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Patterns of consonant behavior within English loanwords in Iraqi Arabic

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أنماط سلوك الصوامت في الالفاظ الإنكليزية الدخيلة في اللهجة العراقية

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Abstract.
This research examines the patterns of consonant behavior within English loanwords in Iraqi Arabic (IA). Quantitative content analysis of all consonant adaptations within 346 English loanwords in IA was conducted to establish these patterns. The study results revealed that the majority of these adaptations exhibit recurring patterns and may consequently be linked to specific features in the phonological systems of the source language and target language. Specifically, the findings suggest two main consonant behavior patterns. While most English input consonants map straight to their IA counterparts, requiring no modification, the remaining consonants may be divided into two groups based on how they behave when incorporated into IA. First, the two consonants /ʒ, ŋ/ consistently undergo phonological substitution as they lack direct counterparts in IA. In contrast, the consonants /p, t, k, s, l/ which do have direct counterparts in IA, exhibit two different behavior patterns when integrated into IA. The consonants /t, k, s, l/ typically map directly to their IA equivalents, and would only occasionally undergo substitution with their closest, typically emphatic or voiced, IA counterparts /tˁ, g, sˁ, z, ɬ/ under the influence of the surrounding back vowels or emphatic/voiced consonants. GB /p/ and /ɬ/, on the other hand, occasionally map directly to their direct IA counterparts /p, ɬ/, but more typically undergo substitution with their closest IA equivalents /b/ and /l/. **Keywords:** Iraqi Arabic, Baghdadi Arabic, loanwords, borrowing, consonant adaptation

الملخص
تهدف هذه الدراسة الى تحديد أنماط سلوك الصوامت في الالفاظ الإنكليزية الدخيلة في اللهجة العراقية. ولتحديد هذه الأنماط، تم استعمال التحليل الوصفي الكمي لجميع التغيرات الصوتية التي طرأت على ٣٤٦ لفظا من الالفاظ الإنكليزية الدخيلة في اللهجة العراقية. وكشفت نتائج الدراسة أن غالبية هذه التغيرات تتبع أنماطاً منتظمة، مما يمكن ربطه بعوامل محددة في كل من النظامين الصوتيين للغة الاولى واللغة الثانية. وعلى وجه التحديد، تُشير النتائج إلى نمطين رئيسيين لسلوك الصوامت. حيث تميل مُعظم مخرجات اللهجة العراقية إلى الحفاظ على سمات الصامت الانكليزي المدخل دون الحاجة إلى تعديل، بينما يُمكن تقسيم الصوامت المُتبقية إلى مجموعتين بناءً على سلوكها عند دمجها في اللهجة العراقية. أولًا، يخضع الصامتان /ʒ، ŋ/ بشكل منتظم للإبدال الصوتي لعدم وجود نظائر مُباشرة لهما في اللهجة العراقية. في المقابل، اما الصوامت /p, t, k, s, l/، التي لها نظائر مباشرة في اللهجة العراقية، فلها نمطين مختلفين من السلوك عند دمجها فيها. حيث تميل الصوامت /t, k, s, l/ عادة إلى الحفاظ على سمات الصامت الانكليزي المدخل دون الحاجة إلى تعديل، باستثناء حالات محدودة تُستبدل فيها تلك الصوامت بنظائرها الأقرب إليها في اللهجة العراقية، أي /tˁ, g, sˁ, z, ɬ/، وذلك تحت تأثير حروف العلة الخلفية أو الصوامت المُؤكدة/المجهورة المحيطة بها. وعلى العكس من ذلك فان الصامتين الانكليزيين /p/ و/ɬ/ في الغالب يُستبدلان بنظيريهما الأقرب في اللهجة العراقية /b/ و/l/. باستثناء حالات محدودة يتم الحفاظ فيها على سمات الصامت الانكليزي المدخل دون الحاجة إلى تعديل. الكلمات المفتاحية: اللهجة العراقية، اللهجة البغدادية، الالفاظ الدخيلة، الاقتراض اللغوي، تغيير الصوامت

1. Introduction

It is common practice for speakers of a language to borrow terms from another to make up for inadequacies in their vocabulary. The popularity of borrowed words and phrases might be attributable to the prestige of the source language, cultural innovations, or other causes. Numerous such terms have been incorporated from English into Iraqi Arabic (IA), over the years (Albazarkan, 2000, p.1). However, only a small number of studies have been undertaken to investigate the prevalence of these words in IA and the changes they underwent after they were incorporated. Moreover, most of these studies were marked by restricted data and a predominant focus on the morphological or sociolinguistic aspects of the adaptations.Only two of these studies sought to identify patterns of adaptation while focusing on the phonological aspect. Both As-Sammer (2015) and Salman (2018) investigated the phonological adaptations of English loanwords in IA by proposing a number of adaptation patterns and providing examples for each pattern, with As-Sammer (2015) providing a descriptive account of these patterns using Chomsky & Halle's (1968) rule-based SPE framework. As-Sammer (2015) characterized adaptations in terms of consonant substitution, whereas Salman (2018) classified her adaptation patterns in terms of adaptation processes.As-Sammer (2015) examined 150 loanwords that he accumulated over time as a result of his own everyday communication in an attempt to explore the adaptation processes that occurred when these English loanwords were incorporated into IA. In terms of consonant substitution, As-Sammer explained how the English consonants /p, k, d, g, ʒ/ changed their voicing and place and manner of articulation when borrowed into IA. As-Sammer (2015) further mentions vowel epenthesis as another consonant adaptation strategy utilized for the purpose of simplifying initial consonant clusters. Salman (2020) examined an unspecified number of English loanwords in IA that she collected by systematically searching for loanwords in two dictionaries, and also through a self-observation technique that she used herself, being a native speaker of IA. The researcher substitution of both consonants that do not exist in the phonological system of IA as well as consonants that are part of the phonological system of IA existed within English loanwords in IA, citing several examples of both. She further listed the following six phonological processes that "affected" consonants: Gemination, Assimilation, Emphasis, Lenition, Fortition, and Addition, providing a few example words for each of these processes. Regrettably, neither of these two descriptive investigations was able to provide sufficient quantitative data to corroborate the presence of these patterns nor did they make any effort to provide an explanation for them. Furthermore, the researcher partly disagrees with the conceptualization of the variables in both studies, such as listing vowel epenthesis as a strategy for segmental (rather than syllabic) adaptation, treating borrowed words that changed their part of speech acquiring new IA morphemes as loanwords (rather than loanblends), etc.As for studies on the adaptation of English loanwords in other Arabic dialects, Aloufi (2016: 105) conducted a descriptive quantitative analysis of the adaptation of consonants in English words as they were borrowed into Urban Hijazi Arabic (UHA). Since the UHA inventory does not include the voiced fricative /v/, the voiceless plosive /p/, the velar nasal /ŋ/, or the affricates /ʧ/ and /ʤ/, the study data indicated that the most prevalent adaptations occur in these English consonants. The UHA loanword data demonstrates that the most prevalent segmental adaptation is the voicing of consonants, specifically the alteration of the voiceless sound /p/ to the voiced /b/. Another phonological alteration associated with laryngeal features is the devoicing of consonants, wherein the voiced /v/ sound is transformed into the voiceless /f/. A further segmental change noted in UHA loanword data pertains to the alteration of the place of articulation of segments, exemplified by the adaptation of the nasal /ŋ/. The velar nasal is modified by transforming the velar articulation into an alveolar one, resulting in the alveolar nasal /n/. An additional observation regarding the adaptation of segments in UHA loanword data pertains to the alteration of the manner feature, wherein the English affricates /ʤ/ and /ʧ/ are consistently transformed into the fricatives /ʒ/ and /ʃ/. The fricative /v/ is adapted into the stop /b/ in 9% of instances. Given the scarcity of research on the phonological substitution of consonants in English loanword within IA, and the substantial and ongoing incorporation of English loanwords into IA, the current study analysis could fill this knowledge gap by providing a more comprehensive and precise understanding of these loanwords and explaining their adaptation, leading to a deeper understanding of IA phonology and phonological theory in general. The purpose of the current research is to identify the patterns of consonant adaptation patterns are evident in the nativization of English words by native speakers of IAThis research is confined to investigating the consonant modifications through substitution that English loanwords in IA have undergone. Consonant modifications through deletion as well as vowel and suprasegmental changes are outside the scope of the current study.

2. Review of literature

2.1. Borrowing and loanword adaptation

Linguistic borrowing refers to the process through which a group of speakers incorporates certain foreign linguistic components into their own language (Thomason & Kaufman 1988: 37; Malmkjaer 2002: 238). When studying any changes that occur during loanword adaptation, it is important to understand the difference between two kinds of loanwords: established borrowings and nonce borrowings.Nonce borrowings, also known as single-word codeswitching, are words that are borrowed from another language and used in the primary language of an utterance to describe a specific event or scenario for which a term does not already exist. Nonce borrowings are distinct from established borrowings in that they do not satisfy the requirements for the level of acceptability or the frequency with which they are used (Poplack 2001: 2063).In contrast, established borrowings, which are the focus of this research, are foreign words that have entered the vocabulary of the borrowing language. These loanwords are the outcome of "a completed language change, a diachronic process that once started as an individual innovation but has been propagated throughout the speech community" (Haspelmath 2009: 38).According to Poplack (2001: 2063), there are three ways to identify established loanwords:

1. Established Loanwords take on the morphological, syntactic, and, frequently, phonological characteristics of the language into which they have been incorporated.
2. They are frequent in the person's speech and common in society at large.
3. These words become part of the recipient language's lexicon and are available to monolingual speakers as part of the usual lexical repertoire.

According to Peperkamp (2005), phonological analysis of established loanwords must be diachronic since it explains the alterations made by the speakers who first introduced these items. Furthermore, depending on the sound changes that happened during adaptation and those that occurred afterward, borrowings may take on distinct phonological structures. It may be difficult to determine how an item reached a target language and if characteristics such as orthography were relevant (Haunz 2007).

2.2 GB and IA consonant inventories

The current study sample utilized the following two varieties:

1. General British (GB), often termed British English, represents the mainstream English dialect spoken and written in the United Kingdom (Cruttenden, 2014, p. 80).
2. Iraqi Arabic (IA), also known as Muslim Baghdadi Arabic or gilit-dialect, is the "dominant, both numerically and in prestige," dialect of the Arabic language spoken in Iraq (Blanc, 1959, p. 449).

A total of 24 consonants make up the GB consonant inventory, including (16 voiced and 15 voiceless) that can be categorized and described by referring to the three key dimensions of voicing, place (or point) of articulation, and manner of articulation, as illustrated in Figure 1.

Figure 1

Chart of GB consonants as adapted from (Roach, 2009, p. 52)

Manner \ Place	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Palatal	Velar	Glottal
Plosive	p b			t d			k g	
Nasal	m			n			ŋ	
Fricative		f v	θ ð	s z	ʃ ʒ			h
Affricate					tʃ dʒ			
Lateral *Approximant*				l				
Approximant	w			r		j		

There is a lack of consensus regarding IA phonology, particularly with regard to IA consonants. Different authors (e.g., Blanc, 1964; Erwin, 2004; As-Sammer, 2015; Younus, 2020.), among many others, provide different descriptions of the consonant inventory of IA, some accepting sounds like /p/ and /v/ as IA phonemes, and others not; some accepting emphatic sounds such as ɬ, $d^ˤ$, $p^ˤ$, $b^ˤ$, $m^ˤ$, $r^ˤ$, etc., as IA phonemes, and others not; some describing the place of articulation of a sound like /s/ for example as dental, while others describe it as alveolar, dentialveolar, etc.The minimal list of phonemes that most of these scholars agree upon comprises 31 consonants (16 voiced and 15 voiceless) that can be categorized and described by referring to the three key dimensions of voicing, place (or point) of articulation, and manner of articulation, as illustrated in Figure 2. The distinctive features mainly follow those put forward by Hassan (1981) and Ghalib (1984).

Figure 2
Chart of IA consonants

Manner \ Place	Bilabial	Labio-dental	Dental	Denti-Alveolar	Alveolar	Post alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive –velarized	p b			t d tˤ				k g	q		ʔ
Affricate						ʧ ʤ					
Fricative –velarized		f v	θ ð ðˤ		s z sˤ	ʃ			x χ	ħ ʕ	h
Nasal	m				n						
Lateral approximant –velarized					l ɫ						
Flap					r						
Approximant	w						j				

3. Method

3.1.Research design

Quantitative content analysis was used to fulfill the study's aim of identifying the consonantal substitution patterns of English loanwords in IA. Krippendorff (2004: 18) defines content analysis as "a technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use." Different scholars have offered varying classifications of content analysis. Thus, while Ahuvia (2001: 139) distinguishes three unique types of content analysis: traditional, interpretive, and reception based, it has been proposed by other scholars that content analysis may be broken down into "latent (subjective and qualitative) and manifest (objective and quantitative) categories of analysis," as described by Babbie (2007: 356) and Holsti (1969: 12–14). The present research uses traditional manifest content analysis, which involves being objective and using highly systematic procedures to compile numerical summaries and tally-ups of manifest content (Holsti 1969: 3–14; Ahuvia 2001: 139; Krippendorff 2004).The concept of validity pertains to the degree to which a measurement tool effectively captures the specific construct it is designed to assess (Mackey & Gass 2016: 158). Typically, this relies on how well the sample reflects the population. Using the whole available population as the research sample strengthened the validity of this study by ensuring that every loanword in the research population had an equal chance of being included in the sample.Interrater reliability is the degree of agreement between two or more independent observers using the same instrument. The researcher interviewed 20 more IA native speakers to verify the presence of the 346 loanwords list in IA. These informants were born and raised in Baghdad, where they continue to reside, and their English proficiency was elementary. In addition, triangulation, or the use of several data-gathering techniques (self-observation, document review), was used to improve the reliability and internal validity of the study (Merriam & Grenier 2019: 14).

3.2.Data collection

The data for the current study were the 346 English loanwords in IA reported in Abdulrazzaq and Al-Ubaidy (2023). These loanwords were drawn from three main sources: an etymological dictionary of loanwords in IA, loanwords listed in four academic research studies of English loanwords in IA, and loanwords collected by the researchers as native speakers of IA using a self-observation technique.

3.3.Data analysis

The first step was to compare the GB and IA pronunciation of each of these loanwords noting any consonant adaptations. To address the study question, the phonological adaptations of each of the 24 GB consonants as it was incorporated into the IA lexicon were then detected and tallied in order to ascertain the patterns of English loanword consonant adaptations in IA and answer the study question (see the tables in Section 4).

4. Results

The GB phonemic inventory consists of 24 consonants, as detailed in Section 2: , namely, /p/ /b/, /t/ /d/, /k/ /g/, /f/ /v/, /s/ /z/, /θ/, /ð/, /ʃ/, /ʒ/, /ʧ/, /ʤ/, /h/, /w/, /n/, /m/, /r/, /j/, /ŋ/, /l/. (Roach 2009: x). Integrating English loanwords into IA typically entails preserving as many features of the consonants present in the GB input as feasible. This unveiled two primary consonant behavior patterns. The majority of GB input consonants, notably the 17 consonants /b, f, v, h, d, m, w, n, g, z, θ, ð, ʃ, ʧ, ʤ, r, j/, correspond directly to their IA counterparts, requiring no modification.

The remaining five consonants, on the other hand, exhibit two different behavior patterns when integrated into IA. First, the two consonants /ʒ, ŋ/, which lack direct equivalents in IA, invariably go through phonological changes via substitution. The five consonants (/p, t, k, s, l/) that remain, however, do have direct counterparts in IA, which

means that they may sometimes map directly to their IA equivalents. Nonetheless, there are other instances where these consonants may change when borrowed into IA through processes such as substitution and deletion. The substitution patterns of each of these 7 consonants are outlined below.

4.1.Adaptation of GB /ʒ/

The voiced postalveolar fricative consonant /ʒ/ does not exist in the IA phonemic inventory. Therefore, the GB consonant /ʒ/ in English loanwords in IA is regularly mapped to its closest phonological match the voiced affricate /ʤ/ (in 4/5 cases, 80%). The only instance in the corpus where this consonant exhibits irregular behavior surfacing as the consonant /z/, as shown in Table 1. This may be attributed to the English spelling of the word television.

Table 1. Adaptation of the GB consonant /ʒ/ in IA

GB input			IA output		Frequency		Total
ʒ	*garage*	gærɑːʒ	ʤ	gaɾaːʤ	4	80%	5
	television	telɪvɪʒən	z	talfɪzjɔːn	1	20%	

4.2.**Adaptation of GB /ŋ/**

Since the voiced velar nasal consonant /ŋ/ is not available in IA, the GB consonant /ŋ/ in English loanwords in IA is regularly mapped into its closest phonological match, the voiced alveolar nasal consonant /n/ (in 13/13 cases, 100%), as displayed in Table 2.

Table 2. Adaptation of the GB voiced postalveolar fricative consonant /ŋ/ in IA

GB input			IA output		Frequency		Total
ŋ	*sink*	sɪŋk	n	sɪnk	13	100%	13

4.3.Adaptation of GB /p/

Despite its presence in the IA phonemic inventory, the GB voiceless bilabial plosive /p/, in a vast majority of its occurrences in the loan corpus is adapted into IA /b/ (in 42/52 cases, 81 %), , e.g., chips, cup, pass, pizza, etc. However, the GB consonant /p/ has also been observed to be perceived faithfully, though to a smaller extent, and regularly mapped to its direct IA counterpart /p/ sound (in 6/52 cases, 11.5%). Some less common adaptations have also been observed where the GB consonant /p/ is adapted to either /f/ in one case or where it is completely deleted in three cases, as illustrated in Table 9.

Table 9. Adaptation of the GB consonant /p/ in IA

GB input			IA output		Frequency		Total
p	*chips*	ʧɪps	b	ʧɪbɪs	42	81%	52
	clips	klɪps	p	klɪps	6	11.5%	
	sponge	spʌnʤ	f	sfanʤ	1	1.8%	
	feed pump	fiːd pʌmp	deletion	fiːt.ˌbam	3	5.7%	

4.4.Adaptation of GB /t/

A total of 112 occurrences of the GB voiceless denti-alveolar plosive /t/ were observed in the loan corpus. In the majority of these instances (in 97/112 cases, 86.6 %), this GB consonant is perceived faithfully and regularly mapped in English loanwords to its direct IA counterpart due to the fact that the consonant already exists in the IA phonemic inventory. However, the consonant is also systematically adapted to the IA (emphatic/velarized) voiceless denti-alveolar plosive /tˤ/ (in 11/112 cases, 10%). The only four occurrences where this consonant shows irregular realizations are in the words bonnet, tracksuit, diplomat, and tube, where the consonant is mapped into the consonants /d/, /s/ and /ʧ/, respectively, as illustrated in Table 5.Table 5. Adaptation of the GB consonant /t/ in IA

GB input			IA output		Frequency		Total
t	*top*	tɒp	t	tɔːb	97	86.6%	112
	bottle	bɒtɬ	tˤ	bʊtˤʊɬ	11	10%	
	bonnet	bɒnɪt	d	baniːd	2	1.6%	
	diplomat	dɪpləmæt	s	dɪblʊmaːsi	1	0.9%	
	tube	tjuːb	ʧ	ʧuːb	1	0.9%	

4.5.Adaptation of GB /k/

A total of 122 occurrences of the GB voiceless velar plosive /k/ were observed in the loan corpus. In the majority of these instances (in 111/122 cases, 91 %), this GB consonant is perceived faithfully and regularly mapped in English loanwords to its direct IA counterpart due to the fact that the consonant already exists in the IA phonemic inventory. However, the consonant is also systematically adapted to the IA voiceless velar plosive /g/ (in 9/122 cases, 7%). The only two occurrences where this consonant shows irregular realizations are in the words colon and catheter, where the consonant is mapped into the voiceless uvular plosive consonant /q/, as illustrated in Table 6.

Table 6. Adaptation of the GB consonant /t/ in IA

GB input			IA output		Frequency		Total
k	*cup*	kʌp	k	ku:b	111	91%	122
	back	bæk	g	bag	9	7.5%	
	colon	kəʊlɒn	q	qɔ:lə:n	2	1.5%	

4.6.Adaptation of GB /s/

Since the voiceless alveolar fricative consonant /s/ is available in the IA phonemic inventory, the GB consonant /s/ is mostly perceived faithfully and regularly mapped to its direct IA counterpart (in 88/113 cases, 77.9%). Some instances of this consonant in the corpus, however, exhibit irregular behavior, surfacing as the consonants /sˤ/, /z/, or /ʤ/, or deleted altogether, as illustrated in Table 7.Table 7. Adaptation of the GB consonant /s/ in IA

GB input			IA output		Frequency		Total
s	*bicycle*	baɪsɪkɬ	s	ba:jsɪkɪl	88	77.9%	113
	sausage	sɒsɪʤ	sˤ	sˤɔ:sˤaʤ	13	11.5%	
	thermos	θɜ:məs	z	tɪrmɪz	9	8%	
	cigarette	sɪgəret	ʤ	ʤɪga:ra	1	0.9%	
	shorts	ʃɔ:ts	deletion	ʃɔ:rt	2	1.7%	

4.7.Adaptation of GB /l/

Since the voiced alveolar lateral approximant consonant /l/ is available in the IA phonemic inventory, the GB consonant /r/ is mostly perceived faithfully and regularly mapped to its direct IA counterpart (in 18/27 cases, 66.5%). Some instances of this consonant in the corpus, however, exhibit other systematic adaptations, either surfacing as the (velarized) voiced alveolar lateral approximant /ɬ/ (in 5/27 cases, 18.5%), or the voiced alveolar approximant consonant /r/ (in 4/27 cases, 15%), as illustrated in Table 3.

Table 3. Adaptation of the GB consonant /l/ in IA

GB input			IA output		Frequency		Total
l	*blouse*	blaʊz	l	blu:z	18	75%	24
	glass	glɑ:s	ɬ	gła:sˤ	6	25%	

4.7.1.Adaptation of GB allophone /ɬ/

Although the (velarized) voiced alveolar lateral approximant allophone /l/ is available also as an allophone in the IA phonemic inventory, the GB /ɬ/ is only occasionally perceived faithfully and regularly mapped to its direct IA counterpart (in 9/41 cases, 22%). Most instances of this consonant in the corpus (in 32/41 cases, 78%)., however, are systematically adapted to the non-velarized version of the consonant, i.e., /l/, as illustrated in Table 4.

Table 4. Adaptation of voiceless alveolar fricative consonant /r/ in IA

GB input			IA output		Frequency		Total
ɬ	*album*	æɬbəm	l	ʔalbɔ:m	32	74.5%	43
	bottle	bɒtɬ	ɬ	bʊtˤʊɬ	9	20.5%	
	pedal	pedəl	r	pai.dar	2	5%	

5. Discussion

This research study sought to shed light on how GB consonants were adapted in English loanwords in IA to determine the phonological patterns in the IA adaptation of English consonants.Analysis of the data revealed that there are predictable patterns in the adaption of GB consonants in English loanwords in IA. These patterns may be explained by referring to the phonetic features of both the source language and the target language. However, spelling seems to have a role in determining a number of consonant modifications that were not dictated by phonetic factors.As mentioned earlier in this study, out of the ٢٤ GB consonants, ١7 consonants, namely, /b, f, v,

h, d, m, w, n, g, z, θ, ð, ʃ, ʧ, ʤ / have direct counterparts in IA and do not need to undergo phonological changes to be accepted in it, while the remaining 7 consonants either do not have any direct counterparts in IA, namely /ʒ, ŋ/ and thus need to undergo phonological changes, or they may do have direct counterparts in IA but still sometimes systematically undergo phonological changes when borrowed into IA namely, /p, t, k, s, l/, as illustrated in Table 11 and Table 12.

Table 11. Adaptations of GB consonants which are not available in IA

	GB consonants	Typical IA mapping	Other IA mappings
1	ʒ	ʤ	z
2	ŋ	n	

Table 12. Adaptation of GB consonants which are available in IA

	GB consonants	Typical IA mapping	Other IA mappings
1	p	p, b	f
2	t	t, tˤ	d, s, ʧ
3	k	k, g	q
4	s	s, sˤ, z	ʤ, deletion
5	l	l, ɬ	
6	ɬ	l, ɬ	r

5.1. GB consonants with no direct IA counterparts

When it comes to the two GB consonants /ʒ, ŋ/ which are not available in the standard phonemic inventory of IA, data analysis showed that these consonants are consistently replaced with their closest IA matches. Thus, the GB fricative consonant /ʒ/ is regularly mapped to its closest phonological match in IA, the affricate consonant /ʤ/. Similarly, the GB velar consonant /ŋ/ is regularly substituted with its closest phonological equivalent in IA, the alveolar consonant /n/, as shown in Table 13.Table 13. Typical adaptation patterns of GB consonants which are not available in IA

GB input			IA output		Frequency	
ʒ	*garage*	gærɑ:ʒ	ʤ	gara:ʤ	4/5	80%
ŋ	*sink*	sɪŋk	n	sɪnk	13/13	100%

The only exception to this pattern, according to the data, is when the /ʒ/ sound displays a different adaptation and becomes /z/, instead of /ʤ/. As a result, speakers would pronounce the word "television" as /talfɪzjɔ:n/ when incorporating it into IA, changing the /ʒ/ sound to /z/. This atypical conversion of the /ʒ/ sound to /z/, rather than /ʤ/ may be attributed to spelling Influence since English does not have a unique letter for / ʒ / (using 's' instead), speakers may rely on the written 's' and pronounce it as a standard /z/.

5.2. GB consonants with direct IA counterparts

As for the GB consonants /p, t, k, s, l/ which are available in IA, data analysis showed that these consonants may be further divided into two major groups: the GB consonants /t, k, s, l/ which are typically mapped faithfully to their IA counterparts while the consonant /p/, and the GB allophone /ɬ/ which, despite having a direct IA counterpart, are primarily adapted into their closest IA matches /b/ and /l/ rather than the direct IA counterparts /p/ and /ɬ/, as shown in Table 14.Table 14. Typical adaptation patterns of GB consonants which are available in IA

GB input			**IA output**		**Frequency**	
p	*chips*	ʧɪps	b	ʧɪbɪs	42/52	81%
	clips	klɪps	p	klɪps	6/52	11.5%
t	*top*	tɒp	t	tɔ:b	97/112	86.6%
	bottle	bɒtɬ	tˤ	bʊtˤʊɬ	11/112	10%
k	*cup*	kʌp	k	ku:b	111/122	91%
	back	bæk	g	bag	9/122	7.5%
s	*bicycle*	baɪsɪkɬ	s	ba:jsɪkɪl	88/113	77.9%
	sausage	sɒsɪʤ	sˤ	sˤɔ:sˤaʤ	13/113	11.5%

	thermos	θɜ:məs	z	tɪrmɪz	9/113	8%
l	*blouse*	blaʊz	l	blu:z	18/24	75%
	glass	glɑ:s	ɬ	gła:sˁ	6/24	25%
	album	ælbəm	l	ʔalbɔ:m	32/43	74.5%
ɬ	*bottle*	bɒtɬ	ɬ	bʊtˁʊɬ	9/43	20.5%
	pedal	pedəl	r	pai.dar	2/43	5%

The data analysis showed that, for the most part, the GB voiceless bilabial plosive /p/ is consistently adapted into IA /b/ (in 42/52 cases, 81 %) through voicing substitution, Despite the fact that Iraqis can pronounce the /p/ sound and do pronounce it in a limited number of IA loanwords such as /panka/ *fan*, and /parda/ *curtain*, only a minority of IA loanwords (6/52 cases, 11.5 %) have the /p/ sound mapped into its direct IA counterpart. This tendency to replace the /p/ sound with the IA /b/ may be due to the fact that standard Arabic does not contain the /p/ sound and that this sound is scarce in most IA words, solidifying the sound /b/ as the principal bilabial stop in Iraqi Arabic..

When it comes to the GB consonants /t/, data analysis showed that this consonant is consistently mapped to its direct counterpart in IA. Still, and despite being available in the IA phonemic inventory, IA speakers do occasionally pronounce the GB /t/ sound in loanwords as /tˁ/ rather than /t/, as in /bʊtˁʊɬ/ *bottle*.. This transformation of the English /t/ sound to its closest IA match, the emphatic /tˁ/, is done via pharyngealization of the consonant /t/ i.e., constricting the pharynx is during the articulation of the sound. This adaptation may be attributed to compliance with the linguistic phenomenon of emphasis spread where an English consonant is emphasized/pharyngealized when surrounded by back vowels (Alhammad. 2014;Davis 1995; Watson 1999). Similarly, the findings show that the GB consonant /k/ is consistently converted to its IA direct counterpart. However, the findings revealed that when borrowed into IA, the GB voiceless velar stop /k/ is sometimes converted to the voiced velar stop /g/ through the process of sonorization/voicing. This limited type of adaptation may be attributed to the prevalence of the /g/ sound in this dialect of IA, where the classical Arabic /q/,ad /k/ are often replaced by /g/ (hence naming it the *gilit* (as opposed to *qeltu*) dialect. This extensive use of the /g/ sound makes the sound /g/ easier to produce when pronouncing foreign words, especially when occurring next to a vowel or another voiced consonant.Though similar to the two consonants /t/ and /g/ in getting consistently mapped faithfully to its IA counterpart, the GB consonant /s/ differs from them in exhibiting two other less common substitution patterns utilizing two different phonological processes.. First, the voiceless alveolar fricative consonant /s/ is sometimes (in 13/113 cases) converted to its closest match the voiceless alveolar emphatic fricative consonant /sˁ/ via pharyngealization of the consonant /s/. This secondary articulation where the base of the tongue is drawn back towards the posterior wall of the pharynx. while the sound /s/ is being produced. This may be ascribed to the influence of the adjacent back vowels in the original English word, as in GB /ʧɑ:ns/ *chance* to IA /ʧansˁ/, and GB /pɑ:s/ *pass* to IA /ba:sˁ/ or to the influence of the nearby back vowels in the adapted IA word , as in IA /ba:sˁ/ *bus*, /ʃa:sˁi/ *chasis*, /gła:sˁ/ *glass*, /sˁa:lɔ:n/ *salon*, /sˁɔ:sˁaʤ/ *sausage*, etc., where the back vowels /a:/ and /ɔ:/ cause the alveolar /s/ to become pharyngealized, shifting it to an emphatic /sˁ/ sound.In addition, the voiceless alveolar fricative consonant /s/ is sometimes (in ٩/113 cases) converted through voicing assimilation to its other close IA match, the voiced alveolar fricative /z/ . This adaptation may again be attributed to the influence of the surrounding voiced sounds (vowels or voiced consonants) in order to reduce vocal effort. Thus, the voiced sounds in the IA loanwords /ga:zi:nɔ:/ casino (the vowels a:,i:, and the voiced consonants /g, n/), /ʔag.zɪ.ma/ eczema (the vowel ɪ, and the voiced consonants /g, m/) /ɣa:z/ *gas* (the vowel a:, and the voiced consonants /ɣ, z/), /ga:zge:t/ *gasket* (the vowel a:, and the voiced consonant /g/), /bi:dza/ *pizza* (the vowel /a:/, and the voiced consonant /d/), cause the voiceless /s/ to become voiced converting it to voiced /z/.Finally, we get to the voiced alveolar lateral approximant consonant /l/, which is available in two versions, the light /l/ and the dark, velarized /ɬ/. However, while the GB phonological system is consistent in defining /l/ as a phoneme, and /ɬ/ as an allophone, the IA system agrees with that of GB in treating /l/ as a phoneme, but is not so consistent when it comes to /ɬ/, treating it as a phoneme in words like /gaɬ.ła/ *he fried* vs /gal.la/ *he told him*, but also as an allophone in phrases like /ʕala gɔ:l̪tak/ vs /ʕala gɔ:ɬtak/ *as you said*. This agreement on using clear /l/ as a phoneme probably explains the tendency of Iraqi speakers to map the majority (about 75%) of /l/ and /ɬ/ sounds in GB into the light unemphatic /l/ in IA.The remaining 20-25% of English loanwords containing /l/ and /ɬ/ sounds, on the other hand, are generally mapped to the velarized /ɬ/ to fit the IA sound system. This adaptation may again be attributed to the influence of the surrounding back vowel sounds in order to reduce vocal effort. Thus, the clear GB /l/ sound in the IA loanwords /gła:sˁ/ *glass*, /zała:tˁa:/ *salad*, / sˁa:łansˁa/ *silencer*, etc., lead becomes velarized with the back of the tongue raised toward the velum, i.e., is converting it to the emphatic IA /ɬ/, under the influence surrounding back vowel /a:/ and

the emphatic consonant sounds /sˤ/ and /tˤ/. In conclusion, the findings are consistent with those reported by As-Sammer (2015) and Salman (2020) that IA typically mapped GB consonants onto their closest IA phonemes, with the exception of cases that can be explained by the availability of a direct counterpart in IA or influence of the surrounding sounds. As for studies on the adaptation of English loanwords in other Arabic dialects, though agreeing with Aloufi (2016) on the major tendency to retain the features of the sounds in the source language, the IA findings differ due to the differences between IA and UHA consonant inventories with IA containing such consonants as /v/, /p/, /ʧ/, which are all absent in UHA.

6. Conclusion

This study aimed to investigate the consonant adaption of English loanwords in IA. In particular, the research sought to identify and characterize the consonant adaption patterns involved in the nativization of English loanwords by IA native speakers. The findings reveal that the output forms tend to retain as many characteristics of the GB input consonant as feasible.Further findings indicate that consonant features are maintained by either mapping GB input consonants to their direct IA counterparts or by replacing them with their closest IA match. Thus, the 17 GB consonants /b, f, v, h, d, m, w, n, g, z, θ, ð, ʃ, ʧ, dʒ, r, j/, which are available in IA, are typically mapped faithfully to their IA counterparts. In contrast, the two GB consonants /ʒ, ŋ/, which do not have a direct parallel in IA, are typically substituted with their closest equivalent in IA.The remaining five consonants /p, t, k, s, l/ which all have a direct counterpart in IA exhibit two different behavior patterns when integrated into IA. The consonants /t, k, s, l/ typically map directly to their IA equivalents IA /t, k, s, l/ , and would occasionally undergo substitution with their closest, typically emphatic or voiced, IA counterparts /tˤ, g, sˤ, z, ɬ/ under the influence of the surrounding back vowels or emphatic/voiced consonants. The two remaining consonant sounds the GB /p/ and the GB allophone /ɬ/ while occasionally mapping directly to their direct IA counterparts /p, ɬ/, they typically undergo substitution with their closest IA equivalents /b/ and /l/ due to these being the more common bilabial and lateral versions in standard Arabic making them the primary such consonants in IA. The current investigation has produced a number of important contributions to both the phonology of IA loanwords and the phonology of loanwords more generally. To begin with, the research has filled a gap in our understanding of the phonology of IA loanwords, providing the first account of this type of consonant adaptation based on a systematic quantitative content analysis of the entire accessible population (346 established loanwords). In addition, much-needed documentation of the IA dialect has been supplied as a result of this work. The approach that was taken in this study to collect primary and secondary data, as well as to confirm the pronunciation of loanwords and to make a careful selection of all established loanwords that are accessible to IA speakers, lends credence to the quality of the loan corpus that was collected for the present study. This study not only offers a description of a dialect that is continually developing, but it also offers the potential to be used in investigating various aspects of IA.

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