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CHAPTER 5

The complicated timeline of Spanish

Implications for lexical processing

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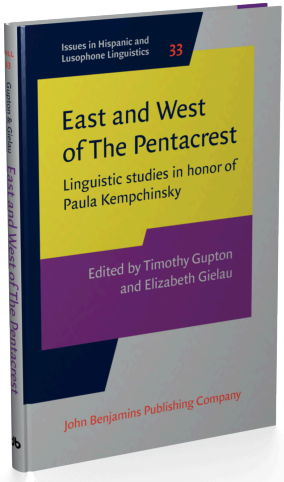

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CHAPTER 5

The complicated timeline of Spanish

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Sound change is a dynamic process that shapes the phonology and lexicon of a language across a language's history. The existence of loanwords and *cultismos* (*learned forms*) complicate this process. Not all words are equally subjected to sound change. In Spanish, *cultismos* and loanwords often exhibit characteristics that differ from *derived* words (words that underwent regular phonological sound changes in Spanish). In either instance, the resulting word differs from other items in the Spanish lexicon. We discuss the significance of loanwords and *cultismos* for the Spanish lexicon. We suggest that although they result in less regularity across the lexicon, there are also consistent patterns that arise. Through these 'regular irregularities,' speakers may build associations between lexical forms and possibly access them to facilitate lexical activation.

Keywords: lexicon, phonological change, lexical borrowing, doublets

Preamble

Paula spoke often (and warmly) about her graduate student years at UCLA and how she was, at an early point, considering phonology as her area of specialization. Part of this initial desire came from her extensive study of historical linguistics with Professor Carlos Otero. In this contribution, we pay tribute to Paula's lesser-known side-interest of historical linguistics. Paula's 'historical' side is perhaps less well-known than her syntactic side, but it is nonetheless an important part of her work at the University of Iowa. Paula regularly taught the History of the Spanish Language to advanced undergraduates, as well as literature and linguistics graduate students eager to learn more about how Spanish evolved.

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1. Introduction

Historical linguistics has largely focused on sound change, particularly regular change in which a phonological shift has occurred across all applicable items of the lexicon (Durie & Ross, 1996). With regard to the history of the Spanish language, historical linguists have described the series of sound shifts through which Latin word forms evolved into modern Spanish lexical items as well as two additional sources for modern Spanish word forms, besides regular sound change. The first is the protected status of *cultismos*, also referred to as *learnèd forms*, which did not undergo the same sound changes as other items due to their context of use or because they were borrowed directly from Latin into Spanish after sound changes had already occurred. The second is the borrowing of lexical items from other languages. Both *cultismos* and loanwords have long been acknowledged as alternatives to the regular phonological evolution from Latin to modern Spanish. In this squib, we assume a novel approach by examining the effect of these items on the resulting modern Spanish lexicon. Our goal is to understand not only how these protected forms and borrowings contribute to the lexicon as an inventory of words, but how they shape and contribute to the lexicon as an inventory of phonological forms. In particular, we are interested in the possible statistical patterns that might arise between loanwords' phonological forms and semantic content and their potential impacts on lexical processing. We also probe the implications of a lexical system in which borrowed or protected forms (such as *fábula* 'fable') exist alongside popular items (such as *habla* 'speak') with similar though non-identical forms. We suggest the existence of a system of statistical regularities between the forms of these protected or borrowed forms and items in the lexicon that have undergone sound change. Finally, we propose that Spanish speakers may be able to track these statistical regularities implicitly and that this statistical knowledge could facilitate word recognition.

This approach links historical and psycholinguistic approaches to Spanish linguistics by examining how lexical and phonological processes in the history of Spanish result in statistical regularities that may influence lexical processing among modern Spanish speakers.

2. Irregularities abound

2.1 Cultismos

Cultismos are Latin forms that were not subject to the same phonological evolutionary processes as other lexical items due to their typical use in written rather than spoken contexts (Candau de Cevallos, 1985; Klein-Andreu, 2010; Menéndez Pidal, 1950, 1977; Penny, 2002). When spoken, these terms pertained to higher registers than their popular counterparts (Lleal, 1990). Furthermore, they typically belonged to certain semantic domains, such as the church, sciences, administration and law (Lapesa & Menéndez Pidal, 1981). While some words exist only in a popular or protected form, there are also numerous doublets that arise from the existence of both forms that share a common Latin origin (Lapesa & Menéndez Pidal, 1981; Menéndez Pidal 1950, 1977; Resnick & Hammond, 2011). Table 1 provides examples of common *cultismos* in Spanish:

Table 1. Common *cultismos*

	Latin	Cultismo	Popular form
Cultismos only	VIRGINE	virgen 'virgin'	*verzen
	ANGELUS	angel 'angel'	*año
Doublets	OPERARI	operar 'operate'	obrar 'act/work'
	INTEGRUM	íntegro 'integral'	entero 'whole'
	LEGALIS	legal 'legal'	leal 'loyal'
	CATHEDRA	cátedra 'professorship'	cadera 'hip'
	STRICTU	estricto 'strict'	estrecho 'narrow'
	LACTE	lact(ar) 'lactate'	leche 'milk'

Some authors also use the term *cultismo* to refer to Latin items that were later borrowed into Spanish. Latin borrowings were popularized in the sixteenth and seventeenth centuries, particularly by the poet Góngora and the stylistic movement *Culteranismo* (Candau de Cevallos, 1985; Lapesa & Menéndez Pidal, 1981). While some of these items had already been attested earlier in spoken Spanish, the use of these terms by Góngora and his contemporaries caused them to be used more

frequently and in a greater range of registers. Examples include *cautela* 'caution', *prodigio* 'prodigy', *frustrar* 'frustrate', *naufragio* 'shipwreck' and *adolescente* 'adolescent' (Candau de Cevallos, 1985; Lapesa & Menéndez Pidal, 1981; Penny, 2002).

Whether Latin forms were protected from sound change or borrowed directly from Latin into Spanish after sound changes had occurred, they did not exemplify the regular phonological changes of Spanish. In the doublet *leche/lactar* ('milk/lactate'), the popular form underwent a series of phonological changes (Klein-Andreu, 2010; Lleal, 1990; Resnick & Hammond, 2011). These are described in Table 2:

Table 2. Derivation of [lak.te] > [le.t͡ʃe]*

	Latin form	**[lak.te]**
1.	Lenition of [k]	[lax.te]
2.	Vocalization of [x] in coda position	[laj.te]
3.	Vowel raising due to adjacency to yod	[lej.te]
4.	Palatalization of [t] due to yod**	[le.t͡ʃe]
	Modern Spanish Form	**[le.t͡ʃe]**

* We use phonemic transcriptions throughout the text other than where we discuss formal derivations.

** Some analyses posit that metathesis of [t] and yod occurred prior to palatalization (Resnick & Hammond, 2011).

The word *lactar*, however, was borrowed directly from Latin into Spanish and did not undergo these changes, resulting in the doublet *lactar/leche*. Notice that the word-medial sequence /-kt-/ in the *cultismo* form corresponds to the affricate /t͡ʃ/ in the popular form. This same correspondence is present in several other doublets, such as *estricto/estrecho* 'strict/narrow', *nocturno/noche* 'nocturnal/night', and *octavo/ocho* 'eighth/eight'.

Other correspondences between popular and *cultismo* forms across doublets include items that maintain their accusative endings /-us#,-um#/ as compared to forms with word-final /-o#/: *campus/campo* 'campus/field', *ultimatum/último* 'ultimatum/last' (Bolaño e Isla, 1971; Lleal, 1990). Furthermore, popular forms are more likely to have paroxytone stress and may exist alongside a *cultismo* with proparoxytone stress: íntegro/entero /ˈin.te.gro/-/en.ˈte.ro/ 'integral/whole', *catedra/cadera* /ˈka.te.dra/-/ka.de.ra/ 'professorship/hip' (Candau de Cevallos, 1985). Thus, *cultismos* demonstrate different phonetic and phonotactic tendencies than other, prototypical Spanish word forms.

2.2 Words borrowed from other languages

In addition to words of Latin origin, the Spanish lexicon also consists of loanwords, predominantly from Arabic, English, French, Greek, Italian, Germanic languages, and languages indigenous to Central and South America, such as Nahuatl, Quechua, and Araucana/Mapudungun (Candau de Cevallos, 1985; Obediente, 2000; Penny, 2002). We focus on Arabic, Nahuatl, English, and French for the purposes of this discussion for two reasons. First is the limited scope of this squib. The second is that our argument focuses on sets of loanwords that differ in form from regular Spanish lexical items. This results when the language of origin differs from Spanish phonologically, phonotactically, or morphologically, resulting in trackable patterns. This may not be the case for all languages. The phonological similarities between Italian and Spanish, for example, may make it difficult to discover unique phonological patterns among Italian words borrowed into Spanish, because these loanwords tend to have similar forms to other items in the Spanish lexicon. Below, we demonstrate that phonological patterns do arise for loanwords from some languages, though we do not provide an exhaustive list of all extractable phonological patterns from all possible languages of origin.

Arabic

The conquest of the Iberian Peninsula in 711 resulted in the addition of approximately 4,000 Arabic terms into the Spanish lexicon, either through direct contact due to migration or indirect conduct through the exchange of cultural products (Corriente Córdoba, 2004). These terms reflected the influence of Arabic culture on Iberian populations. Loanwords from Arabic are often semantically linked to (a) the military: *alfanje, almofré, zaga* ('scimitar, 'sleeping bag', 'defense'); (b) commerce: *aduana, tarifa, almacén* ('custom/duty', 'fare', 'warehouse'); (c) science: *cenit, álgebra, almanaque;* ('zenith', 'algebra', 'almanac') or (d) agriculture: *arroz, arcaduz, algarroba* ('rice', 'channel', 'carob') (Candau de Cevallos, 1985; Klein-Andreu, 2010; Lleal, 1990). The majority of these words begin with either /#a-/ or /#al-/, the Arabic definite article (Resnick & Hammond, 2011). This distinguishes these terms from other Spanish lexical items, which tend to consist of CV syllables.

Nahuatl

Nahuatl, the language of the Aztecs, is still spoken in what is now Mexico and Central America (Resnick, 1981). Words borrowed from Nahuatl into Spanish tend to label plant and animal species indigenous to the region, for which the Spanish conquistadors had no adequate word. These include *tiza, coyote, ocelote, chocolate, guajolote, tomate, aguacate*, and *cacahuate*, ('chalk', 'coyote', 'ocelot', 'chocolate', 'turkey', 'tomato', 'avocado', 'peanut') among many others (Penny, 2002; Resnick, 1981).

The majority of these words, in their Spanish forms, end in the sequence /-te#/, corresponding to Nahuatl /-tl#/, the singular absolutive form of nouns ending in a vowel (Schwaller, 2001).

English
English borrowings into Spanish have dramatically increased since the mid-twentieth century. Borrowed words from English include *váter* 'water closet', *club* 'club', *esmoquín* 'tuxedo', *táper* 'tupperware', *poster* 'poster', and *fútbol* 'soccer' (Klein-Andreu, 2010; Obediente, 2000; Penny, 2002). Because borrowings from Romance comprise 50% of the English lexicon, many English items also have an etymological origin that can be traced back to Latin (Schepens et al., 2013). This results in doublets in which the borrowed English term and the older Spanish term share a Latin etymological origin and overlap in meaning and phonology: *poster/puesto* 'poster/post' (Latin POSITUM), *porch/pórtico* (Latin: PORTICUS), etc. While the original Latin terms contained a final vowel, the English form often does not. This is due to a phonological rule in English in which final vowels were deleted (Lass, 2006).

French
French borrowings were most common in the eighteenth century, when Spain was occupied by the Bourbons, prompting the loan of various military terms: *brigada, fusil, cadete* etc. ('brigade', 'rifle', 'cadet') (Klein-Andreu, 2010). Many other French terms from this period, as well as the nineteenth and twentieth centuries, refer to fashion, food and luxury items, demonstrating the importance of French culture in these domains: *coñac, sofá, champán, cruasán, chaqueta, boutique*, etc. ('cognac', 'sofa', 'champagne', 'croissant', 'jacket', 'boutique') Many of these words have oxytone stress. Notice that the term *boutique* and the Spanish form *bodega* 'winery' are a doublet with a common etymological origin: Latin *APOTHECA* 'repository'.

3. Regularities arise

These protected and borrowed forms at once reduce regularity across the Spanish lexicon but also foment regularity within the subset of protected and borrowed forms. Regularity is reduced by introducing structures and sounds that, while phonotactically permissible in Spanish, are less frequent than other structures (ex: word-initial /#al-/ (Arabic) or oxytone stress (French) as in the words café [ka'fe] or sofa [so'fa]). Regularities exist due to common patterns within the respective borrowings themselves. Thus, there is some predictability in the link between the form and origin of a borrowed or protected item. A native Spanish speaker is unlikely to have knowledge of a given word's etymological origin. However, below we

outline how a speaker might take advantage of the regularities of the form, origin, and meaning of loanwords.

In order to precisely calculate the predictability of these origin-form connections, it would be necessary to have comprehensive corpora from each language of origin as well as the means to determine the density of the given phonetic or phonotactic characteristic in the Spanish lexicon. For most of the origin-form connections described in this squib, this is currently not feasible, due to the lack of comprehensive loanword lists and the non-existence of phonotactic probability calculators for features such as oxytone or proparoxytone stress. However, the density of word-initial /#al-/ in Arabic is considered here as an example of statistically predictable loanword forms. A corpus of 1205 Arabic loanwords was compiled (Corriente Córdoba, 2003; Pan, 2002; Pezzi, 1995; Salgado, 1996; Sola-Solé, 1983). Of those items, 49.3% (594) began with /#a-/ and 30.7% (370) began with /#al-/. The Phonotactic Probability Calculator (Vitevich & Luce, 2004) was utilized to determine the phonotactic probability of these same structures across the Spanish lexicon. The probability of /#a-/ is 0.121, and the probability that <<l>> would be the second letter of a Spanish word is 0.034. This figure includes not only /#al-/ forms, but all forms with <<l>> in second position, such as *playa, iluminar, claro*, etc. Though we were unable to locate a tool to calculate the precise proportion of /#al-/ words in the Spanish lexicon, this probability shows that /#al-/ words must account for less than 3.4% of items in the Spanish lexicon, compared to an estimated 30.7% of Arabic loanwords. This link potentially extends to the semantic domain as well; there is some predictability between a word's origin and its semantic content, as noted in Section 2.2 above.

A third link could be drawn (indirectly) between the form of a word and its semantic content. Because a speaker may not be aware of the etymological history of most lexical items, the link between origin and word form or origin and semantic content may not exist in the individual speaker's lexicon. The third link between form and meaning, however, could develop through statistical regularities. That is to say, if /#al-/ is more statistically likely to be an Arabic loanword and also more likely to refer to be a scientific term, speakers may draw a connection between /#al-/ forms and scientific semantic content. This need not involve knowledge of the word's etymological origin, which most speakers are unlikely to know. Rather, the repeated co-activation of the form /#al-/ and scientific meanings could result in an association between the two, even in the absence of etymological knowledge. This hypothetical association merits investigation. If learners do form associations between loanwords' forms and meanings, it would reveal an important connection between the complicated history of the Spanish lexicon and lexical processing by speakers of Modern Spanish. That is, the atypical forms across the Spanish lexicon due to borrowing may not only result in greater phonological and phonotactic

diversity of Spanish word forms, but may present patterns that could be utilized to modulate lexical activation.

This possibility is best understood within a Parallel Distributed Processing model (McClelland, Rumelhart, & PDP Research Group, 1986), which models lexical processing as inhibitory and excitatory activation of simple units within a network. The connections between units within the network develop through exposure to input and are highly sensitive to statistical regularities. Word recognition is a competitive activation process; the language user utilizes phonetic input as well as other cues in the environment to increase or decrease activation of competing lexical representations. With respect to Spanish loanwords, exposure to regularities between forms such as /#al-/ and scientific terms could train the network by strengthening excitatory activations between the two. Upon hearing /#al-/, a learner might increase activation of lexical units pertaining to the sciences. This increased activation could be quite large or quite small, depending on the robustness of the regularity. Below, we outline some predictable phonological and semantic characteristics of Spanish words originating in Arabic, Nahuatl, English, and French, as well as *cultismos*. Further research is needed to determine whether each of these affects Spanish lexical processing.

Arabic

Alcalde (mayor), alfileres (pins), álgebra (algebra), algoritmo (algorithm), almacenes (warehouses), alquiler (rent), alquimia (alchemy), arroz (rice), azucena (lily), cenit (zenith), cero (zero), cifra (figure), jarabe (syrup), jazmín (jasmine), etc.

Phonological characteristics: word-initial /#a-/ or /#al-/
Semantic characteristics: agriculture, military, commerce, science

Nahuatl

Aguacate (avocado), cacahuete (peanut), cacao (cacao), chicle (gum), chocolate (chocolate), coyote (coyote), guajalote (turkey), jícara (gourd), ocelote (ocelot), petate (straw mat), sinsonte (mockingbird), tamal (tamale), tiza (chalk), tomate (tomato), etc.

Phonological characteristics: word-final /-te#/
Semantic characteristics: plants and animals indigenous to Mexico

English

Airbag (airbag), beicon (bacon), béisbol (baseball), club (club), container (container), crol (crawl), cúter (cutter), nailon (nylon), nocaut (knockout), pádel (paddle tennis), táper (Tupperware), váter (water closet), etc.

Phonological characteristics: word-final consonants
Semantic characteristics: modern cultural exports

French
Aterrizar (to land), boutique (boutique), brigada (brigade), cadete (cadet), champán (champagne), chaqueta (jacket), corsé (corset), cruasán (croissant), desertar (to desert), fusil (rifle), maquillaje (makeup), marrón (brown), pantalón (pants), sofá (sofa), etc.

Phonological characteristics: favor oxytone stress
Semantic characteristics: fashion, military

Latin borrowings and cultismos
Adolescente (adolescent), campus (campus), cátedra (professorship), cautela (caution), currículum (curriculum), cándido (candid), cóncavo (concave), fábula (fable), íntegro (integral), intrépido (intrepid), lactosa (lactose), multitudinario (multitudinous), nocturno (nocturnal), ultimátum (ultimatum) etc.

Phonological characteristics: proparoxytone stress, /-kt-/ in word-medial position, word-final /-us#/ and /-um#/
Semantic characteristics: words belonging to bodies of power such as the Church, politics, science, academia (written contexts)

4. Implications

The regularities that arise between a word's phonological form, its semantic content, and its language of origin have important implications for the Spanish lexicon and indeed for all lexicons. For example, with respect to Spanish, a learner might extract probabilistic information from the form of a noun. We hypothesize that upon hearing word initial /#al-/, the listener may be able to predict (though not determine) that the word is more likely to relate in some way to agriculture, the military, commerce, or science. For known words, this predictability may affect processing. At the level of form, knowing that /#al-/ tends to be the prefix for nouns can facilitate processing and also allows words with this prefix to be grouped together in the lexicon of the learner. For unknown words, it may help the learner deduce the semantic content of the word in context. Upon hearing a word-final /te-#/, the listener can predict that the word is more likely to bear a connection to other words of Nahuatl (or at least Mexican-Spanish) origin and labels a plant or animal native to Central America, increasing activation of those items. The relationship between a word's origin, its form, and its meaning is probabilistic. Though this kind of information can help learners increase or decrease activation of competing lexical items, it is not a tool to determine meaning. For example, upon hearing the name of a new animal that ends in /-te#/, the learner might increase activation of units pertaining to animals native to Mexico, though other /-te#/ words not of Nahuatl

origin, such as *elefante* 'elephant' and *cantante* 'singer' will also be activated. Other information, such as context and the phonetic form of the rest of the word is necessary to resolve lexical competition. Thus, native Spanish speakers and learners of Spanish can benefit from the 'regularities within irregularities' that exist in the lexicon, taking advantage of shared phonological and semantic characteristics that occur across these exceptions to facilitate lexical processing.

The existence of doublets, through both *cultismos* and non-Latin borrowings, presents another type of probabilistic knowledge across the lexicon: form-to-form mappings within the native Spanish lexicon.[1] Certain phonological differences between doublets reflect regularities. For example, if a Spanish *cultismo* contains the word-medial sequence /-lt-/ or /-kt-/, it predictably corresponds to /-t͡ʃ-/ in the popular form: *multitudinario/mucho* 'multitudinous/many', *nocturno/noche* 'nocturnal/night', *lactosa/leche* 'lactose/milk', and if a *cultismo* demonstrates proparoxytone stress, it typically corresponds to a popular form with paroxytone stress: *íntegro/entero* 'integral/entire', *cátedra/cadera* 'professorship/hip' (/ˈin.te.gro/-/en.ˈte.ro/, /ˈka.te.dra/-/ka.ˈde.ra/). Likewise, among doublets involving words borrowed from French, word-final stress in the French loanword frequently corresponds to penultimate stress in the Spanish form: *boutique/bodega* 'boutique/winery' /bow.ˈtik/-/bo.ˈde.ga/. Among doublets from English loanwords, the English borrowing often ends in a consonant and corresponds to a Spanish word ending in a vowel: *póster/puesto* 'poster/post', *porch/pórtico* 'porch/portico'.

These examples are a small part of a system of phonological correspondences between word forms across the Spanish lexicon. This system of correspondences links phonologically distinct sounds or sequences such as /-kt-/ and /-t͡ʃ-/ due to their correspondence across doublets and paradigms.[2]

Evidence from psycholinguistic studies demonstrate that monolingual speakers are able to overcome phonological mismatch in lexical processing (Frauenfelder, Scholten, & Content, 2001; McMurray, Tanenhaus, & Aslin, 2009; Swingley & Aslin, 2000; White, Yee, Blumstein, & Morgan, 2013). This could account for a speaker's ability to recognize the similarity in forms between *noche* 'night' and *nocturno* 'nocturnal' despite the mismatch between the / t͡ʃ/ phoneme in the derived word and the /-kt-/ sequence in the *cultismo*. Our novel suggestion, however, goes beyond the tolerance of mismatch to suggest that Spanish speakers may not only be able to

1. Other form-to-form mappings across the lexicon include words with orthographic and/or phonological overlap. There is strong evidence to suggest that these mappings and overlap play a role in lexical processing (Cristoffanini, Kirsner, & Milech, 1986; Davis, 1998; De Groot, Delmaar, & Lupker, 2000; Dijkstra, Grainger, & Van Heuven, 1999)

2. Paradigms introduce another source of phonological correspondences. Ex: speakers may link /e/ and /i/ through both paradigmatic correspondences *servir/sirvo*.

overcome the / t͡ʃ/, /-kt-/ distinction between the two words, but actually develop a connection between /-kt-/ and /-t͡ʃ-/ through exposure to doublets. The result of this connection would be increased activation of words containing /-t͡ʃ-/ when /-kt-/ is heard or vice versa. The degree of increased activation may be slight for correspondences that are not robust across the lexicon. There is not yet evidence of mappings between phonetically dissimilar phones in monolingual processing. However, studies in bilingual processing have provided evidence that bilinguals develop mappings between distinct L1-L2 graphemes (VanHove, 2016) and phones (O'Neill, 2018) that aid in L2 word recognition and learning.

Loanwords within the Spanish lexicon expose the speaker to the phonetics and phonotactics of the language of origin, potentially leading to similar awareness of correspondences. Crucially, however, this is only the case for phones and structures that are not repaired when the item borrowed is borrowed into Spanish. For example, monolingual Spanish speakers may extract knowledge about word-final stress in French from the many French loanwords that exemplify this rule: *corsé* 'corset', *pantalón* 'pants', *avión* 'plane', etc.[3] However, the monolingual speaker cannot use their Spanish lexicon to deduce the existence of the phoneme /ʒ/ in French or the acceptance of word-final /-t#/, as these are altered when forms are borrowed into Spanish: Spanish *chaqueta* 'jacket' /t͡ʃa.ˈke.ta/ from French *jaquette* /ʒa.ˈket/.

The ability to extract phonological correspondences across doublets requires a high density of doublets, which is affected by both the number of items borrowed and whether those terms exist alongside a pre-existing, semantically and phonologically related term in the lexicon. This occurs if there are multiple periods of borrowing between languages, with significant sound changes between periods of borrowing. This is the case with Spanish and Latin; Latin words underwent sound changes to become derived words in Spanish, then the same Latin forms borrowed directly into Spanish once more.[4] On the other hand, there are no (or very few) known doublets from Nahuatl within Spanish. The same regularities could not be extracted or utilized to facilitate Nahuatl loanword recognition. It is unknown whether the sound-to-sound correspondences across doublets of Latin origin are robust enough for speakers to develop and utilize in lexical processing. Another

3. This requires that the speaker have some knowledge that these terms originate from French. This might be explicit knowledge about the words' origin or implicit, analogical knowledge that links French loanwords in the lexicon. When exposed to L2 French, the learner must connect the phonological regularities across these loanwords to French input, either explicitly or implicitly.

4. In English, the long history of contact with French has resulted in word sets such as *incantation, enchanted, enchanté*, each borrowed from French during a different time period and demonstrating a different phone ([k], [t͡ʃ] and [ʃ] respectively) at the beginning of the root morpheme (*Online Etymology Dictionary*).

aspect of this issue is the regularity of correspondence, i.e. the frequency with which /t͡ʃ/ in a derived form aligns with /-kt-/ in a *cultismo*. However, correspondences may be implicitly learned and utilized even if the regularity of a correspondence is not perfect. Evidence from bilingual processing reveals that learners can develop and utilize competing sound-to-sound mappings across cognates (ex: implicit knowledge that English /ʃ/ can correspond to /s/ *English-inglés*, / t͡ʃ/ *shawl/chal* or /sk/ *fresh-fresco*, among other competing correspondences) (O'Neill, 2018).

5. Conclusions

In this squib we have examined phonological tendencies among words borrowed into the Spanish lexicon; these did not undergo phonological changes that the Spanish lexicon suffered prior to their borrowing. This introduces irregularity into the phonological forms across the lexicon. However, we argue that within borrowings and *cultismos*, there are also important probabilistic regularities between word origin, phonological form, and meaning, and that these may have implications for Spanish lexical processing. Our approach makes an attempt to connect the fields of historical linguistics and psycholinguistics by examining how the history of sound change and borrowings results in patterns across the lexicon that might impact how speakers (without knowledge of historical linguistics or etymology) process Spanish words. Research is needed to investigate the strength and development of correspondences within the L1 lexicon. It is unknown whether the probabilistic links between form and meaning within borrowed terms might also affect language processing. The extent to which the speaker utilizes these regularities in monolingual speech processing merits further study.

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