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On how morphology spreads

ON HOW MORPHOLOGY SPREADS

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The term 'borrowing', especially when applied to bound morphology, often describes phenomena that, while appearing to be identical, are, in reality, not coextensive. By combining data and analyses from contact linguistics, psychology, and cognitive science, this study provides an explicit and principled treatment of different phenomena of morphological transfer, showing that a demarcation reflects psycholinguistic facts, which, if analyzed properly, allow us to gain useful insights into synchronic bilingual processing and diachronic language change. In particular, it is claimed that morphological borrowing occurs via cross-language structural priming and that speakers have the ability to relate to the internal structure of words ('morphological relatability'), which can interfere with the inhibitory control mechanism that preempts access to the non-targeted language, and override it, thereby enabling morphological priming. A large body of evidence, ranging from experimental psycholinguistics to language change and first language acquisition, underpins this assumption. Relatable morphology is claimed to be a precondition for morphological transfer and borrowing to occur, and a Stratal Effect is hypothesized, which, applying to varying extent, gives rise to at least three distinct types of morphological transfer. Finally, the mainstream view according to which affix borrowing can be either direct or indirect is dismissed, and it is shown that affix borrowing always involves an indirect process including extrapolation of relatable formatives and their diffusion within the lexicon.

Keywords: inhibitory control, language change, language contact, morphological borrowing, priming, processing

1. INTRODUCTION

The term 'borrowing' is well-established in the linguistic literature, and in some cases, its meaning is pretty straightforward, for example with respect to lexical borrowing, such as English *beauty* from Old French *biauté*. In other cases, however, borrowing is used to refer to phenomena which appear to be identical but, in reality, are not coextensive. The ambiguity of the term is particularly evident when it applies to bound morphological formatives, such as affixes and clitics, and abstract morphological patterns, such as non-concatenative base modification, reduplication, and conversion. I shall illustrate this point right away, drawing on a set of data from Malinche Nahuatl, an Aztecan language spoken in Mexico. In Malinche Nahuatl, we find the following three Spanish-origin morphemes: the diminutive/affective suffix *-ito*(M) (1a), the nominal plural allomorphs *-s*/*-es* (1b-c), and the agentive suffix *-(t)ero* (1d).

(1)　　　　Malinche Nahuatl
　　　a.　*chiqu-ito*　　　　　　　　　(González Casanova 1933: 715)
　　　　　child-DIM
　　　　　'dear child'
　　　b.　*hora-s*　　　　　　　　　　(Hill & Hill 1986: 164)
　　　　　hour-PL
　　　　　'hours'
　　　c.　*chiquihuite-s*　　　　　　　(Hill & Hill 1986: 165)
　　　　　basket-PL

'baskets'

    d.   *tlahchiqu-ero*   (Hill & Hill 1986: 197)

        maguey_sap-AG

        'person who collects maguey sap to make pulque'

The data in (1b-d) stem from Hill & Hill (1986: 194), who say that these suffixes have been 'borrowed' from Spanish. At a first sight, this claim seems to be correct, for *-ito*, *-s*, and *-ero* are all Spanish morphemes. A closer look, however, betrays that the use of the term borrowing—for the isolated formatives—may be misleading. We observe, first, that the Spanish morphemes apply to lexical bases of different origin. *Chico* and *hora*, to which the diminutive/affective suffix *-ito* and the plural suffix *-s* attach in (1a) and (1b), respectively, are loanwords from Spanish; the plural suffix *-s* occurs also in a Hispanicized form of a Nahuatl noun in (1c), viz. *chiquihuite*.[1] Only *tlahchicqui*[2] to which the agentive suffix *-(t)ero* attaches (1d), is a native Nahuatl lexeme. Second, the occurrence of the Spanish-origin morphemes *-ito*, *-s*, *-ero* is not limited to the lexical bases in (1a-d). Rather, the data in (1) exemplify how the occurrence of Spanish suffixes in Malinche Nahuatl is constrained in terms of the types of lexical bases they select and point to a differential treatment of foreign formatives. In light of this evidence, is it still correct to treat the occurrence of the Spanish morphemes as 'morphological borrowings' from Spanish in(to) Malinche Nahuatl? Intuitively, one would say that this is the case for *-ero*. But then, how about *-ito*? After all, the occurrence of the string /ito/, in *chiquito*, could be due to the fact that the whole wordform is a lexical borrowing. In this case, the presence of string /ito/ could be interpreted as an automatism, and /ito/ would not count as a suffix. However, if we were to follow the undiscriminating use of the term 'borrowing' by Hill & Hill (1986) (and more recently by Lucas & Čéplö 2020), the presence of phonetic strings in a recipient language (RL), which correspond to derivational or inflectional formatives in a source language (SL), would constitute morphological borrowing. The relevant question is: Does the presence of foreign morphology in a language per se mean that these morphological formatives have been *borrowed*?

    Some reader might find this question trivial, a purely terminological issue. It isn't, in fact. Some other reader may object that this issue is not new. Fair enough, but the topic has not yet been settled, as claims made in recently published work show. For example, Gardani's (2008, 2012, 2018, 2020b) proposal that the notion of *morphological* borrowing—as contrasted with *lexical* borrowing—imply the spread of a foreign formative to RL-native bases, has been judged "unduly restrictive" by Evans (2016: 31), who, instead, distinguishes between "the case where SL-origin material is confined to loanword hosts", for which he employs the term 'hosted inflectional borrowing', and the case "where the borrowed material has been extended to native hosts", in which case he speaks of 'recombinant inflectional borrowing'. The position advocated by Evan isn't wrong, in descriptive terms, but, as I will show, it fails to capture an important generalization about the synchronic facts of borrowing and bilingual processing. Also, the topic

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[1] *Chiquihuite* is a Hispanicized variant of *chiquihuitl*.

[2] Nahuatl *tlahchicqui* means 'someone who collects unfermented maguey sap [*tlachique*] as a beverage' (Karttunen 1983: 260). The form *tlachiquero* also occurs in Zacapoaxtla Nahuatl (Puebla, south-eastern Mexico) (Key & de Key 1953: 123, 207).

calls for a careful treatment, not only because borrowing is one of the principal sources of language change, along with sound change and analogy (see, e.g., Anttila 1989; Bybee 2015: 248), but also because cases similar to those observed in Malinche Nahuatl, in (1), are attested crosslinguistically.

The main goal of this epistemological paper is to provide an explicit and principled treatment of morphological transfer and to show that the demarcation between morphological borrowing and other phenomena is motivated, as it reflects psycholinguistic facts, which, if analyzed properly, allow the analyst to gain useful insights into (synchronic) bilingual processing and (diachronic) language change.

The remainder of this article is organized as follows: §2 introduces the notion of inhibitory control mechanism and claims that morphological borrowing implies overriding this cognitive mechanism; §3 adopts the view that morphological borrowing originates in structural priming and claims that relatable morphology (i.e., morphology accessible to the mind of a speaker) is more likely to override the inhibitory control mechanism and have priming effects leading to morphological borrowing; §4 hypothesizes a Stratal Effect, which induces varying degrees of spread as a variable along which to establish different types of morphological transfer; §5 critically discusses claims on the (in)directness of morphological borrowing and argues in favor an indirect process including extrapolation and extension; §6 briefly summarizes the main claims of the article.

2. INHIBITORY CONTROL

Paraphrasing Aronoff & Fudeman (2011: 2), linguistics morphology is the mental system involved in the formation of words and word forms. As a mental system, morphology is intrinsically synchronic and concerns entities having (fully synchronic) representations in the brain and possibly detectable by the language users. Consequently, the object of investigation of morphology is the internal structure of words. However, there is no real consensus in the literature on what is the basic unit in morphology. There are two main opposing views. For advocates of morpheme-based (bottom-up) accounts (e.g., Lieber 2004), the meaning of the whole can be computed on the basis of the meanings of the component parts. For advocates of holistic (top-down) theories, the starting point in computation is the meaning of an existing complex word or schema/pattern of complex words followed by some kind of substitution at the level of the component parts to derive new meaning[3] (cf. Plank 1981).[4] Whichever approach—bottom-up or top-down—one might favorize, the existence of formal components of complex words is undeniable (cf. Fiorentino 2019 for an overview).[5] In this paper, I will resort to the notions arisen in research on perceptual salience (cf. Dressler et al. 1987: 116), such as perceptual analyzability and morphological relatability (the latter term is taken from (Baldi 1983: 15), embracing the idea that speakers "are cognizant of the presence

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[3] For example, German *Hausmann* 'househusband' is composed of *Haus* 'house' and *Mann* 'man', but its semantics cannot be computed from these two semantic units; it has to be inferred from the meaning of *Hausfrau* 'housewife' by changing the semantics of female to male (Rainer et al. 2014: 13).

[4] Clearly, bottom-up approaches fare better for inflection, while top-down approaches fit better the analysis of word formation. Even in research on inflection, for instance in word-and-paradigm approaches (Blevins 2016), the relationship between basis and derived forms has been shown to be a fundamental principle of morphological organization and the basis for analyzability (Bybee (1991: 73–78).

[5] Even the most extreme top-down theories of morphology, such as Anderson's *a-morphous morphology*, have to assume that some complex words such as compounds must have word-internal structure that is subject to computing (Anderson 1992: 298).

and semantic contribution of component symbolic elements" (Langacker 2000: 127) and able "to reflect on and manipulate the morphemic structure of a word" (Luo et al. 2014: 90). This is true for monolingual speakers, of course. In bi- and multilingualism (the basic condition for contact-induced change), however, speakers have access to at least two grammar systems. But how do bilinguals control their two languages systems? The basic assumption is that the parallel activation of two languages creates competition and that this competition must be resolved.

In the context of studies on bilingual lexical access, Green (1998) has proposed a word recognition mode—the 'inhibitory control model'—according to which bilinguals are able to effectively limit attention to one of the two languages thanks to a selection mechanism based on inhibition. Of course, the resolution of ambiguity, in the face of competitive cues, is a core element of language processing in general (Blumenfeld & Marian 2011: 245), as competition also occurs within one and the same language. Still, a view widely held among developmental psychologists is that bilingual individuals have "unique executive control skills" (Athanasopoulos et al. 2015), viz. the ability to select the right element among competing alternatives, as experiments have shown that bilinguals outperform monolinguals when it comes to suppress interfering competing information (that is, information that is not relevant to the task) in tests containing conflicting information (Bialystok & Viswanathan 2009: 499; see also Bialystok et al. 2009; Bialystok et al. 2012; de Leeuw & Bogulski 2016).[6] In bilinguals, representations of two grammars partially overlap on cortex level (Franceschini et al. 2003; Perani & Abutalebi 2005) and both languages are potentially active and compete to control output (Green 1998: 74). Therefore, bilingual individuals use executive functions to control language choice and to perform switches from one language to another (Ye & Zhou 2009). This is why, while language switches can be quite frequent under appropriate circumstances, bilinguals are generally good at preventing interferences between their two languages (see Esposito et al. 2013; Marian et al. 2017) and can function on only one of the two languages, at least as far as performance and the lexicon are concerned.

To clarify how this reasoning relates to borrowing, let us resume the Malinche Nahuatl case in (1d). The lexeme *tlahchiqu-ero* corresponds to Classical Nahuatl *tlahchic-qui* (Karttunen 1983: 260). Classical Nahuatl *tlahchic-qui* is derived from the verb *tla(i)hchiqui* 'to scrape, scratch, especially to harvest magueys' (Lockhart 2001: 219) by suffixation with *-qui* (Lockhart 2001: 54), a Classical Nahuatl deverbal agentive formative that also occurs, e.g., in *ichtecqui* 'thief' (cf. *ichtequi* 'steal' (Carochi 2002: 202)) and *tlaxcal-chiuh-qui* 'bread maker, baker' (cf. *chihua* 'to make', *tlaxcal* 'bread' (Lockhart 2001: 54)). In (2), I contrast Malinche Nahuatl *cuah-tero* (Hill & Hill 1986: 143, 197) with the correspondent native Nahuatl noun *quauhxīnqui* 'carpenter, woodcutter' (Lockhart 2001: 231), constructed on the preterit stem *quauhxīn-* of the verb *quauhxīma* 'to do carpentry' (cf. *quahu(-itl)* 'wood, tree' and *xīma* 'to shave, dress').[7] For both cases, Spanish formations in *-(t)ero* are provided in (2c) and (3c) (*platan-ero* is semantically not corresponding, but morphologically possible).[8]

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[6] Note, however, that the bilingual advantage hypothesis is not uncontested and has been seriously questioned, e.g., by Paap et al. (2014, 2015). For a novel assessment of the ongoing debate, see Kałamała et al. (2020).

[7] The reference form for Classical Nahuatl nouns is the absolute singular, e.g., *quahu-itl* 'wood [wood-ABS.SG]' (Lockhart 2001: 230).

[8] American Spanish *leñatero* corresponds to European Spanish *leñador* (Corominas & Pascual 1980-1991, *s.v.* leña).

(2)

	a.	Malinche Nahuatl	b.	Classical Nahuatl	c.	Spanish
		tlahchiqu-ero		*tlahchic-qui*		*platan-ero*
		maguey_sap-AG		harvest_magueys-AG		banana-AG
		'person who collects maguey'				'banana grower'

(3)

	a.	Malinche Nahuatl	b.	Classical Nahuatl	c.	Spanish
		cuah-tero		*quauhxīn-qui*		*leña-tero*
		wood-AG		do_carpentry.PRET-AG		wood-AG
		'woodcutter, carpenter'				

Obviously, the creation of forms such as *tlahchiquero* and *cuahtero* presupposes a certain degree of computation: first, the identification of both Nahuatl *-qui* and Spanish *-ero* and second, the replacement of the former by the latter.[9] As a matter of fact, linguistic contacts between Nahuatl and Spanish have lasted nearly five centuries, with evident signs of bilingualism starting from approximately 1640 (Lockhart 1996: 261), and speakers of Malinche Nahuatl are nearly all bilingual with Spanish (Hill & Hill 1986: 1). According to one of the most widely accepted claims about grammatical borrowing, the higher the degree of bilingualism, the higher the probability that extensive structural borrowing occurs (Thomason & Kaufman 1988: 67). However, if there exists an inhibitory control mechanism and specifically, interference suppression skills (Linck et al. 2008) that preempt access to the non-targeted language in bilinguals, how can morphological borrowing, as exemplified in (2) and (3), be possible at all? Obviously, excessive mixing is constrained by the need for mutual comprehension, and also, morphological borrowing is a relatively rare phenomenon (for useful overviews of borrowabilty scales, see Wohlgemuth 2009: 11–17 and Matras 2020: 165–174).[10] But even with this proviso, how does the inhibitory control get overridden?

In this paper, I embrace Kootstra & Muysken's (2019: 8) view of priming "as a form of continuous adaptation to the ongoing linguistic environment" (Kootstra & Muysken 2019: 8) and the hypothesis that a link obtains between contact-induced change and cross-language priming as a form of implicit learning (Loebell & Bock 2003). More specifically, I propose that morphological borrowing only concerns activatable parts of a morphological system as these are able to interfere with the inhibitory control mechanism and to trigger cross-language morphological priming (Duñabeitia et al. 2013). In the next section, I will argue that at a processing level, borrowing corresponds to overriding the inhibitory control,

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[9] Note that in Spanish, the suffix *-(t)ero* is productively used to form nouns denoting occupations, such as in *lechero* 'milkman', *zapatero* 'cobbler' (Rainer 1993: 485-492).

[10] And of course, external factors such as the attitude towards linguistic mixing play a decisive role (cf., e.g., van Coetsem 2000: 68). However, discussing the structural factors and sociological conditions favoring the spread of SL formatives lies beyond the scope of this paper.

that this override occurs via structural priming, and that priming is more likely to be triggered by formatives, such as *-(t)ero*, that are recognizable, processable, and activatable by the borrowing agents.[11]

3. RELATABLE MORPHOLOGY

In the previous section, we have seen that processes of word formation, such as those seen in (2) and (3), are clear indicators that speakers must have intuitions about morphological structure, that is, knowledge about the existence of formatives, their (morphotactic) boundaries, function, and even such properties as productivity (for novel insights into the latter, see Saade 2020).[12] I refer to formatives, such as *-(t)ero*, which are recognizable, processable, and activatable, as 'relatable morphology'.[13] One could argue that relatable morphology corresponds to productivity. In reality, they are not truly coextensive: morphological formatives and patterns can be reactivated even if they are unproductive. Thus, relatable morphology subsumes two partly overlapping types, as theorized by Dressler (2003: 33–34): 'dynamic morphology', which is based on productive patterns (Gardani 2013); and 'static morphology', which organizes all stored surface forms, that is, all word forms which have a high enough token frequency to have a chance of being stored in the mental lexicon of a speaker, and thus are operationalizable.

What does the degree of relatability of a formative (string) depend on? In a study on the basic-derived relationship amongst paradigm cells, Bybee & Brewer (1980: 214) hypothesized that the degree of autonomy of a word "is the extent to which [it] is likely to be represented in the speaker's lexicon as a whole and separate unit" and that "[a]utonomy is determined by semantic complexity, word frequency, and morphophonemic irregularity, such that the semantically simpler, more frequent, and more irregular words are more autonomous". If we turn this logic around, there must be something like an 'autonomy reversal', and we may infer that words, which are semantically simpler, more frequent, and—crucially—morphophonologically more irregular, are more difficult to analyze. Consequently, the relatability of a formative seems to depend on factors such as its transparency (for transparency in compounding, see Libben et al. 2020), biuniqueness (in the sense of reliability, see Dressler 2012: 4), frequency (Zuraw et al. 2020), and it can be related to its productivity (Gardani 2013). Interestingly, Plag & Baayen (2009: 133) found that affix productivity "is inhibitory for word naming", that is, elicit longer response tendencies in naming tasks. They tentatively explained these results, which were replicated in Baayen et al. (2011), by the fact that "a productive suffix might activate a larger range of base words, and that these base words subsequently compete with the base that is to be named".

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[11] The term borrowing agent is based on van Coetsem (1988, 2000).

[12] Note that in this paper, I focus on borrowing in the sense of MAT borrowing (see Gardani 2020a), while applications to the borrowing of patterns, such as compounding patterns Ralli (2020) need to be dealt with in a dedicated paper.

[13] Relatable morphology is opposite 'fossilized morphology' (Wohlgemuth 2009: 121), which means vestiges of no longer operating morphological elements or patterns. To exemplify the latter, think of the British English noun *viva* meaning 'oral defense of a PhD dissertation'. Most likely, only an analyst will know that *viva* has resulted from the Latin noun phrase *viva voce* 'with living voice', via ellipsis, and be able to isolate the originally Latin formative *-a*, flagging a cluster of morphosyntactic values such as ablative, feminine, and singular on the stem *viv-* of the adjective *vivus*. Similarly, only an expert will know that the German noun *Requiem* 'mass for the dead' originates from a Latin form bearing an accusative singular inflection.

In the following three sections, I provide evidence for the claim that speakers are sensitive to morphological structure and properties drawing on three sources: processing (§3.1), language change (§3.2), and first language acquisition (§3.3).

3.1. EVIDENCE FROM PROCESSING

Experiments on priming effects have demonstrated that speakers are sensitive to morphological factors, mainly sublexical decomposability (Caramazza et al. 1988),[14] independently of semantic factors of stored lexical representations such as semantic relatedness. Priming effects were found, for instance, in the decomposition of derivationally complex words that are no longer transparently derived, such as English *hardly* — *hard* (Marslen-Wilson et al. 2008) or of pseudo-derived pairs, such as *corner* — *corn* (Rastle et al. 2004: 1093), where *corner* is clearly not decomposable into *corn* and *-er*, but *-er* was recognized as a possible derivational suffix in English. On the other hand, pairs such as *scandal* — *scan* do not prime, because *-dal* is not a derivational affix of English (Bozic et al. 2007: 1466) (see also Marslen-Wilson & Tyler 2007: 831).

Even more revealing was the study conducted by Janssen & Caramazza (2003: 649) on production latencies based on the selection of determiners in the production of Dutch diminutive-plural noun phrases. The relevant Dutch facts, summarized in Table 1, are the following:

- Dutch has two gender values: common (e.g., *kerk* 'the church') and neuter (e.g., *boek* 'book');
- gender is evident on agreement targets such as determiners in the singular, *de* for common, *het* for neuter, yielding *de kerk* and *het boek*;
- in the plural, however, gender is no longer detectable on the determiner, where we have *de kerken* and *de boeken*;
- similarly, the diminutive suffix *-je* triggers neuter gender, independently from the gender value of the base noun, for example *de kerk* but *het kerkje*.

	gender: COMMON	gender: NEUTER
SG	*de kerk* 'the church'	*het boek* 'the book'
PL	*de kerken* 'the churches'	*de boeken* 'the books'
DIM.SG	*het kerkje* 'the little church'	*het boekje* 'the little book'

Table 1: Dutch definite NP

Janssen & Caramazza tested two competing hypotheses in three experiments. According to the 'primed unitized activation hypothesis' (Alario & Caramazza 2002), all the features that are involved in determiner selection are collected in a language-specific determiner frame before selection of the appropriate determiner. It predicts the production of plural NPs with neuter nouns (e.g., *de boeken*) to be slower than the production of plural NPs with common nouns (e.g., *de kerken*) because for neuter nouns, there are two

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[14] Research has shown that speakers are sensitive also to positional information (of affixes) (see, e.g., Crepaldi et al. 2010; Carden et al. 2019).

competing determiner forms, singular *het* and plural *de*, whereas the features plural and common both activate the same determiner form, *de*. By contrast, the 'hierarchical selection hypothesis' claims that "as each relevant feature becomes available it activates its associated determiner form(s) and selection occurs as soon as sufficient information is available for selection of the appropriate determiner" (Janssen & Caramazza 2003: 637). It thus predicts no difference in production latencies because for both common and neuter nouns, the feature relevant, viz. plural, leads to the immediate selection of the determiner form, *de*. The first experiment unambiguously showed that the production of neuter gender plural NPs is slower than that of common gender plural NPs, in favor of the 'primed unitized activation hypothesis'. In a second experiment, Janssen & Caramazza (2003) tested diminutives as these have the same conditions of plurals: as we saw above, there is only a determiner form for both gender values. In a third experiment, a new condition was tested: plural-diminutive NPs. Both the second and the third experiment replicated the result of the first. With this, Janssen & Caramazza demonstrated that the gender of the base noun of a morphologically complex form is visible during the determiner selection process in Dutch. This is evidence for the fact that the properties of the base are still accessible to the speaker in derived forms, which indirectly means that the speaker is able to decompose a morphologically complex form if it is built by relatable formatives, here the diminutive.

3.2. EVIDENCE FROM LANGUAGE CHANGE

A fundamental mechanism of language change, reanalysis occurs via manipulation of the internal structure of words. According to a classical definition, reanalysis is a "change in the structure of an expression or class of expressions that does not involve any immediate or intrinsic modification of its surface manifestation" (Langacker 1977: 58). Timberlake (1977: 168) underlined "the potentially ambiguous character of surface output" as a necessary prerequisite for reanalysis. Crucially, Harris & Campbell (1995: 70) specified that the very precondition for reanalysis to occur is the possibility of multiple structural analyses, provided that "each of the possible readings is a structure that is *otherwise available in the language*".

While the above definitions originate in studies concerned with syntactical reanalysis, the view expressed by Harris & Campbell (1995) applies to reanalysis in morphology, as well. Several types of morphological change subsume to reanalysis. Rebracketing (or resegmentation) is a syntagmatic type of reanalysis by which (a) a boundary between morphological formatives is interpreted in a new way (boundary relocation); (b) a previously existing boundary is dissolved (boundary amalgamation); (c) a new boundary is perceived where no boundary existed before (boundary spawning). An example of boundary relocation is present-day English *adder*: in Old English, the noun was *nǣddre*, cognate with German *Natter*; the NP *a nǣddre* was then resegmented as *an adder* by relocating the determiner boundary, based on the existence of an allomorph *an* (Campbell 2013: 102). An example of boundary amalgamation is the emergence of the suffix *-erei* in German via affix telescoping (Becker 1990: 48; Haspelmath 1995: 3). Consider the German verb *spinn-en* 'to spin' and its derivates *Spinn-er* 'spinner' and *Spinn-er-ei* 'spinning mill; spinning (activity)'. At a certain point, speakers must have related the secondary derivate (*Spinnerei*),

not to the first derivate (*Spinner*), but directly to the base (*spinn-*), thus creating a new suffix *-erei* and licensing formations such as *Dieberei* 'thievery' from a nominal base *Dieb* 'thief', in absence of a primary derivate **Dieber*. An example of boundary spawn is English *threek* 'three-pronged fork', which originated in child speech via reanalysis of *fork* as *four-k* (Fertig 2013: 27, with reference to Deutscher 2002: 483). Cases like *threek* occur when speakers treat a non-analyzable form (here, *fork*) as analyzable, based on the perception of a similarity between a part of the form (the numeral *four*) and an actual element of the language (*four*). Perceived similarity generally has a semantic motivation (but see Maiden 2003, 2008, for a different opinion): in the specific case of *fork*, it is the fact that a fork usually has four tines. For this reason, a change of this type is referred to as folk etymology.

Importantly, folk etymologies frequently arise with loanwords, because often the original internal structure of loanwords is not transparent to, and accessible by, speakers of a recipient language, which leads to wrong segmentation, because of perceived superficial similarities between native and non-native formatives (termed 'lookalikes' by Aikhenvald 2006: 33). Famous cases include English *crayfish*, from Middle English *crevis*, from Old French *crevice* via identification of a semantic component 'fish', which does not exist in the French noun. As Campbell (2013: 100) puts it, these are "cases where linguistic imagination finds meaningful associations in the linguistic forms which were not originally there and, on the basis of these new associations, either the original form ends up being changed somewhat or new forms based on it are created."

A similar heuristic mechanism as that operating in reanalysis also governs backformation. In backformation, speakers form new words, in that they decompose morphological chunks into parts of which they presume the word would be built of and strip some pieces perceived as formatives. Examples are the English verbs (*to*) *edit* from *editor*, a loanword, or (*to*) *housekeep* from *housekeeper*, from (*to*) *keep house*. Just as the other types of analogical change, also this kind of manipulation must be due to recognizability of elements which are anyhow present in the language; in the specific cases of *edit* and *housekeep*, these are the agentive noun formatives *-or* and *-er*.

3.3. EVIDENCE FROM FIRST LANGUAGE ACQUISITION

A third source of evidence for the speakers' sensitivity to morphological properties comes from the study of first language acquisition. Most research in this area has been devoted to the relationship between morphological awareness as "the metalinguistic insight that words consist of meaningful roots and affixes (i.e., morphemes) that can be isolated and manipulated" (McCutchen & Stull 2015) and the development of literary skills such as spelling and reading (Carlisle 1995: 194; Ravid 1995; Deacon & Kirby 2004; Ravid 2012: 41–51; McCutchen & Stull 2015; Deacon et al. 2017), literacy acquisition in school age children (Carlisle 2000, 2010), vocabulary acquisition (McBride-Chang et al. 2008), and bilingual acquisition (Nicoladis 2002; Luo et al. 2014). In general, it seems plausible to claim that the ability to

segment and extract morphological units emerges early on, while explicit metalinguistic explanations are developed at a later stage (Ravid & Malenky 2001).[15]

These insights have been complemented by studies focusing on sequence of acquisition. As research has shown, decomposition precedes composition (Dressler et al. 2003). This is because children have first a rudimentary understanding of the not yet decomposed whole complex morphological constructions, both in inflection and in word formation. After a first phase of decomposition, children start composing new complex words or word forms in analogy to already acquired ones; this is particularly true of productive morphological patterns (see, e.g., Dressler et al. 2010). In a study from the early 1980s on the acquisition of the polysemous (agent and instrument) nominal suffix -er in English, Clark & Hecht (1982) asked 48 children, aged between 3;0 and 6;0, to segment and produce new agent and instrument nouns. In comprehension (i.e., segmentation), all children were able to isolate the pertinent verb base in nouns such as *kicker* and otherwise understood both verb and suffix. In production, the test showed that children relied on different word formation strategies to coin agent and instrument nouns depending on age: the youngest children mostly relied on simple compounds, especially for agents, and on familiar words, especially for instruments; slightly older children made more consistent use of -er, usually for the agentive meaning; the oldest children used -er consistently for both agent and instrument nouns. The authors conclude that the acquisition of agentive and instrumental -er is guided by three interacting factors: semantic transparency, which is responsible for the preference for constructing new words relying on elements known to them; productivity, which leads to realization of meaning by dedicated word formation devices such as -er linked to just one of its meanings, the agentive; and conventionality, which leads the child to prioritize conventional forms over other forms currently in their repertoire and thus in the course of acquisition to repair, e.g., *a fly-person* to *flier*.

To the best of my knowledge, the most astonishing evidence for the ability of children to experiment with and become aware of morphological formatives stems from Rainer's diary study on the acquisition of Austrian German word formation by his daughter Carmen. In this longitudinal study, Rainer (2010: 154–155) shows that three diminutive suffixes are acquired in successive stages. The baby-directed -i suffix is learned right from the beginning. Then, starting from age 2;6, Carmen abandons the diminutive suffix -i and systematically replaces it by the synonymous, colloquial suffix -erl on the same bases, so, e.g., *Hasi* (1;3) 'little rabbit' becomes *Haserl* (2;7) (from the base *Hase* 'rabbit'). The child has recognized the diminutivizing function of the baby-talk suffix -i and now encodes the same function by means of another suffix, which enters the child-directed speech of the parents only in the kid's third year of life. By that time, Carmen has learned a morphotactic rule of the diminutives -i and -erl that triggers deletion of final -er and -el from bases, such as *Windel* 'diaper' and *Kübel* 'bucket' resulting in *Wind-i* and *Küb-erl*. Later, when she acquires diminutive formation by -chen, she applies the same morphotactic rule also when using -chen, producing incorrect diminutive forms such as *Pullobchen* (3;11) and *Äpfchen* (6;0) from the

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[15] Alternatively, in discriminative models inspired by Shannon (1948) Information Theory morphological learning occurs via discrimination rather than hierarchical decomposition (cf., e.g., Baayen et al. 2016; Ramscar et al. 2018).

bases *Pullover* 'sweater' and *Apfel* 'apple' (Rainer 2010: 157). This sort of overregularization shows that, while Carmen has not yet learned the morphotactics of the new suffix *-chen*, she is able not only to recognize bases in *-er* and *-el* (i.e., she is aware of word structure), but also to apply a morphotactic rule of the by then dominant suffixes *-i* and *-erl*. In each successive stage of acquisition, Carmen built on the previous diminutives, using the derivative stems familiar to her from the *-i* stage, replacing *-i* with *-erl* and later *-erl* with *-chen* (*Pulloverl*, apparently, was analyzed as *Pullov-erl*, not as *Pullover-l*).

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Marshalling the evidence provided from processing, language change, and language acquisition, we conclude that speakers are able to recognize, access, and manipulate morphological structure. This ability, which I have labeled 'morphological relatability', does not per se lead to any sort of diffusion,[16] but it is assumed to be an essential *precondition* to morphological cross-language priming. This claim is consistent with results from:

- experimental psycholinguistics, especially 'psycholexical' studies supporting a view of the mental lexicon as a 'dynamic place', in which several conflicting representations of word constituents are activated in order to maximize the opportunity for meaning creation (Libben 2006, 2014, 2015, 2017);
- neurocognitive science showing that the degree of language discrimination capacities of bilingual infants correlates with the two languages' relative phonological similarity (Spanish and Italian) vs dissimilarity (Tagalog and English) (Costa & Sebastián-Gallés 2014: 336–337);
- language contact research showing that similarity, not only structural compatibility (including similarity in preexisting functions) but often also superficial phonetic similarity, plays a major role in morphological borrowing (cf. Weinreich's 1953: 39 notion of 'interlingual equivalence'; Law 2020; Mithun 2020; Ralli 2020; Souag 2020).

Via priming, foreign formatives can enter an RL, as we have seen. By determining the extent to which this foreign morphology spreads and gets entrenched in an RL, we can establish three main different types of morphological transfer, one of which is borrowing. This is the topic of the following section.

4. SPREAD

The idea that a language can have multiple grammars is not new. A great deal of research taking this perspective has focused on morphology (e.g., Kiparsky 1982a, 1982b; Booij 2002: 94–101), phonology (e.g., Itô & Mester 1999; Inkelas & Zoll 2007; Calabrese & Wetzels 2009; Mansfield 2015; Stewart et al. 2018), and prosody (Kubozono 2006; Kang 2010; Davis et al. 2012). With respect to the selectional restrictions to the occurrence of foreign material in an RL, Matras (2002: 193) introduced the term 'compartmentalized grammar', based on the observation that in some languages (contextually: Romani) "different sets of grammatical markers are employed with different parts of the vocabulary" (see also Elšík & Matras 2006: 324–333; Friedman 2013; Matras 2015: 66–75).

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[16] As a matter of fact, morphologically complex lexemes or word forms often enter a language just as lexical borrowings; this can occur even if bilingual speakers are aware of the complex internal structure of the loans.

In §3, I have argued that the ability of speakers to manipulate morphological formatives and patterns constitutes a precondition for morphological cross-language priming. In this section, I discuss *how far* morphology spreads, by relating different phenomena of morphological mixing to different applications of an empirically observable constraint that I shall label the 'Stratal Effect'[17] and define as follows:

The STRATAL EFFECT is a restriction on the application domain of non-native morphological formatives in a recipient language, to specific etymon-based lexical strata of that language.

While it is obvious that grammatical stratification reflects the introduction of grammatical rules from different SLs and at different times, the Stratal Effect is to be interpreted synchronically as the speakers' knowledge that subsets of grammatical rules apply to subsets of the lexicon, depending on their origin.[18] For example, it can show that speakers have access to borrowed morphology, even when it derives from SLs that no longer are contact languages of an RL.

Based on abundant crosslinguistic empirical evidence, I found that three levels of impact of the Stratal Effect on an RL correspond to three phenomena: strictly compartmentalized co-morphologies (§4.1), partially compartmentalized co-morphologies (§4.2), and morphological borrowing (§4.3).

4.1. STRICTLY COMPARTMENTALIZED CO-MORPHOLOGIES

A strict application of the Stratal Effect results in what I shall label 'strictly compartmentalized co-morphologies': derivational and inflectional forms enter an RL and come to coexist with native paradigms, maintaining the original morphological mechanism of their source. The stock example is the English paradigm *alumnus alumni*, a loan-noun that retains the paradigmatic inflections of the SL, Latin, that are relevant to the English morphosyntax: the number values singular and plural. Consider now the following examples from Dutch and German concerning the morphosyntactic features of number (4a) and case (4b), respectively.

(4)   a.   Dutch

De	*economisch-e*	*cycli*	*word-en*	*kort-er*
DET.PL	economic-PL	cycle(M).PL	become-3PL	short-CMPR

'The economic cycles become shorter.'

    b.   German

die	*Mutter*	*Jesu*
DET.F.SG	mother(F)	Jesus.GEN.SG

'the mother of Jesus'

[18] While the Stratal Effect is supposed to mainly work subconsciously, contact-induced morphological change can be deliberate as well, as has been shown by Thomason (2015: 38–41).

Although this phenomenon has long been observed (e.g., Whitney 1881: 17; Jespersen 1922: 213; Haugen 1950: 225), it has not been paid much attention to except for (van Coetsem 2000: 90) and especially the detailed empirical and theoretical treatment provided by Kossmann (2008, 2010). Kossmann shows that, while indeed rare, this phenomenon of transfer is, in fact, more widely diffused than is generally assumed (see also Comrie 2008). He labels it 'parallel system borrowing' to describe a process whereby loanwords retain (part of) their original paradigms and, in this way, come to establishing themselves as morphological systems that are parallel to the native paradigms of an RL. Kossmann's analysis is in terms of etymon-related compartmentalization to the effect that "different morphologies occur in different etymological strata" (Kossmann 2008: 18).

Unlike the case of English and Dutch (and to some extent German), which have relatively small paradigmatic morphology, parallel system borrowing can be fairly prominent in languages with (more) elaborated paradigms: it can concern different parts-of-speech such as nouns, adjectives, and verbs (Kossmann 2013: 410–414) and both inflectional and derivational morphology.[19] Based on current knowledge, the case of parallel system borrowing with the largest extension is found in the Northern Berber language spoken in Ghomara, northwestern Morocco. Here, "there are two parallel systems for all parts-of-speech: nouns, adjectives, verbs, pronouns" (Mourigh 2015: 10). This is particularly evident in verbal morphology because about half of the verbs are inflected according to Arabic morphology (Kossmann 2013: 413). Interestingly, in Ghomara Berber parallel system borrowing concerns not only the verbal inflections but also the verb phrase, such that direct object pronouns are Arabic when they occur with Arabic-morphology verbs and Berber when they occur with Berber-morphology verbs. Compare the paradigms of the direct object suffixed pronouns appearing in the 3SG and 3PL past forms of the Arabic-borrowed verb *ɛṭəq* 'to help' in (5a), with the corresponding paradigms of the direct object encliticized pronouns appearing in the 3SG and 3PL perfective forms of the Berber verb *šəbbəṛ* 'to grab, catch' in (5b).

(5)   a.   Ghomara Berber: Loan morphology (Mourigh 2015: 237)

	ɛṭəq	*ɛəṭqu*
	help.PST.3SG	help.PST.3PL
	'he helped [me, you, etc.]'	'they helped [me, you, etc.]'
1SG	*ɛṭəq-ni*	*ɛəṭqu-ni*
2SG	*ɛəṭq-ək*	*ɛəṭquww-ək*
3SG.M	*ɛəṭq-u*	*ɛəṭquww-əh*
3SG.F	*ɛəṭq-a*	*ɛəṭqu-ha*
1PL	*ɛṭəq-na*	*ɛəṭqu-na*
2PL	*ɛṭəq-ḵum*	*ɛəṭqu-ḵum*
3PL	*ɛəṭq-əm*	*ɛəṭqu-həm ~ -hum*

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[19] As concerns derivation, at the outset of this article I referred to the use of Spanish-borrowed diminutives in Malinche Nahuatl. The use of the native formative *-tzīn* and of the Spanish-derived *-ito* and *-ita* appears to be "split between words of the two languages" (Hill & Hill 1986: 195).

b. Ghomara Berber: Native morphology (Mourigh 2015: 229)

	i-šəbbṛ	*šəbbṛ-an*
	3SG.M-grab.PFV	grab.PFV-3PL
	'he grabbed [me, you, etc.]'	'they grabbed [me, you, etc.]'
1SG	*i-šəbbṛ=ay*	*šəbbṛ-an=ay*
2SG.M	*i-šəbbṛ=ak̲*	*šəbbṛ-an=ak̲*
2SG.F	*i-šəbbṛ=am*	*šəbbṛ-an=am*
3SG.M	*i-šəbbṛ=aṯ*	*šəbbṛ-ən=t*
3SG.F	*i-šəbbṛ=at*	*šəbbṛ-ən=tət ~ təṯ*
1PL	*i-šəbbṛ=anax*	*šəbbṛ-an=anax*
2PL	*i-šəbbṛ=awən*	*šəbbṛ-an=awən*
3PL	*i-šəbbṛ=ahən*	*šəbbṛ-ən=tən*

Mourigh (2015: 6) states that "[n]ative speakers have consistent judgments about which non-integrated forms belong to Ghomara Berber and which not" and comparing his fieldwork data with texts recorded in 1928 (Colin 1929: 52–55), concludes that the phenomenon is stable (Mourigh 2015: 7).

4.2. PARTIALLY COMPARTMENTALIZED CO-MORPHOLOGIES

A less strict application of the Stratal Effect manifests itself when SL-origin formatives occur also on bases belonging to other non-native etymological strata of an RL or on hybrid formations (such as *chiquihuite*, cf. (1c)). I label this phenomenon 'partially compartmentalized co-morphologies'. As a case in point, consider some facts of Maltese derivational morphology. Maltese has borrowed from Italo-Romance many an adverb containing the suffix *-mente*, such as *veramente* 'truly', *umilment* 'humbly', and *inkonxjament* 'unconsciouly' (cf. Italian *veramente*, *umilmente*, *inconsciamente*) (Borg & Azzopardi-Alexander 1997: 66–69). In most cases, the bases for adverbial derivation in *-mente* in Maltese are Romance adjectives. However, Saade (2016) observes that some English adjectives also serve as bases for adverb formation in *-mente* via "pseudo-Romance" forms. The following example shows that the English adjective *alleged* is restructured as an Italian-like form, *allegat* (6a), in order to derive an adverb *allegatament* meaning 'allegedly' (6b). While the form of the new adverb looks Italian, its semantics (6d) is English, because in Italian *allegato* (6c) has a different meaning, namely 'attached'.

(6) a. Maltese b. Maltese
   allegat   *allegatament*
   'alleged'   'allegedly'

   c. Italian   d. English
   allegato   *alleged*
   'attached'

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Other examples include *ultimament* 'ultimately' (vs Italian *ultimamente* 'recently'), *attwalment* 'actually' (vs Italian *attualmente* 'presently'), and *eventwalment* 'eventually' (vs Italian *eventualmente* 'possibly') (Saade 2016). The Maltese case is intriguing as it shows a change in-the-making: The borrowed Italo-Romance formative is spreading to another lexical stratum, the English one, via cognate (that is, similar) lexemes. Other cases show a process of partial spread that is completed, for example, in varieties of Romani spoken in the Balkans, separate inflectional classes are assigned to native Indo-Aryan vocabulary and borrowed vocabulary, respectively (see Boretzky 1989, 1994; Boretzky & Igla 1991, 1999; Igla 1996; Bakker 1997; Elšík 2000; Matras 2002; Elšík & Matras 2006; Adamou 2012; Friedman 2013).[20] For example, in the variety Ajia Varvara, spoken to the west of Athens, we observe partial spread of the participle formative *-(i)mé* derived from the Greek passive participle *-ménos* and whose occurrence is not limited to the Greek lexical stratum. The following examples show *-(i)mé* on verbs of Greek (7a), Romanian (7b), Slavic (7c) and Turkish (7d) origin.

(7) Ajia Varvara Romani (Igla 1996: 73)

a. Greek-origin
    xolamé   *xolá(v)ol*
    'angered'   'to get angry'

b. Romanian-origin
    logodimé   *logodisá(v)ol*
    'engaged'   'to affiance'

c. Slavic-origin
    ožonimé   *ožonisá(v)ol*
    'married'   'to marry'

d. Turkish-origin
    sastimé   *sastú*
    'wondered'   'he wondered(3.SG.PRT)'

We know that the formatives were productive at different synchronic points and that there are no instances of 'backward diffusion', i.e., extension of foreign formatives to the pre-existing native Indo-Aryan etymological stratum.[21]

Unlike cases of strict compartmentalization (§4.1), the data from Malinche Nahuatl, Maltese, and Ajia Varvara Romani attest to a higher degree of entrenchment of the once-foreign elements; they are, to use Mifsud's (1995: passim) terminology, less 'undigested'. In a recent paper on Romani, Friedman (2013:

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[20] In this respect, Elšík & Matras (2006: 324) label inflectional classes that host the pre-European lexical stratum 'oikoclitic' and those that host the post-European lexical strata 'xenoclitic' (for an overview of the different lexical stratifications in Romani, see Matras 2002: 20–25). The traditional terms for oikoclitic and xenoclitic are 'thematic' and 'athematic', respectively.

[21] While the terms 'forward diffusion' and 'backwards diffusion' have become familiar in language contact research since Matras (2009: 209), prior to this, we find a corresponding term pair, 'forward transfer' and 'backward transfer', in a psycholinguistic study by Liu et al. (1992: 454–455).

119) incidentally raises the question of whether compartmentalization is a matter of integration or rather of segregation. This issue is hard to judge if one takes a sociolinguistic and language-ideological perspective, as Friedman does. The language facts, however, are unmistakable. The data tell us that non-native formatives have achieved a certain degree of productivity to the effect that speakers use them beyond the threshold of the formatives' SL, to form new words on borrowed bases. This productivity is evidence for a deeper entrenchment of the new formatives in the morphology of the RL.

Thus far, we have seen instances of transfer in which foreign formatives and structures are used with non-SL, but not with RL-native, lexical bases. Spread to native bases is discussed in the next section.

4.3. MORPHOLOGICAL BORROWING

A weak Stratal Effect produces the spread of SL formatives (including) to the native vocabulary of an RL. New lexemes are then formed through foreign derivational morphemes or native lexemes inflect by means of foreign formatives. This type of transfer could be given whatever name, but in line with the tradition, I will call it 'morphological borrowing'. A case in point is the development of the English splinter *-scape* 'view or picture of a scene or scenery on land'. In the 16th century, the Dutch noun *landschap* 'region, tract of land' entered English as a loanword (Nesfield 1898: 31; Durkin 2009: 97) and was rendered as *landscape*. The first element, *land* /lɑnt/, was clearly recognizable thanks to its transparent semantics and morphotactics and because it is a cognate of English *land* /lænd/. Consequently, English speakers were able to identify and isolate the suffixoid *-schap* / *-scape*. This formative was then extended to native English bases. Remarkably, while in Dutch the formative bearing the meaning of 'view or picture of a scene or scenery on land' was not productive and only occurs in *landschap* (Booij 2002: 129), in English *-scape* has become productive giving rise to several new-formations, including *cityscape*, *dreamscape*, *moonscape*, *seascape*, *soundscape*, *townscape* (Aldrich 1966; Gold 2002; Bauer et al. 2013: 527).

Thus far, we have discussed three different phenomena of transfer, depending on the extent to which the Stratal Effect applies. See Table 2.

	STRATAL EFFECT	PHENOMENON
I	no spread	strictly compartmentalized co-morphologies
II	spread to RL-non-native bases	partially compartmentalized co-morphologies
III	spread to RL-native bases	morphological borrowing

Table 2: Extent of Stratal Effect and resulting phenomena

We have not yet properly discussed the issue of the diffusion amongst members of a speech community. All three phenomena can occur as idiolectally or sociolectally established language change. To showcase this, consider the following data sets from Welsh. In the (8a-d) set, we see four nouns, all belonging to the inherited Celtic stratum, on which the plural is realized via a formative *-s* (and its

allomorph *-is*), borrowed from English. However, in the parallel set, (8a'-d'), the same nouns inflect for plural via native inflectional means.

(8)		Welsh (idiolectal)		Welsh
	a.	*taids*	a'.	*teidiau*
		'grandfathers'		
	b.	*crancs*	b'.	*crancod*
		'crabs'		
	c.	*annwyds*	c'.	*anwydau*
		'colds'		
	d.	*enfysys*	d'.	*enfysau*
		'rainbows'		

What kind of variation are we observing here? The data in (8a-d) stem from the conversational *Siarad corpus* of Welsh-English bilinguals (*The Siarad corpus* 2011), and the plural forms in *-s*/*-ys* occur in the speech of single individuals. The data in the parallel set are commonly accepted Welsh plural forms. Now, what is the status of the English plural formative *-s* in Welsh? Does it only occur in idiolectal use found in the bilingual corpus? From a merely linguistic viewpoint (intended as Saussurean *langue*), the *-scape* case and the plural-*s* case are the same: both cases of morphological borrowing. However, from the point of view of language norm (*parole*), the data in (8a-d)—taken in isolation—exemplify an instance of borrowing occurred at the level of individual speech behavior, and not at the level of language as it exists by means of conventions accepted and adopted across a speech community. Weinreich (1953: 11) taught us that "[i]n speech, interference is like sand carried by a stream; in language, it is the sedimented sand deposited on the bottom of a lake." Thus, we need to bring another dimension into the definition of morphological borrowing: the domain of actuation of borrowed formatives. The domain {idi}iolectal describes the occurrence of borrowed formatives exclusively in individual use, be it occasional or stabilized idiolectal use. The domain {soc}ietal describes the societal dimension of spread, that is, the occurrence of borrowed formatives across a community of speakers (see Table 3).

{idi}	occurring in non-stabilized or stabilized speech of a single individual
{soc}	occurring across the speech community

Table 3: Actuation domains of morphological borrowing

In psycholinguistic terms, frequency of use (types and tokens) makes a difference, as it can modify underlying representations individual-wise, and "when systematically observed among several members of a given community, sometimes over generations of speakers" (Adamou et al. 2019), community-wise. The more a borrowed morphological formative is used by several speakers and gets diffused within a speech community (instead of remaining confined to individual use), the stronger its self-feeding effect,

leading to what Johanson (2002: 298–300) has called habitualization and conventionalization. As a matter of fact, in some Welsh varieties the borrowed English formative -*s* has become an accepted plural formative for some few nouns (Gardani 2008: 76–78). From this perspective, borrowing is a matter of both *full nativization* and *stabilization*. I therefore propose that the term morphological borrowing, when used without further specification, be reserved to cases of spread across the speech community,[22] as follows:

> MORPHOLOGICAL BORROWING is the occurrence on native lexical bases of a recipient language, of foreign morphological entities that are perceived as accessible by the borrowing agents and have become stabilized within the RL's speech community.

[LEAVE A BLANK LINE HERE]

Summing up, I have proposed a Stratal Effect, showing that SL-formatives apply either selectively, that is, to separate etymological strata, or globally, that is, independently from the different lexical strata. This effect can be interpreted both historically and psycholinguistically: historically, it shows that different rules of an SL enter an RL at different times; psycholinguistically, it shows two things: diachronically, SL-rules can progressively extend to other lexical strata, probably as they become more entrenched in an RL; synchronically, speakers make decisions as to whether to uphold or trespass the boundaries between SL and RL. Of course, attitude and degree of adherence to linguistic norms play a role, as well.

5. THE MECHANICS OF BORROWING: EXTRAPOLATION AND EXTENSION

In the previous section, I have claimed that a weak application of the Stratal Effect gives rise to morphological borrowing. In this section, I address the issue of the immediacy (vs intermediacy) of the borrowing process, which is intimately related to the dynamics of formatives spread. What are the mechanics of morphological borrowing? How does it come along, concretely? Is it a mediate or an immediate process? I will argue that morphological borrowing is the result of a process of extrapolation and extension.

The topic of the directness or indirectness of morphological borrowing has received attention in the literature, but mostly from a descriptive perspective. Quite early in linguistic research, Paul (1920: 399) claimed that words are always borrowed in their entirety, whereas derivational and inflectional suffixes are never borrowed alone. However,—he claimed—given a critical mass of loanwords bearing a certain suffix, this suffix can spread from the borrowed lexical stuff to native lexemes of a recipient language by means of analogical new-creation (Paul 1920: 399).[23] This idea was later formulated by Moravcsik (1978) in terms of constraint #2, in an eminent paper on universals of language contact. Behind a rather obscure

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[22] The suggested distinction comes with a methodological caveat. At times, the data provided in the literature are not accompanied by sufficient information about the practices of elicitation adopted and the exact sociolinguistic context. In such cases, ascertaining whether a described occurrence of borrowing is a case of stabilized morphological change or rather an individual use, is hard, if not sheer impossible.

[23] Note that Bloomfield (1933: 454–455) also discusses the diffusion of foreign derivational formatives in terms of analogical extension, although he seemingly does not mean to set up any constraint.

formulation, the constraint states that bound formatives cannot be borrowed unless free morphemes that include them, are also borrowed:

"No member of a constituent class whose members do not serve as domains of accentuation can be included in the class of properties borrowed from a particular source language unless some members of another constituent class are also so included which do serve as domains of accentuation and which properly include the same members of the former class." (Moravcsik 1978: 110)

In his seminal monograph, Weinreich (1953: 31–33) questions the validity of the notion of borrowing with respect to processes of analogical extension. For instance, according to Weinreich, the Yiddish plural formative -im (e.g., *doktójrim* 'doctors') does not qualify as "outright transfer of a highly bound morphemes"; rather,—he claims—it is an analogical extension of the plural suffix identified in pairs borrowed from Hebrew, such as *min* / *mín-im* 'sort' / 'sorts'. On the other hand, Weinreich believes that there exist cases in which isolated bound morphemes enter an RL without lexical support. In his view, a process of borrowing (in his terms, 'transfer') excludes any sort of analogical extension.

The most recent and detailed treatment of the immediacy of the process of affix borrowing is Seifart (2015). Seifart argues that affix borrowing can be either immediate (in his terms, 'direct') or mediate ('indirect') and proposes three criteria to discern between these two types (Seifart 2015: 513). The first criterion is the existence in a recipient language of a set of morphologically complex loanwords, each of which contains an affix with a common and recognizable semantic component (e.g., *profitable*, *honorable*). The second criterion is the existence in a recipient language of a set of loanword pairs, made up by a borrowed word and a corresponding borrowed derivate with an affix that triggers constant and recognizable semantic changes (e.g., *profit profit-able*, *honor honor-able*). Seifart's third criterion is lower token frequency of borrowed derivates than of the corresponding bases in a recipient language (e.g., the token frequency of *profitable* is lower than that of *profit*).[24] For Seifart, if these three criteria test positive, this is evidence for 'indirect borrowing'. Vice versa, if they do not, he speaks of 'direct borrowing'.

Seifart's choice originates from methodological restrictions concerning the available empirical evidence and it is definitely sound from a descriptive point of view. However, it fails to capture the psycholinguistic dimension of borrowing: the lack of loanwords with a certain affix and of loanword pairs in a given RL does not exclude their existence in a bilingual speaker's mental lexicon. Establishing this is not an easy task, though: one would have to resort to a sophisticated psycholinguistic experimentation to pin down the relevant facts about a given bilingual's mental lexicon, in addition to a sociolinguistic survey of a speech community concerning the level of bilingual proficiency and the language attitudes.

To make my point clearer, I shall refer to a recent case of derivational borrowing in Norwegian discussed in Nilssen (2015). Nilssen (2015) shows that the English suffix -ish creating adjectives of similarity or approximation, has recently entered Norwegian in colloquial and informal speech. The first

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[24] Actually, Seifart (2015) formulates his third criterion in terms of pairs of 'complex' loanwords and corresponding 'simplex' loanwords. This terminology is, however, inappropriate because the base of a derivate needs not be a simplex, as it may be itself morphologically complex.

occurrence dates from 1996 and there has been a constant increase since 2000. Crucially, *-ish* occurs with Norwegian bases, such as *sunne* 'healthy', *eventyrlig* 'fabulous', *rutinert*[25] 'organized' in (9), but not with English bases.

(9) Norwegian

    a. *Deilige boller som kan gjøres litt sunne-**ish***

       'Delicious buns that can be made a bit healthy-ish.'

    b. *Se eventyrlig-**ish** Nicki Minaj på BET Awards*

       'See a quite fabulous Nicki Minaj at the BET awards.'

    c. *Prøver fortvilt å være rutinert-**ish** i en ellers kaotisk hverdag.*

       'Desperately trying to stay kind of organized despite chaotic circumstances.'

The data collected by Nilssen (2015) also include forms such as *pukeish*, *shitish*, *waterproofish*, but these only occur in English text chunks, such the following ones.

(10) Norwegian

    a. *random shit-**ish** videoblogg*

    b. *To pjuk or not to puke…kind of puke-**ish***

    c. *outdoor waterproof-**ish** IP-spycam!*

The examples in (10) clearly resemble codeswitching behavior. As such, they are not recorded in dictionaries and do not count as attested loanwords in Norwegian in the sense of Seifart's (2015) first criterion. Thus, if we applied Seifart's (2015) criteria consistently, the cases in (9) would bear witness to a process of direct borrowing for the Norwegian case. On the other hand, it is precisely codeswitching behavior that reflects proficiency in English. As a matter of fact, Norwegians are highly proficient in English, ranking #3 out of 100 countries, as a recent survey has established (cf. http://www.ef.co.uk/epi/spotlights/europe/norway/, accessed on 11 August 2020). In other words, although in Norwegian no English-borrowed words bearing the approximating suffix *-ish* are attested, Norwegian speakers have knowledge of English lexemes with that suffix and use them when speaking English and in codeswitching. Undoubtedly, the mental lexicon of most Norwegian speakers proficient in English hosts both morphologically complex English lexemes and corresponding affix-less lexemes. Nevertheless, English loanwords in *-ish* (with approximating meaning) are not attested in Norwegian. Now, why should we claim that this situation is different from that in which morphologically complex loanwords with a relevant affix are *attested* in an RL? If we assume, as Seifart (2015) does, that affix borrowing is processed in two distinct ways, then we would expect this difference to be psycholinguistically motivated. But is this the case? In my opinion, it is questionable whether the two types of affix borrowing proposed by Seifart and endorsed by Pakendorf (2019) reflect a psycholinguistically real partition. While reasonable from a

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[25] *Rutinert* is an integrated loanword.

methodological viewpoint, an analysis merely based on the presence or absence of loanwords seems not entirely adequate to assume the existence of two distinct processes of affix borrowing. Language proficiency levels and codeswitching behavior are much more revealing about the psycholinguistic reality of the borrowing process. In sum, there is no convincing evidence that borrowing and analogical extension are mutually exclusive phenomena and that affix borrowing comes in two types. Rather, it seems plausible that affix borrowing always involves a process of extrapolation of relatable formatives (and patterns) and a process of extension within the lexicon.

6. CONCLUSION

In this article, I have shown that the term borrowing, especially when it refers to bound morphology, is sometimes used indiscriminately in the literature, to cover phenomena that are not coextensive, and argued for the need to exactly define the notion of morphological borrowing and demarcate it from other types of morphological transfer. I have claimed that a differential analysis of phenomena of morphological transfer is motivated by the fact that they match different, though not reciprocally exclusive, psycholinguistic realities. I have embraced the view that morphological borrowing originates in cross-language structural priming and argued in favor an ability of speakers to relate to the internal structure of words and morphological patterns, which I have called 'morphological relatability'. Based on a large body of evidence, drawn from experimental psycholinguistics, language change, first language acquisition, that underpins this assumption, I consider 'morphological relatability' a precondition for morphological transfer and morphological borrowing to happen: relatable morphology can interfere with the inhibitory control mechanism, and specifically interference suppression skills, that preempts access to the non-targeted language, and override it, thereby enabling morphological priming. I then hypothesized a Stratal Effect, which, applying to varying extent, gives rise to at least three distinct, psycholinguistically motivated types of morphological transfer. Finally, I have dismissed the widespread view that affix borrowing can be either direct or indirect and showed, instead, that it is always indirect, as it involves a process of extrapolation of relatable formatives and their diffusion within the lexicon.

I hope that the views expressed in this article will ignite a debate and collaboration between neuroscientists and linguists, which I deem timely and promising, and inspire novel hypotheses for future research.

Abbreviations

The abbreviations used in this paper are based on Lehmann (2004) and the Leipzig Glossing Rules (available at https://www.eva.mpg.de/lingua/resources/glossing-rules.php).

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