

Morphophonemics of Loanwords in Translation

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Abstract. A natural by-product of translation is the adoption of technical, scientific and culture specific terms for which ready-made equivalents are either unavailable or unpopular. The infiltration of loanwords into standard Arabic is a landmark of the flexibility of Arabic morphology. Yet, the methods of analyzing assimilated (i. e., Arabicized) loanwords often assumed an impressionistic arbitrary nature. The current study attempts to linguistically diagnose and provide a typology for classifying any systematic phonological and morphological changes while also accounting for anomalies. The study adopts a comparative morphophonemic approach to SL/TL forms in view of lexical etymology and the methodology of classical philology and modern linguistics.

Introduction

"A pure language is a poor language."

A natural by-product of translation is the adoption of technical, scientific and culture-specific terms for which readymade equivalents are either unavailable or unpopular. The process whereby a particular language incorporates in its vocabulary words from another language is technically designated by such terms as "borrowing", "loaning" or "adoption", though the latter is usually the case [1].

The study analyzes a corpus of loanwords in Arabic with the aim of investigating the phonological and morphological adaptations that are applied to the incoming lexical items. The term 'adaptation', as Holden explains, refers to the process in the recipient language of altering the phonological (and at times the morphological) make up of the loanword [2]. 'Adoption', on the other hand, is a term that describes the assimilation into the recipient language of loan-words while preserving their original form and pronunciation as per the donor language [3]. In Arabic, some loanwords are fully naturalized and thus become the roots for further derivations. Others, however, remain foreign or partially translated.

1. The concept of 'Arabicization' and the status of loanwords

Arabicization is a process whereby foreign words are incorporated into the language usually with phonological or morphological modifications so as to be

congruent with Arabic phonological and morphological paradigms, hence the term 'analogical Arabicization'. Yet, whereas Sibawayh (author of *al-Kitab*) and al-Jawaliqi (author of *al-Mu'arrab*) recognize all foreign vocabulary used by the Arabs however distant from Arabic molds some of it might be, al-Hariri and al-Zamakhshari advocated that loan-words which violate Arabic patterns degenerate the language [1]. Al-Hariri, for example, includes in his treatise on solecism a number of borrowings that are in breach of Arabic patterns. [1].

Table1. Non-analogical patterns of loanwords.

Non-analogical		Analogical		Native word as a mold
Loanform	Pattern	Loanword	Pattern	
هاون	فاعِل	هاوون	فاعول	فاروق
نستور	فَعول	نستور	فَعول	'jester' بهلول
سرداب	فَعَلل	سرداب	فَعول	'garment' سربال

With regard to methodology, Eid propounds that Arabicization is, by and large, sanctioned by common usage and does not follow any rigid analogical rules. While early philologists were busy at work in their attempt to lay the canons for the process of Arabicizations by describing the already-assimilated words, their ultimate goal was to formulate rules that were in line with Arabic morphological patterns. Such rules were, however, vulnerable to exceptions [4]. This could be accounted for by the fact that their data was in itself inconsistent and marred with anomalies. They were simply applying rules of Classical Arabic morphology on foreign lexical items that have their own rules in their source language(s). Important in this context is Yowell Aziz's view on the application of ancient methods of transliteration: "... the ancient Arabic writer was not always consistent in his (transliteration) methods. Some of the ancient practices are no longer suitable..." [5]

In a nutshell, those who undertook the task of translating foreign books into Arabic or those who came into contact with speakers of other languages had no preset rules for Arabicizing foreign words. The transliterated form of a given loanword was, thus, in concordance with their best knowledge of its pronunciation [4]. At times, some translators were not adequately fluent in the source language, and, therefore, the transliteration form of a given loanword may be the end product of a mispronunciation rather than any real phonological or morphological modifications.

2. Types of phonological and morphological changes in loanwords

This section purports to examine any systematic segmental or suprasegmental alterations in loanwords. The aim is to determine whether such changes are rule-governed in view of the canons of Arabic phonology and morphology. Changes may range from assimilation, dissimilation, metathesis, elision to doubling or replacing one or more segments of the original. In his book *al-Kitab*, Sibawayh remarks that (the

Arabs), "... often change the condition of a word from what it was in the foreign language by assimilating to Arabic those letters which are not Arabic and replacing a letter though it occurs in Arabic by another one. Furthermore, they change the vocalization and position of augmentative letters without attaining the Arabic word structure for, after all, it is a word of foreign origin whose power to attain the Arabic word structure is in their view not sufficient. Frequently, they shorten as in the 'nisbah' construction or add whereby they either attain the Arabic structure or not, as in the case of كهرمان and فيروزو سراويل, اسماعيل, ابراهيم, اجر.¹

Al-Karuri, on the other hand, ascribes all changes that take place in loanwords to one governing criterion. He defines this as the tendency by the Arabs to attain sound harmony [7].

2. 1. Sounds which exist in both the loan form and Arabic but which are yet replaced by similar sounds of the same natural class²

Sibawayh hints at such segmental changes in his book *al-Kitab*: "Often they change the combination of a word from what it was in the foreign language, by assimilating to Arabic letters such as are not Arabic, and replacing a letter, even though it be like Arabic, by another one." But, they may have a noun unchanged when its letters are like theirs [6].³

He, further, describes some irregular changes of loanword sounds that have Arabic counterparts. For instance, he cites the word سراويل (from Persian سراويل) in which the ش was replaced by a س and the Persian گنجلیز 'a ladle' which was Arabized as قفشلیل by replacing the گ by a ق, the ج (or rather ح) [8].⁴ by a ش and the final ز by a ل (by regressive assimilation under influence of the original ل).

Al-Khafaji remarks that irregular changes of loanword sounds that have indigenous counterparts are confined to the ز, س, ش, ع and the ل [9]. Yet, al-Jawaliqi cites instances of similar cases. For examples, he traces the origin of التوت to the Persian تابه (i. e., ت → ث), الحریاء to Persian خریا (i. e., ح → خ) and الطابق 'frying pan' to Persian تابه (i. e., ط → ت) [10]. Indeed, these sounds along with those mentioned by both سیبویه and الخفاجی constitute but few members of a larger group. For instance, in the course of our study we came across some frequent changes of foreign segments that could have been

¹ Note that the original Arabic text includes words like 'may, or, often, frequently' which indicate that such rules admit exceptions and anomalies and are by no means conclusive.

² I owe the division of segmental changes to Ali (1987), pp. 108-9.

³ Sibawayh, pp. 242-3. Translated by Bakalla, pp. 72-3 (with adaptation).

⁴ Eddi Sheer (p.127) cites the Persian origin as گنجلیز. Therefore, the # is not an Arabic sound.

retained intact by dint of having corresponding Arabic equivalents. Some of these segments/ sounds include the following:

A. Consonants

1. Hamza

In Persian a همزة is often replaced by other segments:

أ →	ح	أبرة ⁵	→	حباري	'bustard'
أ →	ع	أنزروت	→	عنزروت	'glue' (i.e., replaced by its velarized counterpart).
أ →	ن	أربيج	→	نربيج	'mouthpiece of a narghile'
أ →	هـ	أندام	→	ندام	'attire' (also Latin <i>endivia</i> → هندباء 'endive')
أ →	ي	زرآب	→	زرياب	'literally: gold-water (also used as a bird's name)'

Similarly, the همزة (or its equivalent) is velarized in loanwords from other languages [9, p. 4].

أ →	ع	Akhatis	(Greek)	→	عقيق 'carnelian'
2. ت					
ت →	د	تراج	'pheasant' →	درآج or (تدرج)	
		(Persian)			
ت →	ط	stabulum	(Latin)	→	إسطبل
3. ث					
ث →	ت		(Greek)	→	ثرياق 'potion'
		thiryakos			
ث →	د	kantharitis	(Greek)	→	خندريس 'vintage wine'
4. ج					
ج →	ز	كنج	(Persian)	→	كنز 'treasure'
ج →	س → ج	جراغ	(Persian)	→	سراج 'lamp (via Aramaic شراغا)
ج →	ش → ج	كفجليلز	(Persian)	→	كفشليل 'a ladle'
ج →	ص → ج	كج	(Persian)	→	جص 'plaster'
ج →	ق → ج	رامج	(Persian)	→	رامق 'a decoy'

⁵ The reader may notice that some Syriac, Hebrew and other loanwords may at and times appear in Arabic characters and at others in Latin alphabet. Our purpose is to preserve the form and, hence, the pronunciation of words as they are quoted in our sources.

5. خ

خ →	خ	خربا	(Persian) →	ء حرباء 'chameleon'
خ →	خ → ق	enchelis	(Greek) →	انقليس 'eel'
خ →	خ → ك	astikhia	(Greek) →	مصطكي 'mastic'
خ →	خ → هـ	dhrakhmi	(Greek) →	درهم
خ →	خ	خربا	(Persian) →	ء حرباء 'chameleon'

6. د

د →	ذ	odor	(Syriac) →	آذار
د →	ز	zindan	(Turkish) →	زندان
د →	ط	دلب بره	(Persian) →	'a mandolin-like instrument'
د →	ض	moda	(Italian) →	'fashion, vogue'

7. ذ

ذ →	ث	شود	(Persian) →	شيث
ذ →	د	خيد	(Persian) →	خيد

8. ر

ر →	ق	سردار	(Persian) →	'pavilion'
ر →	ل	کنده بير	(Persian) →	'huge' (قندويل or قندويل)
ر →	م	barril	(Spanish) →	برميل (i. e., 2nd r → م)
ر →	ن	رهوار	(Persian) →	'ambler' (horse)

9. ز

ز →	ج	زنگل	(Persian) →	'a little bell'
ز →	س	telezma	(Greek) →	'talisma'
ز →	ص	polizza	(Italian) →	بوليصة
ز →	ظ	boza	(Turkish) →	'ice-cream'
ز →	ع	باز	(Persian) →	'span of the outstretched arms' (a measure).

ز →	ق	آبريز	(Persian) →	'a pitcher or a jug'
ز →	ل	كفليلز	(Persian) →	'a ladle'

10. س

س →	ت	سرنوكر	(Persian) →	'despicable'
س →	ج	سرموزه	(Persian) →	'a slipper or its cover'

س →	ض	sahro	(Aramaic) →	شهر
س →	ص	mastikhia	(Greek) →	مصطكا
س →	ط	سرپوش	(Persian) →	'turban, fez' طربوش
11. ش				
ش →	ث	gadich	(Hebrew) →	'grave' جدث
ش →	ض	حرش	(Hebrew) →	'thicket or woodland' حرج
ش →	س	qachicho	(Syriac) →	'priest' قسيس
ش →	ص	شمن	(Persian) →	'idol' صنم
12. ع				
ع →	غ	to 'outo	(Syria) →	'idol or seducer' طاغوت
13. غ				
غ →	ج	أرغوان	(Persian) →	أرجوان
غ →	ق	دوغ	(Persian) →	'butter-milk' دوق
14. ف				
ف →	ب	fleghma	(Greek) →	'phlegm' بلغم
ف →	ت	foum	(Hebrew) →	ثوم
15. ك				
ك →	ج	sac	(Turkish) →	'bread tin' صاج
ك →	خ	carciofo	(Italian) →	'artichoke' خرشوف
ك →	ق	dhorakinon	(Greek) →	'peach' دراق
16. ل: there are no consistent cases of ل segmental changes:				
ل →	أ	لنكر	(Persian) →	'anchor' أنجر
ل →	ع	لشكر	(Persian) →	'army or constabulary' عسكر
ل →	ن	صلمو	(Syriac) →	'idol' صنم
17. م				
م →	ن	pamodora	(Italian) →	'tomato' بندورة
18. ن				
ن →	ب	تنبان	(Persian) →	'tight short pants' تبان

(the Persian ن was changed to م under influence of the ب, then the م was assimilated into the ب in a geminate form).

ن → ص sindhon (Greek) → سندس 'silk brocade'

ن →	ي	صيدلاني	(Persian) →	صيدلاني 'pharmacist'
ن →	ن	جانباز	(Persian) →	جانباز 'gymnastic' (alternatively pronounced جنباز)
19. هـ →	ج	rhetine	(Greek) →	راتينج 'resin' (here the final sound [ʔ] was treated on par with a [هـ]).
هـ →	ح	هران	(Persian) →	حراان 'Carrhae: ancient Mesopotamian town'
هـ →	خ	haimat	(Ethiopic) →	خيمة 'tent'
هـ →	ز	دهلة	(Persian) →	دهليز 'foyer or corridor'
هـ →	ق	بوتة	(Persian) →	بوتقة 'melting pot'
هـ →	ك	نيزة	(Persian) →	نيزك 'meteor'

A note on final |هـ| in Persian loan-words

Sibawayh remarks that Persian speakers replace final |هـ| by either a همزة or a ي in fast speech. Thus, the Arabs replace final Persian ي which contravenes with Arabic morphological restrictions on final segments by its nearest equivalent(s), viz., the ج or alternatively the ك or the ق [6].⁶ In other words, final Persian هـ which is replaced in Arabicized loanwords by a همزة or a ج or a ح or a خ or a ز or a ق or a ك (see above under 19-هـ) is originally a ي and not a هـ.

Al-Karuri, however, traces the origin of the final Persian |هـ| to Middle (Pahlavi) Persian in which the final |هـ| was pronounced a ك [7] (which could, in turn, be a Persian گ [g]; the change is, therefore, phonologically warranted). Further, he notes that the final هـ was at times replaced by a ج or a ق in order to show inflectional endings. In some cases, it was mistaken for the feminine ة /ة in Arabic and at times was replaced by ة /ة as in روزنه (Persian) → روزنة 'a hatch' [7].

Ali attributes such changes of foreign sounds that have native Arabic counterparts to "the tendency of Arabic sounds to combine in certain sequences rather than in others" [1] (i.e., phonotactic cluster sequences). With regard to the velarization of sounds like د, ت, س, د, ت and the hamza by replacing them with their emphatic counterparts viz., ط, ص, ق and ع respectively, he observes that "early Arabs were keen to preserve the character of Arabic. Emphatic sounds, being among the salient features of Arabic must thus have been felt to be more capable of embodying this

⁶ Sibawayh cites the Persian loanword كوسق 'having incomplete teeth' and قريق or قريق 'store or tavern'.

distinction rather than the non-emphatic which are common to most languages" [1]. In other words, whether the Arabs consciously or unconsciously velarized the ت, د, س and the ك, their aim was to exploit the phonological potentials of the language in order to give loanwords an Arabic characteristic [11].

B. Vowels

The earliest reference made with regard to the change of vocalization while Arabicizing loan-words is to be found in the book of Sibawayh, "Further, they change the vocalization as in زُور and آشور which are rendered as زُور 'falsehood' and آشوب 'mixture'" [6].

B.1. Short vowels

Here, we will use Arabic approximants to represent foreign vowels for reasons of uniformity.

1. فتحة |a| (or its near equivalent):

1. فتحة |a| → ألف |a:| bus (English) → باص (instead of the possible form بص)

1.2 فتحة |a| → ضمة |u| khabast (Ethiopic) → خَبِز (bread)

1.3 فتحة |a| → كسرة |i| cambiale (Italian) → كِمْبِيَالَة 'bill of exchange'

2. ضمة |u| (or its near-equivalent):

2.1 ضمة |u| → فتحة |a| Gaborouto (Syriac) → جَبْرُوت 'omnipotence'

2.2 ضمة |u| → كسرة |i| ovrizon (Greek) → اِبْرِيْز 'pure gold'

mushka (Sanskrit) → مِسْك 'musk'

2.3 ضمة |u| → وُ |?| Neon (English) → نِيُون instead of نِين

2.4 ضمة |u| → |I:| Manganon (Greek) → مَنجَلِيْق 'mangelon'

3. كسرة |i| (or its near-equivalent):

3.1 كسرة |i| → فتحة |a| enchelis (Greek) → اَنْقَلِيْس 'eel'

3.2 كسرة |i| → ضمة |u| isotoria (Greek) → اِسْطُورَة 'fable'

3.3 كسرة |i| → ألف |a:| tighnon (Greek) → طَاجِن 'frying pan'

3.4 كسرة |i| → وُ |?| kazik (Turkish) → كَازِيْق 'pole or dirty trick'

3.5 كسرة |i| → |i:| candela (Greek) → قَنْدِيْل 'lantern'

B. 2. Long vowels

1. ألف |a:| (or its near-equivalent):

1.1 ألف |a:| → فتحة |a| كَمَانْجَة (Persian) → كَمْتَجَة 'violin'

1.2 ألف |a:| → ع maccarone (Italian) → مَعْكُورَنَة

1.3 ألف |a:| → |i:| I trabzan (Turkish) → دَرَابْزِيْن 'railing or banisters'

1.4 ألف |a:| → |y| ي كاروان (Persian) → قَبْرَوَان 'caravan'

2. وُ I: :				
2.1. وُ i: →	فتحة a :	opion	(Greek)→	أفيون 'opium'
2.2. وُ i: →	و+ فتحة	i. e., the diphthong aw :		
		رونيك	(Persian)→	رَوْنِق 'splendor or beauty'
2.3. وُ I: →	ألف a: :	Odor	(Syriac) →	أذار 'March'
2.4. وُ I: →	ضممة u :	برغول	(Persian)→	برغُل 'cooked, parched and crushed wheat'
2.5. وُ I: →	→ I: :	Kopru	(Turkish)→	كوبري 'bridge'
3. يـ I: I (or its near-equivalent):				
3.1. يـ I: I →	فتحة a :	piselli	(Turkish)→	يسلى or يسلية (with a short final ألف) 'peas'
3.2. يـ I: I →	ضممة u :	pondika	(Greek) →	بندق 'hazelnut'
3.3. يـ I: I →	كسرة I :	كربان	(Persian)→	جربان 'scabbard'
3.4. يـ I: →	ألف a: :	zorifo	(Syriac) →	زرافة 'a giraffe'
3.5. يـ i: →	وُ u: :	hairtikos	(Greek) →	هرطوقي 'heretic'

2.2. Sounds that do not constitute part of the Arabic phonological system

Such sounds are often replaced by their nearest homorganic equivalents. Sibawayh notes that "... the Arabs assimilate (foreign) letters to Arabic letters... Thus, Persian |g| is changed into either a ج or a ق or a ك as in جُرْبِز or قُرْبِز or كُرْبِيق, respectively. Similarly, they replace the |p| by a ف as in فرند or a ب as in بيرند..." [6].

In like manner, al-Jawaliqi remarks that the Arabs "often change loan-words ... by substituting foreign phonemes by their nearest homorganic Arabic equivalents. At times, they may even replace foreign phonemes by heterogeneous (i. e., heterorganic) substitutes. It is imperative to accommodate such changes lest Arabic should be infiltrated by 'foreign' phonemes" [10].

He, further, quotes al-Jawhari on the subject and comments on the latter's use of the word تَخْلَطُ 'interfere with' in the sentence "العرب تَخْلَطُ فيما ليس من كلامها" which implies that the Arabs "interfere with the pronunciation of foreign phonemes and alter the structure of loanwords to conform with the canonical patterns of Arabic. To achieve this, they modify loanwords by adding, replacing or eliding a segment or a short vowel (i. e., a diacritical)" [10].

In *al-Muzhir*, al-Yasu'i classifies Arabic phonemic substitutes for foreign sounds into two categories:

- 1- Phonemes which regularly replace foreign sounds: These include the ك, ج, ق, ب and the ف. Such phonemes often replace sounds that have no Arabic equivalents.
2. Phonemes which are used to substitute foreign sounds on irregular basis: these include the س, ش, ع, ل, and the ز [12], though, as was discussed earlier under

2.1. some of these phonemes may replace sounds that have identical Arabic equivalents.

Nevertheless, it seems that philologists of late erroneously confined segmental changes to the above said phonemes, despite the fact that Sibawayh and al-Jawaliqi were merely citing examples rather than providing an exhaustive account of the subject. Besides, al-Jawaliqi was primarily interested in Persian loanwords in Arabic and, hence, his comments and notes were directed towards the corpus of loanwords that was at his disposal. Indeed, nowadays the subject of foreign sound substitution has become more diverse with the increase in volume of loanwords and the number of source languages. In the following we will present some examples of substituting phonemes which are lacking in the phonological system of Arabic.

A. Foreign consonants

1. |P|:

This segment constitutes an accidental gap in Arabic phonology and orthography though, as will be discussed below, a devoiced version of the |b| (i. e., |b̥|) is present in certain consonantal clusters [3].

1.1. P →	ب b :	operette	(French)→	أوبريت
1.2. P →	ف f :	spongos	(Greek) →	إسفنج

In certain cases a |P| can be replaced by both a ب and a ف in two versions of the same loanword, e. g., پرنده (Persian) → (فرند/ برند) both meaning 'a sword'. Notice the homorganic feature (labial) in both the original sound and its replacements.

2. |v|:

2.1. v →	ب b (mainly in old loanwords):		(Greek)→	إبريز 'pure gold'
	ovrizon			
2.2. v →	ج dz :	anchova	(Spanish)→	أنشوجة 'anchovis'
2.3. v →	ف f :	archives	(French)→	أرشيف
2.4. v →	و w :	varnish	(English) →	ورنيش (cf. the French 'vernis')

3. |č|:

3.1. č →	ج ʃ :	كمانجة	(Persian) →	كمنجة 'violin'
3.2. č →	ش š :	چاي	(Persian) →	شاي 'tea'
		inch	(English)→	إنش
3.3 č →	ص s :	خارجيني	(Persian) →	خارصين 'zinc'
		جك	(Persian) →	صك 'contract, document, cheque'

(Persian) → Certain loanwords may have alternative spellings as in: جوبه (Persian) → (صوبج، شوبك، شوبج، شوبق) all meaning 'a rolling pin'. The |č| may also be rendered as ش as in: سندويتش (English) → سندويتش

4. |g|:

- 4.1. |g| → ج |tʃ|: tighnon (Greek) → طاجن 'frying pan'
 4.2. |g| → غ |gh|: gas (English/ French) → غاز
 4.3. |g| → ك |k|: magoung (Armenian) → مكوك 'shuttle;
 also a weight
 measure'

In some cases, a loanword may have alternative forms as in: برگار (Persian) → (بركار / فرجار) both meaning 'compasses (geometry)'. Also notice that the |g| in sagrougo → سكرجة was replaced by both a ك and a ج within the same word.

- 4.4. |g| → ق |q|: groschen (German) → قرش 'piaster'

Al-Yasu'i claims that the Arabs used a sound similar to the |g| but was abandoned later [13]. Consequently, the ج in حصص (Persian: كجج) used to be pronounced |g|, for examples, in the dialect of Al-Hejaz as a |g| [14]; hence, the change of the ك → ج instead of a ك or a 5. [?]:

- 5.1. |ʔ| → ج |ʔ|: Montage (French) → مونتاج
 régime (French) → رجيم
 5.2. |ʔ| → |z|: زيوه (Persian) → زنيق 'mercury'

Notice that both the original sound and its Arabic equivalent are continuant, coronal, sibilant fricatives.

A note on marginal consonantal phonemes

In assimilating foreign sounds, reference is sometimes made to 'marginal phonemes', i. e., classes of sound found only in loanwords such as the |v| in the pronunciation of فيديو 'video' and فيتامين 'vitamin', the |g| in كونغرس 'congress' and the |tʃ| in إنش 'inch' or شارلز (alternatively written تشارلز) 'Charles'. But there is no good reason to treat these sounds as phonemes, whether marginal or not, of Arabic. They may best be regarded as non-Arabic insertions and hence may be pronounced with their original allophonic features, though orthographically written in the nearest Arabic alphabetical symbols. In effect, when we consider the replacement of foreign sounds by their Arabic near-equivalents we could be talking about a process of assimilation on a binary level of spelling and pronunciation or simply a phonemic change at the level of spelling but with the retention of the allophonic quality of the source language phoneme.

In the loanword تلفزيون, the |v| sound of the original 'television' almost always shows transfer, i. e., it is pronounced [v]. though written ف in Arabic [1]. Yet, the

analogical form *تلفاز*, is not likely to show such a transfer since it corresponds to a native morphological pattern in line with *سیربال* 'shirt'. This indicates that full phonological assimilation goes hand in hand with full morphological integration [1].

With regard to the [P] in loanwords, Thornberg [3] observes that the [P] occurs as an allophone of Arabic *ب* [b] in the environment of syllable -or word- final position in some borrowed lexical items such as:

helicopter	→	[hellokapter] (هليكوبتر)
captain	→	[kæptɪn] (كابتن)
express	→	[eksprɛs] (إكسبرس)

To account for such exceptional cases, with respect to the general borrowing rules that stipulates $|p| \rightarrow |b|$, she quotes Zughloul's⁷ explanation which can be cast in the following notational rule: $|b| \rightarrow |p| / [-vd]$.

In other words, the [+vd] b becomes [-vd] before another [-vd] consonant. Further, she refers to Vennemann who, "argued that the process of assimilation is a weakening process and the fact that it occurs in syllable-final position is natural due to the universal strength relations," according to which", in syllable-final position we are likely to observe processes of weakening" [3].

It is likely that Thornberg may have overlooked the fact that what she calls exceptional cases are but dialectal pronunciations of the orthographical form for the phoneme $|ب|$. $|p|$ remains a gap in Arabic proper and the occurrence of not only the $[p]$ as an allophone but also the $[ç]$, $[g]$ or even the $[v]$ in the pronunciation of Arabicized loanwords depends on:

1. Level of education: some educated Arabs may tend to imitate the original source sounds of loanwords with a feedback from his/her previous knowledge of the source language.⁸
2. Dialectal influences: some dialects may, out of sluggishness of speech, aspirate the $ب \rightarrow |b?|$ while others may adopt wholesale loanwords with a reproduction of their source sounds.

Further, it should be pointed out that one of the examples given, namely 'express' [eksprɛs] has been mistranscribed, since the actual pronunciation of the loanword of the loan form in Arabic is *إكسبرس* [eksibɾɛs] with a break in the consonantal cluster. In such an environment, the $|b|$ cannot be made [-vd] by reason of being surrounded by two [+vd] segments.

⁷ M. R. Zughloul, "Lexical Interference of English in Eastern Province Saudi Arabia," *Anthropological Linguistics* 20, quoted by Thornberg, [3, p. 52].

⁸ She acknowledges this fact but under another section.

Rather than a [-vd] allophonic version of the |b| we have, as Thornberg quite rightly observes a devoiced |b| [3]. However, Thornberg states that the devoicing occurs when the |b| is in initial position in a stressed syllable before low, mostly back vowels. Yet, the examples cited by her are either confined to certain dialects or are brand names. The latter's pronunciations are highly irregular and are not subject to a given phonological rule. Indeed the |b| in words like 'ping-pong', 'pepsi', 'tape', or 'pipe' (as cited by Thornberg) is likely to be devoiced by way of original sound transfer through imitation, though Thornberg does not deem it to be so [3].

Instead, what we have is a general assimilation rule whereby a |b| will be devoiced before [-vd] consonant, i.e., |b| → |b|/ [-vd]. this rule may optionally apply in the pronunciation of شيبس [čibs], كابتن [kæptin] and any other word with similar consonantal sequence including native Arabic words such as دبس [dibs] 'date' sirup.

Finally, Thornberg notes that "since |ŋ| is neither phonemic nor is it represented in the orthography of Arabic, it is changed to a nasal + obstruent sequence...". The articulation of the adapted form is something akin to |n|+ |k|(or |gh|) but not quite an |ŋ| [3]. She cites some examples amongst which are:

Boeing → |boʔing|
 Westinghouse → |westing^haus|
 Tang → |tæŋ^h|
 Exception to the Rule: ping pong → |bɪŋbʔŋ|

Well, it seems that Thornberg was misled by the transliterated form of the above words since in actual speech نغ / نج or even نك are all pronounced as |ŋ| or to be exact |n| + |g| regardless of the orthographical representation. Thus, for example, the word 'congress' is transliterated either as كونجرس or كونغرس but almost always pronounced [kʔŋgrɛs] or [kʔnɡrɛs]. Another equally interesting example is انجلترا or alternatively انكلترا from French 'Angleterre' [ãŋlɔter] meaning 'England'. Here, both the ج and the ك are pronounced as a |g|, yet, the |ŋ| is, to use Thornberg's term, separated into two segments: ن + ج (or ك) with, كسرة, |l| infixed after the ج (or ك). Thus, the Arabic word would read |'Ingɪlɪtarah|. Once again, the exact pronunciation of the Arabicized form is determined by education and feedback from the speaker's knowledge of the source language.

B. Assimilation of foreign vowels and diphthongs

Both Sibawayh and al-Jawaliqi make reference to the change of the vowel quality of loan-words upon their assimilation into Arabic. Thus Sibawayh states, " وغيروا " and الحركة "they (the Arabs) change the vowels" [6], while al-Jawaliqi includes with other

phonological modifications the substitution of a vowel by another as well as making a vowelized (consonant) vowelless and vice-versa [10].

In the following, it will be seen that, as with other segmental changes the quality and length of foreign vowels is determined by way of approximation rather than by any sound phonological criteria. parlement [parl ? mā] (French) → برلمان

1. [ã] →	فتحة + م am or ألف + ن a:n (i.e., spreading)	Champagne šāpa?	(French) →	شمبانيا
2. [æ] →	فتحة a :	sandwich	(English) →	سندويش
3. [ɛ] →	ـي 3	étiquette etiket	(French) →	إتيكيت
4. [é] →	الف + ن a:n (i.e. spreading)	mannequin maneké	(French) →	مانيكان
5. [ɛʔ] →	ألف a:	Batteria bʔteʔrIʔ	(Italian) →	بطارية
6. [œ]:				
6.1. [œ] →	وُ ʔ: :	docteur dʔktoer	(French) →	دكتور
6.2. [œ] →	ـي 3 :	coiffeur kwafœr	(French) →	كوافير
7. [y] →	وُ ʔ: :	jupe ʔyp	(French) →	ميني جوب (as in جوب)
8. [u] →	وُ ʔ: :	doublage dublaʔ	(French) →	دوبلاج
9. [u:] →	وُ ʔ: :	rheumatism ru:mʔtizʔm	(English) →	روماتيزم
10. [ø] →	ـي I	de luxe dølyx	(French) →	ديلوكس (notice also y → وُ ʔ:)
11. [ʔ~] →	وُ ʔ:n : إن + 'و'	coupon kupʔ~	(French) →	كوبون (notice also the u → وُ ʔ:)
12. [ʔ] →	كسرة I :	gʔlba:b	(Ethiopic) →	جلباب 'gown, dress'

Yet, according to al-Karuri, if a [ʔ] is adjacent to a bilabial, it is changed to a ضمة |u| [7]: e. g., |khʔbast| (Ethiopic) → خبز 'bread', |bʔrha:n| (Ethiopic) → برهان 'proof'.

2. 3. Stress shift

This type of change is incurred on loanwords in Arabic owing to:

a- Mispronunciations in the absence of diacritics or as a result of a transliterational error on the part of the translator, e. g., étiquette (French) → إتيكيت while according to the

French pronunciation [etiket] it should be إتيكيت. nylon (English)→ نيلون / نايلون instead of نيلن or نايالن. keramis (Greek)→ قراميد instead of قراميد. Note that in most of the above examples the stress is shifted from the first to the second syllable.

Such erroneous pronunciations which could also be the result of mistransliterating the original source word are but part of the problem of "... how to represent (foreign) pronunciation within the framework of the Arabic script. For the dictionary user who knows (the foreign language) well, no pronunciation aid would be necessary. Such a user will recognize the word or pronounce it from his knowledge of its (original) spelling. But the dictionary user who does not know (the foreign language) may wish to pronounce the loanword in a recognizable approximation of its native form... The loanword may be respelled in parentheses with the Arabic vowels and consonants that are closest to the foreign phonemes..." [15, p. 448].⁹

b- The influence of Arabic stress patterns

Arabic tends to place the primary stress on the next to the last syllable. This often results in accentuating or prolonging the stressed sound as it is summed up by Ibn Jinni in *al-Khasa'is*, "When short vowels are accentuated, they are changed to their corresponding long vowels. Thus, a فتحة is turned into an ألف, a كسرة into a يـ, and a ضمة into a و." [16], e. g.,

[a:] → |a:|ألف : لوييه (Persian) → لويياء 'bean'

[?] → |i:| : candela (Greek) → قنديل

nickel (English) → نيكل

[u] → |u:|و : Chimos (Greek) → خيموس

technology (English)/ technologic (French) → تكنولوجيا

Similarly, the stress shift to the syllable before the last accounts for the doubling of the ك in دكان 'store' (from Persian: دكان)¹⁰ and the ر in دراج 'francolin (zool)' (from Persian: دراج)[8]. Some cases of stress shift may entail (medial) segmental deletion as in قراميد 'roof tile' (from Greek: keramis) wherein the medial vowel 'a' was dropped owing to transposing the stress to the i |i| which as a result was turned to a يـ |i:| in قراميد. And in the word رستاق / رستاق 'a village and its outskirts' (from Persian: روستا) the و was deleted as a result of the stress shift.

Finally, in the word جريان 'scabbard' (from Persian: كريان) we have a case of doubling the ب and deleting the يـ.

⁹ The parentheses are mine. For more on the subject, see section 4.3. on misspelling and mispronunciation.

¹⁰ Persian according to Sheer [8, p. 65], while according to Fahmi [18, p. 176] it is Greek (dokneion).

2. 4. Segment and features addition

2.4.1. Declusterization by way of epenthesis

In order to break consonant clusters, the Arabs interpose a vowel whether initially or medially (usually after the first consonant) or by prefixing an additional syllable composed of the glottal stop ء (hamza) and a short vowel, thereby creating a new syllable of the type CVC which is permissible in Arabic. Thus, for example, the consonantal string of CCC in words like 'ice cream' and 'express' is broken into CVCC in their Arabicized counterparts إيسكريم and إكسپرس. Similarly, CC in Italian 'balcone' and French 'cadre' is broken into CVC in بلكونة and كادر.

Initial consonant clusters also undergo epenthesis either by prefixing a همزة or inserting a vowel as in the following examples:-

Klima	(Greek)	→ إقليم 'region'
spirito	(Italian)	→ إسپریتو
stade	(French)	→ إستاد 'stadium' anomalies
flourescent	(English)	→ فلورسنت
styrofoam	(English)	→ سٹایروفوم
إنكشپان	(Persian)	→ كشتبان 'thimble'

2.4.2. To show inflection, a همزة or a ج is sometimes added finally to loanwords ending in a vowel or a [h]: e. g., خربا (Persian) → حرباء 'chameleon'. راتينج (Greek) → راتينج 'resin'

Final Nominal Suffix ية:

accademia (Italian)/ akademeia (Greek) → أكاديمية. kathedra (Greek) → كاتدرائية 'cathedral' (notice the addition of the همزة in line with 2 above regarding final addition to show inflection). strategy (English) → إستراتيجية (notice the prefixation of إ in line with 1 above).

2.4.3. Relative/ adjectival ي : artois (French) → إرتوازي. amarantacées (French) → الفصيلة الأمرنتيه

2.4.4. In some loanwords from Syriac as well as other languages some segments are doubled probably to be modeled after existing morphological patterns. سنكل / سنكل (Persian) → مسجیل 'lump of clay' (it is modeled after the pattern فَعِيل, to indicate large quantities). dhorakinon (Greek) → دراق 'peach' (according to the pattern فَعَال). scala (Italian) → سفالة 'scaffold' (according to the patter فَعَالَة).

2.4.5. Miscellanea

زراب (Persian) → زرابي (singular: زربي) 'mat, carpet' (the ي was suffixed to the Persian loanword to form the plural from which the singular was derived by back formation). kastanon (Greek) → كستناء 'chestnut' (suffixing 'alif and همزة after deleting the final '-on')

zemerek (Turkish) → زمبرك 'spring' (by way of coalescent assimilation).

2.5. Deletion (elision)

Deletion is yet another morphophonemic process that is administered to loanwords. To begin with, Sibawayh remarks that, in Arabic, when two t's, i. e., تـ come in succession, one of them may optionally be deleted [6]. In other words, to cite Bakalla's notational formula [17]:

ت → Ø / # ____ ت (opt) e. g.,

تتكلّمون → تكلمون

تتذكّرون → تذكرون

Further, in his discussion of Arabicized loanwords, Sibawayh employs the word حذف 'deletion' [6] to describe one of the changes that are applied to borrowed lexical items. Al-Jawaliqi, on the other hand, uses the expression نقصان حرف [16], i. e., 'the omission of a letter' to describe more or less the same process of deleting a segment or more from the original source form. Such changes, according to al-Karmali, are attributed to the Arabs' keenness to maintain unstrained and easy pronunciation of loanwords by omitting some of their sounds/ letters [18].

In the course of our study, we have noticed that deletion may involve initial, medial or final segments or syllables and may even include the clipping of a part of a word or one member of a compound. In addition, some cases of deletion are language-specific and in effect are more regular than others.

1- Initial segment/ syllable deletion

historia (Greek) → أسطورة 'myth'

musandira (Turkish) → سندرة 'loft'

2- Medial segment/syllable deletion

chabbat (Hebrew) → سبت 'Saturday'

ounguiya (Greek) → أوقية 'ounce'

فرهودند (Persian) → فرهود 'stout boy'

3- Final segment/ syllable deletion

Fallopian (English) → Fallopio (Italian) → فالوب

نردشير (Persian) → نرد 'backgammon'

Language-specific deletion

a. Syriac

Generally speaking, final و |u:| in loanwords of a Syriac origin is omitted upon their assimilation into Arabic, e. g., كليلو → كليل 'crown, diadem'. ترعتو → ترعة 'canal'. شحرورو → شحرور 'thrush, blackbird'.

b. Greek and Latin

In like manner, final segments' syllables in loanwords of Greek or Latin origin are deleted upon their being Arabicised, e. g.,

1. Words of Greek origin

fanarion → فنار 'lighthouse'. patrikios → بطريق 'penguin'. Deletion of medial and final syllable: episcopus → أسقف 'bishop'.

2. Words of Latin origin:

canalis → قناة or قنال 'canal'. centenarium → قنطار 'kantar'. denarius → دينار 'dinar'.

3. 6. Clipping of a whole part of a word or a member of a compound

بریده دم (persian) → برید 'mail'. hydrakele (Greek)- قيلة or أدره (notice that the original loanform was dissected into two parts each of which was Arabicized individually as a full word; yet, both mean 'hernia').

Sometimes, clipping can take the form of assimilation (usually in syllable final position across word boundaries) e. g., baking powder → باکینباور [bekinbawder].

2.7. Dissimilation

When two adjacent sounds sound alike, one is altered by changing its feature value in order to preserve the contrast between otherwise homorganic or semi-homorganic segments. Sometimes, this takes the form of addition 'epenthesis' or deletion, e.g., ددبان (Persian) 'centurian' (deletion of د) باذهر (Persian) 'bezoar' (deletion of د).

2. 8. Metathesis

Arabicization may also involve metathesis, i. e., transposing phonemes or segments from one place to another.

From Persian: دار آفرین → درآفرین 'hand-rail'. زنجیر → جنزیر 'chain, track for a tank, caterpillar.. etc.'

From Hebrew: صلوات → صلوات 'prayers'; جولیات → جالوت 'proper name'

From Syriac: إسفتين → إسفنت 'flavored juice'

From Greek: Eparchia → أبرشية 'parish, bishopric'

litra → رطل 'a unit of weight of variant equivalence: in Egypt 449.28g'.

From Turkish: Eretsane → ترسانة 'arsenal' Frenlemek → فرملة 'brake'

2. 9. Compounding

Examples of compounding are few (see under 2.1). Most of such words are the result of transliterating the pronunciation of two SL components in fast speech, e. g.,

کاه رُبا (Persian)	→	کهرباء 'electricity'
Roba vecchia (Italian)	→	روبايکيا 'antiques'
زم هرير (Persian)	→	زمهرير 'bitter cold'

But we may notice a multitude of partial translations of compounds, usually in scientific register, e. g.,

acide hydro ferrique	→	حمض الأيدرو حديدك
tetrabromide	→	رباعي بروميد
and the awkward 'ideology'	→	فكرولوجيا

2. 10. Remodeling in accordance with Arabic morphological paradigms

The earliest reference made to remodeling loanwords to conform with Arabic word patterns comes from Sibawayh's *al-Kitab*: "The Arabs change those foreign words which are absolutely incongruous with their own, sometimes assimilating them into the structure of their words, and sometimes not. As for that which they assimilate into their forms (i. e., morphological patterns), there is درهم according to هجرج according to ستهب and دينار according to ديماس جوب according to فوعل and عذار فر and رستاق according to فرطاس" [6, p. 342].

Thus, according to Sibawayh, remodeling loanwords is not mandatory though they may be subject to other phonological or morphological modifications, "Often they leave a noun unchanged when its letters are like theirs, be its structure Arabic or not, as in the cases of خراسان, خرم and كرم. They may change a letter which does not exist in Arabic leaving the original Persian structure of the word intact as in أجر (from بريند) and جُر (from اكر) and جُر (from اكر) and جُر (from اكر) [6]

In short, Sibawayhi's interest was in describing and analyzing loanwords rather than prescribing any rules for their incorporation into the patterns of Arabic. To him, المعرب is a term that describes both analogical and non-analogical Arabicization [1].

Other philologists who maintained an approach similar to that of Sibawayhi include Ibn Sawaydah, al-Khafaji, Ibn Birri and al-Jawaliqi [15]. Al-Karuri remarks that Arabicized loanwords as viewed by Sibawayh and al-Jawaliqi can be classified into three categories:

- 1- Those loanwords which were subjected to segmental alterations and were analogically modified to fit into Arabic word patterns, e.g., درهم (Latin 'drachma') analogical with هجرع 'naive' دينار (Latin 'denarius') analogical with ديماس 'toilet'.
- 2- Those loanwords which were subjected to segmental alterations but, nonetheless, were not modified analogically, e. g., فرند, اجر, جريز (see the quotation by Sibawayh).
- 3- Those loanwords which were neither subjected to segmental alterations nor modified analogically, e. g., خراسان, كرم and ابراهيم.

Yet, there is no mention of the criteria for deciding whether a word is to undergo analogical modifications or else to be preserved intact according to its origin in the source language.

Other philologists such as al-Jawhari (d.1005) in *al-Muzhir* and al-Hariri (d.1122) stressed that in order to preserve the purity of the language, borrowings should be made concordant with the phonological and morphological patterns of Arabic. Otherwise, loanwords will always remain اعجمي 'foreign'. In a treatise on solecism, al-Hariri cites a number of borrowings which contravene with the Arabic patterns [1].

Table 2. Non-analogical loanwords.

Non-analogical		Analogical		Native word as a mold for analogical pattern
Loan form	Pattern	Correct loan-form	Pattern	
هاون	فاعل	هاوون	فاعول	فاروق
نستور	فعلول	نستور	فعلول	نهلون 'jester' or 'buffoon'
سرداب	فعلال	سرداب	فعلال	سريال 'garment'

Generally speaking, loanwords or their derivatives, may undergo alterations aimed at making them correspond with existing Arabic patterns.

Table 3. Remodeling of loanwords according to Arabic paradigms.

SL Loanform	Arabicized form	Corresponding pattern
فندو (Syriac)	فندان 'acre'	فعلال
Coulisses (French)	كواليس 'behind the scenes'	pluralization according to the irregular pattern of فعاليل
Doublage (French)	دبلجة	مفعلة
Gargso (Greek) or جرجشت (Persian)	جرجس 'clay used for sealing or stamping'	فعلال
Hairesis (Greek)	هرطقة 'heresy'	فعلله
Patrikios (Greek)	بطريق 'penguin'	فعليل

The process of remodeling loanwords in order to conform with Arabic word paradigms may involve vast changes in the structure of the loanword including segmental and vowel changes, metathesis, addition, elision and modification of stress-patterns. For example, the word فرملة (Italian: freno) was subjected to major changes:

1. Vowel addition: ا |فتحة| was inserted after the ف.
2. Vowel elision: the 'e' after the 'r' in the original word was deleted.
3. Vowel change: the final 'o' in 'freno' was replaced by |فتحة|.
4. Syllable addition: ل| was suffixed to the word.
5. Segmental addition: a final ة- was added to the word فرملة (verb form) to produce the instrumental noun فرملة.

It should be pointed out that the first four changes were undertaken in order to remodel the word in accordance with the Arabic quadrilateral paradigm فععلال. Fahmi remarks that though this particular word could have been Arabicized as فرينة or فريمة, the

loanword form of فرملة escapes the confusion that may result from the semantic association of فرينه with فرن 'oven' and of فريمة with فرم 'mincing'. He quotes the example of the unfortunate coinage of the word جمّاز for 'tram' which is similar in pronunciation to جمباز 'gymnastic', a thing which may justify the unpopularity of the word جمّاز in comparison with its Arabicized loanword ترام.

Remodeling may trespass to loanwords whose original pronunciations have correspondent paradigms in Arabic. The Persian word كنجلاز 'ladle' could have been Arabicized as such in analogy with the word مسمبان 'sesban', yet, the Arabic form of this word is قفشليل. Such changes are warranted on account of the fact that the Arabs may change a paradigm or forfeit another if the sound sequence of the original contravenes with the requirements of sound harmony in Arabic [7]. Subsequently, the final ز in كنجلاز was replaced by ل to correspond with the first ل (both anterior) while the ألف (a back vowel) was replaced by ا → (front vowel) to effect ease of articulation by avoiding the sudden shift from front, to back and front again.

2.11. Derivation and inflection

Some Arabicized loanwords (other than proper names) have been morphologically naturalized and in effect may undergo a process of derivation in line with Arabic derivational patterns and inflectional affixes.

1- Some loanwords are treated as common nouns and, therefore, may be prefixed with the definite article ال as in the following words which were originally borrowed from Persian:¹¹

الديباج 'silk brocade'
الياسمين 'jasmine'
الزنجبيل 'ginger'
الثلج 'bridle'

Aside from regular inflection, such words can also be nunnated when they are indefinite, thus ديباج، ليزوزا، ياسمين etc.

2- Some loanwords may be pluralized according to جمع التكسير 'broken plural', i.e., the irregular plural form plus an optional final ه [6]: e. g.,

صولجان or صولج	'scepter' →	صوالجة
كُربج	'store' →	كراجة or كرابج
جورب	'sock' →	جواربة or جوارب

¹¹ The examples are mentioned in [6, p. 19] yet without providing any etymological background information as to their source language or original forms.

Aside from the irregular plural patterns فواعل and مفاعل as exemplified by the above plural forms (plus the optional final ة), loanwords may assume other patterns which may assume some intervocalic changes as in: كابل or كايبل (English/ French: cable) → كابلات or كيبلات (by suffixing ات) or كوابل (according to the pattern فواعل).

برميل (French: baril)¹² → براميل (according to the pattern فعايل)
شهر (Syriac: شهرو) → أشهر (according to the pattern أفعل)

3- An Arabicized word may be suffixed with ياء النسبة 'relative ياء' as in:
amarantus (Latin) → الفصيلة الأمرنتية 'amaranth'
ideology (English/ideologie (French) → أيديولوجي 'ideological'
tactique (French) → تكتيكي 'tactical'

4- Sometimes a given loanword or its abstracted root serves as the basis for deriving parts of speech. Ali notes, for example, that the abstracted root قنن from قانون (Greek: kanon) has yielded [1]

قنن 'legislate' → مقنن 'legislator'
مقنن 'formed in accordance with the law' → قانوني 'lawful'
تقنين 'legislation' → قوانين 'laws'

Finally, from the Turkish 'manovara' [19]¹³, Arabic has the noun مناورة and the verb يناور 'to manoeuvre' which is a good example of an ill-conceived Arabicized word. The "م" in مناورة was mistakenly thought to be the nominal م as, for example, in مجابهة 'confrontation' from جابه and, accordingly, it was dropped from the verb form.

Conclusion

The corpus of data analyzed in this study reveals two types of loanword modifications. The first type concerns those modifications which are sanctioned by Arabic phonotactics and morphological paradigms. Despite some anomalies most of the morohophonemic adaptations are fairly regular and consistent. Yet there are other examples of loanwords that were changed for no reason other than to give a flavor of Arabic sounds and morphological patterns.

While this study has attempted to classify loanwords according to etymology and define the criteria for morphophonemic changes, yet many issues remain unresolved and call for more extensive analysis. For instance, subsequent studies could tackle the status of Arabic words borrowed or assimilated into other languages. A comparison can,

¹² Abdullaheem [19, p. 22] traces its origin back to Spanish: barril.

¹³ It is of questionable etymology; it could be from French 'manoeuvre' or Latin 'manuopera'. Yet, being a relatively recent lexical entry and in view of the proximity in pronunciation with 'manovara', it is most likely of a Turkish origin.

therefore, be drawn between types of changes of loanwords in both Arabic as well as foreign languages. Further, a more thorough and precise etymological analysis is needed to account for anomalies. Finally, comparative lexicographers can compile dictionaries that list loanwords with their original SL form and TL assimilated version.

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التغيرات الصوتية والتركيبية للكلمات المستعارة

جمال القناعي

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ملخص البحث. إن استعارة الألفاظ الأجنبية تعد عملية طبيعية أثناء ترجمة النصوص إلى لغة قد تمتلك مقابلات مباشرة للمصطلحات الفنية والعلمية والألفاظ التي تحمل خصوصية ثقافية في اللغة الأصل. ولقد اتسمت عملية تحليل الألفاظ المعربة بالعشوائية في غياب منهج لغوي واضح. ولذلك فإن هذه الدراسة تهدف إلى تشخيص أنواع المتغيرات الصوتية والتركيبية للكلمات المستعارة إلى ما يلي: ١ - استبدال السواكن وحروف العلة الأجنبية المماثلة لحروف وأصوات عربية؛ ٢ - استبدال السواكن وحروف العلة الأجنبية غير الموجودة في اللغة العربية؛ ٣ - التصحيف والقلب؛ ٤ - نقل النبر؛ ٥ - الإضافة والحرف؛ ٦ - إعادة صياغة قالب الكلمة وفقاً للأوزان العربية. كما تتطرق الدراسة للحالات الاستثنائية وذلك في إطار منهج لغوي يعتمد تاريخ إنشاء الكلمات في ضوء علم اللغويات والمعاجم.