned with the adaptation of English loanwords into Hasawi Arabic, this section will present a review of the literature on loanword adaptation into Arabic, specifically on studies conducted on Saudi dialects.

Within the Saudi dialects' domain, a small number of studies have investigated phonological adaptations of English loanwords in relation to Hijazi Arabic (Jarrah, 2013; Aloufi, 2017) and Qassimi Arabic which is a sub-dialect of Najdi Arabic (Alhoody, 2019; Alzaaq, 2017).

Jarrah (2013) investigated segmental, syllabic, and suprasegmental adaptation of English loanwords into Madinah Hijazi Arabic. He based the analysis of his study on Optimality Theory. Data which contained around 200 loanwords were collected through interviews from Arabic native speakers of different ages and educational levels. He discussed a number of phonological processes that Madinah Hijazi Arabic speakers relied on to maintain the preferred phonological structures of their dialect. These processes include epenthesis, vowel change, consonant voicing and resyllabification. The results of the analysis showed that Madinah Hijazi speakers tended to use epenthesis with loanwords to make them comply with their dialect syllable structure as its phonology does not allow onsetless syllables or consonantal clusters in the onset. For example, the English word express [ikspres] is mapped into [ʔiksibris] where a glottal stop [ʔ] is used as an onset to avoid onsetless syllables, and a vowel is inserted to break the consonant cluster. Hence, the number of syllables increases in the loanwords because of vowel epenthesis that causes the addition of a syllable to that word. Moreover, Jarrah explained that speakers of Madinah Hijazi Arabic tend to replace some consonant sounds that do not exist in their dialect with their homorganic counterparts, which is a phenomenon observed in loanword adaptation of many other Arabic dialects. For example,

the [v] and [p] are always replayed by their counterparts [f] and [b] such as in the words video [fidju] and Cup [ko:b]. Furthermore, speakers tend to alter vowels in loanwords to simplify word pronunciations. Jarrah also discussed vowel lengthening as an important phonological process, since it can create heavy stressed syllables which comply with the stress patterns of Madinah Hijazi Arabic.

Another study that aimed to examine loanwords in Hijazi Arabic was conducted by Aloufi (2017). Aloufi compiled a dataset that was composed of 100 English loanwords containing illicit consonants and syllable structures in Urban Hijazi Arabic. The list of loanwords was obtained from pronunciations she collected from Urban Hijazi Arabic speakers, a dictionary of loanwords adapted into Arabic, and Jarrah's (2013) study on loanwords in Madinah Hijazi Arabic. To provide a thorough analysis of the phonological patterns of Urban Hijazi Arabic, Aloufi studied the adaptations of the segmental and syllabic structures of English loanwords into Urban Hijazi Arabic, drawing on the Theory of Constraints and Repair Strategy, and Optimality Theory. Aloufi compared the two theories and evaluated their adequacy in accounting for the phonological patterns of Urban Hijazi Arabic. The results showed that although Optimality Theory provides a better explanation of the loanword adaptations in the data, both theories did not fully account for all the different adaptations of English loanwords in Urban Hijazi Arabic. Her study findings provided the phonological adaptation patterns that are used by Urban Hijazi Arabic speakers to compensate for the absence of some English consonants in their dialect's phonemic inventory. These include consonantal mapping, voicing, and devoicing. Moreover, the findings revealed some adaptation patterns utilized by Urban Hijazi Arabic speakers with syllable structures that are illicit in their dialect, mainly through epenthesis of vowels and consonants.

In addition, Alhoody (2019) studied the segmental phonological adaptation of English loanwords into Qassimi Arabic using the frameworks of Contrastive Hierarchy Theory (CHT) and Optimality Theory. First, he examined the contrastive features of the phonological inventory of Qassimi Arabic to identify the contrastive hierarchy of these features. Then, this hierarchy was converted into OT constraints within a ranking that accounts for the various segmental adaptation patterns of English loanwords mapped onto Qassimi Arabic. The data included approximately 400 loanwords which were collected from three sources. The first was Al-Obodi's (2005) etymological dictionary of loanwords adapted into colloquial Arabic. The second was a number of loanwords drawn from two earlier studies of English loanwords in Arabic dialects by Abu-Guba (2016) and Jarrah (2013). The third was the author's own collection of loanwords since he himself is a native speaker of Qassimi Arabic. The results showed that when English segments were available in the inventory of Qassimi Arabic, they were preserved faithfully. Otherwise, they were mapped to their phonologically closest consonants. In addition, the study revealed that some vowels considered foreign to Qassimi Arabic were replaced with their phonologically closest match. Moreover, the analysis showed that the adaptation patterns produced by Qassimi Arabic speakers were influenced by Qassimi Arabic grammar. Furthermore, the analysis demonstrated that the integration of OT with CHT resulted in a correct prediction of the phoneme mapping patterns of English loanwords into Qassimi Arabic. Finally, the phonological, rather than the phonetic, features which are contrastive in Qassimi Arabic determined the segmental adaptation patterns.

Another study on loanword adaptations in Qassimi Arabic was carried out by Alzaaq (2017). He examined the adaptation patterns of English loanwords used by Qassimi speakers, particularly focusing on pharyngealization and vowel epenthesis. His study participants were 55 Qassimi Arabic monolinguals and 55 Arabic-English Qassimi bilinguals. He created nonce words to test and compare the participants' perceptions. The findings of the analysis provided empirical evidence that supports the phonetic approximation stance. Contrary to the perspective of phonological approximation, phonetic approximation claims that loanword adaptation is based on L1 phonology where speakers perceive the phonemes that exist in their dialect and map the ones that do not to the acoustically closest sounds within their inventory.

These results were revealed through pharyngealization and vowel epenthesis in loanword adaptations. Moreover, the study asserted that monolinguals tended to use pharyngealization in the adaptation of the consonant /s/ more than bilinguals. In addition, in terms of epenthesis, the study showed that the place where the vowel was inserted was governed by the nature of the cluster making the output as similar as possible to the input.

2.2.Hasawi Arabic

Hasawi Arabic has received little attention in the literature in comparison to other dialects in Saudi Arabia. This section provides a brief background on Al-Ahsa region, the phonology of Hasawi Arabic, a review of studies conducted on Hasawi Arabic, and finally a glimpse of lexical borrowing in Hasawi Arabic.

2.2.1. Background on Al-Ahsa Region

According to Al-Ahsa city profile published by the Ministry of Municipal and Rural Affairs and Un-Habitat, Al-Ahsa is considered the second capital of the Eastern Region after the Dammam metropolitan area (2019). With a total population of 1,241,140 in 2019, Al-Ahsa comprises four major cities: Al Hofuf, Al Mubarraz, Al-Oyun, and Al-Umran, including the villages and the non-Saudi population. Nowadays, Al-Ahsa is gaining more attention as one of the main cultural and economic spots and tourist attractions in Saudi Arabia. As part of the Saudi Vision 2030, Saudi Arabia is now creating attractions that are of the highest international standards and developing historical and heritage sites (Council of Economic and Development Affairs, 2016). Despite the attention given to Al-Ahsa Governorate in the last few years, the Hasawi dialect still remains one of the major understudied dialects in Saudi Arabia and thus needs to be explored and given more attention.

2.2.2. Phonology of Hasawi Arabic

Hasawi Arabic is known as one of the Gulf dialects spoken by people in the Arabian Gulf countries, including Bahrain, Kuwait, Qatar, Oman, and the UAE (Smeaton,1973; Aljumah, 2008; Al Taisan, 2019, inter alia). Therefore, it is not unusual to find some similarities between Hasawi Arabic and some Gulf dialects. Examples of these include the alternation of the uvulars [q] and [ʁ] (Al Taisan, 2019) and the change of [q] to [g] (Smeaton, 1973). Another similarity is the affrication of the voiceless velar stop [k] into the affricate [ʧ] (El Salman & Al Fridan, 2018; Smeaton, 1973). Smeaton describes it as an allophone of [k] that commonly occurs in the initial position but can also occur in all positions by some speakers (1973, p. 28).

As for the phonology of Hasawi Arabic, it has been explored by only a limited number of studies which have discussed its segmental, syllabic, and suprasegmental structures. Reviewing the literature reveals that the consonantal inventory of HA has always been a source of debate among researchers. For example, Smeaton provided a table containing the 28 classical Arabic consonants along with the common Hasawi deviations from the classical norm (1973). He stated that these consonants will be employed throughout his study in addition to the voiced velar stop [g] which often replaces the voiceless uvular stop [q] in the Hasawi dialect. Moreover, while [dˤ] is a phoneme in classical Arabic, it is not part of his inventory of HA as it is a complete merger with [ðˤ] as Smeaton stated. This is in alignment with Al-Wer's observation which states that [dˤ] is lost in the Arabic Gulf dialects while [ðˤ] is preserved (Al-Wer, 2004). As for the affricate [ʧ], Smeaton considered it an allophone of the voiceless velar [k], making a total number of 28 consonants in his consonantal inventory of HA.

Moreover, according to Aljumah (2008), Hasawi Arabic has 31 consonants, exhibiting an addition of three more consonants in comparison to Classical Arabic. These consonants are [g], [ʒ], and [ʧ]. He stated that, in many cases, the voiced velar stop [g] in HA replaces the voiceless uvular stop [q] and the affricate [ʧ] replaces the voiceless velar stop [k].

In addition, Al Taisan (2022) investigated some aspects of the phonology of HA in her PhD thesis. Based on her study, the consonantal inventory of HA includes 30 consonants. What

distinguishes the consonantal inventory of HA in her study from previous studies is that the voiced uvular stop [ɢ] has a phonemic status and, thus, is considered as a separate phoneme, and not always as an allophone of [g] or [q]. It can appear as an allophone of [g] as a result of pharyngealization, and as an allophone of [q] as a result of assimilation. Moreover, it is worth noting that the velar fricatives [x] and [ɣ] are replaced in her HA inventory by the uvular fricatives [χ] and [ʁ] relying on PRAAT measurements that were used to study the accurate place of articulation in the productions of HA participants. Unlike Smeaton, Al Taisan considered the affricate [ʧ] a separate phoneme in the segmental inventory and not just an allophone of [k]. However, she agreed with Smeaton on the removal of [dˤ] from the inventory and confirmed that any instances of [dˤ] were automatically substituted by [ðˤ]. In comparison to Classical Arabic, Al Taisan added three phonemes: [g], [ɢ], and [ʧ], and removed [dˤ] making a total of 30 consonants in her HA segmental inventory.

Due to the discrepancy among researchers regarding the consonantal inventory of HA, the current study will rely in this study on the consonantal inventory provided by Al Taisan (2022) for the following reasons. First, all the consonants reported in her consonantal inventory were attested in my data. This was attained through careful observations that were obtained directly from Hasawi participants during data collection, which was followed afterwards by a thorough examination and revision of the recordings collected from the participants. Secondly, Al Taisan relied in her thesis on the measurements produced by the Hasawi participants using PRAAT, and she compared these measurements to those of other participants in order to come up with an accurate specification of the place of articulation. Second, the participants in her study were native speakers of HA who never lived in a foreign language speaking country for a long period of time to limit the influence of that language on the participants' production. Similarly, the participants in the current study are also native Hasawi speakers who live in Al-Ahsa region and who only have receptive knowledge of English in order to limit the effect of English proficiency on their pronunciation of loanwords. Third, Al Taisan is a native speaker of Hasawi Arabic who is also specialized in phonology. Lastly, the data exploited by Al Taisan is very recent and thus the findings in her thesis are representative of the present Hasawi dialect. Table (1) shows the consonantal inventory of HA[1].

Table 1: *The Inventory of Consonants in Hasawi Arabic*

Manner of Articulation	**Place of Articulation**									
	Labials	Coronals					Dorsals			
	Bilabial	Labio-dental	Inter-dental	Alveolar	Palato-alveol	Palatal	Velar	Uvular	Pharyngeal	Glottal
Stop	b			t d			k g	q ɢ		ʔ
Emphatic stop				tˤ						
Nasal	m			n						
Fricative		f	θ ð	s z	ʃ			χ ʁ	ħ ʕ	h
Emphatic fricative			ðˤ	sˤ						
Affricate					ʧ ʤ					
Trill				r						
Lateral approximant				l						
Central approximant	w					j				

Similar to the debate about the HA inventory of consonants, and maybe even more disputable, the vowel inventory of HA has been controversial. Previous studies have agreed

[1] It is worth noting that /θ/, /ðˤ/, and /ʁ/ were not attested in the participants' transcriptions because the list of words in the data consisted only of loanwords. However, these phonemes were added to the inventory for the sake of reporting as they surfaced during data collection in the interviews with the participants.

upon the three short vowels found in Modern Standard Arabic and their long counterparts i.e. [i], [a], [u], [i:], [a:], [u:] (Smeaton, 1973; Aljumah, 2008; Al Taisan, 2022). However, differences have arisen among researchers regarding diphthongs and some other vowels. Smeaton listed two diphthongs in the vowel inventory of HA, namely [eɪ] and [oʊ][2]. He also mentioned two diphthongs that occur occasionally in HA which are [aɪ] and [aʊ]. Aljumah agreed with Smeaton on the existence of the diphthong [eɪ] in HA and stated that it has been assumed that this diphthong, which is similar to the one in English, had entered the Hasawi dialect through loanwords. For example, according to Aljumah, the words 'radiator', 'gear' and 'light' are pronounced and adapted in Hasawi Arabic as [radeɪtar], [geɪr] and [leɪt], respectively (2008). However, he disagreed with Smeaton on the diphthongs [aɪ] and [aʊ] and stated that HA does not exhibit these diphthongs.

Regarding other vowels, Smeaton (1973) attributed the emergence of new vowels like [e] and [o] to the contact of HA speakers with other languages such as English. Al Taisan (2022) confirmed the existence of these vowels in HA as well as their long counterparts [e:] and [o:]. As for the schwa [ə], Aljumah (2008) believed that it does not exist in HA.

The vowel inventory in the present study bears some similarities and differences with the aforementioned studies. The three short vowels found in MSA and their long counterparts, namely [i], [a], [u], [i:], [a:], and [u:], that were agreed upon in previous studies were also attested in the present study. Similar to Smeaton and Al Taisan, the vowels [e] and [o] were attested in the collected data. Also, and in alignment with Al Taisan's findings, these vowels' long counterparts (i.e., [e:] and [o:]) were also attested. The diphthongs in this study, however, were distinctly different from previous studies. The only diphthong that was attested in the present data is [aɪ] which was sometimes retained in the pronunciation of loanwords that contain the same diphthong such as in the words 'virus' [vaɪ.ɹəs] and 'nylon' [naɪ.lɑ:n]. It was observed that all the other diphthongs that existed in the original loanwords were mapped into short or long vowels. For example, the word 'light' [laɪt] in the present study was always pronounced as [le:t], which clearly differs from the studies of Smeaton and Aljumah that stated that this diphthong entered the Hasawi dialect as a result of lexical borrowing and was retained. Table (2) provides the vowel inventory of HA.

Table 2: *The Inventory of Vowels of Hasawi Arabic*

Height	**Backness**					
	Front vowels		Central vowels		Back vowels	
	Short	Long	Short	Long	Short	Long
High	i	i:			u	u:
Mid	e	e:			o	o:
Low			a	a:	ɑ	ɑ:

2.2.3. Studies on Hasawi Arabic

The studies on the Hasawi dialect in the literature are relatively limited. In relation to its phonology, Aljumah (2008) studied the syllable structure of Hasawi and compared it to Casablanca Moroccan Arabic. He employed an OT framework to examine the syllable structure of Hasawi Arabic. His main observations indicated that onsetless syllables are not allowed in Hasawi Arabic, which is the case with most Arabic dialects. Since this requires the insertion of a glottal stop to satisfy the ONSET constraint, the violation of DEP-IO cannot be avoided. The hierarchy of OT constraints in Hasawi Arabic based on his study are ranked as follows: Ft-BIN >> ONSET >> COMPLEX >> ONS-DEG-σ >> MAX-IO >> PARSE-seg >> DEP-IO >> DEG-σ >> NUC-H >> NO-CODA. Moreover, Aljumah analyzed geminates in the Hasawi

[2] Note that Smeaton devised different symbols for the diphthongs but were not used here to avoid confusion.

dialect using Selkirk's (1990, 1991) Two-Root Theory. His findings showed that geminates in final position were treated as final consonant clusters. He also formulated a new constraint (i.e., No Geminates Splitting $^{\mu}]^{\sigma}$ Gem. $^{\sigma}[^{\mu}$) to account for medial geminates to prevent their splitting.

In addition, Al Sadhaan (2015) investigated the prosodic structure of function words, particularly determiners, in Hasawi Arabic. Due to the presence of medial superheavy syllables in Hasawi Arabic, her analysis was based on Kiparsky's (2003) framework which reduces the amount of morae to the binarity level by applying extrasyllabicity to satisfy the foot size required by moraic trochaic languages. Moreover, she asserted that similar to the stress patterns of other Saudi dialects, stress in Hasawi Arabic primarily falls on the rightmost heavy syllable, else on the antepenultimate. This is in alignment with Prochazka's (1988) observation of Saudi dialects. However, the findings of her study revealed that, in the case of quadrisyllabic words, stress falls on the initial syllable under some conditions.

In a different phonological vein, Al Taisan (2022) studied the velar, uvular, and pharyngeal alternations in Hasawi Arabic. The study employed a Harmonic Serialism Optimality Theoretic analysis to account for these three phonological phenomena. It provided a fixed constraint ranking and exhibited an interaction between various phonological processes including emphasis spread, manner of articulation assimilation, voice assimilation, insertion, and resyllabification. The results revealed that although emphasis spread on neighboring segments distinctively characterized pharyngealized and uvular segments, the latter showed a longer distance and a heavier emphasis effect on adjacent vowels. Moreover, the alternation of the uvular consonants [q] and [ʁ] is not a free variation phenomenon as pointed by previous research in the literature (Hussain, 1985; Mustafawi, 2006; and Aldaihani, 2014) but rather follows a pattern and is governed by different assimilation processes.

In other domains, Hasawi Arabic has been studied from sociolinguistic and morphological perspectives. For example, Al-Mubarak (2016) investigated the sociolinguistic variation among Hasawi Arabic speakers along with social factors that might have influenced their linguistic variation such as age, gender, education, and affiliation. El Salman & Al Fridan (2018) in their sociolinguistic study investigated the linguistic variation observed in the Hasawi dialect and how lengthened and emphatic sounds were used by some Hasawi speakers to emphasize their identity. Moreover, Alshehri (2019) examined the morphology of Hasawi Arabic, particularly the Hasawi first-person possessive adjective and compared it to Modern Standard Arabic. Finally, Al-Abdullah (2016) in her M.A. thesis looked into the expressions of progressivity in Hasawi Arabic and their involvement with the notion of location and direction.

2.2.4. Lexical Borrowing in Hasawi Arabic

Smeaton's (1973) study is the only work that has tackled loanwords in Hasawi Arabic[3]. His study examined the lexical expansion in the Arabic of Al-Ahsa due to technical change. He demonstrated how the lexical expansion in the vocabulary of Hasawi Arabic manifested itself, and the factors that governed the lexical integration process. He discussed three degrees of loanword naturalization. The first degree relates to words that are beyond adaptation to Arabic phonemes, i.e. the original word is intact. The second degree involves adaptation of the word to bring it closer to an acceptable Arabic pattern through shortening or expanding the word. In the third degree, the word is fully naturalized into the Arabic morphological system.

It is worth noting that the data used in Smeaton's (1973) study were somewhat limited and did not cover all actual or potential Hasawi lexical expansion at the time, focusing mainly on automotive terminology. Smeaton explained that the data were not originally gathered to be utilized for academic purposes, and that his study was not an attempt to linguistically describe

[3] This is to the best of the researcher's knowledge.

the Arabic of the region. He furthermore stated that, since his study primarily involved lexical matters, only a summary outline was provided for the phonological structure of Hasawi Arabic.

In light of the reviewed studies on loanword adaptation into Saudi dialects, it is apparent that there is a considerable gap in the literature which needs to be addressed. Although the Hasawi dialect is a major and distinctive Saudi dialect spoken by many in the Eastern Region of the Kingdom of Saudi Arabia, its phonology has rarely been thoroughly researched. Moreover, the adaptation patterns of English loanwords into Hasawi Arabic have never been investigated in-depth. The only study on loanwords in Hasawi Arabic was Smeaton's (1973) study whose main focus was on technical terms. Moreover, the study was conducted 51 years ago, during which time new words have been borrowed while others have been neglected, especially with the rapid advances in technology and communication over the last two decades. Furthermore, Smeaton's study was conducted in the 1970s, nearly 20 years prior to the development of Optimality Theory, which is the framework employed in the present study.

3. METHODOLOGY

3.1. Theoretical Framework

The analyses of the data in the current study will be cast within the framework of Optimality Theory (henceforth, OT). The theory was first introduced in the 1990s by Prince and Smolensky (1993) and McCarthy and Prince (1993). OT is a development of Generative Grammar although it differs from earlier generative models (Kager, 1999). While Universal Grammar (UG) is defined as a set of universal principles, OT defines UG as a set of universal constraints. The principles of UG are inviolable whereas OT constraints are violable as they do not hold absolutely true in all languages (Kager, 1999; Archangeli, 1999).

The four main components of OT are the universal set of constraints CON, the language-particular constraint hierarchy H, the candidate generator GEN, and the evaluator function EVAL (McCarthy, 2002). CON represents the set of constraints based on the grammar of a language. H represents a specific ordering of these constraints according to their priority in that particular language. GEN constructs output candidates and specifies their relation to the input form. EVAL uses H to order the candidates to locate the optimal output (McCarthy, 2002). The basic architecture of OT is shown in Figure (1).

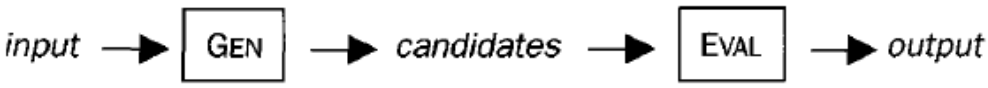

Figure 1:*Basic Architecture of OT*

Note. Adapted from *A Thematic Guide to Optimality Theory* (p.10), by J. J McCarthy, 2002, Cambridge University Press. Copyright 2002 by Cambridge University Press.

OT is a constraint-based approach. Therefore, its basic tenet is the idea of universal constraints that nonetheless can be violated since the ranking of constraints differs from one language to the other (Archangeli, 1999). The core constraints in OT are faithfulness and markedness constraints. While markedness constraints focus on output forms, faithfulness constraints require correspondence between the input and the output (McCarthy, 2008).

Faithfulness constraints prohibit differences between the input and the output. When the constraint requires that the output depends on the input as the source of all its segments, this faithfulness constraint is known as DEP (McCarthy, 2008). This means that there should be no epenthesis and that the output depends on the input. Constraints which insist that

properties of the input correspond to properties of the output are known as MAX. This constraint militates against deletion and, therefore, the input is maximally expressed in the output (McCarthy, 2002).

Markedness constraints relate to the structural well-formedness of outputs (Kager, 1999). They either demand unmarked configurations or prohibit marked configurations (Archangeli, 1999). An example of the former type of markedness constraints is ONSET, which requires that syllables must have onsets. On the other hand, NOCODA, which states that syllables must not have codas, is an example of the latter type of markedness constraints which take the form of prohibition of a marked phonological structure (Kager, 1999).

Constraints are intrinsically in conflict (Kager, 1999). Since language is a system of conflicting universal forces that are embodied in constraints, the satisfaction of one constraint implies the violation of another (Kager,1999). This is regulated and determined by a hierarchical ranking of constraints where high-ranked constraints have priority over low-ranked ones. The output that costs the least violations is the most harmonic or optimal form (Kager,1999).

In OT analysis, candidates are listed in a tableau for comparison. Constraints are put in columns based on their domination order from left to right. When the ranking of constraints is critical, a solid line separates them to show that the constraint to the left is higher in rank than the one to the right. When two constraints are equally ranked (i.e. none of them dominates the other), they are put with columns that have a dotted line between them. Starting from the highest-ranked constraint, candidates compete against each other. Any candidate that does not satisfy the constraint under consideration is assigned a violation mark represented by an asterisk (*). When a candidate violates a constraint that is satisfied by at least one other candidate, its violation is considered fatal, represented by an exclamation mark (!), excluding it from competing further with other candidates. What determines the best candidate in a tableau is the cost of violations. The output with the least costly violations of constraints is the optimal candidate (Kager, 1999). Tableau (1) is an example for illustration.

Tableau 1 : *C1, C2 >> C3*

	C_1	C_2	C_3
a. candidate a	*!		
b. ☞ candidate b			*
c. candidate c		*!	

3.2.Participants

The sample consists of monolingual participants who are all native speakers of Hasawi Arabic, specifically from Al Hofuf, and who live in Al-Ahsa region. A total of fourteen male and female participants, seven of each, who were over 30 years old, were interviewed and recorded. Since the specified age group might include participants who have studied English at school, participants were asked about their level of proficiency in English prior to the interview. Only those who were not proficient in English were included in the sample. This, in turn, limited the effect of English proficiency on the participants' pronunciation of loanwords.

The sampling strategy utilized in the present study was opportunistic, as the study sought to collect data from participants who met certain practical criteria that included easy accessibility and the willingness to volunteer (Dörnyei, 2007). For ethical purposes, a consent form was handed to the participants to read, sign, and return to the researcher.

3.3. Data Compilation

Compiling the list of loanwords went through several steps. A primary list was made using words from social media channels (YouTube, Snapchat, Twitter, etc.) as well as previous studies conducted on Saudi dialects (e.g., Alhoody, 2019; Aloufi, 2017; Jarrah, 2013). This list was then used in face-to-face interviews with Hasawi speakers in Al-Ahsa during a pilot study and was updated according to the actual use of loanwords by Hasawi speakers. After that, more loanwords were added to the list based on the consultation with native Hasawi speakers. Moreover, two dictionaries were examined to add more words to the list: Al-Obodi's (2005) etymological dictionary that contains 800 loanwords from different languages adapted into colloquial Arabic, and Abdulrahim's (2011) dictionary for loanwords in Arabic and its dialects (only English loanwords were considered). Finally, the list was verified by three native Hasawi speakers and updated accordingly to verify that these words are well-established and commonly used in Hasawi Arabic. The verified list contained a total of 133 loanwords. Thirty-nine distractors were added to the list to prevent anticipation and pattern recognition. Thus, the total number of words in the final list was 172 words.

3.4. Data Elicitation

Data were elicited using different ways such as picture naming and interviews. For each word in the list, each participant was shown a picture that describes the word and was asked to identify it. In addition, interviews were held to collect data, especially for words that cannot be elicited using the picture naming method. The pronunciation of each word by each participant was individually elicited and audio-recorded. To prevent any factors that might influence the participants' pronunciation, the researcher refrained from mentioning that the interview was focused on how they pronounced the words.

3.5. Data Transcription

After data collection, each elicited pronunciation was narrowly transcribed according to the International Phonetic Alphabet (IPA) to capture any phonetic details such as changes in stress. With respect to the original English words, they were transcribed using the pronunciations provided in Longman's Dictionary of Contemporary English (2014). In this way, the various types of repairs triggered in Hasawi Arabic to adapt English loanwords were identified and analyzed.

4. ANALYSIS AND DISCUSSION

Adapted forms in Arabic dialects revealed that the insertion of emphasis in consonants has been observed concerning the vowels in their surrounding environment. Based on Abu Guba's (2016) study findings, English vowels in Jordanian Arabic loanwords are more likely to trigger emphasis with backer and lower vowels. Moreover, Alhoody (2019) stated that the co-occurrence of [t] and [s] with the low back vowel [ɑ] motivated Qassimi Arabic speakers to produce these plain consonants as emphatics. Furthermore, this phenomenon was observed not only when words were borrowed into Arabic from English, but also from other languages like French. Kenstowicz and Louriz (2009) investigated a phenomenon previously studied by Heath (1989) relating to the pharyngealization of consonants adjacent to mid and back low vowels in French loanwords that are adapted into Moroccan Arabic. The results of their study showed that French back vowels are systematically adapted with pharyngealized emphatics whereas French front vowels resist such correspondence.

This emphasis effect was observed in the adaptation of loanwords into HA where [s] and [t] were mapped into their emphatic counterparts [sˤ] and [tˤ] in the vicinity of back vowels, which is in alignment with Alhoody's (2019) study. For example, English /stɑːp/ "stop" was adapted into HA as [sˤtˤɑb]. Furthermore, English vowels which were not attested in HA were mapped into vowels that were part of the HA vowel inventory. If the vowel was mapped into a back vowel, this would trigger emphasis on the neighboring consonants. For example, bus

/bʌs/ was adapted into HA as [bɑːsˤ] where [ʌ] was adapted to [ɑː] and consequently triggered the adaptation of [s] into its emphatic counterpart [sˤ]. This phenomenon is clearly shown in the English word "motor" [ˈmoʊ.təɹ] which is adapted into two different words in HA with two meanings. The first adaptation is [ˈmoː.tar] which is used to refer to a car, and the second adaptation is [mɑ.ˈtˤuːr] which is used to refer to an engine. In the first adaptation, the [t] was preserved as the vowel in its vicinity [ə] was mapped into the central vowel [a]. On the other hand, [t] was mapped into its emphatic counterpart [tˤ] when [ə] was mapped into the back vowel [uː].

This following part provides OT analyses of the loanwords that were adapted into HA with emphasis. These words are "bus", "chocolate", "transit", "stop", "short", "motor", "stamp", "salad", "cylinder", and "glass".

Tableau 2: *OT analysis of "bus" /bʌs/*

English /bʌs/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [bʌs]	*!	
☞ b. [bɑːsˤ]		

The word /bʌs/ is adapted into HA as [bɑːsˤ] in which the central mid vowel [ʌ] that is not attested in HA is mapped into the low back vowel [ɑ]. This adaptation triggered the emphasis of the voiceless alveolar fricative [s] into its emphatic counterpart [sˤ]. HA does not allow the central mid vowel [ʌ] as it is not part of its vowel inventory. Thus, the markedness constraint ATTESTED (VOWEL) which states that the vowel must be attested in HA is violated in candidate (a). This, in turn, renders candidate (b) the optimal candidate. The second markedness constraint [+EMPHATIC] adj V+back which states that consonants that have emphatic counterparts must undergo emphasis when adjacent to a back vowel was not violated in both candidates. However, since candidate (a) violated a higher-ranked constraint ATTESTED (VOWEL), its violation was fatal.

Tableau 3: *OT analysis of "chocolate" /ˈʧaːk.ələt/*

English /ˈʧɑːk.ələt/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [ˈʧɑːk.ələt]	**!	
☞ b. [ʃu.ka.ˈlˤɑː.tˤɑh]		

In HA, the word [ˈʧɑːk.ələt] is adapted as [ʃu.ka.ˈlˤɑː.tˤɑh]. In this adaptation, the unattested schwa vowel [ə] that occurs twice in [ˈʧɑːk.ələt] was adapted into [a] and [ɑ]. This resulted in two violations of the higher-ranked constraint ATTESTED (VOWEL) by candidate (a). Hence, candidate (b) is the optimal candidate.

Tableau 4: *OT analysis of "transit" /ˈtɹæn.zɪt/*

English /ˈtɹæn.zɪt/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [ˈtɹæn.zɪt]	*!	
☞ b. [ˈtˤrɑn.zeːt]		

In this adaptation, the English word /ˈtɹæn.zɪt/ is adapted into [ˈtˤrɑn.zeːt] in HA. Since the front open vowel [æ] is not attested in HA, it is mapped into the low back vowel [ɑ] which triggers the replacement of [t] into its emphatic counterpart [tˤ] in onset position. Candidate (a) fatally violates the higher-ranked constraint ATTESTED (VOWEL) and so it is ruled out in favor of candidate (b).

Tableau 5: *OT analysis of "stop" /staːp/*

English /stɑːp/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [stɑːp]		*!
☞ b. [sˤtˤɑb]		

The low back vowel in the English word /stɑːp/ is attested in HA and, therefore, candidate (a) does not violate the constraint ATTESTED (VOWEL). Candidate (a) does, however, violate the second constraint [+EMPHATIC] adj V+back which requires that consonants that have emphatic counterparts must undergo emphasis when adjacent to a back vowel. Therefore, its violation is fatal, and candidate (b) is rendered the optimal candidate.

Tableau 6: *OT analysis of "short" (from short-circuit) /ʃɔːɹt/*

English /ʃɔːɹt/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [ʃɔːɹt]	*!	
☞ b. [ʃoːtˤ]		

The adjacency of the back vowel [oː] to the voiceless alveolar stop [t] causes its adaptation into its emphatic counterpart [tˤ]. In this adaptation, candidate (a) violates the first constraint ATTESTED (VOWEL) as the word /ʃɔːɹt/ has the open mid back vowel [ɔ] which is not part of HA vowel inventory. This violation rules out candidate (a) as it is fatal and, therefore, candidate (b) is the optimal candidate.

Tableau 7: *OT analysis of "motor" /ˈmoʊ.təɹ/ (engine)*

English /ˈmoʊ.təɹ/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [ˈmoʊ.təɹ]	**!	
☞ b. [mɑ.ˈtˤuːr]		

The English word motor [ˈmoʊ.təɹ] is adapted into [mɑ.ˈtˤuːr] when referring to an engine in HA. The voiceless alveolar stop [t] was mapped into its emphatic counterpart [tˤ] when [ə] was

mapped into the back vowel [uː]. The vowel adaptations in this word include the mapping of the unattested diphthong [oʊ] and [ə] into the low back vowel [ɑ] and the high back vowel [uː], respectively. These adaptations resulted in fatal violations of the higher-ranked constraint ATTESTED (VOWEL) by candidate (a). As a result, candidate (a) is ruled out and candidate (b) is the optimal candidate.

Tableau 8: *OT analysis of "stamp" /stæmp/*

English /stæmp/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [stæmp]	*!	
☞ b. [ˈsˤtˤɑm.bah]		

In HA, the word /stæmp/ is adapted into [ˈsˤtˤɑm.bah]. This adaptation includes the mapping of the unattested [æ] into the low back vowel [ɑ] which triggers the emphasis of the adjacent consonants [s] and [t] into their emphatic counterparts [sˤ] and [tˤ], respectively. Candidate (b) is the optimal candidate as candidate (a) violates the ATTESTED (VOWEL) constraint.

Tableau 9: *OT analysis of "salad" /ˈsæl.əd/*

English /ˈsæl.əd/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back	IDENT-IO FRICT [VOICE] ONSET	SPREAD (Emphasis)
a. [ˈsæl.əd]	**!			
☞ b. [ˈsˤɑ.lˤɑ.tˤɑh]				
c. [ˈzɑ.lˤɑ.tˤɑh]			*!	
d. [ˈsa.lˤɑ.tˤɑh]				*!

The word /ˈsæl.əd/ has multiple realizations in HA; [ˈsˤɑ.lˤɑ.tˤɑh], [ˈsˤɑ.lˤɑtˤ], [ˈzɑ.lˤɑ.tˤɑh], and [ˈsa.lˤɑ.tˤɑh]. In all these realizations, the voiceless alveolar stop [t] is always mapped into its emphatic counterpart [tˤ]. However, the voiceless alveolar fricative /s/ is mapped into [sˤ] or [z], or is retained as [s]. It was adapted into [sˤ] 9 times which constitutes 42.86% of the realizations. As for the voiced alveolar fricative [z], it was realized 6 times with a percentage of 28.57%. The voiceless alveolar fricative [s] was retained 6 times which constitutes 28.57% of the realizations.

Of all the competing candidates, candidate (a) is immediately ruled out as it fatally violates the higher-ranked constraint ATTESTED (VOWEL). Candidates (c) and (d) violate the equally ranked constraints (represented by the dotted line) IDENT-IO FRICT [VOICE] ONSET and SPREAD (Emphasis), respectively. Candidate (c) violates the faithfulness constraint IDENT-IO FRICT [VOICE] ONSET which states that the output fricative segment and its input correspondent must have identical values for the [voice] feature in the onset position (Al Taisan, 2022). Candidate (d) violates the SPREAD (Emphasis) constraint which states that in

the vicinity of a back vowel, emphasis must spread across all syllable boundaries. The competition between candidates (b), (c), and (d) is resolved in favor of (b) as it satisfies all the posited constraints in HA.

Tableau 10: *OT analysis of "cylinder" /ˈsɪl.ən.dəɹ/*

English /ˈsɪl.ən.dəɹ/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [ˈsɪl.ən.dəɹ]	*!	
☞ b. [ˈsˤrin.dal]		*

The English word /ˈsɪl.ən.dəɹ/ is mapped into [ˈsˤrin.dal] when borrowed by HA speakers. This adaptation involves metathesis across syllable boundaries of /l/ and /r/, the change of the voiceless alveolar fricative /s/ into its emphatic counterpart /sˤ/, the deletion of the high front vowel [ɪ], and the adaptation of the schwa vowel [ə] that occurred twice in [ˈsɪl.ən.dəɹ] into [i] and [a]. Although candidate (b) violated the constraint [+EMPHATIC] adj V+back since [s] was mapped into [sˤ] without being adjacent to a back vowel, it is still rendered the optimal candidate as this constraint is ranked lower than the ATTESTED (VOWEL) constraint in HA.

Tableau 11: *OT analysis of "glass" /glæs/*

English /glæs/	ATTESTED (VOWEL)	[+EMPHATIC] adj V+back
a. [glæs]	*!	
☞ b. [ɢlˤɑːsˤ]		

The English word /glæs/ is adapted into [ɢlˤɑːsˤ] in HA. Similar to the previous adaptations, the mapping of the unattested [æ] into the low back vowel [ɑ] triggers the emphasis of the adjacent consonants [l] and [s] into their emphatic counterparts [lˤ] and [sˤ], respectively. Candidate (b) is the optimal candidate as candidate (a) violates the ATTESTED (VOWEL) constraint.

5. CONCLUSION

This paper discussed the occurrence of emphatic consonants in the adaptation of English loanwords into HA. The emergence of /tˤ/ and /sˤ/ in the adapted forms of English loanwords by Hasawi speakers motivated the investigation of this interesting phenomenon. Reverse engineering was employed to understand this phenomenon through studying the counter effect of the adjacency of a back vowel. It is not unusual to find emphatic consonants in the vicinity of back vowels as it is quite common in Arabic (Abu Guba, 2016; Alhoody, 2019; Al Taisan, 2022). In alignment with this occurrence, the investigation of the adapted forms in the present study revealed that the adjacency of a back vowel to the consonants /s/ or /t/ triggered the emphasis of these consonants to their emphatic counterparts. This effect surfaced in two cases: when the source word in English already included a back vowel, and when the unattested vowel in HA was mapped into a back vowel which, in turn, triggered the emphasis effect.

The findings of the present study have significant implications across various fields. In relation to pedagogy, understanding adaptation patterns can provide educators with insights about common challenges that learners might face when learning a foreign language. Moreover, and with regard to technology, studying the patterns of adaptations can be used in machine translation and lexical dictionaries or in developing a dialect specific software. In addition, studies on loanword adaptation and specifically the adaptation of English loanwords into Hasawi Arabic add to the body of research on Hasawi Arabic and shed more light on the Hasawi Arabic dialect, especially along with the rising interest in Al-Ahsa as a cultural, heritage destination that gained attention as one of Vision 2030's tourism attraction sites. Thus, research on the phonology of various dialects of Arabic in Saudi Arabia fosters an opportunity to contribute to the field of dialectology and stimulate more studies in the future.

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