Testing convergence via code-switching: priming and the structure of variable subject expression

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Abstract

In this study, we test the hypothesis that code-switching promotes grammatical convergence by investigating Spanish first-person singular subject (*yo* 'I') expression in bilingual conversations of New Mexican speakers of Spanish and English. We find that variable *yo* expression in New Mexican Spanish follows the same grammatical patterning as has been identified for non-contact varieties, and that this is the case regardless of the degree of bilingualism of the speakers. We observe a slightly higher rate of subject expression in the presence of code-switching; however, this is found to be attributable not to the code-switching per se, but to the presence of an English expressed first-person singular subject (*I*) in the preceding discourse. We interpret this as a cross-linguistic priming effect, and note that the presence of *I* increases the proportion of first singular subjects that occur in the context where the previous coreferential subject was expressed (be that Spanish *yo* or English *I*), an environment that favors *yo* expression. We conclude that, despite prolonged contact, the data do not support Spanish convergence with English in this variety, nor code-switching as a mechanism of language change. Instead, multivariate analyses indicate that cross-linguistic priming may play a role in ostensible contact-induced change by modestly raising the rate of a superficially similar construction, without accompanying changes in language-particular grammatical patterns.

Keywords

code-switching, convergence, priming, Spanish, subject expression, variationist comparative method

1 Code-switching and grammatical convergence

Despite much speculation about the relationship between code-switching and contact-induced grammatical change, empirical evidence of such a relationship is scarce (Poplack & Levey 2010).

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In particular, it has been proposed that code-switching promotes grammatical convergence, or structural similarity through language contact (Backus, 2004; Gumperz & Wilson, 1971; Myers-Scotton, 2002; Thomason, 2001; Toribio, 2004). This study tests the hypothesis of convergence via code-switching by investigating patterns of Spanish first-person subject expression in bilingual conversations of New Mexican speakers of Spanish and English.

Code-switching, as illustrated in example (1), is the juxtaposition of multi-word sequences, each of which is internally consistent with the grammatical patterns of its respective language (Poplack, 1993, p. 255). (Code-switching to English is underlined in both the original and the translation in all examples.)

(1) 1. *R:* *<u>I was eleven years younger</u> que mi esposo,*
     2.   *... (H) y **yo** me llevaba –*
     3.   *.. **(Ø)** me vestía como una modelo y **(Ø)** tenía de todo.*
     4.   *.. **yo** tenía lo que –*
     5.   *todas mo- –*
     6.   *las mujeres del community,*
     7.   *en otras palabras,*
     8.   *(H) dicen que **yo** era la .. <u>envy of the community</u>.*
     1. R: '<u>I was 11 years younger</u> than my husband.
     2.   …(H) and **I** wore –
     3.   **(I)** dressed like a model and **(I)** had everything.
     4.   .. **I** had that which –
     5.   all –
     6.   the women of the community,
     7.   in other words,
     8.   (H) they say that **I** was the <u>envy of the community</u>.'

                                                                              (Mis Padres 02: 1033–1040)[1]

It is widely assumed that code-switching leads to grammatical convergence, based on the notion that use of other-language material may be accompanied by infiltration of other-language grammatical properties. For example, in their early study on convergence, Gumperz and Wilson (1971, p. 165) proposed that 'the need for constant code-switching ... has led to reduction and adaptation in linguistic structure'. More recently, Backus (2004, p. 179) considers code-switching to be a 'causal mechanism' of grammatical convergence, claiming that '[it] function[s] to model syntactic patterns which are then subsequently imitated in the base language' (Backus, 2005, p. 334). However, if in code-switching bilinguals are alternating between, rather than 'mixing', their two languages (cf. Haugen, 1950), might it instead be the case that the grammatical patterns of each language are maintained?

In this study, we use the variationist comparative method to test the hypothesis of convergence via code-switching, by drawing comparisons of linguistic patterns across speakers of differing degrees of bilingualism and across contexts where code-switching is, and is not, present in the preceding discourse. Our results demonstrate parallelism in the structure of variable subject expression across comparison groups: first-person singular subject (*yo* 'I') expression in New Mexican Spanish follows the same patterning as has been identified for non-contact varieties, and this is the case regardless of the degree of bilingualism of the speakers. Specifically, *yo* expression is favored by previous realization as *yo* (a structural priming effect), non-coreferentiality with the preceding subject and cognitive verbs for all these groups of speakers.

In the comparison across the presence vs. absence of code-switching, we observe once again the same linguistic constraints in operation across both contexts, but a slightly higher rate of subject expression in the presence of code-switching. This is found to be attributable not to the code-switching per se, but to the presence of an expressed first-person singular subject (*I*) in the preceding English, which we interpret as a cross-linguistic **structural priming effect**. In the presence of code-switching, the use of English *I* raises the occurrence of preceding expressed subjects (be that *yo* or *I*), and concomitantly reduces the occurrence of preceding unexpressed subjects. Since Spanish subject expression is constrained by previous realization, the difference in distribution of expressed (*yo* or *I*) and unexpressed realizations of the previous coreferential subject results in different rates of *yo* in the presence and absence of code-switching, but no change in grammatical patterning.

Thus, despite prolonged contact, the data do not support Spanish convergence with English in this variety, nor code-switching as a mechanism of language change. Instead, they indicate that cross-linguistic priming may play a role in ostensible contact-induced change by modestly raising the rate of a superficially similar structure, without accompanying changes in language-particular grammatical patterns.

2 Subject expression: a locus of convergence?

Variability in Spanish subject expression can be seen in example (1), where unexpressed subjects are given in parentheses in the English translation, and marked with a zero (Ø) in the Spanish original. In line 2, *y yo me llevaba* 'and **I** wore', the subject is expressed, while in line 3, *(Ø) me vestía como una modelo* '**(I)** dressed like a model', it is unexpressed. Note also that the same line is completed with another unexpressed subject, *y (Ø) tenía de todo* 'and **(I)** had it all', while in the next line the same verb is used but with an expressed subject, *yo tenía* '**I** had'.

Variable subject expression is one of the most studied features of Spanish grammar and overall, the range of studies have obtained similar results. The linguistic factors consistently found to have an effect on the patterning of subject expression are switch reference, semantic class of verb, Tense-Mood-Aspect (TMA) and person, while social factors such as age, gender and socio-economic status are typically found to have no effect (for reviews see Silva-Corvalán, 2001, pp. 154–169).

Subject expression has been widely studied as a locus of convergence in investigating the linguistic consequences of Spanish–English contact. In contrast to Spanish, which is characterized as a pro-drop language allowing unexpressed subjects, English is said to be a non-pro-drop language with obligatory subject expression (though unexpressed subjects do occur in some contexts, e.g. Cote, 1996; Harvie, 1998; Leroux & Jarmasz, 2005; Oh, 2005, 2006). The convergence hypothesis adopted by most studies is that increased contact with English should lead to an increased rate of use of expressed subjects in Spanish.[2] However, while some studies have found such a correlation (Lapidus & Otheguy, 2005a, 2005b; Lipski, 1996; Montrul, 2004; Otheguy & Zentella, 2007; Otheguy, Zentella, & Livert, 2007; Toribio, 2004), others have not (Bayley & Pease-Alvarez, 1997; Morales, 1986b, 2000; Silva-Corvalán, 1994; Travis, 2007). Thus, after extensive research, the case for Spanish convergence with English in subject expression remains inconclusive.

In part, these conflicting results may be due to the fact that higher overall rates of expressed subjects are an unreliable gauge of (contact-induced) grammatical change. This is because frequencies of use fluctuate due to factors extraneous to the grammar, such as data collection procedures (e.g. Bailey & Tillery, 2004), genre (e.g. Silva-Corvalán, 2001, p. 163), or region (e.g. Lipski, 1994; Otheguy et al., 2007). Indeed, despite divergent overall rates of subject expression across varieties of Spanish, there is remarkable parallelism in variation patterns. Cameron (1993, 1994), for example, compared interview data from San Juan, Puerto Rico, and Madrid, Spain, and found

that even though the overall expression rate in San Juan (50%) was double that of Madrid (26%), the grammatical patterning of subject expression was very similar across the two dialects. Travis (2007) also found significantly higher rates of *yo* expression in conversation (48%) than in personal narrative (33%), but identical patterning. The narratives she examined had a very high degree of subject continuity, while the interactive conversations had more shifting of topics, and therefore less subject continuity. Given that continuity of subject is one of the constraints on subject expression in Spanish, Travis (2007) concluded that diverging rates of expression were not the result of grammatical differences, but of (genre-driven) differences in distribution.

In this study, in order to assess grammatical change we consider not only overall rates of occurrence, but apply the stricter criterion of the grammatical patterning of subject expression, by comparing the conditions constraining use of *yo* across groups of speakers and in different environments (cf. Otheguy, 2004, p. 177). The few studies that have compared constraints on variable subject expression in contact and non-contact varieties of Spanish suggest that individual constraints may change with contact. Silva-Corvalán observed loss of 'discourse-pragmatic constraints', such as use of expressed subjects with ambiguous verb forms, among English-dominant speakers in Los Angeles (1994, p. 159, 2008, p. 216). Otheguy et al. (2007) found some alterations in grammatical person effects, which they attribute to Spanish dialect contact in New York City. While these studies have observed change in the effects of individual factor groups, in the present study we advance such research by considering the set of factor groups that jointly account for the variation (cf. Labov, 2004; D. Sankoff, 1988b).

3 Contact in New Mexico

Linguists have long debated the existence, extent and mechanisms of grammatical convergence in language contact (see G. Sankoff, 2002, for a review). New Mexico provides an apposite site to test the hypothesis of convergence via code-switching, as it allows us to examine the long-term effects of contact in a native, non-immigrant, community, rather than a community undergoing language loss or shift within three generations (as is the case for most immigrant communities, cf. Silva-Corvalán, 1994, inter alia).

New Mexico emerged as the state with the highest proportion of Hispanics in the USA in the 2000 census count (42%, followed by California at 32%. See US Census Bureau, 2001). Spanish has been spoken in New Mexico for 400 years, developing as a distinct variety over a 300-year period of relative isolation from other Spanish dialects. In New Mexico we see distinct lexical features (Bills & Vigil, 1999, p. 53) including both retentions, such as *cuasi* 'almost' (standard *casi*) and *vide* 'I saw' (standard *vi*), and innovations through compounding, such as *ratón volador* 'bat [flying rat]' (standard *murciélago*) and *gallina de la tierra* 'turkey [chicken of the earth]' (standard *pavo*).

The incorporation of New Mexico into the USA in 1848 brought large numbers of English-speaking settlers into the region, so for over 150 years, New Mexican Spanish has been in intense contact with English, existing as the socially subordinate language. More recently, it has come into contact with varieties of contemporary Mexican Spanish because of increasing Mexican immigration, and with educated standard Spanish, through the teaching of Spanish as a foreign language in schools. New Mexican Spanish as a distinct variety, that is to say, 'traditional New Mexican Spanish', is threatened by its stigmatization in contrast to immigrant and educated varieties of Spanish as well as by shift to English (Bills, 1997; Bills, Hudson, & Hernández Chávez, 2000; Bills & Vigil, 1999, 2000, 2008; Hudson, Hernández Chávez, & Bills, 1995; Vigil & Bills, 2000; Villa & Villa, 2005).

Although the impact of contact on the New Mexican Spanish lexicon (and phonology) has been extensively documented (e.g. Bills & Vigil, 1999, 2008), grammatical repercussions have yet to be investigated. This study tests the particular hypothesis that grammatical convergence is promoted by code-switching, which is widespread in New Mexican Spanish–English bilingual communities.

4 Code-switching in the New Mexico bilingual speech community

Definitions and theories of code-switching abound (cf. discussion in Bullock & Toribio, 2009, pp. 2–4; Winford, 2009, p. 280). Some of these, such as asymmetrical insertion models (e.g. Myers-Scotton, 1993, 2002), treat both single- and multi-word segments from another language as part of the one process. Single- and multi-word items have also been confused in models deriving from general formalist principals of (monolingual) grammar (e.g. MacSwan, 1999; cf. Meechan, 2001). Empirical studies, however, have observed that other-language-origin single words often behave as loanwords; this strategy, known as nonce borrowing, is in fact the most prevalent community strategy for combining languages clause-internally (see papers in Poplack & Meechan, 1998b; D. Sankoff, Poplack, & Vanniarajan, 1990). A distinction between nonce loans and single-word code-switches can be established based on divergent patterning (Meechan & Poplack 1995). Nonce loans follow the grammatical patterns of the recipient language, just like established loanwords. Code-switches, on the other hand, tend to be well formed in their respective language and are juxtaposed at switch sites where the word order of the two languages is equivalent, as modeled in the Equivalence Constraint (Poplack, 1980b, 2004).

In New Mexico, single English-origin nouns that are neither recurrent nor attested in dictionaries (criteria often used to identify other-language material as a code-switch rather than a loanword[3]) tend to be used with Spanish grammatical properties (Torres Cacoullos & Aaron, 2003). They are therefore classified as nonce borrowings in this community. Thus in this study we conservatively restrict our operational definition of code-switching to juxtaposed multi-word sequences of Spanish and English.

Code-switching in New Mexico is widely used as the natural in-group discourse mode (e.g. Gonzales, 1999). First, it is frequent and smooth, and does not fulfill any particular rhetorical or interactional purposes, occurring not in response to particular social motivations but essentially unpredictably, at any potential code-switching site (cf. also Poplack, 1985/1987). Second, transitions between the two languages are not limited to syntactic boundaries, occurring both across and within constituents.

Such code-switching within constituents is often termed 'intra-sentential' and contrasted with 'inter-sentential' (e.g. Poplack, 1980b). However, since the notion of 'sentence' is not readily applicable in spontaneous discourse data (Chafe & Danielewicz, 1987; Crystal, 1979; Harvie, 1998, p. 24), we consider here prosodic units, specifically Intonation Units (IUs), following Du Bois et al.'s (1993, p. 47) characterization as 'a stretch of speech uttered under a single coherent intonation contour'. Though defined prosodically, IUs have been shown to closely interact with syntax (Ono & Thompson, 1995; Sánchez-Ayala, 2001; Tao, 1996), in particular, showing a high degree of correlation with the clause (Chafe, 1994).

Prosody is as fundamental in bilingual as monolingual discourse, and it has been proposed that taking prosody into consideration allows for a more complete account of constraints on code-switching than syntax alone (Shenk, 2006, p. 180). Interestingly, while Shenk (2006) found that switches in conversations between Mexican Americans overwhelmingly occurred at prosodic boundaries, in the New Mexico bilingual community, code-switching occurs also within Intonation Units, over 10% of all multi-word code-switches in one study with this community (Durán Urrea, 2006).

In the following example, the first switch (beginning in line 2) occurs in a new Intonation Unit (that is, an IU in English follows the completion of an IU in Spanish), though within the one larger

constituent (*la hacía resent porque because I had a big load on my shoulders*, but note the repetition of the conjunction here). In contrast, the second switch into English (in line 13) occurs within the same IU, between the (Spanish) auxiliary and the (English) main verb (*estaba taking care of things*). Following Du Bois et al. (1993), each IU is presented on a separate line, and marked with punctuation to indicate its transitional continuity.

(2)   1. *O:*   *la hacía resent porque,*
       2.   *(H) because,*
       3.   *.. I had a big load on my shoulders.*
       4.   *.. I had a very big load on my shoulders.*
       5.   *(H) and and and I was taking a lot of responsibility.*
       6.   *.. of my –*
       7.   *She was little,*
       8.   *and then I had another brother.*
       9.   *.. Y y y luego yo=,*
      10.   *y,*
      11.   *mi otra sister.*
      12.   *(H) pero yo era la mayor,*
      13.   *Yo era la que estaba taking care of things.*
       1. O: 'I resented her because,
       2.   (H) because,
       3.   .. I had a big load on my shoulders.
       4.   .. I had a very big load on my shoulders.
       5.   (H) and and and I was taking a lot of responsibility.
       6.   .. of my –
       7.   She was little,
       8.   and then I had another brother.
       9.   And and and then I,
      10.   and,
      11.   my other sister.
      12.   (H) but I was the oldest,
      13.   I was the one who was taking care of things.'

                                                                              (117–1A3: 217–229)

In bilingual situations such as in New Mexico strong normative pressures may inhibit bilinguals' use of stigmatized features, including code-switching. Thus, data collection methods such as elicitation tasks, which create an artificial speech environment, and interviews conducted by people who are not members of the community (cf. Bailey & Tillery, 2004; Poplack, 1993, pp. 259–260) are not valid in this community for the study of code-switching. In order to test the hypothesis of convergence via code-switching, we draw on spontaneous discourse data, where the regular patterns of natural language use can best be observed.

5 Speaker sample

The data for this study come from two corpora. One, the New Mexico Colorado Spanish Survey (NMCOSS), comprises 350 recorded interviews of northern New Mexican speakers of traditional New Mexican Spanish conducted in 1992–1995 (Bills & Vigil, 1999). These data consist primarily

of narratives, as the interviewees tell their life stories and describe their experiences in schooling and growing up in New Mexico. The second, the New Mexico Spanish–English Bilingual (NMSEB) corpus, is made up of interviews and conversations with speakers from the north and south of the state recorded in 2008 (Torres Cacoullos & Travis, 2008). In all cases, the data were collected by New Mexican students from the University of New Mexico.

The fact that these speakers form bilingual speech communities is crucial to testing the hypothesis of convergence via code-switching, as this allows us to consider community patterns of code-switching rather than isolated examples or idiosyncratic occurrences which may or may not be constrained by group norms. Empirical study has shown that strategies for combining languages are community-specific, even when the language pairs involved are typologically similar or even the same (Poplack, 1985/1987), and reliable patterns may not emerge in data from assorted individuals.

This study is based on data drawn from a total of 22 speakers (14 recorded for the NMCOSS and 8 from the NMSEB corpus), including 14 women and 8 men, between the ages of 48 and 88.[4] The data were extracted from approximately 11.5 hours of speech, corresponding to 120,000 words and 34,500 Intonation Units.

The speakers showed different levels of bilingualism as determined by interviewer and self rating, and were classified into two groups on that basis: 17 'bilingual' speakers, who are fluent in both Spanish and English and regularly use both in the course of their daily interactions, and five 'Spanish-dominant' speakers, who show greater fluency in Spanish and, although they have some knowledge of English, do not use it regularly.

Table 1 and Table 2, for the bilingual and Spanish-dominant groups respectively, provide speaker details in terms of their region and age, and indicate the number of tokens extracted for each speaker, with a total of 1439 tokens for the bilingual speakers and 565 for the Spanish-dominant speakers.

Table 1. Bilingual speaker characteristics

Name*	City or county	Born	Total N	Code-switch	Rate *yo*
Julio	Carlsbad	~1950	19	74%	37%
Patty	Carlsbad	~1950	11	73%	46%
Raquel	Las Vegas	1932	132	64%	56%
Nancy	Las Cruces	1928	30	57%	30%
Odilia (117)	Bernalillo Co.	1930	227	51%	38%
Ximena (47)	Albuquerque	1939	60	48%	22%
Tobías (270)	Catron Co.	1907	56	41%	25%
Wilmer (190)	Tucumcari	1923	110	40%	53%
Mariana	Las Cruces	1943	74	32%	39%
Robert	Carlsbad	1948	108	30%	43%
Pedro (88)	Albuquerque	1947	97	24%	13%
Henry (156)	Rio Arriba Co.	1920	76	22%	47%
Yolanda (147)	Taos Co.	1926	139	12%	23%
Sebastian (102)	Taos Co.	1944	97	12%	13%
Javier (144)	Rio Arriba Co.	1909	63	8%	64%
Ysaura	Albuquerque	1935	95	7%	45%
Luisa	Las Vegas	1937	45	0	51%
Average			N = 1439	33%	38%

*All names given are pseudonyms.
Numbers in parentheses are those assigned to speakers from the NMCOSS; speakers without a number are from the NMSEB corpus.

Table 2. Spanish-dominant speaker characteristics

Name	City or county	Born	Total *N*	Code-switch	Rate *yo*
María (76)	Mora Co.	1918	91	14%	46%
Victoria (4)	Rio Arriba Co.	1911	18	11%	33%
Lourdes (219)	Rio Arriba Co	1897	300	1%	36%
Norma (10)	Española	1904	89	0	34%
Rosa (20)	Taos Co.	1910	67	0	33%
Average			*N* = 565	5%	37%

Speakers from NMCOSS.

In both Table 1 and Table 2, the column labeled 'code-switch' indicates the percentage of those tokens that were produced in the context of code-switching by the same speaker in the preceding discourse (specifically, the preceding 3 clauses or 10 Intonation Units, to be discussed further later). As can be seen, the bilingual speakers produced one third of their tokens in the context of code-switching, while the Spanish-dominant speakers produced just 5 per cent in such a context.[5]

The final column gives the rate of expressed first-person singular subjects, which, as can be seen, for both groups of speakers averages approximately 38 per cent. Thus, level of bilingualism does not correlate with overall rate of *yo* expression, though it remains to be seen whether it has an effect on the linguistic conditioning of *yo* expression.

6 Variationist comparative method: using variability to evaluate convergence

Grammatical convergence is defined as the 'achievement of structural similarity in a given aspect of the grammar of two or more languages, assumed to be different at the onset of contact' (Silva-Corvalán, 1994, p. 5). But how do we gauge grammatical similarity or difference, and therefore evaluate grammatical convergence? Rather than relying on the mere presence of superficially similar constructions or even similar overall *rates* of use, we compare the *structure of variability*, employing the variationist comparative method (Meyerhoff, 2009; Poplack & Meechan, 1998a; Poplack & Tagliamonte, 2001; D. Sankoff et al., 1990; Tagliamonte, 2002; Torres Cacoullos & Aaron, 2003).

The variationist method is founded on the understanding that discourse is characterized by form–function asymmetry, that is, variation among different forms serving generally similar discourse functions (Labov, 1969; D. Sankoff, 1988a; D. Sankoff & Thibault, 1981), in the case under study here, expressed and unexpressed first-person singular subjects. This variability is structured, conditioned by elements of both the linguistic and extralinguistic context, which contribute to speaker choices among variant forms. The structure of variability is shown in quantitative models in which hypotheses about selection constraints are operationalized and tested as factors in multivariate analysis (here, morphosyntactic and discourse factors such as tense, coreferentiality, form of previous realization, and so on.). Thus, *grammatical structure* is observable in the **linguistic conditioning** of variant forms, that is, probabilistic statements about the relative frequency of co-occurrence of linguistic forms and elements of the linguistic context in which they occur.

The variationist comparative approach incorporates variability into the comparative method of historical linguistics. It is based on the comparison of the linguistic conditioning of apparently similar constructions across language varieties (Poplack & Tagliamonte, 2001; Torres Cacoullos & Aaron,
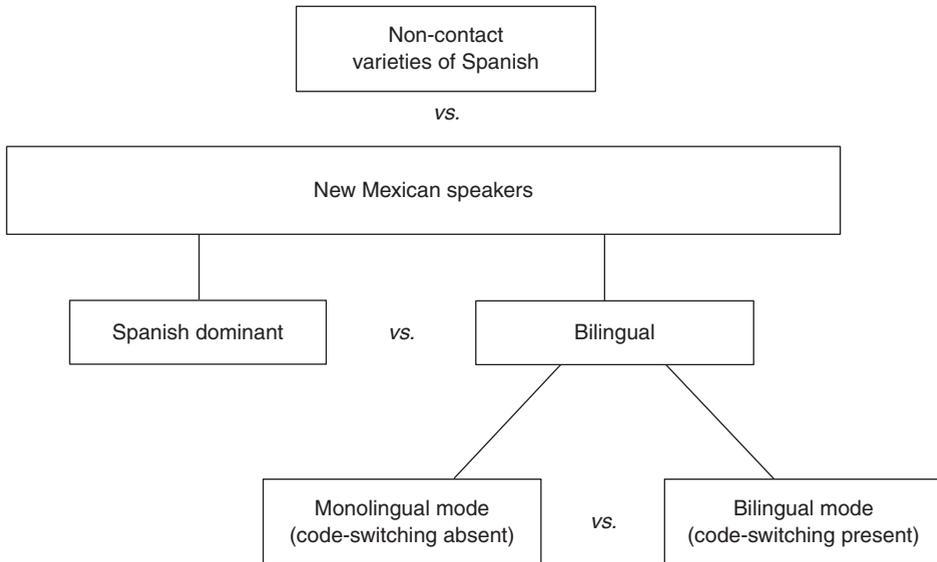
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                        ┌─────────────────────────┐
                        │      Non-contact        │
                        │  varieties of Spanish   │
                        └─────────────────────────┘
                                    vs.
        ┌────────────────────────────────────────────────────────┐
        │                 New Mexican speakers                    │
        └────────────────────────────────────────────────────────┘

   ┌──────────────────────┐                ┌──────────────────────┐
   │   Spanish dominant    │      vs.       │      Bilingual       │
   └──────────────────────┘                └──────────────────────┘

           ┌──────────────────────┐    ┌──────────────────────┐
           │  Monolingual mode     │    │    Bilingual mode     │
           │(code-switching absent)│ vs.│(code-switching present)│
           └──────────────────────┘    └──────────────────────┘
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Figure 1. Groups for comparative analyses

2003), allowing us to discern the grammatical structure of those varieties, and to thereby gauge linguistic difference and change. In this study, contact-induced change is examined through three independent sets of comparisons across (a) New Mexican Spanish vs. monolingual varieties of Spanish, (b) Spanish-dominant vs. bilingual speakers, and (c) for bilingual speakers, in the presence vs. absence of code-switching. Figure 1 presents a summary of the three sets of comparisons to be carried out.

6.1 Data extraction and coding

In order to identify the linguistic conditioning of first-person singular subject expression, all tokens of first-person singular verbs were extracted, excluding truncated tokens where the speaker cut off before completing the verb, and tokens produced by interviewers and other participants who appeared only briefly in the recordings and thus did not produce enough tokens for their patterns of code-switching to be identified.[6]

'Contrast' has been described as one context where subjects are obligatorily expressed and thus where tokens should be excluded in subject expression studies (e.g. Silva-Corvalán, 1994; Toribio, 2004, inter alia). Here, we excluded such tokens only where this was morphologically marked (such as through the use of *yo mismo* 'I myself'[7]). We did not exclude unmarked tokens of contrast because, as noted by Amaral and Schwenter (2005) and Otheguy et al. (2007, pp. 775–776), unexpressed subjects do occur in this environment, and furthermore it is not clear how to operationalize contrast in interactive spoken data, making replicability difficult if not impossible. We did exclude from the multivariate analyses all post-verbal tokens of *yo* ($N = 171$) which represented approximately one quarter of all expressed subjects (23%, 171/749).[8] Though we found that post-verbal *yo* is used in a broad range of contexts, it can be used to mark contrast and, furthermore, it frequently occurs in discourse formulae such as *digo yo* 'I say' and *me acuerdo yo* 'I remember' (which account for one quarter (43/171) of the post-verbal tokens of *yo*); consequently it may be subject to different constraints from pre-verbal *yo*, and thus warrants independent analysis.

Table 3. Variable-rule analysis of the contribution of factors selected as significant to the choice of expressed *yo* in New Mexican Spanish speakers (*N* = 22)

	NM SPANISH *N* = 1,833; Input: .28 (Overall rate: 32%)				NON-CONTACT VARIETIES
	Prob.	% yo	N	% data	
Previous realization*					
Expressed	.68	45%	968	39%	✓
Not expressed	.39	20%	610	61%	
Range	*29*				
Semantic class of verb					
Psychological	.70	51%	290	16%	✓
Other	.46	28%	1543	84%	
Range	*24*				
Subject continuity (switch reference)					
Different subject	.58	39%	986	54%	✓
Same subject	.41	23%	847	46%	
Range	*17*				
Ambiguity of verb morphology (person)					
Ambiguous	.61	37%	503	27%	?
Not ambiguous	.46	29%	1330	73%	
Range	*15*				
Factors not selected as significant					
Clause type					
Position in turn					
Log likelihood: −1020.472					
Chi-square/cell: 1.3379					

* First mentions in the transcript have been excluded from this count, as have tokens where the preceding (potentially) coreferential mention was produced in a truncated utterance, in English, or occurred with a plural verb.

These protocols resulted in 1833 tokens, each of which was coded for a series of factors based on features of the linguistic contexts in which the variants – expressed *yo* and unexpressed first-person singular – occur. All tokens were coded for the following factor groups: previous realization (priming), subject continuity, semantic class of verb, ambiguity of verb morphology, clause type, and position in the turn. The factor groups represent linguistic sub-contexts that are predicted to differ in the relative frequencies of the variants, thus operationalizing hypotheses about constraints on subject expression. The six hypothesized constraints were considered simultaneously in Variable-rule analysis using GoldVarb X (D. Sankoff, Tagliamonte, & Smith, 2005), a kind of multivariate analysis, which is the primary tool of the variationist method for discovering patterns in the data. The multiple regression procedure in Variable-rule analysis helps determine which factor groups *jointly account* for the largest amount of variation in a statistically significant way (D. Sankoff, 1988b). We now turn to the discussion of these results.

7 Variable subject expression in New Mexican Spanish vs. non-contact varieties

The first set of comparisons we conduct is between New Mexican Spanish and monolingual varieties. Table 3 presents the results from a Variable-rule analysis of factors contributing to speakers'

choice of *yo* in New Mexican Spanish, and a summary of corresponding results from prior studies. In this and following tables, the 'input' (here .28) indicates the overall likelihood that the variant – expressed *yo* – will occur (overall rate of expression = 32%). The factor groups that have a significant effect are listed in the table. In this analysis, they are previous realization, semantic class of verb, subject continuity, and ambiguity of verb morphology. Clause type and position in turn were not significant (as in other studies, e.g. Bentivoglio, 1987; Silva-Corvalán, 1994; Travis, 2007).

In addition to the statistical significance of the effect, two other lines of evidence from the Variable-rule analysis are the direction and the magnitude of the effect. The **direction of effect** is indicated by the ordering of the probabilities, or factor weights, from larger to smaller within each significant factor group. These are shown in the first column in Table 3: factors with a higher probability (closer to 1) of *yo* expression can be said to favor, and those with a lower probability (closer to 0) to disfavor, expression. The *Range* (the difference between the highest and lowest factor weight in a factor group) provides an indication of the relative strength, or **magnitude of effect**, of each group of factors in the analysis: here, previous realization has the strongest effect (*Range* = 29), while morphological ambiguity is relatively weak (*Range* = 15). The table also shows (in subsequent columns) the percentage of expressed *yo* in each environment, the total number of tokens in each factor, and the percentage of the data each factor makes up.

The significance, direction and magnitude of effect yield probabilistic statements about the linguistic sub-contexts, which differ significantly in the relative frequencies of the variants, that is, the linguistic conditioning of subject expression (Labov, 1969, p. 742). In Table 3, these results are presented in comparison with those reported in the literature for monolingual varieties of Spanish (cf. Ávila-Shah, 2000; Bentivoglio, 1987; Cameron, 1994; Flores-Ferrán, 2002; Silva-Corvalán, 1994; Travis, 2007, inter alia), with a check mark indicating that the same direction of effect has been found, and a question mark indicating that previous results have been conflicting. Note that in no case did we find a difference in direction of effect between New Mexican Spanish and non-contact varieties.

We begin with the first factor group, the realization of the previous coreferential subject, which may either be expressed (*yo*) or unexpressed. *Yo* is more likely to be expressed when the preceding coreferential subject is also expressed (factor weight .68), than when it is unexpressed. (.39). This can be seen in example (3) where we have strings of expressed subjects in lines 1, 6 and 7 and of unexpressed subjects in lines 9, 10 and 11.

(3)   1.   *O:*   **yo** *les planchaba porque en ese tiempo no había <u>automatic washers</u>,*
2.   *okay.*
3.   *A:*   *Hm.*
4.   *@@ <@ No @>.*
5.   *O:*   *so=,*
6.   **Yo** *tenía una <u>ringer type machine</u>,*
7.   *so* **yo** *me les vinía por la ropa <u>once a week</u>,*
8.   *<u>or twice a week</u> y=,*
9.   ***(Ø)*** *la llevaba pa' mi casa,*
10.   *y* ***(Ø)*** *se las lavaba,*
11.   *(H)* ***(Ø)*** *se las planchaba y* ***(Ø)*** *se las traiba.*
1.   O: '**I** would iron for them because at that time there were no <u>automatic washers</u>,
2.   okay.'
3.   A: 'Hm.
4.   @@ <@ No @>.'
5.   O: 'so,

6.   **I** had a <u>ringer type machine,</u>
7.   So **I** would come for the clothes <u>once a week,</u>
8.   <u>or twice a week</u> and,
9.   **(I)** would take it home,
10.   And **(I)** would wash it for them,
11.   (H) **(I)** would iron it for them and **(I)** would take it to them.'

(117–1A3: 573–575)

This previous realization effect is consonant with a robust constraint uncovered in sociolinguistic and psycholinguistic research, known as structural priming (or parallel structure or perseveration), whereby the use of a certain structure in one utterance functions as a prime on a subsequent utterance, such that that same structure is repeated (cf. Bock, 1986; Cameron & Flores-Ferrán, 2003; Labov, 1994, pp. 547–568; Poplack, 1980a; Scherre & Naro, 1991; Weiner & Labov, 1983, inter alia). This has been observed for subject expression in several dialects of Spanish (Cameron, 1994; Flores-Ferrán, 2002; Travis, 2007). Priming in monolingual Colombian Spanish is illustrated in example (4), from Travis (2007, p. 107), where we have two consecutive coreferential subjects, each of which is expressed.

(4)   ***Yo*** *no sabía cuánto **yo** quiero a mi hermano.*
         '**I** didn't know how much **I** love my brother.'

The results for the second factor group, verb class, indicate that *yo* is most favored by psychological (.70) as opposed to other semantic classes of verbs (.46), a result also reported in numerous previous studies (e.g. Bentivoglio, 1987, p. 60; Enríquez, 1984, p. 240; Silva-Corvalán, 1994, p. 162; Travis, 2007, p. 115). However, close analysis of this class reveals that half of these tokens (49%, 143/290) occur in just two specific discourse formulas or constructions, namely *yo creo* 'I think' and *yo (no) sé* 'I (don't) know', both of which show much higher rates of expression than the overall average of 32 per cent (*yo creo* as high as 87%, 46/53, and *yo (no) sé* at 52%, 47/90). The behavior of these two highly frequent constructions seems to be pulling up the rate for the class as a whole, suggesting that the effect may be one of particular constructions rather than of the general class of psychological verbs (cf. Travis, 2006).

Third, expressed *yo* is less likely to occur when it is coreferential with the immediately preceding subject (factor weight .41), as in lines 10 and 11 of (3), than when it is not, as in (5) in the token in line 2 (.58). The switch reference, or subject continuity, constraint is a consistent finding in the research on subject expression, across the different dialects and for different persons (e.g. Ávila-Shah, 2000; Bayley & Pease-Alvarez, 1997; Bentivoglio, 1987; Cameron, 1994, 1995; Enríquez, 1984; Flores-Ferrán, 2002, 2004; Hochberg, 1986; Morales, 1986a; Silva-Corvalán, 1982, 1994; Travis, 2005; 2007, inter alia). It is important to note that in the multivariate analysis here, the previous realization effect has the greater magnitude (as in the token in line 3 in [5], where, despite coreferentiality, *yo* is expressed, repeating the form of the preceding subject).[9]

(5)   1. *O:*   *No me dejaba salir mucho a jugar porque,*
      2.   ***yo*** *era la mayor,*
      3.   *y **yo** suponía de ayudarle con todo.*
      1. *O:*   '(She/my mother) wouldn't let me out to play much because,
      2.   **I** was the oldest,
      3.   And **I** was supposed to help her with everything.'

(117–1A3: 185–187)

There exists an interesting relationship between subject continuity and verb class, whereby subject continuity is less frequent with psychological verbs than with other verbs: whereas only a third (30%, 88/290) of psychological verbs have the same subject as the preceding clause, half of all other verbs do (49%, 759/1543). Furthermore, subject continuity does not have an effect for psychological verbs: the rate of *yo* expression is the same in 'switch reference' and same subject contexts, at 50 per cent (102/202) and 52 per cent (46/88), respectively. This interaction clearly requires further exploration.

Finally, verb forms that are morphologically ambiguous in person marking (for example in first- and third-person singular Imperfect forms such as *era la mayor* 'I/she was the oldest', in [5]), favor *yo* expression. However, morphological ambiguity has the weakest effect among our significant factor groups (as indicated by its *Range* of 15), and prior results have been inconclusive, with some studies finding a correlation between morphological ambiguity and expressed subjects (Bayley & Pease-Alvarez, 1997; Cameron, 1994; Hochberg, 1986; Silva-Corvalán, 1994), and others finding no such correlation (Bentivoglio, 1987; Enríquez, 1984; Ranson, 1991). This may be due to inter-action with other factor groups. Cameron (1994), for example, found no effect for morphological ambiguity in contexts of subject continuity. In our data, we find no effect for psychological verbs, with the rate of *yo* expression being nearly identical in ambiguous and unambiguous contexts (48%, 12/25, and 51%, 136/265, respectively).[10]

It has also been noted that cases of true ambiguity are rare in natural discourse, as they are generally resolved by context (Ávila-Shah, 2000, p. 242; Bentivoglio, 1987, p. 45; Silva-Corvalán, 1994, p. 154), thus causing some scholars to seek another explanation for this effect. Silva-Corvalán (2001, pp. 161–163) proposes that it is not the ambiguity but the discourse function of the different tense / mood / aspects that motivates their use with expressed or unexpressed subjects (cf. also Bayley & Pease-Alvarez, 1997, p. 363), a hypothesis supported by the present data: Preterit (perfective) forms, which have a foregrounding function, show a significantly lower *yo* rate (24%, 114/478) than Imperfect, Conditional, and Subjunctive forms, which have a backgrounding function (37%, 187/499) (chi-square = 21.263, *p* < .0001).

How does the linguistic conditioning of subject expression in New Mexican Spanish compare with monolingual patterns? The final column in Table 3 provides the comparison with non-contact varieties. The check marks indicate that the direction of effect that we found here is the same as that which has been reported in the literature on monolingual varieties, as the discussion so far has indicated. Thus, both for our New Mexican speakers and speakers of non-contact varieties, expressed *yo* is favored when the preceding coreferential subject is expressed, with psychological verbs and in contexts of switch reference. As noted earlier, reports of ambiguity effects have been inconsistent, captured here with the question mark. In sum, then, we observe the same linguistic conditioning of subject expression in our New Mexican speakers as that that has been reported for non-contact varieties of Spanish. These results do not present any evidence for convergence in this community, suggesting that no contact-induced change in subject expression has occurred.

It may be the case, however, that convergence has only taken place among the bilingual speakers, a result which may not be evident when we consider all speakers together, and thus in the next set of comparisons, we consider the linguistic conditioning of the Spanish-dominant and bilingual speakers separately.

8 Spanish-dominant vs. bilingual speakers of New Mexican Spanish

For this set of comparisons, we consider independently the linguistic conditioning of *yo* expression in the bilingual speaker group (Table 1) comparing it with that of the Spanish-dominant speakers

Table 4. Two separate Variable-rule analyses of the contribution of factors selected as significant to the choice of expressed *yo* in Spanish-dominant (*N* = 5) and bilingual (*N* = 17) New Mexican Spanish speakers*

	SPANISH-DOMINANT $N = 522$; Input: .30 (Overall rate: 31%)				**BILINGUAL** $N = 1311$; Input: .34 (Overall rate: 32%)			
	Prob	% yo	N	% data	Prob	% yo	N	% data
Previous realization								
Expressed	.63	42%	186	38%	.70	47%	423	39%
Not expressed	.42	23%	307	62%	.37	18%	662	61%
Range	*21*				*33*			
Semantic class of verb								
Psychological	.76	61%	57	11%	.70	49%	233	18%
Other	.46	28%	465	89%	.46	28%	1078	82%
Range	*30*				*24*			
Subject continuity (switch reference)								
Different subject	.58	40%	265	51%	.58	38%	721	55%
Same subject	.42	23%	257	49%	.41	24%	590	45%
Range	*16*				*17*			
Ambiguity of verb morphology (person)								
Ambiguous					.66	43%	347	26%
Not ambiguous					.44	28%	964	74%
Range	*n.s.*				*22*			
Factors not selected as significant								
Ambiguity					Clause type			
Clause type					Position in turn			
Position in turn								
Log likelihood: −296.653					−713.287			
Chi-square/cell: 1.0793					1.3797			

*Code-switching was not included as a factor group in this analysis, as doing so does not provide as good a fit (as indicated by the log likelihood) as omitting it. Furthermore, including only the same factor groups in the two analyses makes them directly comparable.

(Table 2). The hypothesis that code-switching promotes convergence would predict that those speakers who code-switch more, that is, the bilingual speakers, should differ from the Spanish dominant speakers, showing a higher rate of *yo* expression. Table 4 presents the results of two independent Variable-rule analyses of factors contributing to choice of *yo* in Spanish-dominant and bilingual speakers.

Note that not only is the overall likelihood that expressed *yo* will occur similar in the two analyses (indicated by the 'input' of .30 and .34, respectively, with Spanish-dominant speakers showing 31% and bilingual speakers 32% expressed *yo*), but the direction of effect in each factor group is identical for both groups of speakers: for both, expressed *yo* is favored by previous realization as *yo*, by psychological verbs, and in contexts of switch reference. The only difference we observe is that morphologically ambiguous verbs significantly favor expressed *yo* for the bilingual speakers, while the Spanish-dominant speakers show no ambiguity effect.[11] However, as noted earlier, results for morphological ambiguity have been conflicting in studies of monolingual Spanish[12] and thus this cannot provide evidence of contact-induced change.

In sum, there is no overall *rate* difference between the two groups, nor have bilinguals' *grammatical patterns*, instantiated in the *linguistic conditioning of subject expression*, undergone change. The results from this set of comparisons, then, also fail to support convergence with English in *yo* expression even for the bilingual speakers. The question remains, however, of whether code-switching itself has an effect on patterns of *yo* expression.

9 Absence vs. presence of code-switching in New Mexican Spanish

Although the fact that bilingual speakers do not differ in their patterning of *yo* expression from Spanish-dominant speakers does not support the hypothesis that code-switching promotes convergence, it also does not contradict it. This result may be because there is insufficient code-switching in the data for the effect to emerge. In order to examine specifically the effect of code-switching, we need to consider just those contexts where code-switching has recently occurred, that is, where both languages may be more 'activated' (cf. Kroll & Tokowicz, 2005), or where speakers may be in 'bilingual' (vs. 'monolingual') mode (cf. Grosjean, 1997, 1998, 2001).

The effects of language activation have been observed in experimental settings. Grosjean (1997), for example, studied story retellings from 15 bilingual French speakers living in Boston. He elicited 'monolingual mode' by having his participants listen to a story depicting a French scene produced fully in French, which they were then asked to recount to a native French speaker newly arrived in the USA. He elicited 'bilingual mode' by having his participants listen to a story depicting an American scene (such as Thanksgiving) produced in French with English code-switches and borrowings, which they were asked to recount to a native French speaker who had been living in the USA for several years, was fully bilingual and well integrated into American society. He found that speakers behaved differently in the two modes, producing a higher number of borrowings and code-switches in 'bilingual' than in 'monolingual' mode.

Toribio (2004) studied Spanish subject expression in fairy tale narrations from two bilingual Spanish speakers living in the USA. She elicited 'monolingual mode' by providing her participants with picture prompts for the fairy tale *Little Red Riding Hood*, and asking them to tell the story in Spanish. She elicited 'bilingual mode' by having them read the fairy tale *The Beggar Prince* in English, then having part of it read aloud to them in Spanish with English code-switching, and asking them to complete the story. Like Grosjean (1997), Toribio found different behavior in the two modes, specifically that speakers produced a higher rate of expressed subjects in 'bilingual' than in 'monolingual' mode, and concluded that 'the simultaneous presence of languages in code-switching further favors the searching for parallels between them, and hence promulgates the striving towards convergence' (Toribio, 2004, p. 172).

The challenge we face in this study is how to operationalize 'level of activation' or 'language mode' in spontaneous discourse. We have done this by distinguishing speech produced in a context where English has recently been used in the discourse from that where it has not. Thus, we have defined 'bilingual mode' as the use of English by the same speaker in the preceding three clauses or 10 Intonation Units (whichever represents the larger segment of discourse). 'Monolingual mode', in contrast, is where there is no such recent use of English. The following two examples illustrate these two modes. They are produced by the same speaker, in the same interview, but while the first-person singular subject token under study in line 6 in (6) is produced in a context where the same speaker has recently used English, that in line 12 in (7) is produced in a non-code-switching environment.

(6)   1. *T:*   *eso decían ellos.*
      2.   *and the –*
      3.   *Well,*
      4.   *my mother used to say that.*
      5.   *My uncle.*
      6.   *(H) y luego esta prima hermana que **(Ø)** tengo,*
      7.   *that she is pre- –*
      8.   *pretty well uh familiar with the= –*
      9.   *.. with the his- –*
     10.   *family history.*
      1. T: 'That's what they would say.'
      2.   and the –
      3.   Well,
      4.   my mother used to say that.
      5.   My uncle.
      6. *   (H) and then this cousin that **(I)** have,
      7.   that she is pre- –
      8.   pretty well uh familiar with the= –
      9.   .. with the his- –
     10.   family history.

                                                                                          (270–1B3: 557–566)

(7)   1. *T:*   *.. No.*
      2.   *y los que mató,*
      3.   *los mataba casi en sangre fría,*
      4.   *you know.*[13]
      5. *F:*   *[Sí].*
      6. *T:*   *[hasta] a sus nietos,*
      7.   *los mató también.*
      8. *F:*   *Eso es lo que oí.*
      9. *T:*   *Sí.*
     10. *F:*   *Dizque los ahogó.*
     11. *T:*   *Sí.*
     12.   ***(Ø)** Pienso que los ahogó.*
      1. T: '.. No.
      2.   And the ones he killed,
      3.   he killed them practically in cold blood,
      4.   you know.'
      5. F: ['Yes'].
      6. T: ['even] his grandchildren,
      7.   he killed them also.'
      8. F: 'That's what I heard.'
      9. T: 'Yes.'
     10. F: 'They say he drowned them.'
     11. T: 'Yes.
     12.   **(I)** think he drowned them.'

                                                                                          (270–1B3: 176–187)

Table 5. Rate of expressed *yo* among bilingual New Mexican speakers (*N* = 17) in the absence vs. presence of code-switching

	% *yo*	*N*	% data
Code-switching absent	30%	288/947	72%
Code-switching present	35%	126/364	28%

Chi-square = 2.150, *p* = 0.1425.

Table 6. Rate of expressed *yo* among bilingual New Mexican speakers (*N* = 12) who frequently code-switch in the absence vs. presence of code-switching

	% *yo*	*N*	% data
Code-switching absent	29%	148/505	60%
Code-switching present	36%	121/334	40%

Chi-square = 4.501074, *p* = 0.0339.

The convergence via code-switching hypothesis would predict that the expressed *yo* rate will be higher in the presence as opposed to the absence of code-switching. Here, we only consider the bilingual speakers, as the Spanish-dominant speakers show much lower rates of code-switching, and thus – if there is contact-induced change via code-switching – it should be apparent in the bilingual speakers who regularly use both languages. Rates of expressed *yo* in the two environments for the bilingual speakers are presented in Table 5. As this table shows, the rate of use of expressed *yo* is slightly higher in the presence of code-switching (35% vs. 30%); however, this difference is not significant.

As was seen in Table 1, there is great variety in the amount of code-switching even among the bilingual speakers, from 0 to 74 per cent. Those bilinguals who make little use of code-switching may exhibit different patterning, and thus for a more stringent test we examined just those speakers who frequently code-switched, which we defined as those who produced over 20 per cent of their first-person singular subject tokens in the presence of code-switching (12 speakers, *N* = 839). If there is convergence due to code-switching, it should be evident precisely in just this group of speakers when they have recently been using English. As can be seen in Table 6, we find a slightly greater rate of subject expression in the presence vs. the absence of code-switching (36% vs. 29%), which in this case does achieve significance (at the .05 though not at the .01 level), and is in the direction predicted by the hypothesis.

In order to determine whether these divergent rates of expression are indeed representative of a change in constraints on subject expression, we now consider the linguistic conditioning of *yo* expression in these two environments. The results of these independent analyses are presented in Table 7.

Table 7 shows that we get precisely the same conditioning regardless of whether code-switching is present or absent in the preceding discourse. As with our previous results, expressed *yo* is favored when the preceding coreferential subject was also expressed, with morphologically ambiguous verbs, with psychological verbs and when there is a switch in subject from the preceding clause. Once again, then, we fail to find support for the hypothesis that code-switching promotes convergence.

Table 7. Two separate Variable-rule analyses of the contribution of factors selected as significant to the choice of expressed *yo* in bilingual New Mexican Spanish speakers (*N* = 12), in absence and presence of code-switching

	C-SW ABSENT N = 505; Input: .25 (Overall rate: 29%)				C-SW PRESENT N = 334; Input: .34 (Overall rate: 36%)			
	Prob	% yo	N	% data	Prob	% yo	N	% data
Previous realization								
Expressed	.69	44%	166	37%	.62	48%	111	37%
English *I*			(16)		.52	38%	69	23%
Not expressed	.39	18%	279	63%	.39	24%	124	41%
Range	*30*				*23*			
Ambiguity of verb morphology (person)								
Ambiguous	.72	48%	128	25%	.67	50%	105	31%
Not ambiguous	.42	23%	377	75%	.42	30%	229	69%
Range	*30*				*25*			
Semantic class of verb								
Psychological	.69	42%	77	15%	.67	48%	63	19%
Other	.46	27%	428	85%	.46	34%	271	81%
Range	*23*				*21*			
Subject continuity (switch reference)								
Different subject	.57	34%	282	56%	.59	43%	178	53%
Same subject	.41	23%	223	44%	.40	28%	156	47%
Range	*16*				*19*			
Factors not selected as significant:								
Clause type					Clause type			
Position in turn					Position in turn			
Log likelihood: −265.873					−198.258			
Chi-square/cell: 1.1861					1.1039			

Given that we observe the same linguistic conditioning in both environments, what might explain the marginally higher rate of expressed *yo* in the presence of code-switching? We propose that this is attributable to a cross-linguistic priming effect through the presence of English *I* in the preceding discourse.

10 Cross-linguistic priming effect

Observe in Table 7 that the factor group 'previous realization' includes one more factor in the presence than in the absence of code-switching: in the presence of code-switching, alongside an expressed (*yo*) and unexpressed subject, there exists the possibility of English *I*. This environment is illustrated in the following example (8), where the preceding coreferential subject was an English *I*, produced as part of code-switched speech (see also the token in line 2 in example [1]).

(8) 1. *W:* *hi=jo,*
     2.   *sure **I** am glad que **yo** no estoy–*
     3.   *(H) … putting any kids to school now.*

1. W: 'boy,
2.   sure **I** am glad that **I**'m not –
3.   (H) … putting any kids to school now.'

<div align="right">(190–3B2: 847–849)</div>

As can be seen in Table 7, in the code-switching data, we observe the same priming effect within Spanish we noted earlier (preceding expressed *yo* favors subsequent expressed *yo*, with a weight of .62). But English *I* also favors *yo* (weight .52) more than does a preceding unexpressed subject (weight .39). Thus, both a preceding *yo* and a preceding *I* favor a subsequent expressed *yo*; that is, the priming effect operates both within Spanish and from English to Spanish (albeit to a lesser degree).[14]

Priming has been observed to occur across languages in recent psycholinguistic research. For example, Hartsuiker, Pickering, and Veltkamp (2004) found a priming effect for passive constructions among Spanish and English speakers in a picture-description task, such that upon hearing a picture described with a passive form in one language speakers were significantly more likely to produce a subsequent picture description with a passive in the other language, and conclude that 'recent use of a structure in one language will lead to repetition of that structure in another language' (2004, p. 413). Priming has also been observed for the double-object vs. prepositional object constructions (e.g. 'A rock star sold an undercover agent some cocaine' vs. 'A rock star sold some cocaine to an undercover agent') in English–German (Loebell & Bock, 2003) and Dutch–German bilinguals (Schoonbaert, Hartsuiker, & Pickering, 2007).

In our data, the occurrence of *I* greatly changes the distribution of the data with respect to previous realization. The previous realization as English *I* makes up 23 per cent of the data in the presence of code-switching, thereby reducing the preceding unexpressed contexts from 63 per cent in the absence of code-switching to 41 per cent in its presence. (Note that the percentage of previous realization as *yo* remains identical in both contexts, at 37%.) This marked difference in distribution can be seen in Figure 2.

This draws us to the conclusion that the higher proportion of first-person singular subjects produced in the environment of a preceding expressed subject – be that *yo* or *I* – in the presence vs. absence of code-switching leads to a higher rate of expressed subjects overall, and it is this difference in distribution that results in a higher *yo* rate in bilinguals' code-switching data. This is therefore not due to code-switching per se, but, more specifically, the presence of English *I*.
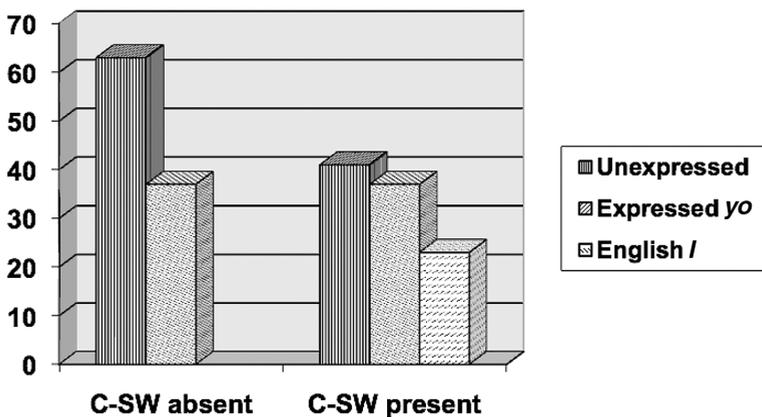

Figure 2. Previous realization of first-person singular: absence versus presence of code-switching

11 Conclusion

In using multivariate analysis to discover the configuration of factors accounting for variable subject expression, and drawing attention to the structural priming effect, the results we have presented are compelling for studies of subject expression and convergence.

We have seen that the New Mexican speakers show similar patterns of variable first-person singular subject expression as in non-contact varieties of Spanish, with use of *yo* favored by previous realization of the coreferential subject as *yo*, when the subject of the immediately preceding verb is non-coreferential, and in constructions with psychological verbs. Furthermore, we find the same linguistic conditioning across groups distinguished by level of bilingualism. These data thus show no evidence of Spanish convergence with English in subject expression, in spite of the extensive and prolonged contact that exists between these two languages. We also find the same conditioning of subject expression among bilingual speakers in the presence and absence of code-switching.

Despite, then, the widely held belief that code-switching functions as a mechanism of contact-induced change, this is not borne out in empirical research, at least for *yo* expression in this community of speakers. This indicates that it is not the case, as has been assumed, that bilinguals engage in a general searching for parallels between their two languages (e.g. Toribio, 2004, p. 172). Rather, in bilingual, just as in monolingual discourse, the local process of syntactic priming plays a key role, whereby the structure of a speaker's utterance is influenced by what has gone before in the discourse. This result leads us to propose that priming may play a role in ostensible language change in contact situations by modestly raising the rate of a parallel structure without involving change in the structure of linguistic variation.

More generally the present results underscore the need to consider the linguistic conditioning, or constraints, on subject expression in evaluating convergence, rather than merely rates of expression (cf. Poplack & Meechan, 1998a; Tagliamonte, 2002). While overall rates of occurrence may give an indication of grammatical structure, only a comparison of the conditioning of variation by language-internal factors can establish grammatical similarities or differences. This confirms prior studies, such as that by Torres Cacoullos and Aaron (2003), who found that although both Spanish and English have similar rates of bare (i.e. determinerless) nouns in Noun Phrases, their distribution patterns are different; the disparate conditioning reflects the different use of superficially similar definite and indefinite articles in the two languages. Just as similar rates may mask differences in conditioning (different grammars), divergent rates may mask similarities. As noted earlier, both Cameron (1993, 1994) and Travis (2007) found near identical linguistic conditioning of subject expression across varieties of Spanish, notwithstanding significantly different rates of use.

In sum, despite prolonged contact, comparisons of the structure of variable first-person singular subject expression do not support Spanish convergence with English in New Mexican Spanish varieties, nor code-switching as a mechanism of (contact-induced) change. They do, however, indicate that code-switching enables cross-linguistic priming, an effect which, far from being specific to code-switching data, is generally operative in language variation. We conclude that the study of the linguistic consequences of contact will profit by incorporating priming into tests of the role of code-switching in language change and, more broadly, can be deepened through comparisons of the structure of variability in the data of spontaneous language use of bilingual speech communities.

Notes

1. Numbers in parentheses following examples indicate recording name or number, tape, side and segment, and the transcription line numbers. Transcription conventions are given in the Appendix.
2. As has been pointed out by Otheguy (2004, p. 176), although it is widely believed that Spanish subject pronouns are comparable with those of English – specifically that expressed subjects are largely equivalent to English stressed pronouns, and unexpressed subjects to English unstressed pronouns (e.g. Payne, 1997, p. 43) – there may be 'no hard equivalence between Spanish overt and English stressed [subjects]'.
3. Phonology is not a reliable criterion for distinguishing between borrowing and code-switching (Jake, Myers-Scotton, & Gross, 2002, pp. 75–76; D. Sankoff et al., 1990, p. 73; Torres Cacoullos & Aaron, 2003, p. 290).
4. Speakers of 'traditional New Mexican Spanish' in northern New Mexico and speakers in the south of the state with greater contact with contemporary Mexican dialects exhibited lexical differences (consistent with what has been reported in the literature by Bills & Vigil, 2008; Vigil & Bills, 2004, inter alia), but separate analyses of the two corpora revealed no systematic differences in their patterns of *yo* expression, allowing us to pool the data for this particular study.
5. There are considerable differences in the frequency of code-switching in these materials, such that among both the bilingual and Spanish-dominant speakers there are speakers who produce no first-person singular subject tokens in the context of code-switching, while at the same time, in the bilingual group several speakers produce well over half of their tokens in such a context (though some speakers produced too few tokens for meaningful comparisons).
6. We focus on first-person singular for several reasons. Grammatical person has been found to be one of the strongest constraints on variable subject expression (cf. Otheguy et al., 2007) indicating that the different persons may exhibit different patterning and can be profitably analyzed independently (cf. also Silveira, 2007, 2008, for Brazilian Portuguese). Of the different persons, first-person singular has the advantage that it only has two distinct realizations (pronominal *yo* or unexpressed), as compared with third person, which, alongside unexpressed and pronominal mentions, allows for lexical NPs, meaning that different issues arise in relation to the priming effect (see section 10, later in the article).
7. This occurred just once in the data, with a post-verbal subject: *Comencé yo misma. a leer inglés.* 'I myself began to read English.' (20–1A1: 736)
8. This includes four tokens where *yo* occurred both before and after the verb (e.g. *entonces yo le dije yo,* 'So I said' [156–1A1: 1041]) and five tokens where it was produced following an auxiliary but preceding the main verb (e.g. *necesito yo telefonearles*, 'I have to call them' [Ang Int 5: 223]).
9. Subject continuity and priming may act synergistically or antagonistically, conspiring or conflicting in the occurrence of *yo* (cf. Travis, 2007, p. 124 for discussion). In these data, cross-tabulations indicate that 'switch reference' is more operative in the context of unexpressed previous realization, that is, the subject continuity effect is weaker when the previous realization of the co-referential subject is expressed (an environment which, according to the previous realization effect, favors expressed subjects). This requires further testing as in our study, previous realization was not restricted to the immediately preceding subject. Cameron (1994), who includes different singular persons and considers just adjacent clauses, reports a weaker priming effect under switch reference. That is, when the immediately preceding subject is not coreferential, whether it is expressed or unexpressed makes little difference, the subject continuity effect apparently overriding the previous realization effect.

10. Moreover, psychological verbs are rarely ambiguous (9%, 25/290, compared with 31%, 478/1543, of other verbs).

11. Among the Spanish-dominant speakers, ambiguous verbs show a *yo* rate of 27 per cent (40/156) and unambiguous verbs 34 per cent (124/366)

12. Results also appear to be conflicting for contact varieties. Silva-Corvalán (1994, p. 159) finds a lower rate of subject expression with ambiguous verb forms among third-generation Spanish speakers in Los Angeles, the opposite of what we find here for more vs. less bilingual speakers.

13. We consider *you know* a borrowing not a code-switch because, although made up of two words, it functions as a single-word unit, as the literature on this discourse marker has noted (e.g. Schiffrin, 1987). See also Aaron (2004) on bilingual discourse markers in New Mexican Spanish.

14. The difference in the effect of *yo* and *I* may be due to a lexical enhancement effect (cf. Gries, 2005; Hartsuiker, Bernolet, Schoonbaer, Speybroeck, & Vanderelst, 2008; Pickering & Branigan, 1998; Szmrecsanyi, 2006), such that the repetition of *yo* leads to a stronger priming effect than from *I* to *yo* (though see Schoonbaert et al., 2007 on the role of translation-equivalent lexical items in cross-linguistic priming). We are currently exploring further the role of lexical enhancement in both Spanish–Spanish and English–Spanish priming.

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Appendix

Transcription conventions (Du Bois et al., 1993).

LETTER:	speaker label
Carriage return:	new Intonation Unit
.	final intonation contour
,	continuing intonation contour
?	appeal intonation contour
–	truncated intonation contour
-	truncated word
...	medium pause (> 0.7 secs)
..	short pause (about 0.5 secs)
(H)	inhalation
=	lengthened syllable
[ ]	speech produced in overlap
@	one syllable of laughter
<@ @>	speech produced while laughing