Code-switching and bilinguals' grammars

Rena Torres Cacoullos and Catherine E. Travis

ABSTRACT

Does code-switching entail grammatical convergence or are speakers who regularly code-switch alternating between separate grammars? Underlying debates on code-switching are the methodological issues of what counts as code-switching, as well as appropriate data and evaluation metrics that prioritize community norms over idiosyncratic instances and robust patterns over isolated cases. This chapter illustrates how bilingual behavior as observed in sociolinguistically constructed corpora of spontaneous speech provides replicable findings. Widely entertained mechanisms of contact-induced change are tested through measures of code-switching presence in comparisons with non-contact benchmarks, pivoted on quantitative diagnostics of grammatical similarity evinced in the linguistic conditioning of variation.

1. INTRODUCTION

Code-switching (CS), using two languages in a conversation, continues to amass scholarly attention. Though CS was once viewed, if noticed at all, as a haphazard mess not amenable to analysis, it has been a growing subject over the last 50 years. Attention to CS comes from different linguistic branches and approaches, ranging from psycholinguistic experiments seeking to illuminate language processing, to grammaticality judgments serving to adjudicate on syntactic theories, to recordings of conversations revealing usage in the speech community. CS has been implicated in change in bilinguals' grammars, a conjecture that can only be tested via proper delimitation of CS and diagnostics of change.

To begin to understand the impact of CS, we need to know what it is. We find a plethora of terminologies and taxonomies and an astounding lack of agreement even on how to recognize a code-switch. A major dispute bearing on the identification of CS is whether to characterize it as alternation between two languages, each of which retains grammatical independence, or rather as insertion of one language into the other, which would be the matrix language grammatically. In the latter situation, the relation between the two languages is asymmetrical, one being morpho-syntactically dominant, whereas in the former, both languages are at work and the question becomes that of discovering the structural sites of CS. The Equivalence Constraint states that bilinguals tend to avoid CS at points of word order conflict between the two languages; the notion of equivalence, congruence, or matching between languages features in many approaches to CS (Poplack, 1980, Poplack, 2015) (see also Lipski, 1978, Muysken, 2000, Deuchar, 2005, Muysken, 2015).

The use of two languages within a speaker turn is exemplified in (1), from a Spanish-English bilingual corpus. Each line of transcription represents an Intonation Unit (IU)

(Du Bois et al., 1993: 47, 52-55).[1] CS here occurs at IU boundaries, following final intonation contour (marked by a period), between lines (a) and (b), and after continuing intonation (marked by a comma), between (f) and (g). Single-word insertion, or nonce borrowing, is illustrated in lines (c) and (d) (*carrots*). (In the examples, the translation appears on the right, with stretches of speech originally produced in English in italics.)

(1)

a.	*... and I used to get chile quite a bit.*	*'... and I used to get chile quite a bit.*
b.	*.. y salía todo.*	.. and everything grew.
c.	*... carrots,*	... carrots,
d.	*unas carrots grandotas.*	some big carrots.
e.	*asina las sacaba.*	I would pull them out like this.
f.	*... y ahora la tierra como que no me sirve=,*	... and now it's like the earth no good,
g.	*something is wrong.*	*something is wrong.'*

[04, 47:10-47:22]

Achieving agreement on CS has been impeded by a dearth of bilingual corpora that are usable and suitable. Usable corpora record the speech of members of a well-defined speech community, transcribed following defined protocols. It is in such corpora that we can contextualize contact phenomena both linguistically and socially, thus allowing us to detect those that represent robust patterns and to explain those patterns in light of bilingual practice in the community. Suitable corpora capture quantities of incontrovertible multi-word instances of CS as well as of single-word insertions, including nonce and established borrowings (such as *carrots* and *chile* in (1) above). Beyond appropriate corpora, the second core methodological issue is the lack of agreed-upon evaluation metrics to assess competing accounts. In this chapter, we look to how bilingual speech itself can elucidate the structure of CS and its relation to other outcomes of language contact, reminding ourselves that it is the speakers using two or more languages who are the locus of contact (Weinreich, 1953/1968: 1).

2.   HISTORICAL OVERVIEW: MECHANISMS OF CHANGE

A widespread hypothesis is that CS promotes contact-induced change, especially grammatical convergence, by encouraging shared structures or simultaneous activation of bilinguals' two languages. How would CS bring about change, though? Spelling out the proposed mechanisms of change bears directly on the predictions that can be made in order to test the hypothesis.

Let us take a single candidate for contact-induced change to illustrate how multiple accounts and even contrasting predictions have been advanced. Subject pronouns are often expected to increase in overall rate in null subject languages (such as Spanish or Turkish) in contact with non-null subject languages (such as English or Dutch) (e.g., Heine and Kuteva, 2005: 70, Doğruöz, 2014). The reasoning is that the distribution of

---

[1]   Examples are from the New Mexico Spanish-English Bilingual (NMSEB) corpus (cf., Torres Cacoullos and Travis, 2018, Chapters 2 & 3). Within brackets following examples is the recording number and the beginning-ending time stamps of the lines reproduced. Transcription protocols are presented in the Appendix.

a variant form converges with that of an analogous form in the contact language (Backus, 2005: 333).

Varied explanations implicate erosion of discourse-pragmatic constraints on choice of a pronominal vs. an unexpressed subject, in particular, weakening of the effect of the accessibility of the referent. One usage-based account for weakening of discourse-pragmatic constraints is that when speaking the non-null subject language bilinguals are not practicing such constraints, which are ostensibly inapplicable in a language like English (Otheguy and Zentella, 2012: 167-168). Alternatively, appealing to the intrinsic demands of bilingualism, some processing accounts consider the overt pronoun a default (Sorace et al., 2009: 473-474), though cognitive 'costs' of CS depend on bilinguals' linguistic experience, as well as on the psycholinguistic measure employed (Adamou and Shen, 2017, Johns, Valdés Kroff and Dussias, 2018). In either case, whether erosion is attributed to insufficient practice or bilingual processing demands, the constraint and its workings must be specified, since the opposite prediction may follow. A decrease in pronoun rate would follow from, for example, reduced use of the first person singular pronoun ('I') in certain interactional contexts, as observed among Spanish speakers in the U.S. shifting to English (Silva-Corvalán, 1994: 147-163).

It is thus worth delving into mechanisms of change, capitalizing on speech data from bilinguals who make regular use of both their languages and switch smoothly between them.

A well-understood mechanism of change is grammaticalization (e.g., Bybee, 2015: 117-160). *Contact-induced grammaticalization* is said to be a kind of grammatical replication, by which an existing structure is used with grammatical meaning modelled on another language (Heine and Kuteva, 2005: 79-122). The aspectual periphrases formed with a gerund in English and Spanish provide an example. Both developed from locative expressions, following a cross-linguistic grammaticalization path. Nevertheless, English *be* + V-*ing* is an obligatory expression of progressivity the absence of which signals habitual meaning (e.g., *I'm drinking decaf* vs. *I drink decaf*) (Bybee, 2015: 193). In this it is farther along the grammaticalization path than Spanish *estar* 'be (located)' + V-*ndo*, which still alternates with simple verb forms to express progressive aspect. This can be seen in (2), where a simple imperfective form in (b) refers to an activity in progress at the moment of reference (note that this simple verb form is most naturally rendered as *be* + V-*ing* in English) (Torres Cacoullos, 2012: 103-107).

(2)
  a. *cuando se le voló,*   'when it ((his hat)) blew off,
  b. *...(1.0)* **venía**[IMPF] *un carro y lo tropelló.*   ...(1.0) a car **was coming**[IMPF] and ran over it.'

[05, 18:59-19:03]

Degree of advancement along a shared evolutionary path constitutes a **diagnostic difference**, that is, a locus of structural divergence between the languages in contact that permits detection of contact-induced change (see Poplack, 2018: 26, on the 'conflict site'). Identifying a diagnostic difference in turn allows us to pose a quantitative question to probe contact-induced grammaticalization: does Spanish in contact with English show increased use of *estar* + V-*ndo* relative to simple verb

forms in progressive aspect contexts, as compared with non-contact Spanish varieties? Not necessarily so. In Puerto Rico, *estar* + V-*ndo* rates in present progressive contexts are similar for bilinguals and monolinguals (22%, N=384 and 27%, N=258, respectively, *p* = 0.11 by Fisher's exact test) (Cortes-Torres, 2005: 53). In New Mexico, in the southwestern U.S., *estar* + V-*ndo* rates in past progressive contexts, exemplified in (2), are similarly high as in a monolingual Latin American benchmark (19%, N=313 vs. 22%, N=284); and they are similarly low in past habitual contexts (3%, N=509 vs. 4%, N=91, respectively) (Dumont and Wilson, 2016: 410-412). To illuminate the existence and nature of a candidate change, note that the quantitative argument rests on co-occurrence patterns—rates of alternative forms in particular contexts.

Simplification involving decreased use of one variant form without a counterpart in the other language (alongside increased use of another with a counterpart) may also be a mechanism of contact-induced change (e.g., Silva-Corvalán, 1994: 3). An example is Spanish mood choice in contact with English. Consider the complement clauses in (3) and (4) with Subjunctive and Indicative, respectively, under the same main clause verb 'seem'. Studies of varieties of Spanish spoken in the U.S. have asserted simplification based on lower rates of the Subjunctive vs. the Indicative.

(3)   *pero **parece** que **pudieran** poner*[SUBJ] *a sign,*
          'but it **seems** like they **could have put**[SUBJ] *a sign*,'

[29, 39:36-39:39]

(4)   *parecía que estaba*[IND] *toda detenida.*
          'it **seemed** like I **was**[IND] all caught up.'

[06, 36:50-36:52]

Yet a more rigorous gauge of simplification is once again supplied by co-occurrence patterns. For example, frequency measures according to the main clause verb have exposed limited Subjunctive productivity, and that this holds in Romance languages regardless of language contact. Thus, much subjunctive selection is determined by the lexical identity of the main clause verb, and subjunctive tokens largely occur with a limited number of verbs that take the subjunctive categorically, leaving little room for semantic-pragmatic considerations in mood choice (Poplack et al., 2018). LaCasse (2018) observes such lexical routinization in Spanish, for both a U.S. Spanish variety and a monolingual benchmark. Where there is room for variability between Subjunctive and Indicative, across the comparison corpora the same linguistic conditioning applies (for example, according to main clause polarity). Why the finding against contact-induced simplification reported in numerous studies of U.S. Spanish? This difference stems from the data source in sampling bilinguals who habitually speak both languages (vs. speakers shifting to the majority language), but also from the evaluation metrics in going beyond overall rate to explore linguistic variation patterns.

Finally, *contextual distribution via codeswitching*, or shifts in the contexts of use of a form, is a mechanism of variation and change that can explain contact effects, for example, the behaviour of cognate words (cf., Torres Cacoullos and Travis, 2018: 95). An example from phonology is the alternation between lenited and stop allophones of word-initial Spanish /d/, depending on the preceding phonetic environment, whereas English word-initial /d/ has a stop allophone only. In Spanish in contact with English,

the rate of lenition is lower in cognate words such as *doctor* than in non-cognates such as *dolor* 'pain' (Brown, 2015: 396). Now, variation and change is affected by the 'usage history' of words, as lexical representations are based on speakers' linguistic experience (Bybee, 2010: 43). The effect of an alternating phonetic context—as is the case preceding word-initial /d/ (e.g., *el dolor*, *mucho dolor* 'the pain, much pain') —is cumulative, such that words used more frequently in a phonetic environment that favours a newer variant undergo change earlier than other words (Bybee, 2015: 87).

The effect of cognate status follows from just such a cumulative usage effect. Factoring in bilinguals' use of English as well as Spanish, and considering the interactivity between cognates in bilingual lexical representation, Brown (2015: 399) shows that frequency of occurrence in contexts propitious to lenition has the same effect on /d-/ lenition in cognates as in non-cognates (left panel, Figure 1), but cognates are exposed less frequently to such contexts (right panel), resulting in an overall lower rate of lenition in cognates. The cognate effect here is thus a corollary of shifts in the contextual distributions of structures once bilinguals' experience in both their languages is included.

Figure 1   Rates of word-initial /d/ lenition (left panel) and Contextual distribution (right panel) according to frequency of occurrence in contexts favourable to lenition, for cognate and non-cognate words in a U.S. Spanish variety
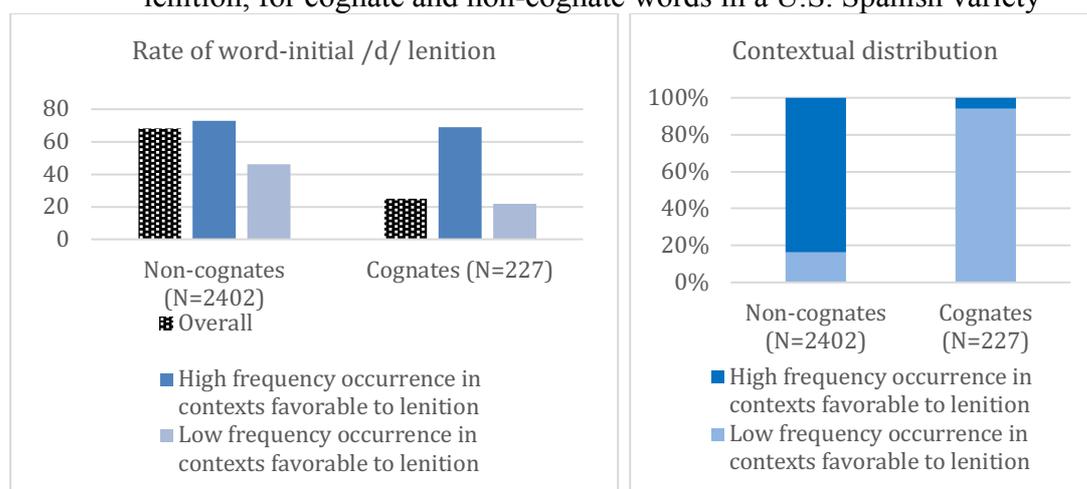
3.   CRITICAL ISSUES AND TOPICS

Conflicting definitions and therefore delimitations of what counts as CS have hindered advances in our knowledge of the conditions on CS and the consequences it may have for grammars in contact. A far-reaching decision concerns the treatment of single-word insertions from one language into the other as CS or as spontaneous borrowing. In this section, we also discuss how patterns of variation between competing forms can be used to assess the role of surmised triggering elements in CS and the actual scope of language mixing phenomena.

Code-switching and nonce borrowing: Alike and disparate

Borrowing involves lexical retrieval from the recipient language only, while CS involves drawing from two languages in real time. There is no dispute there. *Nonce borrowing*, however, and CS have been treated as one and the same in insertional models of CS, which are premised on the blanket assumption that single-word insertions are switches (e.g., Myers-Scotton, 1993). At the crux of the matter are content words typically unattested in dictionaries of the recipient language, as with English *carrots* embedded in a Spanish stretch of speech in (1) above, lines (c) and (d) (and not *chile* in line (a), as an established borrowing). Muysken's (2000) influential classification of CS distinguishes the insertional and alternational kind, responding to the awareness of at least some kind of difference between using one and more than one word from another language. What similarities or differences are there between what we can operationally identify as unattested other-language (inserted) single words versus (alternating) multiword strings?

Single-word insertions, or lone items, and multiword CS strings certainly share social and cognitive properties, such as those noted in Figure 2. Both entail bilingualism, neither is predictable, and the usage of both is guided by community norms.

Figure 2   Shared social and cognitive properties of
single-word insertions and multiword code-switching strings

Single-word insertions and multiword CS strings both:

1. Require bilingualism
    (though they may not involve co-activation of the two languages in the same way).
2. Are unpredictable at any given point
    (though they may be preferred at particular loci).
3. Frequency depends on local community norms
    (though single-word insertions in aggregate tend to be more frequent than multiword strings, and hence many remarks about CS actually pertain to single-word insertions).

Single-word insertions and multiword CS strings nevertheless sharply diverge in their structural linguistic properties, including for word class and word order, as well as categories and constructions. Indeed, perhaps the biggest breakthrough for the study of CS since the 1980s is the knowledge of how bilinguals morpho-syntactically treat lone items in their spontaneous language use, formalized as the *nonce borrowing hypothesis* by Poplack and colleagues (e.g., Poplack, 2018).

Figure 3   Divergent structural linguistic properties of
single-word insertions and multiword code-switching strings

> Single-word insertions and multiword CS strings differ in:
>
> 1. Word class:
>   Single-word insertions are disproportionately nouns;
>   no such disproportion has been reported for the words that are part of
>   multiword CS strings.
> 2. Word order at the juncture between the two languages:
>   Single-word insertions follow the word order of the recipient language;
>   multiword CS strings are juxtaposed at points where the two languages
>   have the same word orders (the Equivalence Constraint).
> 3. Internal morpho-syntax:
>   The categories and constructions of single-word insertions are of the
>   recipient language;
>   the internal constitution of multiword CS strings is consistent with the
>   grammar of their respective language.

For example, the syntactically unattached *carrots* in line (c) in (1) above is a nonce
borrowing rather than a code-switch based on the tendency of English single nouns to
assume the linguistic features of loanwords in this particular speech community
(Torres Cacoullos and Aaron, 2003). This is demonstrably so in line (d), where the
word order and nominal categories are Spanish, as *carrots* appears with a post-posed
adjective and feminine gender – both diagnostic differences between Spanish and
English. The aggregate patterns establishing loanword status remain true even if
integration is not displayed on a case-by-case basis, as with the determinerless and
unmodified *carrots* in line (c).

Consider, in contrast, the multiword CS in example (5), where again, diagnostic
differences allow us to observe the integrity of the use of English and Spanish as
separate languages – line (c) features the English-particular pattern of preposition
stranding (*talking* <u>*about*</u>), and line (d) a proclitic indirect object (<u>*le decían*</u> 'they used
to say <u>to him</u>'), consistent with Spanish grammar.

(5) [talking about nicknames for different people named Miguel]
    a. *más antes había muchos ~Migueles,*   'before there were a lot of Miguels,'
        ((6 IUs intervening))
    b. *pa' saber la **difference** which --*   'to know the **difference** *which --*
    c. *.. Miguel they were talking about,*   .. *Miguel they were talking about*,
    d. *le decían ~Miguel Bajo,*   they used to call him Miguel Short'
                                      [17, 01:12:20-01:12:24]

The treatment of other-language nouns has consequences for the delimitation of
switches and syntactic analyses of CS. In line (b), CS undeniably occurs within the
prosodic unit (IU) but whether it counts as occurring at the determiner-noun juncture
(beginning with *difference*, as represented in (a) in (6)) or at the clause boundary
(following *difference*, as in (b)) follows from the analyst's decision on whether to
categorize *difference* as a nonce borrowing. Note that neither switch site would
violate the Equivalence Constraint (in both languages the determiner precedes the

noun), but to establish patterns of CS, the issue is one of discovering which 'permissible' switch sites are actually favoured.

(6)
a.   *[pa' saber la]   [difference which Miguel they were talking about]*
b.   *[pa' saber la difference]   [which Miguel they were talking about]*
       'to know the difference which Miguel they were talking about'

Finally, let us consider whether, as has been proposed, borrowing and CS form a linguistic continuum (e.g., Matras, 2009: 111). Items on a continuum display a shared property to a greater or lesser degree, for example, some derived words are more compositional than others, as with English *tasteless* vs. *listless* (Hay, 2002: 1048). Continua also often involve a diachronic relationship, for example, lexical morphemes become grammatical morphemes, as with the grammaticalization of 'be located' in progressive aspect constructions.

From a diachronic perspective, the assumption that insertional or single-word CS is the forebear of lexical borrowing may seem a natural one (Backus, 2005: 315). Yet it is at odds with the recognition that lexical borrowing is not contingent upon CS (Haspelmath, 2009). More decisive is the empirical evidence. From a corpus-based study spanning some 60 years (Poplack and Dion, 2012), we learn on the one hand, that single-word insertions tend to be instantaneously integrated into the recipient language on first use; and on the other, that despite on-the-spot morphosyntactic integration, most nonce borrowings do not diffuse to become dictionary-attested established loanwords.

One synchronic criterion applied to single-word insertions relies on frequency, whereby concepts more often expressed by other-language-origin words are deemed loanwords whereas ones that are less often so are instances of CS (Myers-Scotton, 1993: 191-204). Intuitive as it may seem, this social criterion is contradicted by the instantaneous structural integration of single-word insertions into the recipient language on first use. In addition, such a frequency criterion produces implausible classifications, for example, of some English school-related terms in New Mexican Spanish as loanwords and others as switches. To illustrate, when speaking Spanish, English *grades* is the preferred way of referring to school grades (*notas* in Spanish), as in (7), while *teacher* is not a preferred term (instead *maestra/o* is). Yet the putative single-word CS with the compound *substitute teacher* in (8) is patently integrated, appearing as a bare predicate nominal, consistent with Spanish and in contradiction with English grammar.

(7)
*vieras los **grades** que tiene.*   'you should see the **grades** he has.'
                                        [24, 10:47-4:48]

(8)
*era **substitute teacher** en la escuela,*   'she was (a) **substitute teacher** in the school.'
                                        [21, 4:49-4:51]

In assessing the relationship between CS and nonce borrowing we must distinguish between social-cognitive properties, which are shared, and structural properties,

which diverge sharply, not as a matter of degree (as summarised above in Figure 3). The synchronic and diachronic relationships between CS and borrowing thus dictate that they be recognized as distinct manifestations of language contact, an essential distinction for meaningful analysis of bilingual speech.

Code-switching motivations vs. mode: Letting the data speak

Multiple explanations have been offered for why a speaker may combine two languages, be that via insertion or alternation (cf., Matras, 2009: 114ff for a summary). In some contexts, switching languages may be motivated by extralinguistic considerations of setting, topic, or the bilingual abilities of the interlocutors (Blom and Gumperz, 1972). It may also be used for rhetorical effect, such as to make metalinguistic commentary, with quoted speech, or for discourse organization (Auer, 1995, Wei and Milroy, 1995, Aikhenvald, 2002: 190–191). And the choice of language has often been perceived to have a social meaning related to the establishment of identity, as, for example in 'metaphorical CS' (Gumperz, 1982: Ch. 4). One of the challenges to be met by pragmatic explanations is to demonstrate that CS does carry the proposed function. To do so, it must be shown that the same external trigger or meaning tends to be absent when speakers are not engaging in CS (that is, for non-occurrences, as outlined in the following section).

It is not always the case, however, that there is a specific trigger for combining two languages. In 'intrasituational code-switching' (Poplack, 2015: 218), the two languages occur in a single speech event as a general discourse mode (similar to what Grosjean has referred to as 'bilingual mode', 2001). In this case, the use of one or the other language, or a switch between them, is not any more locally predictable than telling a joke (Poplack, 1993: 276, Sankoff, 1998: 39).

How can we know whether CS is locally motivated? Bilinguals' responses to direct questions about meanings associated with different languages or about reasons for switching between them cannot be taken as evidence, as speaker intuitions are notoriously unreliable (cf., Blom and Gumperz, 1972: 430). This is even more so when combining two languages is stigmatized (as is suggested by labels such as *Spanglish* or *Franglais*), and bilinguals have been known to judge utterances that they themselves had produced as incorrect (Torres Cacoullos and Travis, 2018: 39-40, and references therein). Thus, we need to look at how speakers actually use language.

Naturally arising commentary extracted through content analysis of a corpus may provide clues about speaker attitudes to the two languages (Torres Cacoullos and Travis, 2018: 62-71). For example, in a 300,000-word New Mexico Spanish-English corpus (NMSEB), there is not a single mention of any value attached to one or the other language (outside of a few fleeting mentions of church hymns). There is, however, commentary on unreflecting switching between the two languages, as in the following example.

(9)

...(1.0) we can=,	*'...(1.0) we can,*
... be talking in English,	*... be talking in English,*
y=,	and,
...(1.0) en media conversación,	...(1.0) in the middle of the conversation,
estamos hablando españo=l.	we are taking in Spanish.'

[27, 21:54-22:01]

Other clues come from structural analysis, for example, the distribution of the grammatical person of clause subjects. We might expect grammatical persons to differ in their distributions across the languages if they carry different social meanings, for example related to speaker involvement (Gumperz, 1982: 81). Specifically, a more personal language might be preferred for 1st and 2nd person subjects, and a more objective language for 3rd person subjects. In the New Mexico corpus, however, as seen in Figure 4, the grammatical person distribution is very similar for Spanish and English, the presumed more 'personal' and 'objective' languages respectively. This kind of operationalization and quantitative test can reveal community-specific motivations for CS, or, in this case, the absence thereof.

Figure 4   Distribution of clauses by subject person in bilinguals' Spanish and English*
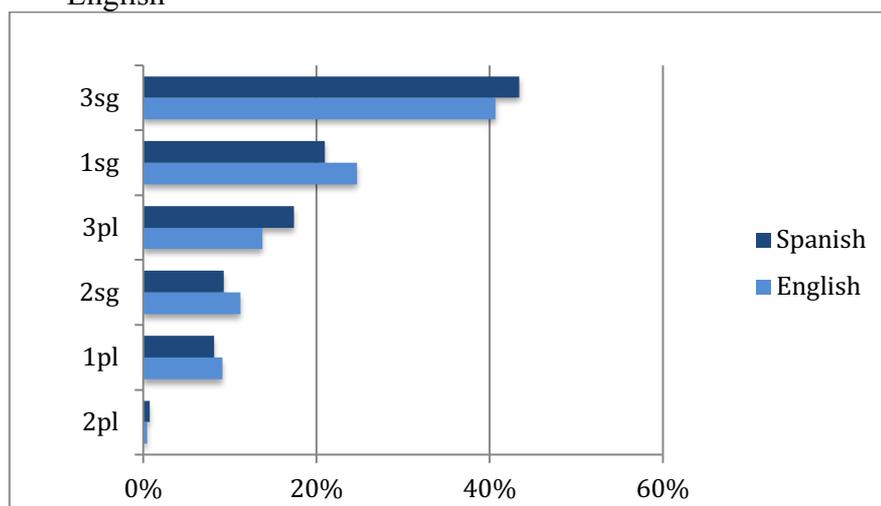
*Language of clause based on the language of the verb;
   Spanish N=17,689; English N=18,322
   (Adapted from Torres Cacoullos and Travis, 2018: Figure 9.1)

Degrees of bilingual practice: Community norms

The familiar notion of individual degree of bilingualism is fraught with often incommensurate ways of assessing proficiency. More apt is what we may call degrees of bilingual practice, or actual use of the two languages and strategies for combining them.

Language combining strategies are governed by the norms of the bilingual speech community. For example, some communities are reported to avoid CS (e.g. indigenous Amazonian languages in the Amazonian Vaupes, Epps and Michael,

2017) .[2] Others use CS primarily for rhetorical purposes, such as meta-linguistic commentary, repetition or, translation (e.g., French Canadians in Ottawa-Hull (Poplack, 2018: 67-71). And in yet other communities CS is a discourse mode, as is the case in New Mexico (cf., Gonzales, 1999). In the New Mexico Spanish-English bilingual (NMSEB) corpus, furthermore, the clauses are evenly divided between the two languages (see note on Figure 4). Thus, neither is more frequently the 'matrix language' (Myers-Scotton, 1993) nor 'more salient' (Myslín and Levy, 2015: 871).

Degrees of bilingual practice can be considered by situating the contact setting in its social context. In a conversational corpus of over half a million words of Chintang (a Tibeto-Burman language), for instance, in comparison with older speakers, children are reported to produce more Nepali insertions, and to syntactically integrate them less (Stoll et al., 2015: 6, 11). Stoll et al. also note that younger speakers are exposed to, and use, more Nepali. With this socio-historical contextualization of the contact setting, they interpret the difference between generations not as grammatical change, but rather as change 'in the nature of bilingualism' (2015: 9, 10).

Knowledge of bilingual community practices is needed to unravel language change or continuity under contact. For example, Stanford (2008) considers clan-based dialect differences in lexical tone among the Sui, an indigenous community in southwest China. According to exogamy in this region, marriage takes place between people of different clans and women move into the village of their husband. Yet these women retain the clan-specific tonal patterns, demonstrating continuity despite intense contact.

Such quantitative descriptions of speech corpora diverge from the commonly embraced view that CS inevitably leads to grammatical convergence (e.g., Thomason and Kaufman, 1988: 154, Backus, 2005: 334). Influential was Gumperz and Wilson's (1971) study asserting that prolonged contact and constant CS between languages in Kupwar, India, had resulted in a shared syntax, with only lexical differences remaining (1971: 256). Some forty years later, a study in this same region suggests a reconsideration of this claim. Rather than precise isomorphism, Kulkarni-Joshi (2016: 168-169) documents (for both young and old speakers) considerable variability in structures in a corpus of spoken narratives. Though variability is a condition for change, 'not all variability and heterogeneity in language structure involves change' (Weinreich, Labov and Herzog, 1968: 188). She further points out that the intertranslatability reported by Gumperz and Wilson (1971) may be an artefact of the data collection method, which itself was based on translations between the three languages (2016: 168-169). As she summarizes from Gumperz (1967: 52), stories were told in one language and then retold in another, and 'translations were further edited to substitute translation equivalents so as to minimize the language distance in those instances where different expressions had been used'.

Systematically compiled speech corpora afford a view of community usage patterns that hold across individuals and sub-groups. To discern patterns, the key

---

2   It has been suggested that "limited code-switching and low levels of lexical borrowing" may accompany grammatical convergence (Epps and Michael, 2017), though the thresholds for high vs. low levels of CS and borrowing remain to be determined (see Section on 'how to count code-switching').

methodological concept for quantifying is the scientific principle of *accountability*: count all occurrences of the linguistic form of interest in the data set, but also all of the contexts in which the form *could have* occurred, even if it did not (Labov, 1972: 72).

Sankoff and Brown's (1976) account of the development of the relativizer use of *ia* in Tok Pisin, an English-based creole spoken in Papua New Guinea, is a model study for tracing 'the origin of syntax in discourse'. Counting occurrences and non-occurrences of the form, Sankoff and Brown describe how Tok Pisin *ia* developed from a place adverb (based on English 'here'), to a deictic or demonstrative, then undergoing further extension for 'bracketing' use, as in relativization and clefts (1976: 663). The structure is shown to arise through a grammaticalization process in everyday speaker interactions, rather than being primarily due to other-language influence. Such insights are thanks to analysis of co-occurrence patterns in a corpus from speakers whose socio-personal history and the speech community they represent are known to the analysts.

4. CURRENT CONTRIBUTIONS AND RESEARCH: CODE-SWITCHING IN ACTION

To substantiate the hypothesis that CS promotes convergence, we need a synchronic test of contact-induced change. The prediction to be tested is whether the grammar of one language is more similar to the other when bilinguals are code-switching than when they are not. In particular, the linguistic conditioning of variable structures should be impacted in the context of CS, and differ from that in its absence. To execute the test, we thus need a demarcation of CS, as well as measures of grammatical similarity or difference.

How to count code-switching

Quantifying CS presents an enduring challenge. First, failure to distinguish CS from borrowing risks obscuring any potential impact of CS. The question for CS-induced convergence is thus whether alternation of multiword strings (unambiguous CS) steers the grammar of one language in the direction of the other. Second, there is agreement that for CS to result in language change it must be 'extensive' (e.g., Myers-Scotton, 1993: 211). Researchers indeed often use quantitative qualifiers such as 'abundant', 'dense' or 'frequent' in reference to CS. Unless numbers are provided, though, assertions of 'extensive' CS remain uninterpretable. Replicable measures of CS frequency are sorely needed to enable comparisons across datasets and communities.

For single-word insertions, an overall frequency measure has been obtained by considering the proportions of tokens of other-language vs. native words in a given corpus (e.g., Tadmor, 2009: 56-57, Adamou, 2016: 212-214). A caveat is that overall rates will vary according to genre and topic. For example, in one study the same speaker showed a rate of single other-language words as much as seven times greater in one recording than in another (Aaron, 2015: 480). Topic driven differences will be exacerbated the smaller the corpus, but a way to mitigate this is to apply the principle of accountability (see Section on 'degrees of bilingual practice'). A measure of borrowability, for example, can be obtained by making the comparison within

semantic domains, that is, the proportion of tokens that are borrowed vs. native in a given domain, for example, technology-, or food-, or school-related terms (Aaron, 2015: 465-468).

Frequency measures for single-word insertions are inapplicable to CS, however. Circumscribing the universe of contexts where CS *could* occur (and not only those where it actually did occur) is far from straightforward since it is impossible to predict the occurrence of CS at any particular point in the discourse (Poplack, 1993: 276, Sankoff, 1998: 39).

One way to define a universe of CS contexts is by syntactic boundary (cf., Sankoff and Poplack, 1981). An example is the boundary between a main and subordinate clause, such as a main and conditional clause (Backus, 2008: 254), or a main and complement clause, as in (10) and (11). In a bilingual corpus of English and Spanish, the rate of CS at this juncture is 6% (63/1,133), where the non-occurrences of CS comprise tokens of [Main Clause + Subordinate Clause] that are all Spanish or all English, as well as tokens containing single-word insertions or multiword CS but not at the clause boundary (Steuck and Torres Cacoullos, To Appear). This calculation would be repeated for all syntactic junctures that are the site of CS, for example, between verb and object, verb and adverbial expression, and so on.

An alternative global measure of CS frequency can build on the prosodic structure of CS, which tends to occur at the boundary of prosodic units (captured here across lines), as in (10), rather than within them, as in (11) (Torres Cacoullos and Travis, 2018: 51-52) (cf., Shenk, 2006: 189, Mettouchi, 2008: 195). In a corpus transcribed in Intonation Units (IUs), the universe of CS is the total number of IUs and the proportion of CS is, of that total, the number of IUs followed by an IU in the other language plus the smaller number of within-IU switches.

(10)
   so I told them,   '*so I told them,*
   que van a salir en el @Sun @.   that they're going to be in the @Sun @.'
                                         [22, 17:05 -17:07]

(11)
   se me hace que they're better.   'I think that *they're better.*'
                                         [04, 29:10-29:11]

In the absence of a global frequency measure of CS in a community or corpus, for a synchronic test of the hypothesis that CS promotes convergence, one solution is to compare speakers according to their propensity to code-switch (Poplack, 2018: 152), as there should be a correlation between copiousness of CS and greater convergence. However, as with single-word items, the smaller the corpus the greater the possibility that individual speaker counts of CS, even normalized ones, may be skewed.

An online measure considers the proximity of CS to the linguistic structure of interest. According to such a measure, each instance of the linguistic variable is classified according to whether it is close to or far from CS, enabling comparison of the two classes of instances. The proximity of CS has been measured in seconds (Balukas and Koops, 2015: 430), prosodic units (Torres Cacoullos and Travis, 2011: 255), and clauses.

By way of illustration, let us return to subject pronoun expression as a candidate for grammatical convergence of 'null-subject' languages toward 'non-null-subject' languages, here with a focus on Spanish and English in the U.S. (Torres Cacoullos and Travis, 2018: Ch. 9). Proximate CS was operationalized, via a clause-based measure, as the use of multi-word strings in the other language by the same speaker who produced the target verb, in the immediately preceding or the same clause. For example, in (12) there are three 1sg subject tokens. The first two, in lines (b) and (c) occur in the absence of CS, while the third, in line (f) occurs with English in the immediately preceding clause.

(12)

a.		Miguel:	*cuando salíamos*	'when we would leave
			en el mediodía,	at midday,
b.	Spanish		*...(1.8) yo **salía**,*	…(1.8) (I) **would go out**,
c.	only		*...(1.0) y Ø **corría**.*	…(1.0) and (I) **would run**.'
d.	Spanish	Rafael:	*... por qué?*	'… Why?'
e.	only	Miguel:	*... I just liked to ru=n.*	'... I just liked to run.
f.			*Ø **estaba** como el de --*	(I) **was** like that one from --
g.			*...(1.0) @@@*	…(1.0) @@@
h.	CS present		*...(1.4) como el este,*	…(1.4) like that one,
i.			*Forrest @Gump.*	Forrest @Gump.'

[04, 35:25-35:40]

Applying this measure of proximate CS to all instances of a linguistic variable in a corpus provides an indication of the distribution of language combining strategies, distinguishing between (1) contexts that are in proximity to CS, (2) those in proximity to single words and other items for which the role of the other language is to be determined (for example, with proper nouns or with interlocutor-produced other-language material), and (3) those that are locally unilingual.

Figure 5 illustrates how such a classification may be manifested in bilingual speech data, the darkest shade representing one language, the lighter shade another, and the lightest shade all other contexts. Here we see strings of IUs produced in the one language (e.g., the IUs in lines (f)–(h) and (i)–(l)); IUs in one language containing a single item from the other (e.g., (a) and (e)); and other contexts (such as IUs containing material that can't be assigned to a language or an interlocutor contribution (e.g., (b), (m)–(n)). The pertinent data sets for comparison to test the impact of CS are constituted by instances of the linguistic structure under consideration occurring in the proximity of CS vs. in a unilingual environment. In this schematized example, there are three instances of the variable of interest in the contexts to be compared; one occurs in the presence of CS (i), and two in its absence ((k) and (q)).

Figure 5   Distribution of a linguistic variable according to the proximate presence of
code-switching in a bilingual speech corpus

How to measure grammatical (dis)similarity

Having demarcated CS contexts, convergence must still be determined—how can grammatical similarity or difference be measured in order to corroborate *increased* grammatical similarity? The answer is to compare the linguistic conditioning of analogous linguistic variables across data sets.

Subject expression again serves to illustrate, drawing on the findings from Torres Cacoullos and Travis (2018: Chapters 6 & 7). The variation in Spanish was seen in (12) above, where the unexpressed subject is marked with a Ø in the original, and a pronoun in parentheses in the translation. Unexpressed subjects also occur in English, albeit within a much more limited envelope of variation than in Spanish. English unexpressed subjects are restricted to coordinate clauses, as in line (c) in (13), and, in non-coordinate clauses, to prosodic-initial position, as in (d) and (e) in (14).

(13)
  a. *I go home,*
  b. *I take a shower,*
  c. *and I sit and Ø **watch** the novela,* (('soap opera'))

                                                              [12, 04:35-04:38]

(14)

  a. *.. I was able to scramble and,*

  b. *.. find the --*

  c. *my other flashlight,*

  d. *... Ø **turned** it on,*

  e. *Ø **worked** on the one I had just broke.*

<div align="right">[16.1, 26:06- 26:12]</div>

Given its restricted envelope of variation, English has a rate of pronominal subjects approaching ceiling, with some estimates lying at around 97%, compared with rates ranging from 10 to 50% in Spanish (Torres Cacoullos and Travis, 2018: 112, 151). Thus, the suggestion is that convergence with English would be seen in an increase in pronominal subjects (see Section 2). However, overall frequency rate increases alone are an unreliable measure of grammatical change, as they may fluctuate due to extra-grammatical factors such as genre; the threshold for a linguistically significant increase is also unknown.

To discern increased similarity, or change in the direction of English, we instead look to diagnostic differences in the linguistic conditioning of the variation, that is, where the co-occurrence patterns in Spanish differ from those in English. Comparison across languages shows that the probabilistic constraints replicated in numerous studies of Spanish correspond with cross-linguistic tendencies in subject pronoun expression: the same direction of effect for the same predictors (e.g. accessibility, priming, tense-aspect) obtains in a range of other languages quantitatively studied, regardless of language type—including English. Thus, within the restricted envelope of variation, English is actually qualitatively similar to null-subject and other traditional language types. What, then, are the interlingual differences that will allow us to measure potential convergence in contact varieties?

Even when probabilistic constraints are shared, diagnostic differences may be sought in the magnitude of those constraints. Here, we dissect the most replicated constraint for subject expression, accessibility, which concerns recency of mention, most often configured in terms of coreferentiality with the preceding clause subject. For example, (15) illustrates a non-coreferential context, with a switch in subject between the target clause in (c) and the preceding clause in (a), and (16) illustrates a coreferential context. Pronouns are favoured (as a tendency, not a categorical rule) in non-coreferential, over coreferential, contexts.

Within coreferential contexts, accessibility is reinforced by linking between clauses, syntactic and/or prosodic. In (16), the two coreferential-subject clauses are not linked – there is no conjunction; the first clause ends with final intonation (indicated with the period); and there is a pause separating the two clauses (indicated by the three dots, with the length given in seconds following). In (17), like (16), the two clauses share the same subject, but here the target clause in (b) is linked to the preceding, via both the conjunction *y* 'and', and continuing intonation on the first clause (marked with a comma). In this structurally linked context, where the subject can be considered to be more accessible, pronouns are less likely to occur than in than in a coreferential non-linked context.

(15)

    a. *y las veces que iba,*   'and whenever I visited,
    b. *pues=,*   well,
    c. *ahi Ø* **estaba** *siempre,*   (he) **was** always there,
    d. *you know?*   you know?'

                                                        [04, 59:02-59:04]

(16)

    a. *.. y Ø se salió.*   'and (he) left.
    b. *...(1.0) al ratito Ø* **volvió** *pa'trás.* ...(1.0) a bit later (he) **came** back.'

                                                        [03, 18:44-18:48]

(17)

    a. *y luego de ahí Ø se iba para el*   'and then from there (he)'d go
       otro lado,   somewhere else,
    b. *y Ø* **compraba** *una cerveza.*   and (he)'d **buy** a beer.'

                                                        [06, 18:42-18:44]

Figure 6 gives the probability with which a first- or third-person singular subject is realized with a pronoun, drawn from separate logistic regression analyses for six comparison data sets–benchmarks from conversational monolingual Spanish and English corpora in the sets of columns on the far left and right respectively; bilinguals' Spanish and English on the second-most left and right columns; and, within bilinguals' Spanish, the absence and presence of CS in the middle, in accordance with the operationalization above (depicted in Figure 5). Due to the preponderance of pronouns in English, we extracted all unexpressed 1sg and 3sg subjects, and a sample of pronominal subjects (two for each unexpressed). Thus, the relevant comparison is not the absolute values, but the relative heights of the bars within each corpus.

Note that the predicted direction of effect obtains throughout, including for English: from lowest to highest, the probability for pronominal expression goes from coreferential linked contexts (the darkest bar), to coreferential non-linked contexts to non-coreferential contexts (the lightest bar).

Yet this three-level measure of accessibility reveals a quantitative difference between English and Spanish, in relative strength of the effect. We will first examine the two monolingual benchmarks. Accessibility is far more important for English than Spanish subject expression, being ranked higher than any other constraint within the English regression analysis but having the same or smaller size in Spanish (Torres Cacoullos and Travis, 2019: 672-674). The stronger effect for English can be seen here in the greater range between the probability values across the three degrees of accessibility (reflected in the heights of the bars), compared with Spanish. This interlingual difference in magnitude of effect provides a diagnostic on the basis of which to test convergence: convergence would be evidenced by a more pronounced disparity between non-coreferential and coreferential linked contexts in the likelihood of a subject pronoun in bilinguals' as compared with monolingual Spanish.

Thus, we come to the truest test of convergence, by comparing the same speakers' use of their two languages. We now juxtapose bilinguals' Spanish and English, as shown

in the second sets of bars on the left and right. As we can see, the speakers maintain the same patterns as their monolingual counterparts. Not only is bilinguals' Spanish similar to monolingual Spanish, but bilinguals' English displays the stronger effect for accessibility of monolingual English. The notable corollary is that bilinguals' language varieties are no more similar to each other than the monolingual varieties are.

Given that these bilingual speakers separately retain Spanish and English patterning, the key question remains: what happens when they code-switch? If CS promotes structural similarity, then we should observe greater susceptibility to this English pattern—that is, a greater magnitude of effect for accessibility—when speakers are engaging in CS than when they are not. Looking now to the middle two sets of bars in Figure 6, we see that Spanish patterns are retained, and the stronger effect of accessibility in English has not been transferred, even in the context of proximate use of English. This stringent test of the impact of CS shows that bilinguals are not impacted by the English pattern when speaking Spanish, even in the environment of using English nearby.

Figure 6   Interlingual similarities and differences in variation patterns: Subject pronoun probabilities according to accessibility, in monolingual and bilingual varieties, and in presence vs. absence of code-switching*
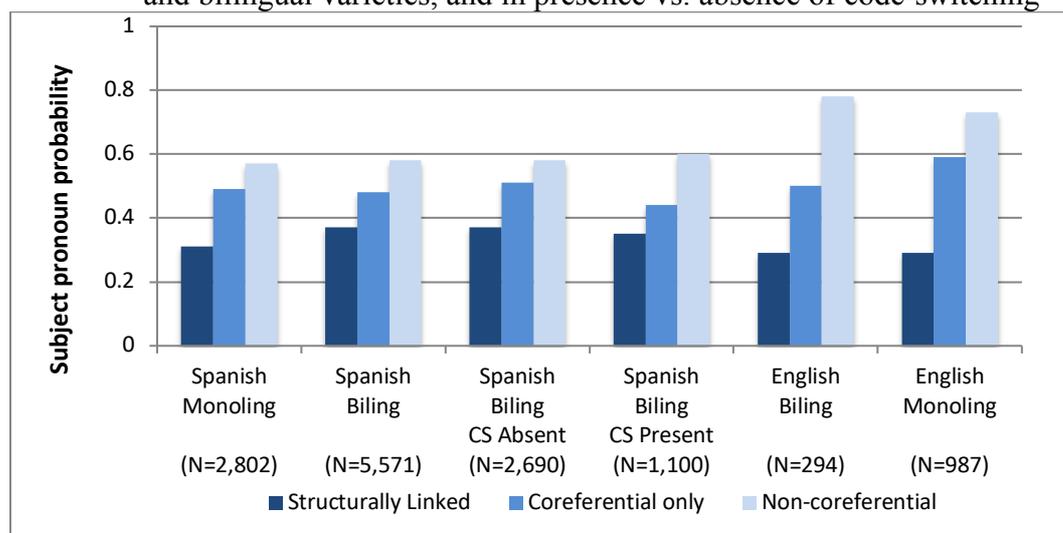
*   Results from six independent logistic regression analyses including Accessibility configured in three levels as shown here, as well as Priming, Verb class, Tense, Person (for Spanish only), and Presence of English (overall bilinguals' Spanish only). English based on a sample, of two pronominal subjects extracted for each null subject. (For full results and corpus information, see Torres Cacoullos and Travis, 2018: 114, 184, 213-214.)

Bilinguals' grammars in interaction

What does the lack of evidence for convergence mean for the bilinguals' cognitive associations between languages? Structural priming across the two languages suggests answers.

Structural priming is where the use of one variant favours subsequent use of that same variant, over alternatives. It is a robust factor in community-based studies of language-internal variation (e.g., Weiner and Labov, 1983) and also applies across languages. In the latter case, the use of one variant in one language favours subsequent use of an analogous variant in the other language, as in the dative alternation across English and German (e.g., *the lawyer sent his client the contract* vs. *the lawyer sent the contract to his client*) (cf., Gries and Kootstra, 2017). Subject pronoun expression is also impacted by cross-language priming across Spanish and English, such that the use of a coreferential English subject pronoun primes a Spanish pronoun, as in lines (a) and (b) in (18). (Travis, Torres Cacoullos and Kidd, 2017, Torres Cacoullos and Travis, 2018: Ch.10).

(18)
a.	*... **I** was a statistician.*	'... **I** was a statistician.
b.	*.... **yo** fui a !todos los basketball games.*	… **I** went to all the basketball games.
c.	*but I did all the stats.*	but I did all the stats.'

[22, 11:22-11:29]

Priming provides a measure of association between linguistic classes or constructions. For example, in English ING variation between velar [ŋ] and alveolar [n] nasals, priming only occurs when the prime and target are in the same morphological class: *working* (vs. *workin'*) is primed by *kicking* but not by *morning* (Tamminga, 2016). In a seeming parallel, structural priming across languages has been taken to support the conjecture that bilinguals have a 'shared syntax' whereby coinciding grammatical structures 'are represented once' (Hartsuiker, Pickering and Veltkamp, 2004: 409).

If there is interaction between bilinguals' grammars, then the result that CS does not impact Spanish subject pronoun expression in New Mexico bilinguals would appear all the more remarkable. To begin to tackle the question of bilingual associations, we zoom in on how coreferential subject priming operates for those instances of variable subject expression that occur in the proximate presence of CS. This is where there are most opportunities for cross-language priming (a full one half of the instances with a prime (372/710) occur with a previous coreferential mention as an English pronoun, as in (18)).

The probability of a Spanish pronominal subject in the presence of CS according to the realization of the previous coreferential mention is given in Figure 7.[3] Spanish-to-Spanish priming is seen in that, compared with a previous unexpressed mention, a pronoun is more likely when the previous coreferential mention was a Spanish pronoun (the higher bar reflecting a higher probability). English-to-Spanish priming is seen in that a pronoun is also more likely when the previous coreferential mention was an English pronoun. It is this cross-language priming that provides evidence that Spanish and English pronouns are associated for these bilingual speakers.

But also observe that the priming effect from English to Spanish is weaker than that from Spanish to Spanish, seen in the lower probability of a pronoun in the former context than the latter. This weaker effect is consistent with the independent

---

[3] Tokens for which a prime could not be identified in the previous 10 clauses have been excluded (N=390).

grammatical patterns of subject expression discussed in the preceding section, and it indicates that association is a matter of degree. Using priming as a measure of degrees of association between constructions, we can say that [PRONOUN + verb] constructions are associated across Spanish and English but also that associations are stronger within the same language than across languages.

Figure 7   Priming across vs. within languages:
Subject pronoun probabilities in presence of CS, according to priming (realization of the previous coreferential mention)*
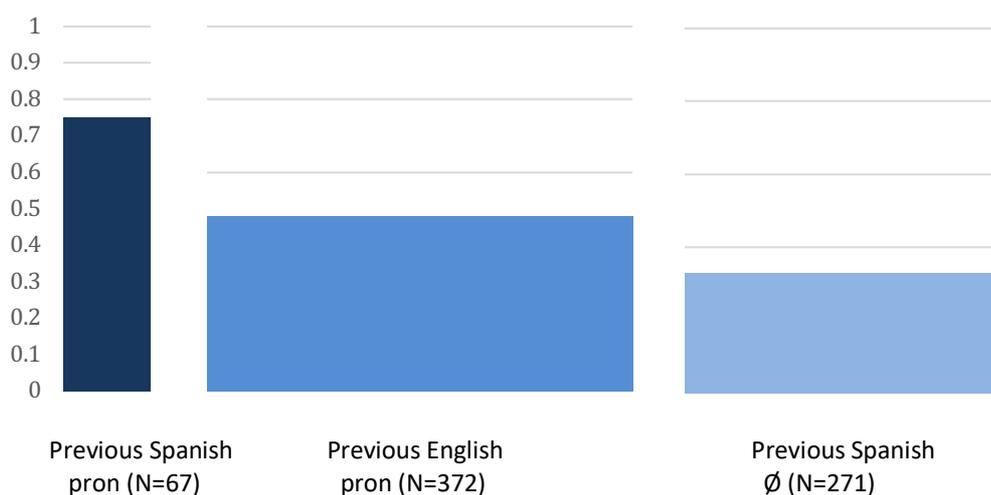
* Results are from the same logistic regression analysis for the presence of CS reported in Figure 6; column thickness represents data distribution. (Based on Torres Cacoullos and Travis, 2018: 184)

In sum, while cross-language priming attests to a connection between the two languages for these bilingual speakers, the fact that it is weaker than within-language priming corresponds to the separation of grammars shown in the previous section, even in the presence of CS. For these bilinguals, the grammars are connected, but they are not mixed. The evidence, then, is that in CS, speakers strictly alternate between two languages, each language retaining the same grammatical patterns as in the absence of CS.

5.   FUTURE DIRECTIONS

CS remains a contentious topic. The overriding methodological issues to be resolved involve appropriate data and systematic quantitative analysis, prioritizing community norms over idiosyncratic instances and robust patterns over isolated cases.

We have seen that for there to be cross-fertilization and cumulative advances in our understanding of the conditions on, triggers for, and grammatical consequences of CS, it will first be necessary to identify tokens of CS, delimit their boundaries, and define their units of occurrence. In demarcating CS, it will be profitable to separately evaluate single other-language words, which cannot be automatically classed with multiword strings.

Defining the units of discourse to which CS may apply, or the universe of CS contexts, will allow analyses to account for not only all occurrences but also all non-occurrences of CS. Accountable reporting of CS distributions in turn will allow discovery of CS patterns: out of all places where bilinguals can switch, where they prefer to do so. For this, prosody offers a promising avenue, with the observed tendency for CS to occur at the boundary of prosodic units rather than within them, or the tendency to prosodically separate the two languages.

The conviction that grammatical convergence or mixing is an inevitable consequence of CS is ripe for review. Comparisons of language-internal variation patterns yield measures of interlingual grammatical similarity and dissimilarity, and a demonstration of change or continuity. As we've seen, just such a comparison reveals that CS--by bilinguals who make regular use of both languages and switch smoothly between them--is the alternation between structurally independent languages.

FURTHER READING

Poplack, S. 1980. Sometimes I'll start a sentence in Spanish y termino en Español. *Linguistics* 18: 581–618. (See also 2013, *Linguistics* 51(Jubilee): 11-14.)
  A still unmatched quantitative community-based study, this article puts forward the basic insight that bilinguals tend to avoid CS at points of word order conflicts between the two languages, known as the Equivalence constraint.

Poplack, Shana. 2018. *Borrowing: Loanwords in the speech community and in the grammar.* Oxford: Oxford University Press.
  A synthesis of cumulative research across language pairs and contact situations, this book lays bare lexical borrowing as a process whose principal mechanism is morphosyntactic integration.

Torres Cacoullos, Rena, and Travis, Catherine E. 2018. *Bilingualism in the community: Code-switching and grammars in contact*. Cambridge: Cambridge University Press.
  Relying on variation patterns in bilingual speech to advance quantitative diagnostics of grammatical similarity, this book demonstrates that code-switching speakers maintain distinct structures in their two languages.

Travis, Catherine E. and Rena Torres Cacoullos (Guest editors). 2015. Gauging convergence on the ground: Code-switching in the community. *International Journal of Bilingualism (Special Issue)*. 19(4): 365-480.
  Analyses of variation in a bilingual speech community demonstrate, in phonology, other-language influence and, in morphosyntax continuity--rather than change--and grammatical separation--rather than mixing.

RELATED TOPICS
experimental approaches, a variationist perspective, usage-based approaches, convergence.

APPENDIX: TRANSCRIPTION CONVENTIONS (DU BOIS ET AL., 1993)

Carriage return	new Intonation Unit	..	short pause (0.5 secs)
.	final intonation contour	...	medium pause (0.5-0.7 secs)
,	continuing intonation contour	...( )	timed pause (longer than 0.7 secs)
?	appeal intonation contour		
--	truncated intonation contour	=	lengthened syllable
@	one syllable of laughter	~	pseudonymized proper noun
@word	speech produced while laughing	(( ))	researcher's comment

ACKNOWLEDGMENTS

REFERENCES

Aaron, J. E. (2015). Lone English-origin nouns in Spanish: The precedence of community norms. *International Journal of Bilingualism,* 19(4)**,** pp. 459-480.

Adamou, E. (2016). *A corpus-driven approach to language contact : Endangered languages in a comparative perspective.* Boston/Berlin: De Gruyter.

Adamou, E. and Shen, X. R. (2017). There are no language switching costs when codeswitching is frequent. *International Journal of Bilingualism***,** pp.

Aikhenvald, A. Y. (2002). *Language contact in Amazonia.* Oxford: Oxford University Press.

Auer, P. (1995). The pragmatics of code-switching: A sequential approach. In: L. Milroy and P. Muysken, eds., *One speaker, two languages: Cross disciplinary perspectives on code switching*. Cambridge: Cambridge University Press, pp. 115-135.

Backus, A. (2005). Codeswitching and language change: One thing leads to another? *International Journal of Bilingualism,* 9(3-4)**,** pp. 307-340.

Backus, A. (2008). Can a mixed language be conventionalized alternational codeswitching? In: Y. Matras and P. Bakker, eds., *The mixed language debate: Theoretical and empirical advances*. Berlin: De Gruyter, pp. 237-270.

Balukas, C. and Koops, C. (2015). Spanish-English bilingual VOT in spontaneous code-switching. *International Journal of Bilingualism,* 19(4)**,** pp. 423-443.

Blom, J.-P. and Gumperz, J. J. (1972). Social meaning in linguistic structures: Code-switching in Northern Norway. In: J. J. Gumperz and D. Hymes, eds., *Directions in Sociolinguistics*. New York: Holt, Rinehart, and Winston, pp.

Brown, E. L. (2015). The role of discourse context frequency in phonological variation: A usage-based approach to bilingual speech production. *International Journal of Bilingualism,* 19(4)**,** pp. 387-406.

Bybee, J. (2010). *Language, usage and cognition.* Cambridge: Cambridge University Press.

Bybee, J. (2015). *Language Change.* Cambridge: Cambridge University Press.

Cortes-Torres, M. (2005). ¿Qué estás haciendo?: La variación de la perífrasis estar + -ndo en el español puertorriqueño. In: D. Eddington, ed., *Selected Proceedings of the 7th Hispanic Linguistics Symposium*. Somerville, MA: Cascadilla Proceedings Project, pp. 42-55.

Deuchar, M. (2005). Congruence and Welsh–English code-switching. *Bilingualism: Language and Cognition,* 8**,** pp. 255-269.

Doğruöz, A. S. (2014). On the borrowability of subject pronoun constructions in Turkish–Dutch contact. In: M. Hilpert and J.-O. Östman, eds., *Reflections on Constructions across Grammars*. Amsterdam/Philadelphia: John Benjamins Publishing Company, pp. 143-169.

Du Bois, J. W., Schuetze-Coburn, S., Cumming, S. and Paolino, D. (1993). Outline of discourse transcription. In: J. Edwards and M. Lampert, eds., *Talking data: Transcription and coding in discourse*. Hillsdale: Lawrence Erlbaum Associates, pp. 45-89.

Dumont, J. and Wilson, D. V. (2016). Using the variationist comparative method to examine the role of language contact in synthetic and periphrastic verbs in Spanish. *Spanish in Context,* 13(3)**,** pp. 394–419.

Epps, P. and Michael, L. (2017). The Areal Linguistics of Amazonia. In: R. Hickey, ed., *The Cambridge handbook of areal linguistics*. Cambridge: Cambridge University Press, pp. 934-963.

Gonzales, M. D. (1999). Crossing social and cultural borders: The road to language hybridity. In: L. Galindo and M. D. Gonzales, eds., *Speaking Chicana: Voice, power and identity*. Tucson: University of Arizona Press, pp. 13-38.

Gries, S. T. and Kootstra, G. J. (2017). Structural priming within and across languages: A corpus-based perspective. *Bilingualism: Language and Cognition,* 20(2)**,** pp. 235-250.

Grosjean, F. (2001). The bilingual's language modes. In: J. L. Nicol, ed., *One mind, two languages: Bilingual language processing*. Massachusetts: Blackwell Publishers, pp. 1-22.

Gumperz, J. J. (1967). On the linguistic markers of bilingual communication. *Journal of Social Issues,* 23(2)**,** pp. 48-57.

Gumperz, J. J. (1982). *Discourse strategies*. Cambridge: Cambridge University Press.

Gumperz, J. J. and Wilson, R. (1971). Convergence and creolization: A case from the Indo-Aryan / Dravidian border in India. In: D. Hymes, ed., *Pidginization and creolization of languages*. Cambridge: Cambridge University Press, pp. 151-167.

Hartsuiker, R. J., Pickering, M. J. and Veltkamp, E. (2004). Is syntax separate or shared between languages. *Psychological Science,* 15(6)**,** pp. 409-414.

Haspelmath, M. (2009). Lexical borrowing: Concepts and issues. In: M. Haspelmath and U. Tadmor, eds., *Loanwords in the world's languages: A comparative handbook*. Berlin: Mouton de Gruyter, pp. 35-54.

Hay, J. (2002). From speech perception to morphology: Affix ordering revisited. *Language,* 78(3)**,** pp. 527-555.

Heine, B. and Kuteva, T. (2005). *Language contact and grammatical change*. Cambridge: Cambridge University Press.

Johns, M. A., Valdés Kroff, J. and Dussias, P. E. (2018). Mixing things up: How blocking and mixing affect the processing of codemixed sentences. *International Journal of Bilingualism***,** pp.

Kulkarni-Joshi, S. (2016). Forty years of language contact and change in Kupwar: A critical assessment of the intertranslatability model. *JSALL,* 3(2)**,** pp. 147-174.

Labov, W. (1972). *Sociolinguistic patterns*. Oxford: Basil Blackwell.

LaCasse, D. (2018). *The subjunctive in New Mexican Spanish: Maintenance in the face of language contact.* PhD PhD, Pennsylvania State University.

Lipski, J. (1978). Code-switching and the problem of bilingual competence. In: M. Paradis, ed., *Aspects of Bilingualism*. Columbia, SC: Hornbeam Press, pp. 250-264.

Matras, Y. (2009). *Language Contact.* Cambridge: Cambridge University Press.

Mettouchi, A. (2008). Kabyle/French codeswitching: A case study. *Berber in contact: Linguistic and sociolinguistic perspectives*, pp. 187-198.

Muysken, P. (2000). *Bilingual speech: A typology of code-mixing.* Cambridge: Cambridge University Press.

Muysken, P. (2015). Déjà voodoo or new trails ahead? Re-evaluating the Mixing Typology Model. In: R. Torres Cacoullos, N. Dion and A. Lapierre, eds., *Linguistic variation: Confronting fact and theory* New York: Routledge, pp. 242-261.

Myers-Scotton, C. (1993). *Duelling languages.* Oxford: Oxford University Press.

Myslín, M. and Levy, R. (2015). Code-switching and predictability of meaning in discourse. *Language,* 91(4)**,** pp. 871-905.

Otheguy, R. and Zentella, A. C. (2012). *Spanish in New York: Language contact, dialect levelling, and structural continuity.* Oxford: Oxford University Press.

Poplack, S. (1980). "Sometimes I'll start a sentence in Spanish y termino en español": Toward a typology of code-switching. *Linguistics,* 18(7/8)**,** pp. 581-618.

Poplack, S. (1993). Variation theory and language contact: Concepts, methods and data. In: D. R. Preston, ed., *American dialect research*. Amsterdam: John Benjamins, pp. 251-286.

Poplack, S. (2015). Code Switching (Linguistic). In: J. D. Wright, ed., *International encyclopedia of the social & behavioral sciences (2nd ed.)*. Oxford: Elsevier, pp. 918-925.

Poplack, S. (2018). *Borrowing: Loanwords in the speech community and in the grammar.* Oxford: Oxford University Press.

Poplack, S. and Dion, N. (2012). Myths and facts about loanword development. *Language Variation and Change,* 24(3)**,** pp. 279-315.

Poplack, S., Torres Cacoullos, R., Dion, N., de Andrade Berlinck, R., Digesto, S., LaCasse, D. and Steuck, J. (2018). Variation and grammaticalization in Romance: A cross-linguistic study of the subjunctive. In: W. Ayres-Bennett and J. Carruthers, eds., *Manuals in Linguistics: Romance Sociolinguistics*. Berlin: de Gruyter, pp. 213- 246.

Sankoff, D. (1998). A formal production-based explanation of the facts of code-switching. *Bilingualism: Language and Cognition,* 1(1)**,** pp. 39-50.

Sankoff, D. and Poplack, S. (1981). A formal grammar for code-switching. *Papers in Linguistics: International Journal of Human Communication* 14(1)**,** pp. 3-45.

Sankoff, G. and Brown, P. (1976). The origins of syntax in discourse: A case study of Tok Pisin relatives. *Language,* 52(3)**,** pp. 631-666.

Shenk, P. S. (2006). The interactional and syntactic importance of prosody in Spanish-English bilingual discourse. *International Journal of Bilingualism,* 10(2)**,** pp. 179-205.

Silva-Corvalán, C. (1994). *Language contact and change: Spanish in Los Angeles.* Oxford: Clarendon Press.

Sorace, A., Serratrice, L., Fillaci, F. and Baldo, M. (2009). Discourse conditions on subject pronoun realization: Testing the linguistic intuitions of older bilingual children. *Lingua,* 119(3)**,** pp. 460-477.

Stanford, J. (2008). A sociotonetic analysis of Sui dialect contact. *Language Variation and Change,* 20(3)**,** pp. 409-450.

Steuck, J. and Torres Cacoullos, R. (To Appear). Complementing in another language: Prosody and code-switching. In: J.-A. Villena-Ponsoda, ed., *Language variation: European Perspectives VII*. Amsterdam: Benjamins, pp.

Stoll, S., Zakharko, T., Moran, S., Schikowski, R. and Bickel, B. (2015). Syntactic mixing across generations in an environment of community-wide bilingualism *Frontiers in Psychology,* 6**,** pp. 82.

Tadmor, U. (2009). Lexical borrowing: Concepts and issues. In: M. Haspelmath and U. Tadmor, eds., *Loanwords in the world's languages: A comparative handbook.* Berlin: Mouton de Gruyter, pp. 55-75.

Tamminga, M. (2016). Persistence in phonological and morphological variation. *Language Variation and Change,* 28**,** pp. 335-356.

Thomason, S. G. and Kaufman, T. (1988). *Language contact, creolization and genetic linguistics.* Berkeley, CA: University of California Press.

Torres Cacoullos, R. (2012). Grammaticalization through inherent variability: The development of a progressive in Spanish. *Studies in Language,* 36(1)**,** pp. 73-122.

Torres Cacoullos, R. and Aaron, J. E. (2003). Bare English-origin nouns in Spanish: Rates, constraints and discourse functions. *Language Variation and Change,* 15(3)**,** pp. 289-328.

Torres Cacoullos, R. and Travis, C. E. (2011). Testing convergence via code-switching: Priming and the structure of variable subject expression *International Journal of Bilingualism,* 15(3)**,** pp. 241-267.

Torres Cacoullos, R. and Travis, C. E. (2018). *Bilingualism in the community: Code-switching and grammars in contact.* Cambridge: Cambridge University Press.

Torres Cacoullos, R. and Travis, C. E. (2019). Variationist typology: Shared probabilistic constraints across (non-)null subject languages. *Linguistics,* 57(3)**,** pp. 653-692.

Travis, C. E., Torres Cacoullos, R. and Kidd, E. (2017). Cross-language priming: A view from bilingual speech *Bilingualism: Language and Cognition,* 20(2)**,** pp. 283-298.

Wei, L. and Milroy, L. (1995). Conversational code-switching in a Chinese community in Britain: A sequential analysis. *Journal of Pragmatics,* 23(3)**,** pp. 281-299.

Weiner, E. J. and Labov, W. (1983). Constraints on the agentless passive. *Journal of Linguistics,* 19(1)**,** pp. 29-58.

Weinreich, U. (1953/1968). *Languages in contact: Findings and problems.* The Hague: Mouton.

Weinreich, U., Labov, W. and Herzog, M. I. (1968). Empirical foundations for a theory of language change. In: W. P. Lehmann and Y. Malkiel, eds., *Directions for historical linguistics: A symposium*. Austin, TX: University of Texas Press, pp. 95-188.