

Subject pronoun expression and language mode in bilingual Spanish

Abstract

In research on Spanish subject pronoun expression, Spanish-English bilinguals have been shown to present higher rates of overt subjects in code-switching than in monolingual Spanish mode, an outcome attributed to priming from English (Torres-Cacoullos & Travis 2010b) or to convergence with English (Toribio 2004). In this study we seek to arbitrate between these competing accounts. For that purpose, productions were elicited from bilinguals in tasks that complement the semi-spontaneity of sociolinguistic research with controlled experimental methods, manipulating priming source and target structures in three modes: monolingual Spanish, language switching, and code-switching. Participants demonstrated the anticipated sensitivity to priming across conditions and effects of bilingual mode in the code-switching condition, with greater overt pronoun use with null subject primes. These results allow us to isolate structural priming from bilingual effects and to ascribe the source of increased use of overt pronominal subjects in bilingual Spanish to dual language activation or convergence.

Keywords: subject expression, structural persistence, syntactic priming, code-switching, bilingual mode

1. Introduction

This research article concerns itself with the effect of language mode (Grosjean 1998, 2001) on the production of variable phenomena in bilingual speech. The particular phenomenon under study is subject pronoun expression (SPE) in the Spanish of U.S. Spanish-English bilinguals. In Spanish, a null subject language, the distribution of overt vs. null personal pronominal subjects is regulated by a cluster of variables, among these are: discourse function, co-referentiality, and person, to name but a few. For instance, a large body of literature within the variationist sociolinguistic tradition has revealed that where speech is most connected, i.e. where the subject is coreferential with the previous subject and where the tense, aspect, and mood (TAM) is the same as in the previous verb, subjects tend to be null, while, in sentences where the speech is not as connected, subjects tend to be overt. Additionally, it is generally accepted that overt forms lead to overt forms, and null forms lead to null forms, across genres and dialects of Spanish (cf. Cameron, 1994; Travis, 2005, 2007), a tendency that has been referred to as priming or structural persistence. Comparisons across dialects and between monolingual and bilingual speakers have reported few differences in the variables that are returned as significant in predicting overt SPE or the direction of effects within a variable. Speech connectivity, for example, has been found to be significant across monolingual and bilingual varieties of Spanish and always in the same direction: same referent and same TAM favor null pronominal subjects while a different referent favors overt pronominal subjects (Otheguy & Zentella 2012).

Nevertheless, there are significant differences in rates of SPE between monolingual reference varieties and bilingual U.S. Spanish, traced to contact with English patterns of nearly categorically overt subject pronouns (cf. Otheguy et al., 2007, however see Torres-Cacoullos & Travis 2010). The elevated rates posted by bilinguals are variously attributed to convergence, defined as “the enhancement of inherent structural similarities found between two linguistic Systems” (Bullock and Toribio 2004: 91), with the non-null subject contact language, namely English, and to simplification to alleviate the processing cost of bilingualism. Particularly relevant to this project is the examination of Spanish SPE in code-switching (CS), in which bilinguals activate both languages and alternate between them. While previous research on CS has largely centered on the syntactic restrictions on CS, giving rise to highly debated theories (cf. Myers-Scotton, 1993; MacSwan, 1997; Muysken, 2000), a distinct line of research has focused on the consequences of CS for variable phenomena. In a case study of morphosyntax, Toribio (2004) observes that overt pronominal forms in Spanish are increased when speakers are engaged in CS mode, a finding she interprets as indicative of convergence of the two contributing systems. But, Torres-Cacoullos & Travis (2010b) conclude that such elevated rates in their own data are due to structural priming from English, not necessarily to CS. In order to arbitrate between these views as to the source of the increased use of overt pronominal subjects in bilingual Spanish, what is needed is a study in which priming and language mode are manipulated in the design.

The present research pursues this line of inquiry, assessing the effects of mode on SPE in bilinguals’ spontaneous, albeit semi-controlled, Spanish-language production across monolingual mode and two bilingual modes: CS and language switching (LS). Consistent with antecedent literature, we anticipate priming effects or structural persistence across all modes; the issue is

whether the effects of English are enhanced in the bilingual modes, where Spanish and English are simultaneously activated. In pursuing these issues, the work complements the methods of variationist sociolinguistics, contributing to the investigation of persistence of syntactic structures in three ways: it examines perseveration in subject expression in Spanish, which has been amply explored but without benefit of task designs that control for linguistic context; it investigates SPE across monolingual and bilingual modes, analyzing speech samples from participants in a Spanish-only condition, an English-Spanish LS condition, and a Spanish-English CS condition; and it focuses on a group of bilinguals that remains underrepresented in studies of syntactic priming: U.S. Spanish heritage bilinguals. The study also furnishes new data and methods to the body of knowledge on variable subject expression in Spanish, by attending to third person singular DPs and pronominal forms (which are woefully understudied relative to first person singular forms), by isolating the potential contributions of priming through controlled tasks, and by examining the role of dual language activation in LS and CS on subject expression.

The remainder of the article is organized as follows. Section 2 provides a review of research on structural priming from the fields of psycholinguistics and sociolinguistics as well as works on SPE in Spanish, both in the variationist literature and the bilingualism literature. Summarizing the advances in these areas and taking account of some of the limitations, Section 3 provides the rationale for the present undertaking; its main purpose is to set out the research questions and the hypotheses, motivate the research design, and present the results. Section 4 discusses and contextualizes the results, and finally, Section 5 offers conclusions and avenues for research on variable phenomena that avail themselves of tools and techniques from allied fields.

2. Previous studies: Subject expression, structural priming, and bilingual code-switching

As the present study examines Spanish SPE in monolingual and bilingual Spanish, the following sections review relevant findings on structural priming of subject expression vs. omission in monolingual Spanish, structural priming within and across languages, and structural priming of subject expression vs. omission in bilingual Spanish-English mixed speech. This research review informs the present proposal regarding the effects of language modes (monolingual and bilingual) on the realization of Spanish null and overt (pronominal and lexical DP) subjects in the elicited production of Spanish-English bilingual speakers.

2.1. Subject expression in Spanish

Subject expression vs. omission is a phenomenon that is emblematic of Spanish linguistics. As such, the wealth of attention in this area facilitates the task of the researcher in identifying the factors that are implicated in its variability. Variationist studies of Spanish SPE provide ample evidence that the distribution of null and overt pronominal subjects is variable and orderly. It is variable in most contexts studied, as consistent with the Spanish 'pro-drop' grammatical system. However, the distribution is not random; certain factors promote the use of one or another variant.

One of the variables that has received considerable attention in variationist research is discourse function (i.e. co-referentiality, switch reference, or topic shift), which specifically refers to the information structure of the subject under analysis, given that such subjects can be new topics, the same topic as in the previous clause, or a topic different from that of the previous clause. If the subject finds its antecedent in the subject position of the previous sentence (co-referential, topic maintenance), the probability that the speaker uses a null subject increases. But, if the subject is

not the same as in the previous clause (topic shift), the probability that the speaker uses an overt form is higher than that of using its null counterpart. Other variables that have been studied extensively are continuity of verbal tense, aspect, and mood (TAM), where the use of the same TAM as in the previous sentence promotes the use of a null subject (1a). Combining topic shift with TAM continuity (same subject and same TAM vs. same subject and different TAM vs. different subjects) in variationist analyses has revealed that the more connectivity in the speech, the more probable it is that a speaker will use a null form (Otheguy et al., 2007). The examples in (1) show the decrease in speech connectivity that has been associated with the use of a higher rate of overt pronominal subjects in Spanish.

(1) a. Same referent and same TAM

Y yo los bañaba, y los vestía, les daba de comer, los ponía a dormir.

'And I would bathe them, dress them, feed them, put them to sleep.' (Travis 2007)

b. Same referent but different TAM

Mañana voy. Yo dejé diez paquetes allá.

'I will go tomorrow. I left ten packets there.' (Travis 2007)

c. Different referent

Parece que ellos piensan que es signo de cultura.

'It seems as if they think that is it a sign of culture.' (Morales 1996)

In (1a) both the referent (yo 'I') and the TAM (imperfect indicative) are constant, which has been reported to favor null subjects. In (1b) there is the same referent (yo 'I') in both clauses but the TAM changes from the present indicative in the first sentence to the preterit in the second sentence,

which has been shown to neither favor nor disfavor overt pronominal subjects. Lastly (1c) exemplifies more disconnect between the two clauses as the subject of the first clause is different from that of the second clause, a context where overt subjects tend to be produced more.

Another significant factor examined across studies is verb person, with first person found to increase the odds of using an overt pronominal subject (Enríquez, 1984; Morales, 1997; Otheguy et al., 2007; Silva-Corvalán, 1982, 1994; Travis, 2007). Verb form ambiguity is also shown to increase the probability of using an overt form (Silva-Corvalán, 1994; although see Casanova, 1999; Morales, 1997; Ranson, 1991), motivating Hochberg (1986) to propose the Functional Compensation Hypothesis in accounting for the preponderance of pronouns in varieties in which segmental deletion has rendered forms of multiple paradigms homophonous. Finally, semantic verb type (mental vs. stative vs. external) has also been reported to have an effect on the probability of using a null vs. an overt pronominal form, where mental and stative verbs favor the use of the overt form (Enríquez, 1984; Morales, 1997; Otheguy et al., 2007; Otheguy & Zentella, 2012; Silva-Corvalán, 1982, 1994; Travis, 2007).

In addition to language-internal variables, some community or individual factors have received attention in the extant literature on Spanish subject expression. Especially relevant are studies that examine the effect of language contact, particularly the contact situation between a null and a non null subject language. These studies employ variationist comparative methods where the speech from bilinguals who have experienced different degrees of contact with English (e.g., monolingual Spanish speakers vs. newcomers vs. US-born and raised) is analyzed to evaluate the possible increase in overt subject rates and the changes in factors regulating their distribution as an index of

degree of contact with English. These studies return conflicting results: there are those that report a bilingual effect (Lapidus & Otheguy, 2005a, 2005b; Otheguy, Zentella & Livert, 2007; Otheguy & Zentella, 2012; Shin 2013; Shin & Otheguy, 2013; among others) and those that do not (Torres-Cacoullos & Travis, 2010). It is possible, though, that the contradictory results are due to different grammatical persons included in the studies; some studies only examine first person and others third person or all persons. In cases where a bilingual effect has been reported, researchers have sought to attribute it to priming from English, a hypothesis we consider in the following section.

2.2 Structural priming or syntactic persistence

In her seminal study, Bock (1986) found that the structure of a prime sentence persists into succeeding sentences in oral production. Subsequent studies confirm the pervasiveness of structural persistence, observed via a variety of tasks, targeting several different structures, and focusing on multiple languages. More importantly for the present purposes, results from a variety of studies have helped to consolidate the notion of structural priming as a mechanism that operates not only within but across languages. The most studied construction in both monolingual and multilingual experiments has been the double-object dative, illustrated in the following Spanish-English example from Meijer & Fox Tree (2003). As can be surmised from the example, the Spanish DP-PP construction (2a) primes the counterpart construction in English (2b), over the more frequently used DP-DP target (2c). In another study, Hartsuiker et al., (2004) found priming of grammatical voice as Spanish-English bilingual participants described pictures to one another while switching languages; Spanish passives primed the production of passive sentences in English.

(2) a. **Spanish Prime: V DP PP**

La mujer le trajo [el niño]_{DP} [a su mamá]_{PP}

the woman dat.3p.sg. brought the child to her mom

'The woman brought the child to her mom.'

b. **English Response: V DP PP**

The car salesman sold [a red sports car]_{DP} [to the woman]_{PP}

c. **Target: V DP DP**

The car salesman sold [the woman]_{DP} [a red sports car]_{DP}

Structural persistence has also been observed in variationist sociolinguistic studies, in both monolingual and bilingual spoken language corpora. Regarding monolingual studies, Weiner & Labov (1983) were the first to uncover structural priming effects in passive vs. active constructions in English. For Spanish and Brazilian Portuguese, researchers have examined priming effects in various morphosyntactic structures, among these, nominal number agreement (Scherre, 2001) and word order (Raña Risso 2010), but the overwhelming majority of studies focuses on pronominal subject expression, using different elicitation techniques. A number of researchers analyze the omission and expression of 1st person singular subject pronouns, sometimes in addition to other grammatical persons, drawing on interview narratives collected in different communities, e.g., in San Juan and Madrid (Cameron, 1995), New York City (Flores-Ferrán, 2007), Colombia (Travis, 2005, 2007), and New Mexico (Travis, 2007). The idea behind these studies is that “pronouns lead to pronouns and null subjects lead to null subjects” (Cameron, 1994:40), in what Travis (2005)

aptly labels the 'yo-yo' effect, even across conversational turns. This is illustrated in the following examples, from Cameron & Flores-Ferrán (2004), Travis (2005), and Travis (2007), respectively:

- (3) ...**Yo** soy un títere de la calle. No me cruces la línea a mí. Y al tipo empujarme, **yo** le metí un puño en la misma oficina. Y el otro salió corriendo. Y entonces la secretaria estaba mirando pero se dio cuenta que fue que él me empujó. **Yo** me defendí. ¿Entiendes?....

'... I am a street guy. (You) don't cross my line. And the guy, when he pushed me, I punched him right in the office. And the other guy ran out. And then the secretary was looking but she realized that he had pushed me. I defended myself. Understand?'

(Cameron and Flores-Ferrán, 2004:52)

- (4) Ahí, Ø tengo uno, Ø tengo dizque el capa, ahora, y Ø tengo que bajar el Macafi por internet, y sinceramente, Ø no he tenido tiempo."

'(I) have one, (I) have one so-called capa now, and (I) have to download MacAfee over the internet, and honestly, (I) haven't had the time.' (Travis, 2005:330)

- (5) A: **Yo** no creo, pues, que eso sea lo mejor.

'I don't think that this is the best.'

S: ... **Yo** no sé mi amor.

'I don't know, my love.'

A: No, no. ... De verdad. **Yo** quiero que hablemos, negro.

'No, no. Really. I want us to talk, sweetheart.' (Travis, 2007:120)

As the examples illustrate, subject pronouns are most likely to be produced following an explicit mention of that same pronominal subject, and subject omission is most likely found after a prior unexpressed subject, across interview narratives and conversational genres.

As stated, the expression vs. omission of Spanish personal pronouns is the most examined structure in the variationist sociolinguistic priming literature, and, 1st person singular subject expression appears to be the focus of the majority of studies. A notable exception is Abreu (2012), who includes the entire pronominal paradigm of Spanish subjects. Importantly, Abreu considers the pragmatic and discursive factors that influence SPE in the speech of monolinguals and bilinguals. The elicitation of data was achieved via sociolinguistic interviews with participants who shared the same variety of Spanish; the sessions lasted an average of 60 minutes, with bilingual speakers occasionally switching into English. The results are consistent with those of previous studies, as bilinguals, on average, produced a higher rate of overt subject pronouns than monolinguals did. In addition, these results further confirm the existence of priming effects both in monolingual speech production as well as across languages.

2.3 The effects of code-switching on Spanish morphosyntax

In addition to studying certain morphosyntactic features in U.S. Spanish, some researchers in the field of bilingualism and language contact have used similar research methods to examine code-switching (CS), broadly defined as the linguistic phenomenon in which speakers employ two or more languages in the same utterance, either within or across sentences. Unlike antecedent research that aimed to understand the ‘grammar’ of CS by reference to extant theoretical constructs (e.g. the Government Constraint of DiSciullo et al., 1986, the Functional Head

Constraint of Belazi et al., 1993, and the null theories of Mahootian, 1993 and MacSwan, 1996), this new approach consists of examining CS as an independent variable, exploring its effects on certain linguistic phenomena. For instance, researchers have reported reflexes of CS on segmental features such as VOT (Balukas & Koops, 2014; Bullock et al. 2006; Bullock & Toribio, 2009; Olson, 2013, Piccini & Arvaniti, 2015) and suprasegmental properties such as pitch height and stressed vowel duration (Olson 2012, 2015). In the realm of morphosyntax, a CS effect has been reported for copula distinction and mood choice among Spanish-English bilinguals (see Prada Pérez & Hernández, forthcoming).

Such an approach has been employed for the study of SPE, too, though with contradictory results. Toribio (2004) analyzed the speech samples of two Mexican-American Spanish-English bilinguals as they produce fairy tale narratives in Spanish and in Spanish-English CS, inviting independent judges to assess the appropriateness of the overt pronominal subjects in the segments identified as Spanish. The results showed that seemingly infelicitous overt pronouns were produced more often when the participants were producing CS narratives, as in (6a) than in monolingual Spanish narratives, as in (6b).

- (6) a. ... all the things that, that, that she took for granted, you know, she, uh, she started to reflect upon, así que **ella** decidió en la, durante la cuarta semana, de que **ella** se iba a regresar al palacio, **ella** no podía vivir como una persona humilde.
'... so she decided in the, during the fourth week that she was going to return to the palace, she could not live like a humble person.' (Toribio, 2004:171)

- b. ... el lobo, el mismo lobo que la iba persiguiendo. Él le dio unas flores y le dijo qué bonita Ø se miraba. También Ø le preguntó que pa' dónde Ø iba, verdad, y ella le respondió, y le dijo, "Ø voy a la casa de mi abuelita..."

'... the wolf, the same wolf that had been following her. He gave her some flowers and told her how pretty (she) looked. (He) also asked her where (she) was going, right, and she responded and she said, "(I) am going to my grandmother's house..."' (Toribio, 2004: 170)

Toribio interprets these findings as reflecting the enhancement of cross-linguistic similarity—i.e. convergence of Spanish with English—in CS, following Bullock & Toribio (2004).

Torres-Cacoullos & Travis (2010b) set out to test Toribio's hypothesis by examining the rates and constraints of SPE using a variationist approach to the analysis of spontaneous data. Specifically, the authors compared the segments of speech where bilinguals had recently (with the previous 3 clauses or 10 Intonational Units) employed English to those where they had not used English. While the use of overt pronominal subjects was higher in the 'CS' than in the monolingual condition, the difference did not reach significance when all the participants were included. In an analysis where only those speakers who regularly engage in CS were included there was a significantly higher rate of overt pronominal subjects in CS than in the monolingual condition. To further explore differences, the results from two logistic regressions, one for the data with CS and one with the monolingual mode data, were compared. No differences were found between the CS and non-CS data with respect to the constraints that regulate the use of overt pronominal subjects. They report that priming in CS could come from the Spanish subject and the English subject form

'I', which increased the contexts of a previous expressed subject. In particular, 63% of the data had an unexpressed previous subject in the monolingual mode contexts while it was only 43% in the CS contexts. Therefore, the authors argue that the increase in subject expression in the CS condition is due to cross-linguistic priming from English first person 'I' in addition to intra-linguistic priming, and not simply due to CS.

The divergent interpretations of the increase in overt pronominal subjects in Toribio (2004) and Torres-Cacoullos & Travis (2010b) call for consideration. First, there are discrepancies as to what constitutes CS. Toribio (2004) refers to CS as "when bilinguals' languages are simultaneously deployed" and explains that it includes alternation and insertion (Muysken, 2000). The contexts selected as CS in Torres-Cacoullos & Travis (2010b), on the other hand, include recent use of English, and not necessarily intra-sentential and/or inter-sentential change of linguistic codes. Moreover, the data points differ, and hence the analyses are not comparable. The studies are not only incommensurable, but each faces challenges. Toribio's analysis has been questioned by Otheguy (2004) on the grounds that its "reductionist" equivalence of overt pronouns in Spanish with stressed pronouns in English demonstrates a failure to understand the variables that contribute to the realization of pronouns in monolingual reference varieties. In addition, because the proposal is supported by case-study data, generalizations cannot be made about the bilingual Spanish variety or about CS mode.

In turn, Torres-Cacoullos & Travis's analysis, though methodologically rigorous, also invites scrutiny. The latter authors examine the possibility of cross-linguistic priming by comparing the percentages of use of overt pronominal subjects across CS and not-CS conditions using chi-

square statistics and supplement these with comparative variationist analysis. Although the authors reported a higher rate of overt pronominal subjects in CS than in non-CS contexts, both returned the same variables as significant, and with an equal conditioning. Further examination of the data revealed that for the variable priming there were more data with previous overt forms in the CS (37% Spanish form + 23% English form) than in the non-CS (37%) segments. However, their multivariate regression analysis shows that the range for the previous realization variable (i.e. priming) is lower, thus, the magnitude of effect is smaller in CS than in non-CS contexts, a finding that requires further attention. In order to appropriately test Toribio's hypothesis, then, it is necessary that participants be engaged in CS and that the priming form be manipulated in the design. The purpose of this study, then, is to shed some light on the contribution of priming vs. CS to the increased use of overt pronominal subjects in bilingual vs. monolingual utterances by controlling priming in the comparison of monolingual vs. bilingual production.

In concluding this overview of the literature, it merits pointing out that the subject priming studies carried out by Toribio and Torres-Cacoullos & Travis differ in important respects from the psycholinguistic studies of structural priming reviewed above. While all of these studies consider the consequences of activating two linguistic systems on particular linguistic phenomena, the psycholinguistic studies rely on data elicited via language switching (LS), understood as experimentally cued switching, whereas the studies of structural priming in bilingual speech are based on CS data typically collected in spontaneous conversation. LS and CS may represent distinct degrees of activation or language modes (Grosjean 1998, 2001). Thus, it could prove informative to examine the consequences of each type of bilingual mode for priming. The experimental design of the study detailed below includes modes that represent degrees of linguistic

activation found among bilingual speakers: monolingual mode, in which one language is employed while the other remains relatively inactive, and two bilingual modes—LS and CS.

3. The present study

The important advances in the previous literature have inspired and informed our study both in topic and methodology. As in previous variationist studies, we are interested in the effect of priming on SPE in Spanish; these studies employ logistic regressions on subject pronoun use in spontaneous data production taking into account the form of the previous subject as a variable. In the present study, we elicit semi-spontaneous production data where we provide the previous subject and, thus, are able to control for it. Thus, we also draw on techniques from laboratory studies by carefully controlling context and adopting and adapting the language-switching paradigm of priming studies. In so doing, we bring new methods and data to variationist research on subject expression in Spanish, with the purpose of clarifying whether the increased use of overt pronominal subjects observed in CS can be attributed to priming from the presence of English alone (Torres-Cacoullos & Travis 2010b) or if it can be attributed to language mode (Toribio 2004).

The present study of SPE is novel in comparing and controlling for language mode (Grosjean 1998, 2001). While some of the research reviewed above focuses on contact varieties of Spanish spoken in multilingual areas, none of these studies investigates SPE in *bilingual* speech across bilingual modes, perhaps with the exception of the work of Toribio (2004) and the study by Torres-Cacoullos & Travis (2010b) which includes a code-switching condition (with the limitations discussed in the previous section). The effect of bilingual mode on SPE merits attention, especially

considering the competing hypotheses and predictions offered in the literature. Toribio (2004) hypothesizes that convergence between the contact languages is likely to be enhanced when language systems are simultaneously activated, as when bilinguals engage in CS. Torres-Cacoullos & Travis (2010b), on the other hand, argue that priming from English overtly realized pronominal subjects, and not necessarily CS, is the principal factor that increases the use of overt pronominal subjects in bilingual Spanish. We seek to adjudicate between these hypotheses by eliciting naturalistic oral data in controlled linguistic contexts.

3.1. Research questions and hypotheses

As noted, previous research in psycholinguistics indicates that the use of a specific form of a variable structural phenomena increases the probability of its subsequent use, as opposed to other available forms, in controlled monolingual and LS trials. Likewise, previous literature examining naturalistic data has reported a higher use of overt pronominal subjects in Spanish when bilinguals are CS than when they are in monolingual mode. In the sociolinguistics literature, the use of overt pronominal subjects is found to lead to a higher probability of pronoun use; likewise, null subjects are found to lead to more null subjects. Pursuing this line of inquiry, we seek to answer the following question regarding priming in subject expression across conditions that represent monolingual and bilingual language modes:

- Research Question 1

Is there evidence of intra- and cross-linguistic priming of subjects (null, overt pronominal, and lexical DP) in bilinguals' Spanish productions in Spanish monolingual mode and bilingual (LS and CS) modes?

In view of previous findings where both intra- and cross-linguistic priming of subjects have been attested, we anticipate that participants will show evidence of intra-linguistic priming in the Spanish monolingual mode condition in the form of higher rates of overt pronouns and lexical DPs in contexts where they are primed with overt pronouns and lexical DPs and higher rates of null subjects in contexts where they are primed with null subjects. Similarly, we expect to find evidence of cross-linguistic priming in the bilingual (LS and CS) conditions for lexical and overt subject pronouns. In the LS condition, English pronouns and lexical DPs in prompts are expected to lead to more Spanish overt pronominal subjects and lexical DPs in responses. In the CS condition, we hypothesize that English and Spanish overt pronominal subjects and lexical DPs will lead to more Spanish overt pronouns and lexical DPs, and Spanish null subjects will lead to more Spanish null subjects.

Since priming relies on the saliency of a linguistic form after being activated, it is not surprising that cross-linguistic priming takes place. In the psycholinguistic literature there is a wealth of research that examines the activation of both languages in the mind of a bilingual speaker. Despite the initial controversy over the possible complete deactivation of one language while the other is in use (what is known as “monolingual mode”), most researchers today agree that none of the composite languages of a bilingual can be completely “turned off”; rather, they remain active to different degrees even when speakers are operating in monolingual mode (see Kroll and De Groot 2005, for a review). In this study we are interested in the effect that the degree of activation of the less active language has on the pervasiveness of structural priming:

- Research Question 2

Does the simultaneous activation of two language systems increase the use of overt pronominal subjects, irrespective of priming (the form of the previous subject)?

Based on the debate in the literature, different hypotheses are proposed. If Torres-Cacoullos & Travis's (2010b) proposal is accurate, the increase of overt pronominal subjects will occur equally in the monolingual and bilingual conditions so long as the preceding subject (the prime) is an overt pronominal subject. In contrast, Toribio's (2004) proposal that convergence between the languages is enhanced in CS would find support if a higher use of overt pronominal subjects in bilingual (LS and CS) conditions than in monolingual conditions were attested in our data, crucially even in the CS context when the preceding subject is a null subject.

If bilinguals are found to exhibit more overt pronominal subjects when one of the linguistic systems has been activated to a higher degree than in monolingual mode, as in LS or CS, a further question emerges:

- Research Question 3

If attested, is convergence between the languages equally prevalent in LS and CS contexts?

Since, to the best of our knowledge, no single study has to date has examined the effects of different bilingual modes, we cannot make any predictions; for that reason, we adhere to the null hypothesis.

3.2 Methods: Participants, materials, and procedures

In addressing the above research questions and testing the predictions, we analyze the oral productions of 26 Spanish-English heritage bilinguals in controlled elicitations. These participants, all university students, ranged in age from 18 to 21 and were born in the U.S., i.e., they are second-generation heritage speakers. All were English dominant and demonstrated advanced abilities in Spanish, as indicated in self-reports, where they evaluated their spoken Spanish above 5 on a 7 point scale (1= minimal abilities, 4=moderate abilities and 7= native-like abilities), and corroborated with a segment of the DELE (Diploma del Español como Lengua Extranjera), with scores between 40 and 50 (maximum = 50).

In order to elicit the language samples that would allow us to test our predictions, we created materials for three experimental sessions in which language samples were collected in structured oral elicitations. Each session began with participants reading a short story silently, followed by a short-answer comprehension task. What distinguished the sessions was the language(s) of the stimuli and elicited productions. The first session was a Spanish-only or monolingual condition, in which the fairy tale and comprehension questions were presented in Spanish and participants were asked to reply using Spanish exclusively. The second session was a Language Switching (LS) condition, in which the stimuli were presented in English and participants were asked to react to the stimuli employing Spanish. Finally, the third session was a CS condition, in which both languages were used in the stimuli and participants were free to use whichever language(s) they desired in

their responses¹. In the CS mode, participants were exposed to stimuli that mirrored some of the types of grammatical CS observed among Spanish-English bilinguals in the U.S. Crucially, participants were free to reply using whichever languages(s) they preferred (including a combination of the two), which rendered spontaneous, albeit controlled, oral speech samples of Spanish-English CS. Although we collected the data from each participant in a single day, we provided breaks between the three stories and related activities from the larger study, so that there was a time lag between the different sessions. Each of the three sessions focused on a short story adapted from Zeballos' (1997) *El venado herido* (for the monolingual Spanish condition), *The lightning bolt* (LS condition) and *El gallo named Cock-o-doodle-do* (CS condition) respectively, edited for comparable length (190-207 words) and target structures. An overview of these conditions is provided in Table 1.

Table 1. Materials.

Session/Language Mode Condition	Language of the story	Language of instructions, questions, and prompts for responses
Monolingual Spanish	Spanish	Spanish
LS	English	Spanish
CS	CS	CS

All of the instructions, directions, narratives, and short-answer prompts were presented using the written modality on a computer screen, and participant responses were recorded via head-mounted microphone onto a digital recorder. We concede that the research methodology might

¹ The sessions were always presented in a fixed order, with the monolingual mode first, to avoid asking participants to switch from a bilingual mode to a monolingual mode. The authors invite further research, though, examining the effects of the different ordering of sessions.

bring about a loss in the naturalness that is the goal of sociolinguistic studies, but we maintain that, as compared to psycholinguistic studies, it brings more naturalness to the tasks, while still benefitting from controlling for the relevant linguistic factors. One methodological aim, then, was to find a balance between naturalistic and controlled studies using a monitored elicited production task. Participants briefed after they completed all tasks reported believing they were working on a reading comprehension activity.

The short-answer elicitations targeted priming of subjects by manipulating the prompt, or the form of the previous subject, as in the sample items in (7)-(9). In the Spanish-only condition (7), there were three possible subject forms in the prompt: DP (el Abuelo Lino), pronoun (él), or null. In the language switching condition (8), there were two possible subject forms— an English DP (Grandpa Lino) or pronoun (he)—since the prompts were in English. Finally, there were five possible subject forms in the CS condition (9): English DP (Grandpa Lino), English pronoun (he), Spanish DP (el Abuelo Lino), Spanish pronoun (él), or Spanish null.

(7) Spanish-only condition

- a. ¿Dónde vivía **el Abuelo Lino**?

‘Where did Grandpa Lino live?’

Response: *El abuelo vivía en un bosque (Participant #12)*

‘The grandfather lived in a forest.’

- b. ¿De qué se alimentaba **él**?

‘What did he eat?’

Response: *El abuelo se alimentaba de lo que la naturaleza le ofreció, nueces, frutas, y vegetales de su jardín.* (Participant #21)

'The grandfather fed on what nature had to offer: walnuts, fruit, and vegetables from his garden.'

- c. ¿Dónde encontraba Ø su comida?

'Where did he find his food?'

Response: *Él encontraba su comida en el bosque y que había en el monte que rodeaba su cabina.* (Participant #23)

'He found his food in the forest and what he found in the mountain surrounding his cabin.'

(8) LS condition

- a. What was **Grandpa Lino** doing out in the woods?

Response: *El abuelo Lino estaba estaba todo el día en el bosque cazando animales.*
(Participant #24)

'Grandpa Lino spent the entire day in the forest hunting animals.'

- b. Why couldn't **he** light the lamp?

Response: *El abuelo Lino no tenía fósforos para la... no tenía no tenía fósforos.*(Participant #36)

'Grandpa Lino didn't have matches for the... he didn't have matches.'

(9) CS condition

- a. ¿What did **Grandpa Lino** have en su cabina en el bosque?

'What did Grandpa Lino have in his cabin in the forest?'

Response: *Grandpa Lino had un trueno y luz en su cabina del bosque.*(Participant #34)

'Grandpa Lino had a lightening and light in his cabin in the forest.'

- b. ¿What did **he** see bajo el árbol?

'What did he see under the tree?'

Response: *Bajo el árbol all he saw was a plump wolf.* (Participant #23)

'Under the tree all he saw was a plump wolf.'

- c. ¿Qué animal tenía **el Abuelo Lino** as a friend?

'What animal did Grandpa Lino have as a friend?'

Response: *El animal que tuvo el abuelo Lino como su friend was a chicken, a rooster.*
(Participant #38)

'The animal that Grandpa Lino had as his friend was a chicken, a rooster.'

- d. ¿Qué encontró **él** in the cabin and surrounding areas?

'What did he find in the cabin and surrounding areas?'

Response: *Abuelo Lino pensaba que el gallo was missing en los surrounding areas pero solamente encontró sus scattered feathers.* (Participant #41)

'Grandpa Lino thought that the rooster was missing in the surrounding areas but he only found his scattered feathers.'

e. ¿Qué escuchó Ø loud in the distance?

‘What did he hear loud in the distance?’

Response: He heard the singing of the rooster, the *quiquiriquí* that he usually heard in the mornings. (Participant #48)

‘He heard the singing of the rooster, the cockadoodledo that he usually heard in the mornings.’

Each condition included at least three tokens of each subject form. Specifically, the Spanish-only condition had 9 questions (3 tokens x 3 subject forms), the English-only condition had 8 questions (4 tokens x 2 subject forms), and the CS conditions had 15 questions (3 tokens x 5 subject types), which required separate statistical analysis². The sentences were controlled for variables that have been found in the variationist literature to have an effect on subject expression: (i) discourse function (all the contexts consisted of topic continuation); (ii) person/number and animacy of the referent (all sentences referred to Grandpa Lino; a third person singular animate referent); (iii) TAM (all sentences were in the past tense); and (iv) clause type (all tokens were in a main clause)³. The productions were transcribed, and coded for subject form produced per prime type and condition, as depicted in Table 2.

Table 2. Variables.

² The different number of tokens were used given the differences across languages (Spanish has null subjects and English does not) as well as the different number of options (more options in CS when the subject can have all three forms from Spanish plus the two forms from English). As a result, the statistical analysis had to be run separately for each session (see results section). We acknowledge that having had the same number of tokens per session would have facilitated the direct comparison across conditions.

³ In the interest of maintaining naturalness, the length of the prompt could not be strictly restricted as it tends to be in the psycholinguistic literature. All Spanish-only prompts were between four and ten words long (including function words), all LS prompts were between six and ten words long, and all CS prompts were between six and eleven words long.

Variable	Level	Coding
Response (DV)	Spanish DP	[SubjectForm=1.0]
	Spanish pronoun	[SubjectForm =2.0]
	Spanish null	[SubjectForm =3.0]
	English DP	[SubjectForm =4.0]
	English NP	[SubjectForm =5.0]
Prime type (IV)	Spanish DP	[Primetype=1.0]
	Spanish pronoun	[Primetype=2.0]
	Spanish null	[Primetype=3.0]
	English DP	[Primetype=4.0]
	English NP	[Primetype=5.0]
Session/ Language mode (IV)	Spanish-only	[Session=1.0]
	Language switching (LS)	[Session=2.0]
	Code-switching (CS)	[Session=3.0]

With this design, 32 tokens were elicited from each participant, although some tokens were lost due to the nature of the task (e.g. participant skipped the question or did not respond with a conjugated verb form), resulting in a total of 513 tokens, controlled for numerous variables reported in the previous literature to have an effect on subject expression. The data were submitted to statistical analysis using SPSS v.21. The results are presented and discussed in the next sections.

3.3 Results

The effects of priming on subject expression were examined through the manipulation of the subject form in the text comprehension elicited production task across the three sessions of the study: monolingual Spanish, Spanish-English LS, and Spanish-English CS. The data were submitted to a multinomial logistic regression with the subject form produced as the dependent variable and prime type and session (or speaker language mode) as independent variables. The results revealed a relationship between the dependent variable and the combination of independent variables, $X^2 (12, N = 513) = 182.91, p < .01$. Additionally, each of the independent variables also had an individual effect on the dependent variable (Session, $X^2 (4, N=513) = 31.68, p < .01$; Prime type, $X^2 (8, N= 513) = 143.88, p < .01$).

The variable Session (Spanish-only, LS, and CS) had an effect on speakers' production of subject forms. Speakers' odd ratio of producing a DP over a pronoun in the Spanish monolingual session vs. the CS session decreased by 40%. The DP odds ratio, on the contrary, increased in LS as compared to the CS session. Therefore, our results indicate that the condition where lexical DP subjects were favored over pronouns was in LS, followed by CS, and the monolingual Spanish condition. Regarding the odds ratio of nulls vs. pronouns, nulls were more likely to be produced in the Spanish monolingual session than in the CS session; but, they were equally as likely in the LS condition as in the CS condition. These results, however, have to be interpreted with caution as not all conditions allowed for the same type of primes (e.g. the Spanish monolingual session used only Spanish primes, the LS session only English primes and CS used both).

To better understand the data, we performed a series of multinomial logistic regressions for each of the sessions in order to examine the effect that each of the primes had in each session.

Recall that different sessions had different prime stimuli and different possible responses. Likewise, separate analyses were performed to examine the effect of the session on each type of prime. For each analysis, we present descriptive statistics (multinomial probabilities) and the regression model statistics, which include information on whether the variable was returned as significant or not. Lastly, if the variable was found to be significant, further information is provided contrasting the different levels of the variable (parameter estimations).

3.3.1 Priming effects: Within modes comparison

In order to assess whether the variable prime type had an effect on participants' use of a lexical DP, an overt pronominal subject, or a null subject in their responses, three analyses were performed (one for each session/language mode). To facilitate comparisons, Table 3 presents the percentages and number of tokens for each of the three Spanish responses: lexical DPs, overt pronouns and nulls). In the CS condition, participants could also respond with an English DP or a pronoun. The percentages of Spanish and English responses, however, have been calculated separately here to present comparable results across conditions.

Table 3. Results: Descriptive statistics.

Session	Response	Spanish	Spanish	Spanish
	Primetype	DP	pronoun	null
		% (N)	% (N)	%(N)
Spanish only	Spanish DP prime	65.3% (47)	8.3% (6)	26.4% (19)
	Spanish pronoun	9.5% (7)	43.2% (32)	47.3% (35)
	prime			
	Spanish null prime	12.7% (9)	32.4% (23)	54.9% (39)
Language	English DP prime	69% (69)	7% (7)	24% (24)
switching	English pronoun prime	29.4% (30)	34.3% (35)	36.3% (37)
Codeswitching	Spanish DP prime	80.9% (55)	5.9% (4)	13.2% (9)
	Spanish pronoun	24.2% (15)	50.0% (31)	25.8% (16)
	prime			
	Spanish null prime	29.8% (17)	43.9% (25)	26.3% (15)
	English DP prime	60% (27)	15.6% (7)	24.4% (11)
	English pronoun prime	25.5% (12)	36.2% (17)	38.3% (18)

Recall that in the Spanish monolingual mode condition only Spanish (lexical DPs, overt pronouns, and nulls) were used as prime stimuli. Similarly, the only possible subject form in the responses were Spanish DPs, pronouns and null subjects. The Spanish monolingual language mode data revealed that, with a Spanish DP prime, participants provided a Spanish DP in their

response 65.3% of the time, as compared to 8.3% of the time when they produced a Spanish pronoun and 26.4% of the time when a null was produced. With an overt Spanish pronoun in the prime, however, both overt pronouns and null subjects were produced at similar rates (43.2% and 47.3% respectively) and more frequently than Spanish DPs (9.5% of the time). With Spanish nulls in the prime, participants produced more nulls (54.9% of the time) than pronouns (32.4%) and Spanish DPs (12.7%).

In the monolingual mode, Spanish-only session, Prime type was returned as a significant factor, $X^2(4, N=165) = 53.79, p < .01$. The parameter estimates for the Spanish monolingual session provides the odds ratio of using a lexical DP instead of an overt pronoun in Spanish when presented with a Spanish DP, a Spanish pronoun, and a Spanish null as a prime in the question. This analysis likewise compares the odds ratio of using a null subject instead of an overt pronominal subject in Spanish when presented with the different types of primes. Only one of the comparisons was returned as significant in this session. The odds ratio of using a DP over a pronoun steeply increased with lexical DPs as primes over nulls as primes ($p < .01$). It was, however, not different when the prime was an overt pronoun than when it was a null ($p > .05$). With respect to null vs. pronoun contrasts, the odds ratio of using nulls over pronouns was the same with a DP or a pronoun prime than with a null prime ($p > .05$).

The LS data, where participants were asked comprehension questions in English and had to respond in Spanish, revealed that, with an English DP prime, participants predominantly produced a Spanish DP in their responses (69% of the time vs. 7% production of a Spanish pronoun and 24% production of nulls). With an English pronoun in the prime, however, the distribution of

responses is more widespread (36.3% nulls, 34.3% Spanish pronouns, and 29.4% Spanish DPs). In the LS condition, the type of prime (English DP or English pronoun) had an effect on the participants' production of subject expression in Spanish, $X^2(2, N = 150) = 53.74, p < .01$. The parameter estimates for the language switching session compared the use of Spanish DPs vs. pronouns as well as the use of null vs. overt pronouns in response to English DPs and pronouns in the primes. The odds ratio of producing a DP over a pronoun increases following an English DP prime, as compared to an English pronoun ($p < .01$). With an English DP, too, the odds ratio of using a null vs. a pronoun increase as compared to conditions with an English pronoun in the prime ($p < .05$).

In the CS condition, the use of a Spanish DP vs. a Spanish pronoun vs. a Spanish null depending on the prime used indicate that, with a Spanish DP prime, participants largely produced a Spanish DP (80.9%, vs. 5.9% pronouns and 13.2% nulls). With a Spanish pronoun, participants produced more Spanish pronouns (50%) than nulls (25.8%) and Spanish DPs (24.4%). With a Spanish null, participants produced more Spanish pronouns (43.9%) than Spanish DPs (29.8%) and pronouns (26.3%). With an English DP, participants produced more Spanish DPs (60%) than nulls (24.4%) and Spanish pronouns (15.6%). Lastly, with an English pronoun, participants produced Spanish nulls (38.3%) at similar rates as Spanish pronouns (36.2%) and slightly more than Spanish DPs (25.5%).

The regression model indicated that the type of prime was a relevant factor at predicting the odds ratio of producing a DP vs. a pronoun or a null pronominal subject in the CS language mode, $X^2(8, N = 198) = 58.10, p < .01$. The parameter estimates for the CS language mode compared the

use of DPs to pronominal subjects as well as null to pronominal subjects across the five possible prime types (Spanish DP, pronoun, null and English DP and pronoun). The results summarized showed the increased effect that English and Spanish DPs had on the odds ratio of producing a DP vs. a pronoun ($p < .01$). In contrast, there was no effect for the null vs. pronoun prime ($p > .05$). That is, the distribution of null vs. overt pronominal subjects was not affected by the form of the prime in CS.

In this section, the results for the effects of the different primes were reported within monolingual and bilingual modes, induced in three sessions (Spanish only, LS, and CS). The priming effects of lexical DPs (in either language) over DPs were attested across sessions. Pronominal priming was only observed in the LS condition, where the prime is in English. Even though it did not reach significance for the CS condition, the element that primed the most prolific production of Spanish pronouns was the English pronoun. In the following section, we report the results that address our second research question regarding the effects of bilingual modes by examining the effects of the different primes across the different sessions.

3.3.2 Bilingual mode effects: Across modes comparisons

We compared the results for the effect that bilingual speaker modes had on the production of a specific subject form in response to a controlled prime or previous subject form. Recall that certain primes could only appear in certain bilingual speaker modes, e.g. the Spanish primes can only be compared in the Spanish-only and CS conditions, and the English primes can only be compared in the LS and CS conditions. Table 4 provides a comparison of the percentages of use of each response presented above between modes.

Table 4: Results: Descriptive statistics for comparisons across modes.

Primetype	Response	Spanish	Spanish	Spanish
	Session	DP	pronoun	null
Spanish DP prime	Spanish only	65.3%	8.3%	26.4%
	Codeswitching	80.9%	5.9%	13.2%
Spanish pronoun prime	Spanish only	9.5%	43.2%	47.3%
	Codeswitching	24.2%	50.0%	25.8%
Spanish null prime	Spanish only	12.7%	32.4%	54.9%
	Codeswitching	29.8%	43.9%	26.3%
English DP prime	Language switching	69.0%	7.0%	24.0%
	Codeswitching	60.0%	15.6%	24.4%
English pronoun prime	Language switching	29.4%	34.3%	36.3%
	Codeswitching	25.5%	36.2%	38.3%

The conditions where Spanish DPs are used as primes (all except the LS condition) yield a useful model where session is a significant factor, $X^2 (2, N= 102) = 7.26, p < .05$. The parameter estimates, however, revealed that there were no statistical differences between the monolingual and the CS sessions ($p > .05$). Therefore, the higher use of lexical DPs than pronominal subjects with a DP prime was similar in the monolingual and the CS language modes. Likewise, the low use of null and pronominal subjects with a DP prime was similar in the monolingual and CS conditions ($p > .05$). In the case of Spanish overt pronouns, the model returned session as significant, $X^2 (2,$

$N = 98$) = 6.26, $p < .05$. Therefore, taking the session into account improved the model. The results from the parameter estimates indicated that no differences between the Spanish-only and the CS condition were attested ($p > .05$). The model for Spanish null primes is also improved by including the variable session since it was returned as significant, $X^2(2, N = 97) = 14.2$, $p < .01$. Spanish nulls—in contrast with Spanish DPs and pronouns—showed a higher priming effect in Spanish than in the CS condition ($p < .01$), that is, participants used significantly more Spanish nulls in response to null primes in the Spanish-only condition than in the CS condition.

A comparison of priming effect of English DP and pronoun primes between the LS and CS conditions was performed. With English DP primes, the variable Session was not returned as significant, $X^2(2, N = 108) = 5.94$, $p > .05$. Therefore, we can conclude that with English DP primes there are no differences between LS and CS. Regarding the English pronoun prime, the model's accuracy is below the proportional-by-chance accuracy. Therefore, we cannot make any generalizations from these data regarding the differences in subject expression between the LS and the CS conditions.

To briefly summarize this section, the crucial condition for our second research question, session contrasts with a null prime, indicated a higher use of overt pronominal subjects in the CS condition than in the Spanish-only condition even when the prime was a null pronominal subject. With these results in mind, we return to our research questions in the following section.

4. Discussion

The speech data obtained from the short-answer elicitation task performed by 26 advanced heritage Spanish-English bilingual speakers were submitted to statistical analysis to examine the

effects of priming and modes on the realization of null versus overt subjects, a noted variable phenomenon of Spanish. The general model revealed that there were effects of both priming and mode in these bilinguals' productions.

The priming effects were most consistent with lexical DP subjects in the prime in all three sessions: monolingual mode, language switching (LS) and code-switching (CS). In the LS session, unlike in the other two sessions, priming was also attested with English pronouns, which primed the use of Spanish pronouns. With these results, we return to our first research question: Is there evidence of intra- and cross-linguistic priming in the participants' productions in Spanish monolingual mode, LS and CS? The data indicated that there was structural priming although not uniformly: There was priming of lexical DPs in monolingual Spanish, LS and CS; there was priming of pronouns only in LS; and there was no structural priming with null subjects in any condition. We anticipated participants' productions would show evidence of intra-linguistic and cross-language priming in the different modes. The data from the LS session are consistent with this hypothesis. The data from the other two sessions, however, showed mixed results, as evidence of priming was only attested with DPs, but not with pronouns or nulls. This is so in spite of the unnaturalness of use of DPs in the response to questions with a DP prime in the question. This result may be explained as a task effect, where participants were asked to respond with a complete sentence. While the reminder to respond with a complete sentence appeared with each question, it is possible that the presence of a DP in the question may have served as a more salient prompt. Thus, this result may not be consistent with data from spontaneous production. The lack of significant differences in the use of null and overt pronominal subjects across sessions also merits further discussion. Although the present study did not aim to examine contact effects on the

expression of personal subjects in Spanish, some of the results are consistent with the results of previous studies that report a language contact effect on subject expression. (e.g. Otheguy and Zentella 2012). In this study, we examine third person singular data. Thus, the lack of significant differences between null and overt pronominal subjects in our data is consistent with the literature on third person subject expression in Spanish in contact with English, which reports a contact effect. Further comparison with a monolingual Spanish speaker group would be necessary, however, to confirm a language contact effect. Since our data were obtained from an experimental elicited production task and is not directly compared to data from a monolingual Spanish speaker group, this contact effect could not be confirmed, although a similar rate of null and overt pronominal subjects was attested in our data.

The previous literature on SPE in Spanish-English CS consistently found an increase in overt pronoun use in bilinguals' CS vs. non-CS speech (Toribio 2004, Torres-Cacoullos & Travis 2010b). In order to further examine what this effect might be attributed to (activation of two systems vs. the specific priming from a previous subject type), we isolated the effect of priming by controlling for subject form in the question and examining the subject form in participant responses for each prime type. Therefore, with these data we can address our research question on bilingual modes: Does the simultaneous activation of two language systems increase cross-linguistic priming? We hypothesized that in cases where both linguistic systems were simultaneously active (even to different degrees), as in LS and CS, bilinguals would exhibit greater cross-linguistic priming than in contexts where one of the bilinguals' composite languages is more inhibited, as in monolingual mode. The data returned a significant effect for session. This effect, however, did not reach significance across prime types. With Spanish DP primes and pronouns and English DPs, for

instance the contrast among modes did not reach significance, which means that the priming was the same in the monolingual as in the bilingual mode conditions. Additionally, there were inconclusive results with English pronoun primes. Nonetheless, an effect of bilingual mode, independent of priming, was attested with null subject as primes. When participants were primed with a null subject, there was an increase in the use of overt pronominal subjects in bilingual conditions (the CS condition in particular) as compared to monolingual Spanish conditions. This is consistent with Toribio's (2004) claim that the use of overt pronouns instead of nulls in Spanish is expected in CS independently of priming (contra Torres-Cacoullos & Travis, 2010b). Thus, we can conclude that the simultaneous activation of two language systems did not increase intra-linguistic priming with DPs and pronouns. The effect that was found—an increase in pronoun use in LS and CS as compared to monolingual Spanish with a null subject prime—cannot be attributed to priming but to the mode itself.

The follow-up research question sought to compare within the bilingual mode (LS vs. CS). Contrary to the prediction that there would not be a significant difference (the null hypothesis), we found that LS had a stronger effect than CS in the production of DPs over pronouns. The difference is not statistically significant with respect to the production of null vs. overt pronominal subjects. Overt DPs are phonologically more prominent and tend to be used to introduce a new referent, in line with the Accessibility Theory (see Ariel 2001, for an overview). The hypothesis we offer at this time, pending further testing, is that the relationship between the response subject and the prime may be more disconnected in the LS condition, which may favor the production of full lexical items over potentially ambiguous overt pronouns or nulls. As explained in the variationist literature, connectedness in the discourse, as in the combination of switch reference and TAM continuity,

exerts a strong effect on subject expression (cf. the Speech connectedness variable in Otheguy et al., 2007). The more connected the speech (same referent and same TAM), the more likely it is for a speaker to use a null form. If LS is perceived as less connected, it might explain the higher use of DPs in LS than in the other two modes.

In sum, the analysis indicates that priming effects as well as bilingual mode effects were attested in our data. Further testing revealed that in Spanish monolingual mode, DPs primed DPs, whereas the effect of priming on pronouns and null subjects was not as strong. In LS, English DPs and pronouns primed Spanish DPs and pronouns respectively. In CS, priming effects were only attested with DPs, just as in monolingual mode. Therefore, we cannot conclude that priming was pervasive in our data. Interestingly, priming was more evident with DPs and in the LS condition. Regarding bilingual mode effects, there were significant differences in the use of overt pronominal subjects with Spanish null pronominal subjects as primes in the CS session as compared to the Spanish monolingual session. This result indicates that even when priming is controlled for, there is some effect of bilingual mode on subject expression. This effect, however, occurs equally in LS as in CS.

5. Conclusions

Variable language phenomena have been empirically shown to demonstrate effects of syntactic priming. This study has focused on one of the most researched variable phenomena in Spanish: subject expression. In our analysis we compared the distribution of null subjects vs. overt (pronominal and lexical DP) subjects in the spontaneous production of Spanish heritage speakers in the U.S. in three modes: Spanish-only (monolingual mode), English-to-Spanish language

switching mode, and Spanish-English code-switching mode. On the one hand, we examined the effects of priming across modes using both English and Spanish primes. We reported statistically significant priming effects from Spanish and English DPs across sessions and from English pronouns in the LS session. Even though we obtained significant results, the effects of structural priming were not as pervasive as would have been anticipated based on the previous literature (e.g. Travis 2005, 2007). The differential findings may be due to differences in methodology. Our materials are rather innovative in that they combined the semi-spontaneity of oral production characteristic of sociolinguistic research with the controlled experimental design usually employed in psycholinguistics. Thus, some of the discrepancies may have been caused by the nature of the tasks used in our study; examination of the speech of a single bilingual cohort with various methodologies would be useful in disentangling these issues.

On the other hand, we examined the effect that language mode has on subject expression. This line of research is innovative in inquiry on CS, where the theoretical literature has traditionally focused on identifying constraints on CS sites (e.g., Belazi et al., 1994; DiSciullo, 1986; MacSwan, 2000; Poplack, 1980; Woolford, 1983), while the growing body of empirical research in bilingual pronunciation has emphasized the effect of CS on specific phonetic forms (Bullock, 2009; Bullock & Toribio, 2009; Olson, 2012, 2013, 2015 and references therein). Even though this study examined morphosyntactic phenomena in Spanish-English bilingual speech, the intent was not to identify why CS might be more or less opportune at a particular grammatical juncture (also an interesting question), but to examine the effect of CS (and LS) on subject expression. One of the proposals for the effects of CS on subject expression identifies cross-language priming (Torres-Cacoullos & Travis, 2010b) while another identifies convergence in CS speech as the source

(Toribio, 2004). Therefore, we tested the effect of bilingual modes on the subject production of bilingual speakers while controlling for the subject form in the prime. If the effects of CS are due to priming from English, there should not be an increase in pronoun use when the speaker is primed with null subjects, a result that is not consistent with our data. Our participants presented overt subjects with null primes in the CS condition, which can be interpreted as an indication that, in CS, convergence between the languages is enhanced (Gardner-Chloros & Edwards, 2004; Sebba, 1998; Toribio, 2004).

This interpretation is consistent with Bullock & Toribio's (2004) understanding of convergence as an enhancement of structural similarities between two systems. However, Toribio further suggests that the increased rates of pronoun expression may be a response to processing, i.e., "a reflex of a speaker's attempt at reducing the complexity (and cognitive cost) of processing two simultaneously active language systems" (2004: 172). But the shared structures account (convergence) and the simplified structures account (processing load) can be teased apart. It is possible, for instance, that the converged and the less cognitively-costly outcomes do not coincide. Inspired to further pursue this issue, Prada Pérez (under review) examines subject expression in the CS productions of speakers of two null subject languages—Spanish and Catalan—employing a translated version of the materials used here. Preliminary analyses indicate a CS effect of increased pronoun expression, which cannot be attributed to priming from Catalan nor to convergence with it. Moreover, Prada Pérez (2015) compared Catalan-Spanish bilinguals to Spanish monolinguals using the variationist comparative method, and reported no contact effect. Thus, the increase in overt subjects for Catalan-Spanish bilinguals is exclusively present when these bilinguals are in a bilingual mode. These results, like the present ones, can be interpreted as

being consistent with the increased demand of cognitive resources involved in the simultaneous activation of both languages together with the freeing of attentional resources when using overt subjects. The convergence with English in the present study, then, could be illusory, a fortuitous result of a situation where the less costly option of the overt pronoun expression coincides with the grammar of the co-active language, English.

In general, these results call for more research with diverse variable phenomena. Subject expression is variable in Spanish, but it is largely constrained by pragmatics, as instantiated in the variable discourse function. Other morphosyntactic phenomena seem to be more variable in that no change in the semantics or pragmatics takes place between the variants (e.g., dative alternation, Hartsuiker & Kolk, 1998:171). In on-going work, we examine clitic climbing, where there are no semantic or pragmatic variables affecting the proclisis vs. enclisis distribution in Spanish. Statistical comparisons of different variable phenomena can shed light on the role that variability plays in bilingual speech. This line of research lends itself to refinement of theories of cross-linguistic language influence. In fact, Prada Pérez (2015) hypothesizes that the more variable a phenomenon is (i.e. a variant is used close to 50% of the time in a specific context), the more cross-linguistic effects will be attested. An extension of that work to CS data would predict that more variable phenomena would be subject to a greater effect of CS than less variable phenomena.

6. References

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