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1 Introduction

In recent years, loanword phonology has attracted continuously growing attention as an area able to shed additional light on universal phonological patterns. The contexts and processes of loanword adaptation present a dynamic interaction between two distinct systems allowing for different theoretical interpretations (Paradis, 1996). Optimality Theory (Prince and Smolensky, 1993) has been suggested as a possible framework to analyze these processes (Yip, 1993; Katayama, 1998; Jacobs and Gussenhoven, 2000). The fact that OT recognizes the difference between languages as a difference in the ranking of the same universal constraints could explain the changes that loanwords may or may not suffer depending on the compatibility of the donor and the recipient languages' inventories and structures. The strategies of loanword adaptation through oral process in a contact situation, such as the one between Spanish and colloquial Arabic in North Africa, consist in the recipient language harmonizing the borrowed item to satisfy its own constraint hierarchy. Because loanwords already show higher lexical contrast with the rest of the words in the recipient language, given that they satisfy the source language's faithfulness constraints, then we might expect that markedness constraints can easily dominate the faithfulness ones in the process of adaptation since by belonging to another grammar these words already show higher level of lexical contrast with the rest of the recipient grammar.

The extensive domains of use of Spanish and its intense contact with many languages have led to the assimilation of hundreds of Spanish loanwords into several other varieties. Indeed, there are several studies of Spanish loanwords in English, other Iberian languages, and indigenous Latin American languages (Rodríguez González, 1996; Stewart, 1999; Field, 2002). In the case of Arabic, however, there is a very limited body of research covering its contact with Spanish. While historically, the presence of Arabic loanwords in Spanish attracted more attention, Spanish loanwords in Moroccan Arabic have been rarely addressed (Ben Aziz, 1950; Heath, 1989; Nissabouri, 1997). To fill in this lack and contribute to a better understanding of the results of the contact between Spanish and Arabic, I have compiled a corpus of Spanish loanwords in Northern Moroccan Arabic in order

to analyze the major processes of their adaptation. Using the framework of Optimality Theory, I argue that when adapting Spanish words Northern Moroccan Arabic tends to rank the markedness constraints above the faithfulness ones (Prince and Smolensky, 1993; Smolensky, 1996).

2 Spanish Loanwords in Northern Moroccan Arabic

The contact between Spanish and Northern Moroccan Arabic has been brought about by several sociohistorical factors including the resettlement of refugees from the Iberian Peninsula during the Spanish Inquisition, Spanish immigration to the region during the 19th and early 20th century, the establishment of the Spanish Protectorate over Northern Morocco between 1912 and 1956, and finally the nearness of this area to Spain and its two North African cities, Ceuta and Melilla, with all its implications. Today, the results of this contact are reflected in varying degrees of competence in Spanish by many northern Moroccans, frequent code-switching between Arabic and Spanish, and, as it is usually the case in most contact situations, lexical borrowing. Predominantly, the process of borrowing is unidirectional, from Spanish into Arabic, given the higher prestige enjoyed by Spanish. In addition, many semantic fields were directly impacted by Spanish life-styles during and after the Protectorate period and as a result new lexico-semantic items were introduced in Northern Moroccan Arabic. Finally, Arabic speakers in this area often develop high competence in Spanish without Spanish speakers doing the same in Arabic even in the case of those settled in Northern Morocco.

Among the earliest works that dealt with loanwords in Northern Moroccan Arabic is the one carried out by Ben Aziz in 1955. The glossary he put together was the first effort to draw attention to the impact Spanish was having on Northern Moroccan Arabic while the region was still under Spanish domination. Much later, in his comprehensive study on code-switching and borrowing in Moroccan Arabic, Heath (1989) analyzed the mechanism of borrowing into this variety both from Classical Arabic and from European languages. He dedicated a brief section to the Arabic of the northern city of Tetouan and analyzed the elements of Spanish loanwords present in it. His results showed that pharyngealization in Moroccan Arabic plays a key role in the adaptation of French and Spanish words given that it strongly affects the vowels and as a consequence the syllable structure as a whole (Heath 1989:74). More recently additional research has been carried out on Northern Moroccan Arabic and the loanwords that it borrowed from Spanish. El Harrak (1998) conducted a study specifically focused on Spanish maritime loanwords in the Arabic of three cities in Northwestern Morocco: Tangier,

Arcila and Larache. Her results confirm that this particular semantic field has been the one that received more loanwords than any other. Also, in his survey of the features of Spanish spoken in Northern Morocco, Ghailani (1997) presented a comprehensive glossary of Spanish loanwords classified under the corresponding semantic fields.

Overall, beyond lexical borrowing there is little influence of Spanish in Northern Moroccan Arabic. As for the influence of Moroccan Arabic in Spanish spoken in this area, I have been able to identify very few instances and in their majority they consist of inserted discourse markers rather than stable cases of transference.

3 Data

For this paper, a corpus of 1,933 Spanish loanwords in Northern Moroccan Arabic was analyzed. Taking Ben Aziz's (1950) glossary as the starting point, I added to it new loanwords included by Ghailani (1997) and El Harak (1998) in addition to the ones I directly collected during my fieldwork in the region in 2002 and 2003. Many of these words refer to new technologies and modernized aspects of life in postcolonial Morocco during the last fifty years. It has to be noted that the popularity and the impact of Spanish mass media in the area over the last decades has sustained this process of lexical borrowing.

4 Phonological Adaptation of Spanish Loanwords

At the segmental and suprasegmental levels, processes of phonological loanword adaptation include different strategies of preservation, epenthesis, and deletion. Although one of the most reoccurring strategies is vowel epenthesis, for example in the case of Japanese, it is not the case in Northern Moroccan Arabic where usually vowels are shortened or even deleted in favor of complex clusters. For this paper, I will focus on four major processes of Spanish loanword adaptation in Northern Moroccan Arabic. At the segmental level, I will look at the adaptation of the unvoiced bilabial stop, a sound that is absent in Arabic phonology, and the changes in the height of the vocalic sounds, namely vowel raising. At the suprasegmental level, I will analyze the different strategies of adaptation of vowel-initial Spanish words, a case that is particularly interesting given that Northern Moroccan Arabic does not possess vowel-initial words as such. And finally, I will briefly discuss some changes at the prosodic level regarding word-stress maintenance and shift.

4.1 Segmental Changes

Moroccan Arabic has a simple vowel inventory that comprises three sounds: /a/, /i/, and /u/. Spanish, on the other hand, possesses two more vocalic phonemes: /e/ and /o/. Phonetically speaking, however, these two latter sounds can be produced in Moroccan Arabic as [i], and [u] respectively (Heath 1997:208). This happens as a result of the process of pharyngealization which for phonotactic reasons dictates that if a consonantal sound is not pharyngealized then the flanking vowels have to be raised (e > i (1), o > u (2)) while when the consonants are pharyngealized then /i/ and /u/ have to be lowered (Heath 1989:75) as in (3) and (4). This phenomenon allows for phonetic variation especially in speakers of Spanish as a foreign language more than in cases of borrowing where one of the two options, pharyngealized or not each with its own implications for the neighboring vowels, usually become stabilized.

(1)	a. material	/matirial/	(material)
	b. seguro	/siguru/	(sure)
	c. premio	/primio/	(prize)
(2)	a. monja	/munxa/	(nun)
	b. granito	/granitu/	(granite)
	c. cocina	/kuzina/	(kitchen)
(3)	a. capitán	/capetan/	(captain)
	b. clavija	/clabexa/	(pin)
	c. garita	/gareta/	(sentry box)
(4)	a. pintura	/pintora/	(painting)
	b. fruta	/frota/	(fruit)
	c. tribuna	/tribona/	(tribune)

As for the unvoiced bilabial stop, it is usually reproduced in Arabic dialects as /b/ which to a certain extent confirms the claim made within the Theory of Constraints and Repair Strategies (Paradis, 1996) that when a segment is not preserved, its closest phoneme would be adapted. However, /p/ is systematically preserved in Spanish loanwords in Northern Moroccan Arabic (5). And more interestingly is the fact that this strategy, the preservation of /p/, has in some instances led to the presence of this segment where the Spanish word has /b/ (6), suggesting a possible phonological change in

Moroccan Arabic produced by the contact conditions mentioned above. However, since it has not been extended to any non-European words, it makes it still debatable whether it is not just a case of hypercorrection. Yet, the fact that bilingual speakers are able to produce the right forms in (6) when speaking Spanish but still use the Moroccan form when interacting with monolingual Arabic speakers who themselves are able to produce the /p/ sound, unlike monolingual speakers of some other dialects of Arabic, confirms the penetration of this sound in the phonological or at least the phonetic inventory of Northern Moroccan Arabic.

- (5)
- | | | |
|--------------|-------------|--------------|
| a. triple | /tripli/ | (triple) |
| b. portero | /portero/ | (goalkeeper) |
| c. panadería | /panaderia/ | (bakery) |
- (6)
- | | | |
|--------------|-------------|-------------|
| a. bocadillo | /pukadio/ | (sandwich) |
| b. bolígrafo | /poligrafo/ | (pen) |
| c. batido | /patido/ | (milkshake) |

4.2 Suprasegmental Changes: Word-initial Syllable Changes

As a result of the processes of reduction and centralization of the Classical Arabic vowels, consonant clusters are very common in Moroccan Arabic. Kiparsky (2002) considers Moroccan Arabic to be a C- dialect opposed to the other two types CV- and VC- dialects, since it has a tendency towards complex clusters. In fact, Arabic in general does not allow onset-less syllables and Northern Moroccan Arabic favors complex onsets although it does allow simple onsets, a typological feature that is attested for in other languages (Féry and van de Vijver, 2003:6). Since in Spanish there are onset-less word-initial syllables with or without a coda giving place to words such as /a.mi.go/ or /es.kue.la/, this type of words represents particular incongruence with the Moroccan Arabic word-initial syllable template. In the corpus there is a total of 283 vowel-initial words including those that are spelled with initial silent h- in Spanish. Significantly, this number represents 15% of all Spanish loanwords in Moroccan Arabic. In order to preserve syllabic well-formedness, Moroccan Arabic applies different strategies to assimilate these words although there are also a few instances of non-adaptation. The variation in the adaptation strategies calls for the application of a constraint-based theory rather than a rule-based one given the flexibility guaranteed by the first.

4.2.1 Epenthesis of /l-/ with or without Initial Vowel Deletion

l- represents the reduction of the definite Arabic article *al-* agglutinated at the beginning of the word (Heath, 1997:208; Sayahi, 2003). In some cases, it is epenthesized at the initial of onset-less Spanish loanwords. This happens when the word-initial vowel stands as an independent syllable in Spanish and if deleted the loanword will violate the faithfulness constraint without fully satisfying the Moroccan Arabic preference for complex onsets since a CV cluster is left. As a result, the first vowel is deleted, violating the MAXIMALITY-OI constraint, but *l-* is epenthesized thus fulfilling the higher-ranked ONS constraint and more importantly maintaining the overall well-formedness of the whole syllabic structure.

(7)

a. equipo	/lkipo/	(team)
b. abono	/lbono/	(fertilizer)
c. oficina	/lfisina/	(office)

However, the vowel is not deleted if the coda of the first syllable is a nasal that precedes a voiceless obstruent onset in the second syllable. If the vowel is elided, these two consonants will form the onset of the now initial syllable. This is not tolerated by Moroccan Arabic and is in fact attested for typologically as claimed by Kager (1999:61) who argues that a constraint prohibiting a nasal and voiceless obstruent sequence is “grounded in articulatory mechanism” present in several languages.

(8) *ONS/NAS-OBST

No nasal plus obstruent sequence in onset.

(9)

a. enchufe	/linčufi/	(plug)
b. ancla	/lankla/	(anchor)
c. antenna	/lintina/	(antenna)
d. empalme	/linplame/	(juncture)

(10)

/enchufe/	ONS	*ONS/NAS-OBST	MAX-IO	DEP-OI
a. inčufi	*!		*	
b. nčufi		*!	*	
c. čufi			*!	
d. linčufi				*

Finally, in cases of disyllabic words *l-* epenthesis is allowed without initial vowel deletion, else we will have either only one consonant (11b) or a single VC syllable where both markedness and faithfulness constraints are violated (12b). *l-* epenthesis in this case satisfies the ONS constraint although without producing a complex onset. Input faithfulness governs epenthesis of yet another letter or the elimination of a whole syllable in a disyllabic word. Lexical optimization would select (12c) since it does not violate ONS and reproduces the input more faithfully.

(11)

a. eje	/lexe/	(axis)
b. as	/las/	(ace)
c. arte	/larte/	(art)
e. hotel	/lotel/	(hotel)

(12)

/exe/	ONS	MAX-IO	DEP-OI
a. e.xe	*!		
b. xe		*!	
c. le.xe			*

Although epenthesis of *l-* does violate morphology-prosody alignment described by McCarthy and Prince (1993) to be a typological feature, it is not relevant in this case since we are dealing with loanwords where reference to the original morphological and even prosodic version in the donor language is often lost.

4.2.2 Word-initial Vowel Deletion

The ability of Moroccan Arabic to geminate initial consonants facilitates vowel deletion and the production of initial complex clusters (Heath, 1987, 1989; Kiparsky, 2002; Watson, 2002; Dell and Elmedlaoui, 2003). Part of the resyllabification of the word, the coda in the first syllable of the Spanish word becomes the first consonant in the onset cluster now word-initial in the Moroccan Arabic word (13). According to Kager (1999:106): “epenthesis is excluded whenever it yields no gains in term of structural well-formedness” which is the case for (14c).

(13)

a. espia	/spia/	(spy)
b. electrodo	/lektrodo/	(electrode)
c. iglesia	/glisia/	(church)
d. estufa	/stufa/	(stove)

(14)

/espia/	ONS	DEP-OI	MAX-IO
a. es.pi.a	*!		
σ b. spi.a			*
c. lespia		*!	

4.2.3 Word-initial Syllable Truncation

In addition to the *l*-epenthesis and deletion of initial vowels, a word-initial onset-less syllable may also be deleted especially in multi-syllabic loanwords. Following constraint (8), if the coda in the initial syllable is a nasal the whole syllable is deleted since if only the nucleus is deleted then the word will start with a complex cluster that has a nasal as its first consonant. The other solution would be *l*-epenthesis but since it violates the DEP-OI constraint without producing a complex onset, Moroccan Arabic opts for initial syllable deletion which is the optimal solution in this case.

(15)

a. enfermero	'frmiro'	(nurse)
b. instalación	'stalasion'	(installation)
c. entrenador	'trenador'	(trainer)
d. ambulancia	'bolansia'	(ambulance)

(16)

/entrenador/	*Ons/Nas-Obst	ONS	DEP-OI	MAX-IO
a. entrenador		*!		
b. ntrenador	*!			*
σ c. trenador				*
d. lentrenador			*!	
e. lntrenador			*!	*

4.3 Prosodic changes: stress maintenance and shift

Like other Arabic dialects, Moroccan Arabic is a stress-timed language where according to Watson (2002:9) "a combination of an iambic stress sys-

tem together with a tendency to delete unstressed vowels leads to word-initial consonant clusters". As a result, word-stress usually falls on the penultimate syllable unless the final one is heavy. Given the tendency of Spanish towards open syllables, the fact that it lacks CVV type syllables, and that in the case of CVC syllables the vowel is usually reduced to a schwa in loanwords in Moroccan Arabic, stress on these words always shifts to the penultimate syllable if it is not the one originally stressed in Spanish. (17).

(17)

pin.tú.ra	/pintúra/	(painting)
pin.tór	/pin.tor/	(painter)
téc.ni.ca	/tik.ni.ka/	(technique)
sá.ba.na	/sa.bá.na/	(sheet)
cor.dón	/kór.dón/	(shoelace)

5 Summary

In this paper, I have shown that Spanish loanwords in Moroccan Arabic present varying types of phonological adaptation processes both at the segmental and suprasegmental levels. An important conclusion is the fact that vowel epenthesis, although more common within loan phonology in general, is not present in the case of Spanish words in Moroccan Arabic. On the contrary, given the nature of Moroccan Arabic syllabic structure vowels may be deleted especially word-initially. In addition, there are other adaptation processes that include prosodic changes such as resyllabification and word-stress shift. Although there are instances where it is difficult to make the exact prediction or interpretation, it is important to note that this contact situation as a whole, and loanwords in particular, have triggered structural changes within Northern Moroccan Arabic, such as the borrowing of unvoiced bilabial stop, that go beyond the lexico-semantic level.

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