

Contemporary Trends in Hispanic and Lusophone Linguistics

Edited by
Jonathan E. MacDonald

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Volume 15

Contemporary Trends in Hispanic and Lusophone Linguistics
Selected papers from the Hispanic Linguistic Symposium 2015
Edited by Jonathan E. MacDonald

Contemporary Trends in Hispanic and Lusophone Linguistics

Selected papers from
the Hispanic Linguistic Symposium 2015

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Jonathan E. MacDonald

University of Illinois at Urbana-Champaign

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Preface

The papers in this volume represent a selection from the presentations at the Hispanic Linguistic Symposium (HLS) held at the University of Illinois at Urbana-Champaign in 2015. HLS started in 1997 (at Miami University in Oxford, OH) and has established itself as the top Linguistics conference in Hispanic and Lusophone Linguistics in North America. HLS is a competitive peer-reviewed conference. This volume consists of a subset of those from the conference, each of which has been selected based on the results of a rigorous double-blind peer review by at least two different reviewers, and in some cases, by three. The peer-review process is an integral part of the scientific publishing endeavor, the goal of which is to maintain a high research standard. In line with this goal, the papers selected for this volume were those that were most highly evaluated by peer-reviewers. In this regard, this volume owes a tremendous amount to my colleagues who generously took time to provide productive and critical feedback in a timely manner. I thank them for their valuable contribution to this volume. They are: Gabriela Alfaraz, José Luis Blas Arroyo, David Basílico, Esther Brown, Jennifer Cabrelli Amaro, Rerisson Cavalcante de Araújo, Richard Cameron, Rebeka Campos Astorkiza, Jennifer Cole, Sonia Cyrino, Justin Davidson, Israel de la fuente, Maria del Mar Vanrell, Ana de Prada Pérez, Manuel Díaz-Campos, Ana Maria Díaz Collazos, Danny Erker, Anna María Escobar, Núria Esteve-Gibert, Richard J. File-Muriel, César Felix-Brasdefer, Rebecca Foote, Kimberly Geeslin, Patricia Gubitosi, Pedro Guijarro Fuentes, Timothy Gupton, Manuel Gutierrez, Rosa E. Guzzardo, Nick Henriksen, Maria Luisa Hernanz, Chad Howe, José Ignacio Hualde, Michael Iverson, Paula Kempchinsky, Luis López, Fernando Martínez-Gil, Ana María Martins, José-Luis Mendivil-Giro, Jim Michnowicz, Silvina Montrul, Alfonso Morales-Front, Marianna Nadeu, Rafael Núñez-Cedeño, Chiyo Nishida, Erin O'Rourke, Luis Ortiz López, Ricardo Otheguy, Luis Alonso Ovalle, Anita Saalfeld, Manuel Pérez Saldanya, Silvia Perpiñán, Carmen Picallo, Rajiv Rao, Daniel Recasens, Pablo Requena, Scott Schwenter, Sandro Sessarego, Emma Ticio, Ian R. Tippets, Mercedes Tubino Blanco, Jorge Valdes Kroff, Julio Villa-García, Álvaro Villegas, Erik Willis, Karen Zagona, and André Zampaulo.

Introduction

Jonathan E. MacDonald

Each paper in this volume represents original and previously unpublished research within the domain of Hispanic and Lusophone linguistics. The languages discussed include varieties of Spanish from several different regions (Mexico, Puerto Rico, Spain, Costa Rica, Argentina, Bolivia, Peru, Honduras), Catalan, and Brazilian Portuguese, as well as varieties in contact with English and Purépecha. The collection of chapters is not only representative of contemporary research being carried out in Hispanic and Lusophone linguistics, but also representative of contemporary research being carried out in linguistics in general. There are two ways in which this is so. The first is reflected in the substantial number of quantitative analyses of linguistic patterns. Of the sixteen chapters, thirteen adopt some form of quantitative analysis. The substantial number of quantitative analyses reflects, in part, the rather widespread rise in statistical methods applied to the results of both formal experimental approaches and corpus searches. The second way is reflected in the growing interest in bilingual speakers, languages in contact, and first and second language learners, all language contexts in which multiple grammars interact. It seems to be widely thought that a controlled formal experiment, or a satisfactory statistical analysis, lends itself to a better grasp of the additional variables that may be in play when more than one grammatical system is at work. It is this focus on single vs. multiple grammars that fundamentally underlies the main division among the papers in this volume. The first part, broadly speaking, consists of papers whose focus is on the structure and use of language. The second part consists of papers whose focus is on the interaction of multiple grammars. Implicit in this division is an assumed dichotomy between explicit analyses of the interaction among multiple grammatical systems of multilingual speakers vs. analyses of a “single” grammatical system of the monolingual speaker. This dichotomy is (tacitly) present in much current linguistic literature. Thus, before recapping each chapter in this volume, I briefly address the theoretical status of this dichotomy.

If one talks about multiple grammatical systems, one talks about multiple languages. Pretheoretically, it is simple to identify two, or more, languages, with their two, or more, apparent autonomous – albeit interacting – grammatical systems.

Theoretically, however, the line between two, or more, autonomous grammatical systems is by no means easily identifiable. While it is simple to count and list the number of overlapping and non-overlapping morphosyntactic, phonetic and phonological properties, and represent that set of properties in a way that clearly motivates treating them as belonging to separate grammatical systems, a quantitative question arises as to how many non-overlapping morphosyntactic, phonetic or phonological properties constitute the minimum number to call two apparent autonomous grammatical systems two separate languages? One? One hundred? The choice in number of properties is arbitrary, a situation familiar from the classic Sorites paradox. But then we are forced to conclude that there is no linguistically motivated way to identify two apparent autonomous grammatical systems as two separate languages, at least not by counting and listing the number of overlapping and non-overlapping morphosyntactic, phonetic and phonological properties. This line of reasoning is reminiscent of the linguistically unmotivated dichotomy between languages and dialects. Intuitively (and pretheoretically), however, we can distinguish one language from another in most cases, even a three-year old who can't tie their shoes can. How can this be? Chomsky's distinction between the external and extensional E-language vs. the internal and individual I-language is useful here. What we recognize intuitively as separate and identifiable languages fall within the domain of E-languages. There are many E-languages. In contrast, the set of properties that make up the internal grammatical system of a speaker is the domain of I-language. There is no linguistically motivated non-arbitrary quantitative method of distinguishing between two I-languages. But, then, what of multilingual speakers? How can we investigate interacting grammars if we cannot distinguish between two grammatical systems in a non-arbitrary way?

This question would be irrelevant, if there were a single grammatical system in play, even for the multilingual speaker. In my estimation, a single grammatical system even for the multilingual speaker is a conclusion that previous and current research leads us to naturally and, it is one which we should seriously consider the consequences of.

Consider Roeper (1999) and his notion of *Universal Bilingualism* (or more recently Amaral & Roeper's (2016) *Multiple Grammars*), in which every language has within it contradictory specifications for some grammatical property. One of his examples comes from modern English, which, for all intents and purposes, is a non-verb second (V2) language. German, in contrast, is a V2 language. Nevertheless, there are some constructions in English where V2 phenomena are clearly present. This is an illustration of a contradictory specification for the grammatical property associated with being V2. How is it that a subpart of the modern English grammar is V2 while a different subpart is not V2? Consider one way to address this question. Imagine that only in English-German bilinguals did the V2 phenomenon arise in

modern English grammar, and only when the verb used was a German verb taken from the German lexicon. This would be classified as an instance of code switching between English and German – in the English sentence the bilingual speaker code-switches, as manifested by the choice of German verb, and with the choice of a German verb, V2 arises. Why should we treat the current state of Modern English grammar that allows for both non-V2 phenomena and V2 phenomena any differently? I contend that, linguistically, V2 phenomena in modern English is an instance of code-switching as well, in this case, however, the switch is between an “older” grammatical system and a “newer” grammatical system. Initially, one might not consider this a case of code switching because the “same” language is involved. The issue with restricting code switching in this way, however, is that we cannot define “language” precisely enough to determine whether the same language is involved or not. Moreover, on an approach to bilingual grammars such as Vergara & López (2017), and López (2017), building on MacSwan (1999 et seq.), in which a bilingual speaker has a single grammatical competence, that is, a single syntax and a single lexicon – simplifying a bit – it would not be surprising to find precisely the series of language situations discussed in Roeper (1999), in which there are contradictory specifications for some grammatical property in the same language. In my mind, Roeper (1999) correctly concludes that, at the appropriate level of description, we are all bilingual (and consequently, we all code-switch). To the extent that this conclusion is justified, it is a step forward, since our model of grammar should account for this language situation. Moreover, if we are all bilingual, none of us are. The range of patterns observed is nothing more than options allowed by the single grammatical system we are genetically endowed with: universal grammar.

The division of this volume into two parts that pit explicit discussions of multiple interacting grammars against discussions of the structure and use of a single grammar, then, while reflecting current approaches in the literature, appears to be arbitrary. This arbitrary division, however, highlights an important fact: each study in this volume contributes equally to a more complete understanding of the same object of study: Language. In what follows, I briefly summarize each of these contributions.

Part 1, “Language structure and use”, consists of nine chapters. In Chapter 1, “Evaluating the syntactic status of aspectual *se* in directed motion verbs”, Grant D. Armstrong lays out the properties of *SE*-marked directed motion constructions, such as *caer-se* ‘fall-se’, *ir-se* ‘go-se’ or *subir-se* ‘go up-se’. He argues, corroborating previous work on these constructions, that there are two distinct underlying syntactic constructions: an anticausative (Schäfer, 2008) and a figure reflexive (Wood, 2014).

In Chapter 2 “Subcategorization and change: A diachronic analysis of *sin embargo* (de que)”, Patricia Amaral and Manuel Delicado analyze the syntactic and

semantic changes that *sin embargo* (*de que*) ‘without obstacle/impediment’ undergoes as it develops its clausal-taking properties in Spanish from the 12th to the 16th centuries, illustrating that the change arises from the subcategorization properties of the noun *embargo*.

In Chapter 3, “Variable clitic placement in US Spanish”, Philip P. Limerick carries out a corpus study of clitic placement (CP) among US Spanish speakers, focusing on linguistic and social variables. Results indicate an overall proclisis rate of 67% and subsequent multivariate analysis revealed that CP is significantly influenced by the specific construction used, the non-finite verb form, and the speakers’ age of arrival.

In Chapter 4, “Variable Negative Concord in Brazilian Portuguese: Acceptability and Frequency”, Tainara Agostini and Scott Schwenter provide empirical evidence that colloquial Brazilian Portuguese (BP) is a variable negative concord language. The results of an online survey ($N = 443$) distributed via Facebook show that speakers’ acceptability judgments toward the lack of negative concord in BP are closely connected to the frequency of the individual negative indefinites (NI), and in particular to the frequency of V + NI collocations. Speaker judgments are also sensitive to the type frequency and token-type ratio of individual NIs.

In Chapter 5, “Simultaneous lenition of Modern Spanish /ptk/ and /bdg/ as a chain shift: Evidence from Peruvian Spanish”, Christopher D. Eager examines dialect differences in the simultaneous lenition of intervocalic /ptk/ and /bdg/ in Peruvian Spanish in Lima and Cuzco. Results from a read speech task show both sets of plosives are lenited significantly less in Cuzco than in Lima. Random forests are used to demonstrate that in order to best distinguish Cuzco /bdg/ from Lima /ptk/, relative intensity must be given more importance than voicing. The overall results are consistent with these lenitions constituting a chain shift in progress and they offer insight into how these shifts may occur.

In Chapter 6 “Are Argentines *a*-blind? Acceptability of *a*-marked inanimate direct objects”, Mark R. Hoff examines the syntactic and discursive factors of variable *a*-marking of inanimate DOs in Argentine Spanish in which Argentine respondents ($N = 140$) evaluated acceptability of the items using a 5-point Likert scale. Results showed that although participants assigned significantly higher ratings to normative unmarked inanimate DOs than to *a*-marked ones, *a*-marking was still widely accepted, with definite DOs, pre-verbal position, and monotransitivity as significant predictors. Furthermore, in 10 of 16 cases, participant ratings showed no significant difference between marked and unmarked DOs, and thus are to an extent, “*a*-blind”.

In Chapter 7, “The importance of motivated comparisons in variationist studies”, Whitney Chappell shows, building on Paolillo (2002), that identical binomial logistic regression models yield disparate results given differential treatment of

a complex dependent variable, an important result since, as the state of the field advances empirically, sociolinguists are increasingly expected to utilize statistics in their data analysis, yet some researchers have limited formal statistical training and the focus of model construction is often on the independent variables. She concludes by offering concrete, hands-on advice for linguists working with their data in R with the goal of promoting judicious analyses among Hispanic sociolinguists.

In Chapter 8, “The past persists in the present: a multivariate analysis of Present Perfect and Preterit in Southern Arizona Spanish narratives”, Abel Cruz Flores examines the relative frequency of the present perfect and preterite alternation and the particular conditioning factors that favor the use of the PP in Southern Arizona Spanish. Results show that frequency and approximate adverbs, stative predicates, and indeterminate reference favor the PP in this variety, meaning that the PP shows characteristics of a continuative perfect. He concludes that the use of Southern Arizona PP is at stage II in the typology of periphrastic pasts proposed in Harris (1982).

In Chapter 9, “‘El vos nuestro es, ¡Ey vos, chigüín!’: Honduran *vos* as a marker of national identity”, Jeriel Melgares offers an analysis of the underlying reasons why Honduran speakers use *vos* the way they do. Through semi-directed interviews, thirty informants shared their attitudes toward address forms, from which three themes emerged: (1) *vos* belongs to the Honduran norm; (2) *vos* indexes Honduran national identity; and (3) innovative uses of *vos* reflect its greatly rooted status in Honduran Spanish. Adopting Billig’s (1995) theory of *banal nationalism*, he concludes that *vos* functions as a marker of Honduran national identity.

Part 2, “Interacting grammars”, consists of seven chapters. In Chapter 10 “Acquisition of articulatory control or language-specific coarticulatory patterns? Evidence from the production of laterals in second-language Spanish”, Megan Solon examines the acquisition of coarticulatory patterns in Spanish as a second language (L2). Through an acoustic analysis of the production of /l/ by English-speaking learners of Spanish ($n = 85$) and a comparison of L2 Spanish patterns to those in L1 Spanish ($n = 20$ speakers) and in L1 English, evidence is provided that acquisition of coarticulation proceeds from more L1-like patterns in early stages of learning toward more target-like coarticulatory patterns in later stages.

In Chapter 11, “Voice onset time and the child foreign language learner of Spanish”, Mandy R. Menke compares the VOT values of /p, t, k/ of a cross-sectional sample of child foreign language learners of Spanish with those of Spanish-English bilinguals in order to tease apart the variables of age and context. She finds that learner productions do not differ from those of native speaking peers, yet there is a significant interaction of first language and grade level, suggesting that age of acquisition alone is insufficient to explain outcomes. Quantity of input, in both the first and second/foreign language, is explored as a possible explanation.

In Chapter 12, “Extraña uno lo que es la tortillas: A preliminary study of number agreement in Spanish in contact with Purépecha”, Andrea Mojedano Batel addresses a lacuna in research on contact between Spanish and Purépecha, a Latin American Indigenous language, by examining number marking and number agreement in the Spanish production of five L1 adult Purépecha speakers. These speakers show non-standard number marking and lack of number agreement across the noun phrase, between the subject and the verb, and between the noun and its predicative adjective, possibly due to a shift dynamic (Thomason, 2001).

In Chapter 13 “Mothers’ use of F0 after the first year of life in American English and Peninsular Spanish”, Covadonga Sánchez-Alvarado, Alba Arias, Eduardo García Fernández, Isaac McAlister, and Meghan E. Armstrong investigate infant-directed speech in a longitudinal study. They compare F0 use in two language varieties, American English and Peninsular Spanish, exploring how F0 peaks and F0 range change as a function of the child’s linguistic development, defined as the children’s mean length of utterance (MLU). Results show that mothers exhibit changes in their use of both of these parameters after the child’s second birthday, with turning points between 28 and 31 months, although MLU was not found to be a significant predictor for either language.

In Chapter 14, “Extra-syntactic factors in the that-trace effect”, Jeanne Heil and Shane Ebert test whether non-syntactic factors play a role in the *that*-trace effect. Though generally analyzed syntactically, some work on *that*-trace supports a syntax-prosody account (Kandybowicz, 2006). They demonstrate that bilinguals have the syntactic underpinnings necessary for both syntactic and syntax-prosody accounts of *that*-trace. Bilinguals, however, differ from the monolinguals with regard to *that*-trace, extending the phenomenon’s restriction on extraction to a new context, supporting a syntax-prosody account of *that*-trace.

In Chapter 15, “A preliminary examination of imperfect subjunctive variation in Catalanian Spanish: A contact linguistics and usage-based approach”, Sean McKinnon investigates the distribution of the two Spanish morphological subjunctive forms, *-ra* and *-se* in Catalanian Spanish, a variety in close contact with Catalan. The results of a corpus analysis show that the overall distribution of *-se* is slightly higher than what has been reported for European Spanish. Furthermore, a multivariate analysis reveals that structural priming, the existence of a cognate verb in Catalan and the combination of local frequency and morphological irregularity in the imperfect subjunctive significantly favor the use of *-se*.

In Chapter 16, “Testing English influence on first person singular “yo” subject pronoun expression in Sonoran Spanish”, Ryan M. Bessett explores the impact that contact with English has on the variation of first person singular “yo” subject pronoun expression in Sonoran Spanish. He analyzes sociolinguistic interviews from

sixteen monolinguals from Sonora, Mexico and sixteen bilinguals from Arizona, United States with either Sonora-born parents or grandparents. The results show a lack of evidence for English influence on the bilinguals in the study.

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PART 1

Language structure and use

SE-marked directed motion constructions

Anticausatives and figure reflexives

Grant Armstrong

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This paper discusses the descriptive properties of SE-marked directed motion constructions typically instantiated by verbs such as *caer-se* (fall-se), *ir-se* (go-se) or *subir-se* (go up-se). I argue that such constructions are surface representations of two distinct underlying syntactic configurations: an anticausative (Schäfer, 2008) and a figure reflexive (Wood, 2014). The anticausative analysis corroborates work on the same topic by Cuervo (2014), Jiménez-Fernández & Tubino (2014) and Pineda (2016) while the figure reflexive analysis is a novel contribution.

Keywords: SE clitic, directed motion verbs, anticausatives, figure reflexives

1. Introduction

Aspectual SE is the name commonly given to the reflexive clitic that may appear with some transitive and intransitive verbs in Spanish, giving rise to telic interpretations (Nishida, 1994; Zagona, 1996; De Miguel, 1999; De Miguel & Fernández Lagunilla, 2000; Sanz, 2000; MacDonald, 2004, to appear; De Cuyper, 2006; Basilico, 2010; Armstrong, 2013; García Fernández, 2015). Much work has focused on how the aspectual effects of SE arise in transitive verbs like *comer-se* (eat-SE) while only recently have intransitive verbs of directed motion such as *caer-se* (fall-SE), *ir-se* (go-SE) and *salir-se* (leave-SE) been looked at in detail (Cuervo, 2014; Jiménez-Fernández & Tubino, 2014; García Fernández, 2015; Pineda, 2016). In this paper, I build on this recent line of investigation into the structure of SE-marked intransitive motion verbs and add to some of the claims made therein. I do this by integrating into these proposals work on expletive Voice by Schäfer (2008) and work on PPs by Svenonius (2007) and Wood (2014).

I believe the central claim in Cuervo (2014), Jiménez-Fernández & Tubino (2014) and Pineda (2016) that SE-marked intransitive motion verbs are anticausatives to

be partially correct. Some SE-marked motion verbs are indeed anticausatives, but not all of them are. The main contribution of this paper is to support the hypothesis that SE-marked intransitive motion verbs instantiate an additional type of syntactic construction as well: a figure reflexive (Wood, 2014). The theoretical claim of the paper is outlined below in (1).

- (1) a. *caer-se el libro, salir-se un clavo*
 [VoiceP [se] Voice [_{vP} v_{cause} [_{√P} √Root [_{PP} [FIGURE] p [_{PP} P [GROUND]]]]]]]
 b. *subir-se alguien a la mesa, bajar-se alguien del árbol*
 [VoiceP [AGENT] Voice [_{vP} v_{cause} [_{√P} √Root [_{PP} [se] p [_{PP} P [GROUND]]]]]]]

The main idea is that SE appears with directed motion events (not controversial) but that it may appear in one of two possible positions. It may merge in Voice (1a), giving rise to an anticausative or it may merge in the specifier of the prepositional phrase that introduces a GROUND, giving rise to a figure reflexive (1b). All of these terms will be outlined in detail below.

The paper is organized as follows. In Section 2 I provide an overview of the descriptive properties of SE-marked intransitive motion verbs. In Section 3 I discuss some of the major similarities between anticausative changes of state and SE-marked intransitive motion verbs, while noting that there are some SE-marked intransitive motion verbs that differ from anticausatives. Finally, in Section 4, I provide the background for the analysis sketched out in (1) that captures the descriptive properties of these constructions as well as the similarities and slight differences they exhibit with respect to the more well studied change of state anticausative construction.

2. Descriptive properties of SE with intransitive motion verbs

2.1 Directed motion

The core set of intransitive motion verbs that can appear with SE in most dialects of Spanish (with a certain amount of variation) is listed in (2).¹

1. The verbs in this list stand out because they are used as intransitive motion verbs both with and without SE. There are many other motion verbs that appear with SE but lack an intransitive variant without it. These may or may not have transitive uses as well. Some examples are *acercar-se* (to get close), *alejarse* (to get away/walk away), *aprear-se* (to get off), *asomar-se* (to go out onto/up to something) and *encaramar-se* (climb on top of) (see Bosque, 2015 for a detailed list of directed motion verbs, classified according to different spatial qualities of the movement involved).

- (2) *bajar-se* ‘go down’, *caer-se* ‘fall/fall down’, *escapar-se* ‘get away/escape’, *fugar-se* ‘get away/flee’, *ir-se* ‘leave/go away’, *marchar-se* ‘leave/depart’, *regresar-se* ‘return/come back’, *salir-se* ‘leave; come out/off’, *subir-se* ‘go up onto’, *venir-se* ‘come/come back’, *volver-se* ‘return/come back’

As has been noted in previous research (De Miguel & Fernández Lagunilla, 2000; Cuervo, 2014; Jiménez-Fernández & Tubino, 2014; García Fernández, 2015; Pineda, 2016), what is striking about the list in (2) is that all of the verbs describe inherently directed motion. Such motion events involve a direction of motion that is defined in terms of a goal, a source, a path and perhaps an axis (vertical or horizontal). For instance, the verb *salir* (leave; come out/off) describes an event in which an entity departs from a source or comes out of a source of motion while in its most typical uses the verb *subir* (go up) describes vertical movement of an entity in an upward direction or to/onto a goal (see Bosque, 2015 for detailed discussion). This contrasts with other motion verbs such as *caminar* (walk), *correr* (run), *nadar* (swim) and *saltar* (jump), which describe a manner of motion without necessarily entailing a particular direction or a change in location that can be defined in terms of notions such as source, goal and path.

This basic observation might lead us to the tempting generalization that SE can only appear with intransitive verbs that describe inherently directed motion events. While I believe this generalization to be correct, there are some caveats that should be mentioned. First, some intransitive manner of motion verbs appear to be acceptable with SE. For instance, the use of the verb *marchar* (march), which is a manner of motion verb in the absence of SE, gives rise to a directed motion meaning (leave/depart) when it appears with SE. While it could be argued that *marchar-se* has lexicalized this particular meaning, in (3) it can be observed that a directed motion meaning can be coerced when certain manner of motion roots appear with SE.

- (3) a. Juan se rodó por las escaleras cuando se tropezó con Ana
 Juan SE rolled by the stairs when SE tripped over Ana
 ‘Juan rolled down the stairs when he tripped over Ana’
 (Maldonado, 1988, p. 157)
- b. Por usar la vieja pluma fuente, la tinta se corrió
 Because of using the old pen fountain, the ink SE ran
 sobre el papel
 over the paper
 ‘Because of using the old fountain pen, the ink leaked out onto the table’
 (Maldonado, 1988, p. 159)

- c. Pon un pisapapeles encima de ese documento porque se
 Put a paperweight on top of that document because SE
 va a volar²
 is going to fly
 ‘Put a paperweight on the document because it’s going to fly away’
- d. Juan se trepó hasta lo más alto de la pared
 Juan SE climbed until the highest of the wall
 ‘Juan climbed up to the highest part of the wall’

Verbs such as *rodar* (roll), *correr* (run), *volar* (fly) and *tregar* (climb up/scale) are typically treated as manner of motion verbs that describe atelic activities when used intransitively rather than changes of location. It is important to note that when they do appear with SE, they clearly describe directed motion as can be gleaned by the presence of the PPs that describe a path (3a) or goal (3b, d) of motion. I take this not as an indication that SE may appear with manner of motion verbs generally but that it appears in a *construction* associated with a change of location meaning and certain roots that typically describe manner of motion like the ones in (3) can appear in this construction (see Borer, 2005 for a general description of the neo-constructionist view of argument structure that is adopted here). In sum, rather than act as counterexamples to the generalization that SE is associated with directed motion, these data actually lend further support to it.

Another potential stumbling block for the generalization that SE appears in inherently directed motion constructions is that, in all standard varieties of Spanish, it is unacceptable with a number of verbs that clearly describe inherently directed motion such as *entrar* (enter) and *llegar* (arrive).

- (4) a. Juan (*se) entró en la casa
 Juan SE entered in the house
- b. María (*se) llegó a la fiesta
 María SE arrived to the party

If SE is truly a marker of inherently directed motion, then it is a mystery why it cannot appear in (4). De Miguel (1999) and De Miguel & Fernández Lagunilla (2000) suggest that the generalization needs to include information about the type of motion involved. For these authors, SE appears only when the motion event culminates at its initiation or source. This means that verbs that specify a culminating

2. This example is adapted from a suggestion by an anonymous reviewer. Example (3d) is taken directly from the same reviewer’s commentary on an earlier version of this paper. I thank the reviewer for offering these examples and other helpful commentary with respect to the motion verbs that can appear with SE.

point as abandoning or movement away from a source are compatible with SE while those that specify a culminating point such as arriving or moving to a goal are incompatible with SE. This idea enables us to make a neat distinction between pairs like *salir-se* and *entrar(*se)* as noted in Sánchez López (2002, p. 116), but some have questioned whether it holds across the entire range of intransitive motion verbs that can appear with SE (see Cuervo, 2014; Jiménez-Fernández & Tubino, 2014; García Fernández, 2015; Pineda, 2016). One test that provides clear evidence for the idea that SE is compatible with either changes that culminate at a source or a goal of motion, thus casting doubt on the idea discussed in De Miguel & Fernández Lagunilla (2000), is outlined in MacDonald (2008, p. 100–104).

According to this test, directed motion verbs behave differently if the location of the FIGURE argument (= the entity that is at a particular location or in motion, see Talmy, 1985) at a particular point in time corresponds to the source or goal. For instance, in (5a), the interpretation is that John is at the party at 10pm while in (5b) he is not at the party at 10pm. Since the location of John corresponds to the goal argument in (5), verbs like *return* are called goal-oriented directed motion verbs. In (6), the opposite obtains. In (6a), John is not at the airport at 10pm while in (6b) he is. This is because *depart*, and other verbs like it, are source-oriented.

- (5) a. John returned to the party at 10pm (MacDonald, 2008, p. 100)
 b. John returned from the party at 10pm
- (6) a. John departed to the airport at 10pm (MacDonald 2008, p. 101)
 b. John departed from the airport at 10pm

If the claim that SE always indicates culmination at the initiation (or source) of motion is correct, we would expect any directed motion verb that is SE-marked to be source-oriented. However, this does not seem to be borne out as SE is compatible with both source-oriented (7) or goal-oriented interpretations (8).

- (7) *irse* = source-oriented
 - a. Juan se fue a la fiesta a las 10
 Juan SE.3 went to the party at 10pm
 ‘Juan left for the party at 10pm’ (= Juan is not at the party at 10pm)
 - b. Juan se fue de la fiesta a las 10
 Juan SE.3 went from the party at 10pm
 Juan left the party at 10pm (= John is at the party at 10pm)
- (8) *volverse* = goal-oriented
 - a. Juan se volvió a EE.UU. el día 15
 Juan SE.3 returned to USA the 15th
 ‘Juan returned to the US on the 15th (= John is in the US on the 15th)

- b. Juan se volvió de EE.UU. el día 15
 Juan SE.3 returned from USA the 15th
 'Juan returned from the US on the 15th' (= John is not in the US on the 15th)

In light of this data, it appears that there are some rather idiosyncratic gaps in terms of where SE may appear within the set of intransitive motion verbs in the language. Before resorting to listing lexical roots as exceptions, it should be noted that the gaps observed in modern varieties of Standard Spanish do not obtain in earlier varieties. For instance, Bogard (2006) notes that SE is possible with *entrar* and *llegar* in the *Çid* as shown in (9).

- (9) a. entraron se ala çibdad [Çid, 2895–2897] (Bogard, 2006, p. 799)
 entered SE to.the city
 b. Aguiio myo Çid, ala puerta se legava [Çid, 35–37]
 I observe my Çid, to.the door SE arrived

Moreover, the restriction that prohibits SE from appearing with verbs like *entrar* and *llegar* simply does not hold in certain varieties of Spanish. For instance, Jiménez-Fernández and Tubino (2014) show that the equivalents of (4) are acceptable in Andalusian Spanish.

- (10) Andalusian Spanish (Jiménez-Fernández & Tubino, 2014)
 a. Juan se entró en su casa
 Juan SE entered in his house
 b. Juan se ha llegado a la fiesta
 Juan SE has arrived to the party

Pineda (2016) shows in detail that in some varieties of Catalan, in Aragonese and in Italian varieties, virtually the entire range of intransitive verbs that describe inherently directed motion can appear with SE. An example from Catalan is shown in (11).³

- (11) L'advocat se n'ha entrat a la sala
 The lawyer SE en.has entered to the room
 'The lawyer entered the room'

3. Note here that in Catalan, Aragonese, Italian and French, the ablative clitic *en/ne* appears obligatorily whenever SE marks a verb of inherently directed motion. I will not work out an explicit claim about where *en/ne* originates, but the articulated prepositional structure discussed in Section 4, particularly the *p* head that introduces figure arguments is a potential locus for this clitic.

The fact that SE is not sensitive to the source versus goal-oriented distinction among directed motion verbs, in addition to the fact that there is diachronic and synchronic variation with respect to which verbs SE appears with, lends, in my view, further credence to the generalization that SE may only appear in a directed motion construction but without necessarily specifying what the fine-grained components of those motion events are. Most roots that describe changes in location are compatible with this construction, but there is variation as to which specific ones may be excluded from the construction and this seems to change over time. Even roots that are not typically associated with directed motion may appear with SE, in which case they are ‘coerced’ into a directed motion reading.

2.2 Culmination

Within the set of events that count as directed motion, the distribution of SE is limited not only by its inability to appear with certain roots but also by lexical aspect. If we take *caer* (fall) as an example, we see that it can appear in at least two types of constructions. One is a presentational unaccusative that simply describes a natural process (12a) and the other is a change of location (12b).

- (12) a. Afuera cae nieve
 Outside falls snow
 ‘Outside snow is falling’
 b. Cayó un libro del estante
 Fell a book from.the shelf
 ‘A book fell from the shelf’

While (12a) does involve downward motion, it does not specify any kind of source, goal or path of motion. It simply describes an occurrence or happening. (12b), on the other hand, does describe a directed motion event in which movement is specified away from a source. The former is non-culminating as it describes a continuous process while the latter is said to culminate at the point that the book leaves the shelf (De Miguel & Fernández Lagunilla, 2000). The fact that SE may only appear with (12b), as shown below, is clear evidence that it requires a culminating directed motion event, as all the previous literature has shown.

- (13) a. Afuera (*se) cae nieve
 Outside SE falls snow
 ‘Outside snow is falling’
 b. Se cayó un libro del estante
 SE fell a book from.the shelf
 ‘A book fell from the shelf’

To continue this illustration and demonstrate that SE can appear with culminating points at a goal of motion, let us look at the pair of examples in (14). The verb *subir* in (14a) is intended to describe a durative event of upward motion for some time (maybe up some stairs or a mountain). What is key here is that it does not culminate. On the other hand (14b) does describe a culminating directed motion event (= Pepe ends up on the table), so we expect SE to be compatible only with a construction like (14b). This is borne out as shown below as SE is generally required for this type of construction.

- (14) a. Pepe (*se) subió mucho
 Pepe SE went up a lot
 Intended: Pepe climbed/walked upwards a lot
 b. Pepe *(se) subió a la mesa⁴
 Pepe SE went up on the table
 ‘Pepe got up on the table’

2.3 Other restrictions: Agentivity and permanence

Now that we have established that both directed motion and culmination necessarily correlate with the presence of SE, let us turn to examples in which both of these ingredients are present and SE is optional like (15).

- (15) a. María (se) salió de la reunión.
 María (SE) left from the meeting
 b. Juan (se) bajó a la calle.
 Juan (SE) went down to the street

Since both (15a) and (15b) describe directed motion events that culminate at the source, some have raised the question as to whether SE adds something beyond simply signaling that both of the necessary components mentioned above do in fact obtain. This has been a notoriously difficult task in the literature (see Maldonado, 1988; De Miguel & Fernández Lagunilla, 2000; Gallardo, 2008; Jiménez-Fernández & Tubino, 2014; Bosque, 2015; García Fernández, 2015). The reason for this difficulty is because there does not appear to be one characteristic of SE-marked directed motion verbs that applies to all of them. For instance, it has been noted that many SE-marked directed motion verbs like *bajar-se*, *ir-se*, *regresar-se*, *subir-se*, *venir-se* and *volver-se* are limited to animate arguments with agentive readings

4. Bosque (2015) shows that there are different types of goals in vertical movement verbs like *subir*, which he classifies as ONTO goals, END-OF-PATH goals and UPPER PLACE goals. SE is only compatible with ONTO goals like the one in (14b).

(Sánchez López, 2002; Gallardo, 2008; Jiménez-Fernández & Tubino, 2014; García Fernández, 2015; Pineda 2016). What SE purportedly adds is the notion of volitional abandonment of a place (the source of motion) with the intention of staying away from it or staying at some new place (the goal of motion). This is shown below.

- (16) a. *(Me) voy de aquí para no volver
(SE.1s) I go from here to not come back
(Sánchez López, 2002, p. 118)
- b. *(Me) vine de Alemania para siempre
(SE.1s) I came back from Germany forever
- (17) a. Marta se bajó a la calle, #pero no se quedó
Marta SE went down to the street but didn't stay there
(Jiménez-Fernández & Tubino, 2014, p. 18)
- b. Marta bajó a la calle pero no se quedó
Marta went down to the street but didn't stay there

While this generalization holds over a wide range of SE-marked directed motion constructions, it does not explain why other SE-marked directed motion verbs do not impose an animacy requirement on their argument and thus lack the idea of volitional abandonment as in (18).

- (18) a. Se salieron tres clavos (Cuervo, 2014, p. 51)
SE came off three nails
'Three nails came off'
- b. Se cayeron tres vasos (Cuervo 2014, p. 51)
SE fell three glasses
'Three glasses fell (from somewhere)'
- c. El problema se me fue de las manos
The problem SE DAT.1s went from the hands
(Maldonado, 2002, p. 2)
- 'The problem is out of my hands' (lit. It left from my hands)

Other authors have noted a ban on SE in motion events that describe natural or expected occurrences (Maldonado, 1988; Cuervo, 2014; García Fernández, 2015). In other cases, SE seems to be sensitive to more fine-grained notions associated with the type of goal of motion as Bosque (2015) has noted for *subir-se* (see footnote 4).

I will not delve into these interesting and difficult issues here. Below I outline an analysis that is compatible with both agentive and non-agentive readings of SE-marked directed motion verbs, leaving an explanation of other restrictions for future research.

3. On the connection between marked anticausatives and directed motion constructions

As mentioned in the introduction, recent analyses by Cuervo (2014), Jiménez-Fernández & Tubino (2014) and Pineda (2016) treat *SE*-marked directed motion verbs and change of state anticausatives as syntactic equivalents. Abstracting away from certain details, the sentences described above have identical syntactic structures as those in (19), which describe changes of state rather than directed motion.

- (19) a. *Se secó la ropa*
 SE dried the clothing
 ‘The clothing dried’
 b. *Se durmió el niño*
 SE slept the child
 ‘The child fell asleep’

In this section I provide some brief notes on some of the major similarities between the anticausatives in (19) and the *SE*-marked directed motion sentences we have seen thus far before presenting an analysis that partially makes use of the core insights of this general proposal.

Both *SE*-marked directed motion verbs and anticausatives are paradigmatic, non-doubling uses of *SE*, which means they can be 1st/2nd person and cannot be doubled by a strong *mismo* anaphor. In addition to this characteristic that distinguishes them from impersonals, passives and extrinsic reflexives, they also share a number of important syntactic and semantic characteristics. From the semantic perspective, *SE*-marked anticausatives describe changes of state that typically have non-spontaneous causes (see Levin & Rappaport Hovav, 1995; Mendikoetxea, 1999; Schäfer, 2008 and references therein for details). Likewise, *SE*-marked directed motion verbs describe changes of location that typically have non-spontaneous causes (which correlates with the observation that they are anomalous with natural processes and expected occurrences).

They also share a number of syntactic properties. First, they both resist post-verbal bare NP subjects as shown in (20) (Masullo, 1992; Cuervo, 2014).⁵ Basically, this means that *SE* in both constructions is incompatible with presentational unaccusative sentences.

5. Cuervo (2014) provides a battery of tests showing that *SE*-marked anticausative change of state and *SE*-marked directed motion verbs behave in the same way. We cannot reproduce all of those tests here for reasons of space.

- (20) a. ??En la casa encantada, se cierran puertas
 In the house haunted, SE close doors
 b. ??En la casa encantada, se caen vasos
 In the house haunted SE fall glasses

A second area in which similarities between the two constructions can be observed are aspectual and transitivity alternations. The lexical roots that appear in anticausatives fall into three groups based on such alternations. Some anticausatives such as *arrodillar-se* (kneel), *agachar-se* (crouch down), *acatarrar-se* (to get cold) do not have uses outside of this particular construction. Most anticausatives, though, participate in at least one type of aspectual or transitivity alternation. The most common is the causative alternation (Levin & Rappaport Hovav, 1995; Mendikoetxea, 1999; Schäfer, 2008). This is the alternation characterized by verbs like *romper(se)* (break), *dormir(se)* (put to sleep/fall asleep) and *secar(se)* (dry), which in addition to the anticausative construction, also appear as unmarked transitive verbs in which a causer argument is the grammatical subject and the theme argument that undergoes the change of state is the direct object as in (21).

- (21) a. El niño rompió el vaso (vs. se rompió el vaso)
 The child broke the glass
 b. Dormí al niño (vs. se durmió el niño)
 I slept ACC.the child
 ‘I put the child to sleep’

Finally, there are a handful of verbs that appear as unmarked intransitives in addition to anticausatives such as *morir(se)* (die) and *despertar(se)* (wake up), which exhibit aspectual differences (see Cuervo, 2014; Vivanco, 2016 for observations on this alternation).

While we cannot go into the details of these aspectual and transitivity alternations here, what is striking is the same types of constructions that are used to classify different roots that appear in anticausative constructions into groups, also exist for verb roots that appear in the SE-marked motion verb construction. Some appear solely as SE-marked directed motion verbs such as *encaramar-se* (go up on top of) and *asomar-se* (go out onto/up to), but most either alternate with a transitive variant, an unmarked intransitive one, or both. *Bajar* (go down), for example, appears in all three constructions as shown in (22).

- (22) a. Bajé la caja al sótano
 I took down the box to.the basement
 b. Me bajé al sótano
 SE.1s I went down to.the basement

- c. Bajé al sótano
I went down to.the basement

Moreover, Jiménez-Fernández and Tubino (2014) and Pineda (2016) have shown that there is a strong correlation between the roots that appear in *SE*-marked directed motion constructions and the ability to transitivize. For instance, in Andalusian Spanish, Aragonese as well as the Catalan and Italian varieties studied by these authors, verbs like *entrar* and *caer* have transitive uses as shown in (23).

- (23) a. María entró el coche en el garaje (Pineda, 2016, p. 3)
María put the car in the garage
b. Alberto cayó el vaso (Pineda, 2016, p. 3)
Alberto dropped the glass

The fact that *SE* may appear with an intransitive use of a particular directed motion verb does not guarantee that it will have a causative transitive, but like anticausatives, there is a strong correlation between the two phenomena.

A final note is in order with respect to certain restrictions on the DP argument in each of the constructions. Anticausatives typically involve inanimate theme arguments that undergo a change of state, but they can have animate arguments as well, as in (24).

- (24) a. Si salgo en este calor me derrito
If I go out in this heat *SE*.1s I melt
b. ¡Cuidado! te vas a hundir en este lodo
Careful! *SE*.2s you are going to sink in this mud

In fact, as noted in Koontz-Garboden (2009, pp. 100–101), some anticausatives with animate arguments can give rise to agentive readings in the right contexts as the following example demonstrates.

- (25) Ana, toda vestida de blanco, inmaculada, se inmoló, más bien se
Ana, all dressed in white, immaculate, *SE* immolated actually *SE*
ahogó para olvidar a Coraje
drown in order to forget *ACC* Coraje

These facts show that the sole argument of an anticausative is always interpreted as a theme that undergoes a change and, when animate, may be interpreted as an agent. What is different about *SE*-marked directed motion verbs is that some of them *require* an agentive reading in the intransitive variant rather than simply permit it. Thus, the nature of the alternation with transitive variants is somewhat different. Take (26) for instance.

- (26) a. Bajé la caja al sótano
 I took down the box to.the basement
- b. Me bajé al sótano
 SE.Is I went down to.the basement
- c. *La caja se bajó al sótano
 The box SE went down to.the basement

If this were exactly like an anticausative, we would expect an alternation in which (26a) and (26c) instantiate the transitive and intransitive variants. However, what is constant in the alternation is an agent that is simultaneously interpreted as a figure argument. In (26b) an internal argument is added that is interpreted as accompanying this agent in the motion event (see Jiménez-Fernández & Tubino, 2014; Pineda, 2016 for similar observations).

To sum up, marked anticausatives and SE-marked directed motion verbs share a number of important semantic and syntactic characteristics, but some of the latter verbs differ from anticausatives in that their sole argument must be agentive. In the next section, I present an analysis of SE-marked directed motion verbs that takes this into account.

4. Analysis

I present the analysis in three parts. First, I present Schäfer's (2008) analysis of marked anticausatives and how these are related to reflexives. Then I discuss Wood's (2014) analysis of figure reflexives in Icelandic. Finally, I put the pieces together in the last subsection, showing how combining aspects of these two proposals captures the full range of properties of SE-marked directed motion verbs.

4.1 Anticausatives and intrinsic reflexives

Schäfer (2008) claims that marked anticausatives are syntactic constructions that contain three core components: (i) an inner predication that is built from a lexical root and a DP, (ii) a dynamic light verb (= v_{cause}) and (iii) a Voice layer. The effect of embedding the inner predication under v_{cause} is what gives rise to a change of state interpretation (a causing event that leads to a state). The Voice layer that is present in anticausatives is an expletive Voice that does not introduce an agent, but, like other argument-introducing heads, has a formal $\langle D \rangle$ feature that must be checked. Schäfer (2008) uses the notation $\{D, \emptyset\}$ (shown below) to indicate that Voice is a head that does not introduce an agent/causer argument. However, this specification is actually derived in the system he proposes if we assume that weak

reflexive morphemes have no phi-features and cannot receive theta roles. If they are merged in the position normally reserved for an argument, the effect is that of an argument expletive. Finally, the phi-features of the reflexive morpheme are valued through agreement with the DP argument of the inner predication that is embedded under v_{cause} . The structure of an anticausative like (27a) is shown in (27b).

- (27) a. El hielo se derritió en el sol
The ice SE melted in the sun
- b. $\left[\text{VoiceP } [\text{D } se] \text{ Voice}_{[D, \emptyset]} [\text{vP } v_{cause} [\text{PredP } [\text{DP } el \text{ hielo}] \text{ Pred } [\sqrt{derrit-}]]] \right]$
- Expletive Voice Cause Inner predication (state)

Anticausatives differ from reflexive constructions that have an agentive interpretation only in terms of where the DP and the weak reflexive morpheme are merged. In reflexive constructions, *se* is merged in the argument position of the inner predication layer while the DP is merged in the specifier of a non-expletive Voice head, labeled $\{D, Ag\}$ below. As discussed in Wood (2014) (more on this below), *se* continues to be an expletive in these cases but the effect of merging it in a low position gives rise to an intrinsic reflexive interpretation in which the theme argument of the inner predication is linked to an agent argument in Voice. The phi-features of *se* are again valued through agreement with the DP, this time in the reverse configuration though. An example of an intrinsic reflexive construction with an agentive interpretation is shown in (28).

- (28) a. Pepe se suicidó
Pepe SE committed suicide
- b. $\left[\text{VoiceP } [\text{DP } Pepe] \text{ Voice}_{[D, Ag]} [\text{vP } v_{cause} [\text{PredP } [\text{D } se] \text{ Pred } [\sqrt{suicid-}]]] \right]$
- Expletive Voice Cause Inner predication (state)

Schäfer (2008) discusses at length the connection between the Voice layer and the causative alternation. Simplifying greatly, he notes that the particular set of roots that are compatible with expletive Voice varies across languages and dialects, but typically marked anticausatives isolate change of state roots that describe non-spontaneous changes with an unspecified cause. Since Voice is what introduces an external argument, it follows that most of these roots will also appear as transitive causatives.

Anticausatives are unaccusative structures on this account, which leads to the question of why they do not permit post-verbal bare NP subjects (see Example (20) above). Cuervo (2003, 2014) makes use of a modified version of Suñer's (1982) generalization regarding the distribution of bare nouns in order to account for why they are impossible in anticausatives.

- (29) The Bare Noun Phrase Constraint (Cuervo, 2014, p. 54)
An unmodified common noun cannot be the subject of a predicate under conditions of normal stress and intonation

This constraint makes plain the intuition that subjects (specifier positions) do not permit bare nouns in the absence of modification or focus while complements are not subject to the same constraints (note: it does not provide a clear *explanation* for why this is, but it does capture the distribution). The fact that the sole argument of anticausatives is generated as the subject of an inner predication would make it behave like an external argument (subject of an external predication mediated by Voice) with respect to (29). The next question is how to integrate directed motion constructions into this particular approach to anticausatives. This is the subject of the next section.

4.2 Figure reflexives

In order to extend Schäfer's (2008) proposal to directed motion constructions, I will begin with a discussion of the syntactic representation of motion and locations. Svenonius (2007) presents a wide range of generalizations about adpositions in the world's languages, arguing that they exhibit a set of argument structure properties that are very similar to verbs. Following Talmy's (1985) terminology, all adpositions are claimed to take an external argument, labeled **FIGURE** and an internal argument labeled **GROUND**. Figure arguments refer to the entity that is located or in motion while ground arguments refer to a location. The former are universally introduced as the external argument of P while the latter are introduced as internal arguments. This asymmetry reflects to a large extent the difference between agents/causers (external arguments of verbs) and patients/themes (internal arguments). He proposes to capture these similarities between adpositions and verbs by proposing the split P hypothesis, represented in (30).

- (30) [_{PP} [**FIGURE**] *p* [_{PP} P [**GROUND**]]]

As with verbs, the asymmetry between figure and ground arguments is represented by splitting P into two heads. The P head selects a ground while the *p* head introduces a figure argument (among other potential functions – see Svenonius, 2007). The PP in (30) masks as much complexity as the label V does in verbs. The different components of PP, which include notions such as direction, goal, source and path as well as aspectual distinctions between different types of Ps can be represented in a decomposed fashion (Zwarts, 2005; Gehrke, 2008; Ramchand, 2008; Bosque, 2015 and references therein).

Taking this proposal as his point of departure, Wood (2014) argues that beyond providing a way of representing the parallelisms between verbal and prepositional argument structure, the split P hypothesis can be used to account for a set of verbs in Icelandic that are marked with the morpheme *-st*, which is used in a similar range of environments as the *SE* clitic. Two constructions that are marked with *-st* relevant for the present paper are anticausatives and events involving directed motion, which Wood (2014, pp. 1392–1398) labels ‘figure reflexives’, as shown in (31).

- (31) a. Dyrnar opnu-ðu-*st* Icelandic anticausative
 Door.the open-PST-*st*
 ‘The door opened’
 b. Hann troð-*st* inn með hópnum Icelandic figure reflexive
 Hann.NOM squeezed-*st* in with group.the
 ‘He squeezed in with the group’

Wood (2014) argues that the *-st* morpheme is a clitic that functions as an argument expletive. As discussed above for *SE*, this means that it merges in the specifier positions of argument introducing heads Voice and *p* but is unable to saturate theta roles. In anticausatives, *-st* merges in the specifier of expletive Voice as in (27b) above. Since Voice is the highest projection in the argument structure configuration and no theta role can be assigned to the argument in its specifier, it follows that there can be no theta role introduced in Voice. Figure reflexives involve a different structure and give rise to a different interpretation in the semantics. Their structure is as shown in (32).

- (32) a. Hann troð-*st* inn með hópnum Icelandic figure reflexive
 Hann.NOM squeezed-*st* in with group.the
 ‘He squeezed in with the group’
 b. [_{VoiceP} [_{DP} *Hann*] Voice_{D, Ag} [_{vP} $\sqrt{\text{troð-}v_{\text{cause}}}$ [_{pP} [_D *-st*] *p* [_{pp} *inn með hópnum*]]]]]

The *-st* morpheme in this case merges in the specifier of *p*. Wood (2014) argues that rather than represent a case of true expletivization, this particular scenario gives rise to a reflexive interpretation. Since the argument introduced by *p* is not the highest one within the entire structure, it can be linked to an argument through a semantic rule that enables the DP in specifier of Voice, *Hann*, to simultaneously saturate the argument variable of both the AGENT predicate introduced by Voice and the FIGURE predicate introduced by *p*. What is important here is that the reflexive interpretation that links the agent and figure roles to the same DP is not a product of syntactic binding but is rather derived through expletivizing a low argument position, which is then linked to a higher one.

4.3 SE-marked directed motion verbs

Now we have all the ingredients we need to propose an analysis of SE-marked directed motion verbs. I claim that all of them arise from the following syntactic construction.

- (33) [_{VoiceP} [_{AGENT}] Voice [_{VP} v_{cause} [_{VP} $\sqrt{\text{Root}}$ [_{pP} [_{FIGURE}] p [_{PP} P [_{GROUND}]]]]]]

First, the pP containing a figure and ground is assembled. As mentioned above, I am abstracting away from the complexity of P which may contain information related to direction, goal, source and path. The figure argument that is located or in motion with respect to the ground is introduced in the specifier of p . Certain lexical roots may take different types of figure-ground relations as complements – this move represents a difference between my proposal and Wood (2014). I aim to maintain as part of this system that lexical roots are not free to modify v_{cause} in Spanish but they are in Germanic languages (see Mateu, 2012 for discussion). This root + pP structure is the embedded under the now familiar causative light verb and a Voice layer.

I claim that there are two different types of SE-marked directed motion constructions that correspond to the difference between anticausatives and intrinsic reflexives discussed in 4.1. On the one hand, there are anticausative directed motion constructions typically instantiated by roots such as *caer* (fall) and *salir* (come out/off).

- (34) a. Se cayó un libro del estante
 SE fell a book from.the shelf
 ‘A book fell from the shelf’
 b. [_{VoiceP} [_{se}] Voice [_{D, Ø}] [_{VP} v_{cause} [_{VP} $\sqrt{cae-}$ [_{pP} [_{DP} *un libro*] p [_{PP} *del estante*]]]]]]

All of the characteristics that are shared among anticausative changes of state and anticausative directed motion constructions stem from this shared structure. Expletive Voice is associated with a non-spontaneous change of location that has an unspecified cause. The lack of post-verbal bare NP subjects falls under Cuervo’s generalization in (29) and, where possible, the transitive uses of verb roots that appear in this construction will involve the addition of a causer argument in the specifier of non-expletive Voice. The primary differences between the two are located in the nature of the change that affects the internal argument and how aspect is conceptualized.

Other verbs that appear in SE-marked directed motion constructions are instances of figure reflexives. An example is shown below in (35).

- (35) a. Pepe *se* subió a la mesa
 Pepe *SE* went up on the table
 ‘Pepe got up on the table’
- b. [_{VoiceP} [_{DP} *Pepe*] Voice_[D, Ag] [_{vP} *v_{cause}* [_{vP} *√sub-* [_{pP} [*se*] *p* [_{pP} *a la mesa*]]]]]]

The properties of these constructions are by and large identical to the figure reflexives discussed in Wood (2014), which I will not repeat here (see 4.2 above). The lack of bare nouns follows from Cuervo’s generalization (29) and, where possible, these particular verbs exhibit transitivity alternations in which a figure argument may be added that is interpreted as accompanying the agent in motion.

This rather simple proposal has a number of positive consequences for the analysis of *SE*-marked directed motion constructions. Not only does it allow for a plausible explanation of the entire range of properties exhibited by these constructions in standard varieties of Spanish, and the connection they exhibit to anticausatives and intrinsic reflexive constructions generally, it can be easily extended to handle diachronic and synchronic variation as well as variation across Romance. The main questions that need to be investigated in the future concern how the conceptual information in individual roots interacts with the abstract structural information in the syntax in order to exclude some roots from appearing in the construction as well as working out the fine-grained details of *pP* and which aspectual notions in the domain of spatial *P* correlate with the presence of *SE*. I believe that this proposal provides a solid base upon which to carry out such investigations.

5. Conclusion

In this paper I have provided an overview of the descriptive properties of the *SE*-marked directed motion construction and argued that these should be analyzed as different instantiations of essentially the same syntactic construction. The difference between these two instantiations mimics one found between anticausatives and intrinsic reflexives in the domain of change of state verbs. Distinct semantic effects emerge as a consequence of merging the reflexive clitic in different argument positions.

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Subcategorization and change

A diachronic analysis of *sin embargo* (*de que*)

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This paper analyzes the syntactic and semantic changes undergone by the PP *sin embargo* ‘without obstacle/impediment’ as it develops its clause-taking properties in Spanish from the 12th to the 16th centuries, essential for its further reanalysis as a concessive connective. We argue against an account that explains this change through a metaphor from the lack of a barrier in the sociophysical world to the epistemic world. Instead, we show that the syntactic and semantic change stems from the subcategorization properties of the noun *embargo*, which in the 1400s selects for the preposition *de* and later for the complementizer *que*, with scope over a proposition. The selection of a clausal complement, and hence the increase in scope of the original prepositional phrase, underlies the creation of the sentence connective.

Keywords: concessive, clausal complementation, change, subcategorization, Spanish

1. Introduction¹

The current study combines two veins of research in the study of the Spanish concessive connective *sin embargo* (*de que*): (i) research on the creation of concessive markers across languages, and (ii) the syntactic development of complementizers in Spanish and Romance more broadly.

The grammatical development of concessive and adversative connectives is a main topic of research in syntactic and semantic change (König, 1988, 1991; Schwenter & Traugott, 2000; Pérez Saldanya & Salvador, 2014; a.o.). In contrast to other classes of markers, the origin of concessives tends to be formally transparent,

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i.e. compositional. As König (1988, p. 151) points out, “[c]oncessive connectives are complex in nature, their components are easy to identify and can easily be related to another, original – or at least earlier – meaning”. A cross-linguistic comparison of these connectives shows that the meaning of their basic components can be related to other domains, like conditional clauses, free-choice quantification, and nouns meaning ‘obstinacy, will, sorrow’ originally applicable to human agents or experiencers (König, 1988). The development of the concessive meaning within specific constructions has been analysed for particular languages with a focus either on the class of concessives or on mechanisms of change affecting the constructional unit (for Spanish, see Garachana Camarero, 1998; Torres Cacoullós, 2006; Pérez Saldanya & Hualde, 2012; Pérez Saldanya & Salvador, 2014).

However, the evolution of *sin embargo de que*,² especially the development of its finite clause-taking properties, must be studied in the context of the creation of subordinating patterns and complementizers in Spanish and other Romance languages (Tarr, 1922; Herman, 1963; Serradilla, 1996, 1997; Barra Jover, 2002), especially the evolution of prepositional finite clauses introduced by functional prepositions, that is, the evolution of the syntactic pattern [P [fin-CP que]] (Delicado Cantero, 2013), present in *sin embargo de que*.

In this paper, we focus on the development of *sin embargo de que* up to the 16th century, the period during which the structure and the interpretation of the concessive connective emerge. Our analysis is documented with examples taken from the CORDE and the *Corpus del Español*. Our study focuses on the creation of *sin embargo de que* and leaves aside the posterior development of the discourse connective, i.e. the use of *sin embargo* to connect discourse fragments (*Juan está cansado y, sin embargo, vendrá*. [Portolés, 1995, p. 234]).³ The former function is lost in contemporary Spanish, in which only the latter can be found. Specifically, we propose that the subcategorization properties of the noun *embargo* play an important role in the development of the concessive connective. In the 1400s the noun selects for the preposition *de* and later for *que*, with scope over a proposition, as captured in (1).

- (1) a. [sin [embargo [de ...]]]
- b. [sin [embargo [de [que ...]]]]

2. In this paper, we mention *sin embargo de que* for descriptive purposes, without claiming that this sequence was grammaticalized as a unit. In fact, we will propose that the sequence is compositional from a syntactic and semantic point of view.

3. The further development of *sin embargo* falls outside the scope of this paper. The interested reader is referred to Garachana Camarero (1998) and Pérez Saldanya & Salvador (2014).

This increase in scope is crucial for the posterior reanalysis of *sin embargo* as a connective.

This paper is organized as follows. In Section 2 we provide a summary of the syntactic properties of *sin embargo* (*de que*) from the 13th–16th centuries, tracing the development from the PP *sin embargo* to the concessive connective. In Section 3 we present two previous accounts of the development of the concessive construction and identify their problems. In the following section we address these problems by presenting our account. Specifically, we lay out the semantic and syntactic properties of the noun *embargo* in diachrony and show how they play a role in the development of the concessive connective. Section 5 presents the theoretical implications of our study and some concluding remarks.

2. The construction: Data and summary of the properties

The first attestations of the PP *sin embargo* ‘without obstacle/impediment’ date from the 13th century.⁴ In this structure we see that the noun *embargo* allowed for modification, as in (2)–(4), and that a modifier could be either postposed to the noun or interpolated between the preposition and the noun, as can be seen with *otro* in (2) and (4) and with *algun* in (3).

- (2) quel desempare sin otro embargo ninguno toda su heredad
(*Fuero General de Navarra*, 13th c.)
‘that he shall give up with no other opposition/obstacle all his land’
- (3) pora rezebir sin algun embargo a todos los griegos qui quisiessen uenjr
(*Traduccción de Vidas paralelas de Plutarco*, Fernández de Heredia, 14th c.)
‘in order to receive without any obstacle all the Greeks who wanted to come’
- (4) & ya perseo commo heredero del Reyno syn otro embargo començo de pensar
commo mas ayna muriese su padre el Rey felipo
(*Caída de principes*, Boccaccio; transl. Pero López de Ayala & Alonso de Cartagena, 15th c.)
‘and already Perseo, as the heir of the kingdom, without any other obstacle, started to think how quickly his father King Philip would die’

4. In this section, we present corpora attestations of the relevant expressions without providing quantitative data. Given that our purpose is to explore the subcategorization properties of the noun *embargo*, a quantitative study would not bear on the value of the attestations. Although one could additionally provide a frequency study of the development of *sin embargo de que*, we think that such a study by itself would not be illuminating for our research question, as our purpose is to situate this development in a broader context, namely the pattern of clause-taking nominals and other categories in the history of Spanish.

The noun *embargo* could also be coordinated with other nouns, as is the case with *contrario* in (5):

- (5) e señorio de ella sin embargo e contrario alguno de los dichos clérigos
 (Concordia-Acuerdo, 14th c.)
 ‘and [have] dominion over it with no impediment or opposition from the said clergymen’

Beginning in the 14th century, we find examples of *sin embargo*, with the noun *embargo* subcategorizing for a PP headed by *de*, as in (6) and (7).

- (6) daqui adelante que la canten sus capellanes syn embargo del abbat e del convento de Onna
 (Carta de sentencia de don fray Juan, 14th c.)
 ‘and hereafter may their chaplains sing it without obstacle from the abbot or the convent of Onna’
- (7) e sin embargo de lo por vós otros dicho e alegado
 (Real provisión de Enrique IV, 15th c.)
 ‘and with no impediment of that which was said and claimed by you’

Examples like (7) show that the complement of the preposition *de*, although nominal, may have propositional content, hence foreshadowing the possibility of subcategorization of a clausal element, like the infinitival clause in (8):

- (8) sin embargo del fuir
 (Tratado de consolación, Villena, 15th c.)
 ‘without obstacle/risk of fleeing’

Starting in the 15th century, we observe the selection of a finite clause introduced by *que*, as in (9) and (10), examples from the 15th and 16th centuries, respectively:

- (9) E sy non tommo cosa alguna del dicho rromero syn embargo que non fiziese la dicha manda Peche a nos seysçientos marauedis
 (Ordenanzas reales, Díaz de Montalvo, 15th c.)
 ‘And if he didn’t take anything from the aforementioned pilgrim, despite not having made said order, he must pay us 600 *maravedis*’
- (10) es tierra esteril, que sin embargo que se crien en ella olivas y viñas, (...) se coge poco fruto por ser la tierra esteril
 (Relaciones topográficas de los pueblos de España, 16th c.)
 ‘it is a barren land, which despite the fact that there are olive trees and grapevines planted on it, there is low yield because the land is barren’

Finally, since the 16th century we find examples of *sin embargo de que*, as in (11), a development in line with the subcategorization properties of nouns, adjectives and verbs in Spanish in the same period.

- (11) *sin embargo* de que haya de salir a hacer sus visitas como le está mandado
 (Nuevas ordenanzas de la coca, Francisco de Toledo, 16th c.)
 ‘despite the fact that he may have to leave in order to pay his necessary visits’

The syntactic properties of *sin embargo* during the period under consideration are summarized in Table 1.

Table 1. Syntactic properties of *sin embargo* in diachrony

	Properties	Date	Example
<i>Sin X embargo</i>	Modification, interpolation	13th c.	(2)
		14th c.	(3)
		15th c.	(4)
<i>Sin embargo de</i> + DP/NP	Coordination with other Ns Subcategorization	14th c.	(5)
		14th c.	(6)
		15th c.	(7)
<i>Sin embargo de</i> + infinitive	Clausal subcategorization	15th c.	(8)
<i>Sin embargo que</i>	Finite clausal subcategorization	15th c.	(9)
		16th c.	(10)
<i>Sin embargo de que</i>	Finite clausal subcategorization with <i>de</i>	16th c.	(11)

This development is described in the literature as a case of grammaticalization of the PP *sin embargo* (Garachana Camarero, 1998) involving the creation of an unanalyzable unit (a concessive connective), with loss of the internal structure of the original prepositional phrase. We review the main previous accounts of this change in the next section.

3. Previous accounts

The most representative accounts for the evolution of this construction agree on the recategorization of the PP *sin embargo* into a unit, a connective, and on its chronology. In the following, we present the main contributions of two accounts and their limitations.

Garachana Camarero (1998) focuses on the cognitive mechanisms in the development of the concessive connectives *sin embargo* and *no obstante*. In the former case, the author proposes a mechanism of metaphorical change by which the meaning ‘lack of a physical obstacle’ is transposed to a more abstract domain and the construction comes to denote ‘lack of an epistemic obstacle’. This semantic change is treated as part of the grammaticalization process; as a result of this change, an intra-clausal constituent acquires wider scope and becomes inter-clausal (in the

terms of the author, a procedural concessive connective). Crucially, in this view, the increase in scope is the *consequence* of the metaphorical change (Garachana Camarero, 1998, p. 209). With respect to the syntactic development of the construction, the author does not discuss the syntactic mechanisms in detail, but the data presented in the paper show that from the 15th century we find instances of both *sin embargo de* and *sin embargo que*.

The study by Pérez Saldanya & Salvador (2014, pp. 101–103) adopts a comparative perspective with other concessive constructions in the history of Spanish. In the section devoted to *sin embargo*, the authors describe the diachronic change from PP to connective and acknowledge the occurrence of *sin embargo de* and *sin embargo (de) que* in the corpus. However, they do not provide a syntactic analysis of the change. These authors mention the link between the verb *embargar* and the deverbal noun *embargo* (Pérez Saldanya & Salvador, 2014, p. 99), but they do not explore this link to analyze the semantic or syntactic properties of the deverbal noun.

These two studies have made an important contribution by describing the syntactic properties of the construction at different stages and by presenting the development of *sin embargo* in relation to the semantics of other concessive constructions. However, these studies have the following limitations. First, they focus on the semantics of concessive constructions as a class and do not analyze the interaction of syntactic and semantic factors in the development of *sin embargo (de que)*. Specifically, they disregard the semantics of the noun *embargo* and likewise disregard the evolution of similar constructions with different semantics in the same period (N+P+*que*).

In the next section, we address these two aspects; we show that both the analysis of diachronic data containing the noun *embargo* and a broader picture of the properties of deverbal nouns in the evolution of Spanish shed light on the posterior creation of this concessive connective.

4. Our account

Our proposal has two main components. First, we argue that the process of reanalysis underlying the creation of the concessive connective *sin embargo* was favored by the subcategorization properties of the noun *embargo* rather than by a metaphoric process (*contra* Garachana Camarero, 1998). Both semantic and syntactic factors contribute to the reanalysis because the clausal complement taken by *sin embargo de*, having a proposition as its denotation, allows for the development of a sentence connective. Second, both the semantics of noun *embargo* and its syntactic properties found in the diachronic data provide evidence for a more compositional account of this change than has been acknowledged in the literature.

We begin by presenting the diachronic data relative to the semantic and syntactic properties of *embargo*.

4.1 The data

4.1.1 Early examples of the semantics of the noun *embargo*⁵

Observe the following Example (12), in which the noun *embargo* is modified by *ninguno* and can only be interpreted as ‘physical obstacle’:

- (12) & si no al menos que sea .iiij. cobdos rasos el camino sin embargo ninguno del altar ata la puerta maor de la glesia (Fuero General de Navarra, 13th c.)
 ‘and, otherwise, at the very least the path must be three elbows (*length unit*) long, without any obstacle from the altar to the main entry of the church’

However, at the same time we document several instances of *embargo* as ‘obstacle’ where it does not need to be necessarily physical. These examples allow for ambiguity and the noun can be interpreted as meaning ‘obstacle in general, obstacle of some sort’. Note for instance Example (13), where *embargo* is coordinated with *miedo* ‘fear’, as well as the possible modification by *todo* or *de razón* (*embargo de razón* ‘mental obstacle’) in (14):

- (13) porque non oviessen ellos miedo nin embargo de catarle e oyessen bien lo que Nuestro Señor le mandava que les dixiesse
 (General Estoria. Primera parte, Alfonso X, 13th c.)
 ‘so that they wouldn’t have fear or obstacle to see him and could listen to what Our Lord ordered him to tell them’
- (14) ueno muerte o emfermedat o algún otro embargo de razón
 (Vidal Mayor, 13th c.)
 ‘there came death or illness or any other mental obstacle’

In (15) the noun occurs in a religious text in which it can have both a physical and a moral interpretation (‘an obstacle to salvation’):

- (15) Querrié si lo quisiesse el Reï celestial, ... quitarse del embargo de la carne mortal
 (Vida de San Millán de la Cogolla, Berceo, 13th c.)
 ‘He wanted, if the heavenly God so desired, ... to remove himself from the obstacle/prison of mortal flesh’

5. We have excluded from the analysis the occurrences of the noun *embargo* with the value of commercial or judicial sequestration, as defined in the *Diccionario de Autoridades de la Real Academia Española*: “Sequestro y detención de bienes y hacienda, hecha por mandamiento de Juez competente” (*Diccionario de Autoridades*, tomo III, 1732).

In (16)–(18) *embargo* can mean ‘abstract obstacle, obstacle in general’; for instance, in (16) it could be a physical obstacle (prison) or another type of obstacle (*enfermedad* could be any type of illness, physical or mental, and *embargos derechos/embargo legítimo* may refer to any obstacle considered a legitimate reason not to show up):

- (16) si el que non uiniere podier mostrar embargo alguno por que non uino, como efermedat, o prisión, o avenidas de rríos, o grandes nieves, o otros embargos derechos, ..., non aya pena (Fuero Real, Alfonso X, 13th c.)
 ‘if whoever didn’t show up could prove any obstacle for his absence, such as illness or prison, or river floods or big snowfalls, or any other legitimate obstacles, he will not be penalized’
- (17) enpero si,..., aqueill contra qui fué appellado prouare abastadament que embargo legítimo ouo, por que non pudo parescer en aqueill día que li fué assignado ... (Vidal Mayor, 13th c.)
 ‘but if ... the accused person could sufficiently prove that he encountered a legitimate obstacle to be absent the day he was to appear ...’
- (18) E cuemoquier que los nobles reyes dont yo vengo ondraron e defendieron las eglesias e les dieron muchas franquezas porque aquellos que las avién de servir más ondrada mientre e más sin embargo pudiessen fazer servicio a Dios e a la eglesia, franqueza de moneda non les dieron (Privilegio rodado, Alfonso X, 13th c.)
 ‘And, given that the nobles from my land honored and defended the churches and gave them many privileges so that they could serve them with dignity and so that they could serve god and the church without any obstacles, they didn’t give them any money’

To sum up, these examples show that the noun *embargo* allowed for interpretations of both physical and mental obstacles since early on, which makes it unnecessary to posit a metaphorical process at the origin of the development of *sin embargo*.

4.1.2 Subcategorization properties of the noun *embargo*: Embargo (de) que
 Once we have examined the interpretations of the noun *embargo* in the history of Spanish, we present here data illustrating the evolution of its subcategorization properties up to the 16th century.

Examples (19)–(23) illustrate the typical nominal features of *embargo*, such as adjectival/quantificational modification, coordination with other nouns and pluralization. Examples (24)–(26) show the noun *embargo* taking a DP/NP via the functional preposition⁶ *de*, the same functional preposition which is attested

6. A functional P or K[ase], as in Lamontagne & Travis (1987) and Travis & Lamontagne (1992), does not contribute lexical information, lacks selectional properties and does not restrict its

as early as the 13th century with infinitival clausal complementation, as in (27). Finally, (29) shows *embargo* taking a finite clause.

Table 2. Syntactic properties of the noun *embargo* in diachrony

	Properties	Date	Example
<i>Embargo</i> = <i>N</i>	Modification	14th c.	(19), (23)
	Coordination with other Ns	14th c.	(20)
		15th c.	(21)
	Pluralization possible	13th c.	(22)
		14th c.	(23)
<i>Embargo</i> <i>de</i> + DP/NP	Subcategorization	14th c.	(24)
		15th c.	(25), (26)
<i>Embargo</i> <i>de</i> + infinitive	Clausal subcategorization	13th c.	(27)
		14th c.	(19)
		15th c.	(28)
<i>Embargo</i> <i>que</i>	Finite clausal subcategorization	16th c.	(29)

- (19) entiendo que me cunpliría mucho de fazer aquello que me él ruega, et de otra parte he muy grant enbargo de tomar dél aquella ayuda, pues veo que me lo dize tan floxamente (Conde Lucanor, Don Juan Manuel, 14th c.)
 ‘I understand that I should do what he is begging for, but at the same time I have great resistance in accepting his help, as it seems to me that he does not seem to be very sincere’
- (20) quien puede entender el enbargo o peligro que puede en el fecho acaesçer ante que acaesca (Libro de los estados, Don Juan Manuel, 14th c.)
 ‘who can understand the obstacle or danger that may come about before it does’
- (21) & qualquier que lo contrario fiziere o diere enello embargo o impedimiento alguno sea auído ageno y estraño delas dichas hermandades (Cuaderno de las leyes nuevas de la hermandad, Reyes Católicos, 15th c.)
 ‘and whoever did the opposite or created any obstacles or problems shall be considered as an outsider by the aforementioned fraternities’

complements semantically. As such, this functional category can be formally captured as the spell-out or materialization of inherent Case; see Delicado Cantero (2013) for discussion on (Spanish) prepositional clauses introduced by functional and lexical prepositions. See also Rauh (1993, 2010) and Horno Chéliz (2002), a.o., for further discussion on the categorization of lexical and functional prepositions.

- (22) Pero si les acaesçiessen embargos de grand enfermedad o de romeria
(*Fuero Real*, Alfonso X, 13th c.)
'but if they were to suffer from obstacles of illness or peregrination'
- (23) Este rey Remiro ovo muchos embargos de los suyos mesmos, senyaladamiente de un cuende que avia nombre Nepociano, que se le alzo en Asturias
(*Crónica de los estados peninsulares*, 14th c.)
'King Remiro received many obstacles from his own people, especially from a count named Nepociano, who rose against him in Asturias'
- (24) Et lo que dexa deles fazer non es si non por embargo de pecados o de malas obras quelos omnes ponen entre dios & ellos
(*Libro del caballero y del escudero*, Don Juan Manuel, 14th c.)
'And what he allows them to do is only due to obstacles created by sins or bad deeds that men put in between themselves and god'
- (25) estonze seria quando no pudiese cunplir su mandado por embargo de grand enfermedad
(*Siete Partidas de Alfonso X*, 15th c.)
'then it would be the case that he could not fulfill his requirements due to obstacles created by a big illness'
- (26) que assi tome la carga & el embargo de lo que le auia de fazer
(*Siete Partidas de Alfonso X*, 15th c.)
'may he thus take the load and the embargo of what he had to do'
- (27) porque non oviessen ellos miedo nin embargo de catarle
(*General Estoria. Primera parte*, Alfonso X, 13th c.)
'so that they wouldn't have fear or obstacle to see him'
- (28) Flaqueza de coraçon: o de cuerpo de onbre: o de amos ayuntadamente es enfermedad: o embargo de non poder yazer con las mugeres
(*Siete Partidas de Alfonso X*, 15th c.)
'Lightness of the heart or of the man's body (or both) is an illness or impediment not to be able to lay with women'
- (29) E un día púsole embargo que no se pudiese lavar porque supiese por [qué lo] hazia
(*Libro de los proverbios glosados*, 16th c.)
'And one day he imposed the impediment on him that he couldn't wash himself so he could find out why he was doing it'

In short, the data presented in this section show that the noun *embargo*, clearly an N categorially, can select for a DP/NP, which may have clausal content, as in (26), and may select for clausal complements, initially only non-finite ones, as in (28), and later on even finite ones (29). *Embargo de que* is only attested in the 16th century, and always as *sin embargo de que*.

4.2 Sin embargo (de) que in the context of <(de) que> in the evolution of Spanish

As mentioned above, the syntactic study of the evolution of *sin embargo de que* requires us to analyse this construction in the general context of the development of Spanish subordination and complementizers, especially with regards to the emergence of <de que>.

Classical studies such as Tarr (1922) and the pan-Romance study of Herman (1963), as well as more recent publications such as Bogard & Company Company (1989), Serradilla (1996, 1997), Barra Jover (2002), Delicado Cantero (2013) and Pérez Saldanya (2014), provide extensive evidence necessary to understand the evolution of *sin embargo de que* in its context rather than as an isolated case. There are at least two important aspects that we must highlight.

The first point has to do with chronology. The aforementioned studies consistently prove that the Spanish pattern <de que> – or other functional Ps or Ks such as *a* or *en*, syntactically represented as [K [fin-CP *que*]] – is not documented, in general, until the 16th century, with some sporadic early examples (Serradilla, 1995). As described in the previous sections, such is the chronology of *sin embargo de que*.

A second important point is the fact that *embargo* is but one clause-taking category among a pool of not only nouns but also verbs and adjectives with similar subcategorization properties and evolution, as also evidenced in the previously mentioned references. Independently of their semantics, those Ns, Adjs or Vs taking <de que> (or even <a que>, <en que>, etc.) show an evolution chronologically and syntactically coherent with that of *sin embargo de que*.

What is more, other Ns – whether deverbal or associated with a verb – participate in this evolution, including *temor (de) que*, *miedo (de) que* ‘fear (of/that)’, as in (30) and (31), and also in constructions involving a light verb, such as *haber/tener miedo (de) que* ‘have fear (of/that)’, as in (32) and (33):

- (30) Tenía entonces un corazón muy pequeño, con gran dolor de que no tenía las partes que otros, para ser amado y estimado dellos
(*Vida del P. Baltasar Álvarez*, Luis de la Puente, 16th c.)
‘He had then a very small heart, with great pain that he lacked the parts others had to be loved and liked by them’
- (31) por temor de que eran muchos los caballos y españoles
(*Crónica del Perú*, Cieza de León, 16th c.)
‘for fear that the horses and the Spaniards were many’
- (32) tengo temor de que hayan hecho en aquella cristiandad algún daño
(*Jardín de flores curiosas*, Torquemada, 16th c.)
‘I have fear that they may have caused some damage to that Christian group’

- (33) no haya miedo de que reciba la otra (La gitanilla, Cervantes, 16th c.)
 ‘that she is not afraid that she might receive the other one’

The same evolution is found with other nouns, e.g. *pena*, as in (34):

- (34) yo te doy mi palabra, pena de que tu desgracia me acabe, de no decir a mortal criatura que tú me la diste (Arcadia, prosas y versos, Lope de Vega, 16th c.)
 ‘I give you my word, or else may your disgrace finish me off, that I won’t say a word to anyone that you gave it to me’

To sum up this section, we have proved that the development of *sin embargo de que* is in line with that of many other categories, whether nominal or otherwise, which could select for a finite clause through the mediation of a functional preposition (a K). The mechanism for such evolution and extension has been argued to be analogy, especially the extension of the pattern <de +DP> or <de +infin-CP/TP> to finite clauses introduced by the complementizer *que* (Tarr, 1922; Serradilla, 1997; Delicado Cantero, 2013, 2014).

4.3 Discussion: The semantic and syntactic properties of the construction

From the data and analysis presented in this paper we can extract the following points:

- a. The lexical semantics of the noun *embargo* since early occurrences allowed for an epistemic interpretation; therefore, there is no need to argue for semantic bleaching or metaphor as part of the development of the construction *sin embargo*.
- b. Table 2 shows that the noun *embargo* could subcategorize for propositional complements (see (19), (26), (27), (28)). This allowed for the parallel development of the construction *sin embargo* as a contrastive connective, which begins to establish a relation between two propositions. This development was possible *thanks to* the combinatorial possibilities of the noun *embargo*; it is the change in subcategorization properties with increase in scope (to propositional scope) that allows for the emergence of the connective. For this reason, the development of *sin embargo de que* must be studied in the wider context of the development of <de que> in different constructions, rather than in isolation or limited to the evolution of concessives.
- c. The creation of the propositional connective is made apparent by the co-occurrence with an anaphoric element (*esto*, *aquello*, *todo esto*) which referred to a previously expressed proposition, as in (35)–(37):

- (35) y seyendo cierto y certificado, que sin embargo de aquello, era complidero a su servicio de faser (El Seguro de Tordesillas, Conde Haro, 15th c.)
‘and being certain and certified that, in spite of that, it was mandatory for him to serve him’
- (36) E ansi toda via sin enbargo de aquello, deveades fazer e cumplir lo contenido en las dichas mis cartas (Abreviación del Halconero, 15–16th c.)
‘And, in spite of that, you must still do and fulfill what is written in my letters’
- (37) sin embargo de esto lo ejecutareis remitiendolos que acudan ante Nos (Traslado de la instrucción que se dio a Juan de Peñalosa de ..., 16th c.)
‘in spite of this, you will execute it requesting them to appear before us’

Crucially, the contrastive interpretation was allowed by the syntactic properties of the construction inherited from the subcategorization expansion of the noun, which as early as the 13th century accepts infinitival complements (see (27)), together with the negative meaning of *sin*, in a compositional manner.

- d. Crucial to the creation of the concessive connective is the association with contrast, specifically, with a *result* that contravenes what is expected from the previous information. Hence, we find the negation of a possible causal relation (“causa ineficiente”), which is expressed by the clause selected by *embargo*: “la escenificación de una causa o condición que, contrariamente a lo esperable, no lleva aparejado un determinado efecto” (Pérez Saldanya & Salvador, 2014, p. 5). This connection between causal and concessive interpretations has been pointed out in studies on semantic change; a concessive interpretation is the logical counterpart of negated causality (König, 1988, 1991). We can thus understand the meaning of the connective in a compositional manner, i.e. as ‘with no impediment of a condition p that is generally expected to prevent q’. It should be pointed out that in the data we also observe the co-occurrence of *sin embargo* with other adversative and concessive constructions (*empero*, *pero*, *todavía*) in the initial stages of the creation of the concessive (see e.g. (36); see Montero Cartelle, 1993; Pérez Saldanya & Salvador, 2014; this could be seen as an instance of “harmonic collocations”, cf. Traugott & Dasher, 2002).⁷

7. Although this term was initially used for the co-occurrence of modal verbs and adverbs (e.g. *must* co-occurring with *absolutely* and *ought to* co-occurring with *perhaps*, see also Bybee et al., 1994), we believe that a similar phenomenon is found here, with emerging concessive markers co-occurring in contexts that involve contrastive reasoning.

5. Conclusion

The previous studies of the diachronic emergence of *sin embargo* have made an important contribution by describing the syntactic properties of the construction at different stages and presented the development of *sin embargo* in relation to the semantics of other concessive constructions. However, these accounts have disregarded the semantics of the noun *embargo* and have overlooked the importance of subcategorization and the role of the general evolution of similar constructions (N/Adj/V+(P)+*que*) in the evolution of Spanish complementizers.

This paper shows that the semantics and syntax of the noun *embargo* played a role in the development of *sin embargo* <*de que*>. We have found evidence that (i) the noun *embargo* allows for the interpretation ‘obstacle in general’ early on and outside of the combination with P *sin*, and that (ii) *embargo* subcategorizes for infinitival clauses earlier than the PP *sin embargo*. Therefore, we argue that the role of the noun in this historical development is more important than previously acknowledged.

It is important to point out that our goal is not to deny the potential role of constructions, specific word collocations or other broader units in processes of syntactic and semantic change. Rather, our findings show that the notion of *construction* may be further refined, and that a construction may build on an existing pattern in the language (as proposed by Amaral, 2016). In this particular case, the subcategorization properties of deverbal nouns, which are well represented in the grammar of Spanish during the period of time considered, play a role in the development of the larger phrase, first, and further of the concessive connective, showing that some aspects of the internal structure of the phrase are not lost. Although it is true that in the concessive construction the noun *embargo* loses its nominal behavior – it can no longer be pluralized, modified or coordinated with another noun (a change noted with respect to *pesar* in a *pesar de* by Torres Cacoullos, 2006) – the properties of the noun do not disappear *tout court*. In this respect, we disagree with an analysis that puts the emphasis on collocations and on the complete *loss* of the internal structure of a construction.

As we have shown, the subcategorization properties of the noun remain in the construction and influence its development. These data show that the construction is not “opaque” or completely indivisible, since some of the syntactic-semantic properties of its parts are relevant to the diachronic change. Crucially, not only is the functional preposition *de* the same preposition subcategorized by the noun *embargo*, but also the chronology of the change is exactly the same as that of the changes undergone by the combinatorial properties of this noun. Additionally, the same chronology and development is shared by other deverbal nouns in the language (as well as other categories, like V and Adj). In other words, the development

of *sin embargo* coincides with and is on a par with a much broader pattern observed in Spanish.

While increase in scope and the shift from lexical to functional categories are well-known consequences of syntactic and semantic change (Tabor & Traugott, 1998; Roberts & Roussou, 2003), the development of *sin embargo* raises important questions about the compositionality of the units that undergo change. We believe that an analysis as the one developed in this paper not only makes it possible to tease apart the precise contribution of constructions to language change but also to understand how the creation of new units and categories builds on existing grammatical rules, which may themselves change. Hence, the last stage considered in this study (*sin embargo de que*) has to be placed in the wider context of the development of <*de que*> constructions in the evolution of Spanish finite clauses. The coincidence of these developments in time shows the importance of integrating and contextualizing the diachrony of individual phenomena within systemic changes in a given language.

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Variable clitic placement in US Spanish

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This study examines clitic placement (CP) among US Spanish-speakers using data from two corpora: *Corpus del Español en el Sur de Arizona* (Carvalho, 2012–) and a corpus of interviews conducted in Roswell, Georgia (Wilson, 2013). Clitics were analyzed and coded for linguistic and social variables (e.g. specific construction, age of arrival). Results indicate an overall proclisis rate of 67%, which is similar to the rate reported for speakers in Mexico City (e.g. Davies, 1995). A subsequent multivariate analysis reveals that CP is significantly influenced by the specific construction used, the non-finite verb form, and the speakers' age of arrival. This analysis lends support to the argument for the impermeability of CP to contact-induced change in Spanish (Silva-Corvalán & Gutiérrez, 1995).

Keywords: clitics, US Spanish, language contact, morphosyntactic variation

1. Introduction

Numerous researchers have examined the variable placement of object clitics in Spanish periphrastic constructions, which can either appear in postverbal position (*enclisis*, [finite + non-finite verb + clitic]), as illustrated in Example (1), or preverbal position (*proclisis*, [clitic + finite + non-finite verb]) (also known as “clitic climbing”), as in (2) (e.g. Myhill, 1988; Davies, 1995, 1998; Silva-Corvalán & Gutiérrez, 1995; Torres Cacoullos, 1999; Gudmestad, 2006; Gutiérrez, 2008; Schwenter & Torres Cacoullos, 2014a,b).

- (1) *Yo era estudiante de arte en la universidad antes de entrar a español. Quiero terminarlo, no sé.*

(*Corpus del Español en el Sur de Arizona*, CESA, Carvalho, 2012–)

‘I was an art student at the university before going into Spanish. I want to finish it, I don’t know.’

- (2) *yo escuché una vez en las noticias que Roswell, lo querían hacer como, como el centro de Atlanta ...* (Roswell, Wilson, 2013)
 ‘I heard one time on the news that Roswell, they wanted to make it like, like downtown Atlanta ...’

Clitic placement (CP) has been investigated in several varieties of Spanish in Latin America and Spain. However, there is a dearth of research of this phenomenon in US Spanish, and a study of this type, aside from shedding light on the language internal factors that condition clitic use, offers a further opportunity to explore the potential influence from English, a language in which preverbal clitics are disallowed. This paper examines the use of both accusative and dative clitics among Spanish-speakers in two different regions of the United States: the Southwest (Arizona) and the Southeast (Georgia). Specifically, I intend to answer the following questions:

- a. What are the overall rates of clitic usage in each of the two regions?
- b. What linguistic and social factors influence CP?
- c. Is there any evidence that supports an English contact hypothesis concerning CP?
 - i. Do the clitic rates and/or constraints of Arizona speakers, who were born in the US, differ from those of Georgia speakers, who were born in Mexico?
 - ii. Do speakers from either region differ in their clitic rates and/or constraints from monolingual Mexican speakers?

To answer these questions, I carry out a quantitative analysis using two corpora of sociolinguistic interviews: *CESA* (Carvalho, 2012–) and a series of interviews conducted in Roswell, Georgia (Wilson, 2013). I examine factors such as verb reflexivity, type of non-finite verb (gerund vs. infinitive), particular construction, and age of arrival (AOA) to the US, among others, and their influence on clitic variation in these Spanish varieties.

In this paper, I first review clitic rates and factors that influence CP among different Spanish varieties and give a summary of previous studies of clitic variation. I then outline the methodology for the present study in section three and discuss the results in section four, including overall clitic rates and conditioning factors of clitic variation. Finally, I discuss some general conclusions and considerations for future research.

2. Variable CP in Spanish

2.1 Clitic rates and conditioning factors

I present below the reported overall proclisis rates for numerous Spanish varieties (see Table 1). It is important to note the cross-dialectal variability in rates in both monolingual and US varieties.

Table 1. Proclisis rates across dialects of Spanish

Variety	Proclisis rate	Source
Venezuela	89%	Gudmestad, 2006*
Michoacán, Mexico	78%	Gutiérrez, 2008
Mexico City (average of <i>habla culta</i> , <i>habla popular</i> , and <i>Corpus sociolingüístico de la ciudad de México</i>)	73%	Schwenter & Torres Cacoullós, 2014a
Houston Mexican Spanish	71%	Gutiérrez, 2008
Mexico City (average of <i>habla culta</i> and <i>habla popular</i>)	66%	Davies, 1995
Los Angeles Mexican Spanish	63%	Silva-Corvalán & Gutiérrez, 1995
Average of ten varieties**	56%	Davies, 1995

* In contrast to other studies that include numerous verbs, Gudmestad simply studies *ir* and *querer*. This may explain the comparatively higher rate since verbs with lower proclisis rates were not included. For instance, Davies (1995) observed frequent proclisis with *ir* and *querer* but infrequent proclisis with *esperar* and *intentar*.

** Davies analyzed CP in data from Cuba, Peru, Colombia, Bolivia, Puerto Rico, Chile, Venezuela, Argentina, Mexico, and Spain. The rates ranged from 41% (Peru) to 66% (Mexico).

One could argue that lower rates of proclisis (and thus higher rates of enclisis) in varieties of Spanish in contact with English compared to monolingual varieties suggests contact-induced language change. That is, since English permits only post-verbal clitics (e.g. *I want to see 'er* [her], but not **I 'er want to see*), Spanish-speakers in the US might show evidence of transfer from English through increases in enclisis use due to contact with English speakers. However, the differences in rates reported thus far were not found to be significant (e.g. Gutiérrez, 2008), and it has been argued that CP in Spanish is impermeable to external change (Silva-Corvalán & Gutiérrez, 1995). I intend, therefore, to address this question further and test the contact hypothesis by examining clitics in other varieties of US Spanish.

The particular factors shown to influence clitic usage in Spanish are the following: animacy (Davies, 1995), verb reflexivity (Gutiérrez, 2008), multiple clitic use (Davies, 1995), frequency of the construction (Schwenter & Torres Cacoullós, 2014a), priming (Schwenter & Torres Cacoullós, 2014b), verbal semantics (Myhill,

1988), non-finite verb form (Gutiérrez, 2008), register (Davies, 1995), topic persistence (Schwenter & Torres Cacoullós, 2014a), and person/number of the verb (Gudmestad, 2006).

Davies (1995) was one of the first researchers to examine this phenomenon using spoken data. He studied CP among ten different dialects of Spanish and also compared proclisis rates of spoken and written data, finding a substantially higher rate in spoken Spanish across all dialects. His study also examined numerous linguistic factors affecting clitic use including the finite verb used, the use of multiple clitics, reflexivity, animacy, and preceding material such as coordinating and subordinating elements. Davies found that proclisis was favored when multiple clitics (both accusative and dative) were used in the same construction and when the clitic was animate. In addition, proclisis was more frequent when the construction was preceded by a subordinating conjunction as opposed to a coordinating element and also when the clitic was non-reflexive.

Moreover, Schwenter and Torres Cacoullós (2014a) analyzed third-person accusative CP in three corpora of Mexican Spanish: *Habla Culta* (Lope Blanch, 1971), *Habla Popular* (Lope Blanch, 1976), and the *Corpus sociolingüístico de la ciudad de México* (CSCM, Martín Butragueño & Lastra, 2012). They examined factors such as frequency of the construction and animacy, which both had a significant effect on clitic use with more frequent constructions (e.g. *ir a* 'go', *poder* 'can', *querer* 'want', *tener que* 'have to' + Infinitive; *estar* 'be' + Gerund) and inanimate clitics favoring proclisis. Additional factors (e.g. clitic gender/number) were analyzed but were not found to be significant. These researchers stated that the construction constraints were very strong, suggesting a gradual spread of proclisis in relation to particular constructions, and they also highlighted the role of frequency and the grammaticalization of certain constructions (e.g. Motion *ir a* + Infinitive [favoring enclisis] vs. Future *ir a* + Infinitive [favoring proclisis]).

Regarding clitics in US Spanish, very little research has been carried out. The only studies to my knowledge are those of Silva-Corvalán and Gutiérrez (1995), who examined Los Angeles Spanish, and Gutiérrez (2008), who studied Houston Spanish. Regarding Los Angeles Spanish, Silva-Corvalán and Gutiérrez analyzed clitics in relation to possible effects of language contact among 20 Mexican-American speakers across three generational groups (according to place of birth and AOA).¹ The primary linguistic factor studied was the semantic class (e.g. progressives, modals) of the finite verb. As found in prior studies, the authors found that progressives, epistemic modals, and future reference verbs occurred with preverbal clitics most

1. Group 1: Mexican-born speakers who immigrated after age 11. Group 2: US-born speakers or speakers who arrived before age six. Group 3: US-born speakers with at least one parent in Group 2.

frequently. Specifically, future *ir a* + Infinitive, progressive *estar*, and epistemic *poder* constructions favored proclisis. Additionally, constructions such as *tener que*, *deber* ‘must/should’, and *querer* + Infinitive preferred proclisis. Concerning English influence, Silva-Corvalán and Gutiérrez concluded that there were no substantial differences among bilingual speakers as compared with monolinguals. That is, the patterns of bilinguals generally followed Spanish language patterns of proclisis preference rather than English patterns of enclisis. In addition, they found evidence against transfer when comparing the three generations of speakers. For instance, those that were born in the US or arrived before age 6 actually showed higher rates of proclisis than speakers who arrived to the US after age 11 (Silva-Corvalán & Gutiérrez, 1995, p. 309). It was concluded that this specific feature of Spanish seems to be impermeable to externally-motivated language change and also that “[t]he preverbal slot for verbal CLs appears to be firmly imprinted in speakers’ minds” (Silva-Corvalán & Gutiérrez, 1995, p. 310). Interestingly, they point out that evidence of this is found in examples from their data such as *Mi mom quiere que los keep ... my grades up* ‘My mom wants me to keep my grades up’ in which the verb is in English but the clitic is still in Spanish (p. 310).

Further, Gutiérrez (2008) studied clitics among Spanish-speakers in Houston, Texas across three groups of Mexican immigrant generations as well as a monolingual control group from Michoacán, Mexico.² The linguistic factors analyzed in the study were reflexivity of the verb, type of construction used in terms of grammaticalization (grammaticalized meaning vs. non-grammaticalized meaning), and the use of the non-finite verb, all of which had a significant effect on clitic usage. In particular, non-reflexive and more grammaticalized forms favored proclisis. The former finding is consistent with Davies (1995) and the latter with both Schwenter and Torres Cacullos (2014a), and Silva-Corvalán and Gutiérrez (1995). Further, gerund forms favored proclisis over infinitive forms. In terms of overall rates of proclisis, Houston speakers showed a lower rate of proclisis (71%) when compared to speakers from Michoacán (78%). However, this difference was not statistically significant. Another notable difference was that bilingual speakers had lower rates of proclisis for reflexive verbs when compared to monolingual speakers. The author concludes that while there could be some type of contact effect, differences are too small and should be interpreted cautiously. Gutiérrez is generally in agreement with Silva-Corvalán and Gutiérrez (1995) regarding the impermeability of CP to

2. The groups were categorized similarly to those of Silva-Corvalán and Gutiérrez’s (1995) study, but with the following exceptions: speakers in Group 2 also had at least one parent in Group 1; further, Group 3 included US-born speakers whose parents were of Mexican ancestry and who, by definition, belonged to the second generation (Gutiérrez, 2008, p. 303).

English influence. In the following section, I discuss in greater detail each factor that is relevant to the present study.

2.2 Linguistic factors

2.2.1 Reflexivity

Regarding reflexivity, it has been found that verbs used with reflexive pronouns favor enclisis and non-reflexive verbs favor proclisis (Davies, 1995; Gutiérrez, 2008). One explanation for this pattern is that reflexive clitics often remain attached to the infinitive since they are part of the verb's lexicon (Davies, 1995) (e.g. *levantar(se)* 'get oneself up' would prefer enclisis as in *quiero levantarme* 'I want to get up' whereas simply *levantar* 'get up' would prefer proclisis as in *La quiero levantar* [a la niña] 'I want to get her up [the little girl]'). These studies do not restrain themselves to "true" reflexives (e.g. *se cortó* 'he/she cut himself/herself') but include other types of reflexives such as "obligatory" (*se salió del juego* 'he/she left the game'), "indirect" (*se cortó el dedo* 'he/she cut his/her finger'), and "inanimate subject" (*se quemó el pan* 'the bread got burnt') reflexives (Silva-Corvalán & Gutiérrez, 1995, p. 306).

2.2.2 Non-finite verb

The form of the non-finite verb in relation to CP has also received some attention (e.g. Myhill, 1988; Silva-Corvalán & Gutiérrez, 1995; Torres Cacoullós, 1999; Gutiérrez, 2008). For example, Myhill (1988, p. 238) observed that progressive constructions, such as *estar* + Gerund and *ir* + Gerund had high proclisis rates (89% and 86%, respectively). Additionally, Silva-Corvalán and Gutiérrez (1995) found that proclisis occurred frequently with progressives, particularly with progressive *estar* (92% overall among the three speaker groups). Similarly, Gutiérrez (2008) found that when the non-finite verb was a gerund as opposed to an infinitive, proclisis was favored. This pattern potentially has to do with the grammaticalization of these forms. According to Myhill (1988), progressive meaning has a strong tendency to grammaticalize and grammaticalized forms tend to favor proclisis.

2.2.3 Finite verb and construction

CP is also significantly affected by the particular finite verb being used. For instance, Davies (1995) found that proclisis was frequent with finite forms of *ir* and *querer* but infrequent with *esperar* 'hope' and *intentar* 'try'. Further, Torres Cacoullós and Schwenter (2009) found that constructions such as Future *ir a* + Infinitive, *poder* + Infinitive, and *estar* + Gerund favored proclisis while Movement *ir a*, *querer*, *tener que* + Infinitive, and all other constructions favored enclisis. For instance, 44% of *querer* + Infinitive cases in their study were enclitic vs. only 9% for Future *ir a* +

Infinitive. Myhill (1988) has suggested that the more grammaticalized the construction is as a tense-mood-aspect expression, the more likely it is that proclisis occurs. In other words, for finite verbs that have acquired auxiliary functions (e.g. *estar*), the clitic tends to be preposed. In contrast, finite verbs with more lexical meaning are less likely to be proclitic. This is, in fact, consistent with the patterns found by Torres Cacoulllos and Schwenter (2009) mentioned above. Similarly, both Silva-Corvalán and Gutiérrez (1995) and Gutiérrez (2008) observed higher proclitic rates for grammaticalized constructions (e.g. *estar* + Gerund, *ir a* + Infinitive and *poder* + Infinitive).

2.2.4 Frequency

Construction frequency is also an important factor that conditions variable CP. Schwenter and Torres Cacoulllos (2014a), for example, found that frequent constructions favored proclisis while less common constructions favored enclisis. They state that this pattern occurs because proclisis is related to the chunking together of the finite and non-finite verb. Drawing from Bybee (2010), the authors explain that “[I]n a usage-based view, a consequence of frequent repetition is the chunking of contiguous linguistic units and increasing fusion of the sequence of (erstwhile) units” (Schwenter & Torres Cacoulllos, 2014a, p. 11). Therefore, as periphrastic constructions are repeated frequently, the finite verb tends to fuse together with the non-finite verb (e.g. *estar* fuses with the gerund). It is important to note that frequency is tied to the aforementioned pattern of grammaticalization. For instance, Schwenter and Torres Cacoulllos (2014b) observed that the three most frequent constructions in their data set – *estar* + Gerund, Future *ir a* + Infinitive, and *poder* + Infinitive – were also the most grammaticalized and that these constructions favored proclisis the most. Additionally, they found that while both Motion and Future *ir* + Infinitive constructions were frequent, the latter case was more likely to be proclitic. Consequently, while frequency partially explains CP, Myhill’s (1988) grammaticalization proposal is very much related to frequency and needs to be taken into account upon explaining frequency effects.

2.3 Social factors

Though most CP studies have not considered possible effects of social factors, a few studies explore such variables. For instance, in her study of CP with the verbs *ir* and *querer* in Venezuelan Spanish, Gudmestad (2006) examined socioeconomic class, gender, and age, finding that socioeconomic class and gender were statistically significant factors for *querer*; however, none of the social variables were significant for *ir*. Specifically, speakers from a lower class and female speakers preferred proclisis

for *querer*. Gudmestad hypothesizes that since proclisis is the less conservative form, it may be used more by lower class speakers and less by the upper class. In addition, she notes that linguistic change (from enclisis to proclisis) could explain this pattern since lower class speakers tend to lead change, but that a more likely explanation is that it is a stable social difference. Regarding gender, it was initially hypothesized that women may use proclisis less than men if it is the stigmatized variant. Nevertheless, the pattern found was the opposite and the author concludes that, similarly to socioeconomic class, the gender pattern may be a stable difference rather than a change in progress. For both of the significant social variables, she notes the tentative nature of the results due to a small dataset.

As discussed above, factors such as speaker generation and whether speakers are bilingual or monolingual have been examined in CP studies of US Spanish to test contact effects (Silva-Corvalán & Gutiérrez, 1995; Gutiérrez, 2008). These are precisely the social factors that are employed in the present study. However, since the speaker groups from the present data are slightly different than those of previous studies, an alternative analysis of AOA (discussed below) is carried out. Additionally, the factor of length of residency (LOR) in the US is considered, which was not systematically included in previous CP research. LOR and AOA are very important factors to consider when testing English contact. Particularly, LOR in the US suggests greater exposure to English, and AOA to the US indicates speakers' susceptibility to change. Drawing from Veltman (2000), Otheguy, Zentella, and Livert (2007, p. 779) highlight that older arrivals who speak Spanish more frequently and fluently should show greater resistance to English influence. In their study of subject pronoun expression in NYC, they found that longer LORs correlated with higher frequencies of overt pronouns. Further, they found that younger arrivals, being more susceptible to English influence, demonstrated higher overt pronoun rates than older arrivals, who tended to use less English and whose Spanish was more proficient, thereby making them less vulnerable to contact influence.

Through a variationist analysis of CP using conversational corpus data from Mexican speakers, I will show that CP in Arizona and Georgia Spanish is influenced by the particular construction used and the form of the non-finite verb, as well as external factors such as AOA. I will also show that clitic usage in these regions exhibits similarities to that of monolingual Spanish in Mexico; however, differences in proclisis rates as well as grammatical patterning between Arizona and Georgia speakers are also observed. Finally, I argue that similarities in proclisis rates with monolingual varieties as well as patterns for AOA contradict an English contact hypothesis concerning the varieties examined, lending further support to the argument that CP is impermeable to interlinguistic influence (Silva-Corvalán & Gutiérrez, 1995).

3. Methodology

3.1 The data

Using a variationist sociolinguistic approach, I examined CP among 21 Mexican speakers living in the US using two corpora: *CESA* (Carvalho, 2012-) and a corpus of sociolinguistic interviews conducted in Roswell, Georgia (Wilson, 2013). *CESA* consists of interviews with speakers in the Tucson, AZ area, many of whom were born and/or raised there. The *CESA* data included in the present study consist of eleven speakers (6 females, 5 males), the majority of whom were born and raised in the US (one speaker was raised in Mexico and arrived to the US at age 8) and whose average LOR is 25 years. Additionally, all but one speaker have completed or partially completed some form of post-secondary education. The Georgia data consist of 10 speakers (6 female, 4 male) who are relatively recent arrivals (average LOR = 12.5 years). Their AOAs range from 21–38 years old (average = 27) and their education, which took place in Mexico, ranges from elementary to university level (see Tables 2 and 3).³

Table 2. Speaker demographics (Georgia)

Speaker	City/state of origin	Education	Profession	LOR	AOA
M54Mex	Tampico, Tamaulipas	University	Waiter	16	38
M38Mex	Mexico City, D.F.	University	Owner of clothing boutique	13	25
F36Mex	Mexico City, D.F.	Partial Law school	Owner of clothing boutique	11	25
F39Mex	Veracruz (state)	University	Housekeeping	6	33
M43Mex	Pachuca, Hidalgo	Middle school	Housekeeper	15	28
M44Mex	Veracruz (state)	Elementary	Housekeeper	21	23
F32Mex	Michoacán (state)	Partial secondary school	Housekeeper	7	25
F41Mex	Veracruz	Middle school	Housekeeper	11	30
F33Mex	Guadalajara, Jalisco	Partial high school	Housekeeper	12	21
F38Mex	Tampico, Tamaulipas	Technical school	Housekeeping supervisor	13	25

3. The sample originally included 29 speakers; however, eight of the speakers exhibited categorical or near-categorical CP (i.e. only proclisis, and for two speakers, only enclisis) and were therefore excluded.

Table 3. Speaker demographics (Arizona)

Speaker	Age	Gender	City/state of origin	Education	Profession	LOR	AOA
CESA006	43	Male	El Paso, Texas (raised in Tucson, AZ)	Associate's Degree	Field Service Professional	43	0
CESA007	20	Male	Tucson, AZ	2 years of University	Student	20	0
CESA018	23	Female	Tucson, AZ (state)	Partial University	Translator	23	0
CESA008	55	Female	Corpus Christi, TX (also raised in TX)	Master's	Retired	55	0
CESA003	23	Male	Tucson, AZ (raised in Mexico)	University	Master's student	15	8
CESA020	22	Female	Phoenix, AZ	University	Student	22	0
CESA022	20	Female	Tucson, AZ	Partial university	Translator	20	0
CESA024	20	Female	Tucson, AZ	Partial University	N/A	20	0
CESA025	19	Female	Tucson, AZ	Partial University	Student	19	0
CESA048	20	Male	Tucson, AZ	High School	Greens mower	20	0
CESA044	20	Male	Los Angeles, CA (raised in Tucson, AZ)	2 years of University	Student	20	0

The main dependent variable is CP (proclisis/enclisis), and the independent linguistic variables include reflexivity, non-finite verb form, construction, and frequency of the construction. The three social variables examined are LOR, AOA, and gender.

3.2 Analysis

For the data analysis, I extracted all accusative and dative clitics within periphrastic constructions, including double object constructions such as *te lo voy a mandar* 'I'm going to send **it** to **you**.' I then excluded tokens outside the variable context, which consisted of:

- Invariable enclitic constructions (e.g. *hay que hacerlo* 'one must/has to do it' (**Lo hay que hacer*); *fue difícil adaptarme* 'it was difficult to adapt'): Certain constructions such as *hay que* + Infinitive and *ser* + Adjective + Infinitive do not typically permit proclisis and did not exhibit variation in the present data.
- Invariable proclitic constructions (e.g. *me lleva a trabajar* 'he/she takes me to work'; *la invité a bailar* 'I invited her to dance') since the clitic refers to the

direct object of the finite verb (rather than to the nonfinite verb) and must appear before it.

- c. Conjoined or juxtaposed nonfinite verbs (e.g. *tratas de, de hablar con jóvenes, juntarlos*, ‘you try to to talk to young people, get them together’) since these contexts did not exhibit variation and were all enclitic. Essentially, the nonfinite verb to which the clitic is attached, which in this case is the infinitive *juntar*, appears without an immediately preceding finite form. There is an intervening infinitive (*hablar*) between it and the finite verb to which it is tied (*tratas*).
- d. Constructions with duplicate clitics (e.g. *se puede comunicarse* ‘one can communicate’): These cases were excluded since a clitic is found in both proclitic and enclitic position, and no choice is made one way or the other.

After the exclusions, I was left with 464 tokens for analysis. Regarding the coding of the data, I first coded whether each construction was proclitic or enclitic. Next, I coded for the aforementioned independent linguistic and social variables. In order to determine the significance of each variable as well as the constraints that condition CP, I carried out a multivariate analysis using Rbrul (Johnson, 2009). The next section addresses the coding of each variable in greater detail.

3.3 Coding

3.3.1 Reflexivity

Reflexivity has a binary categorization in the present study (reflexive/non-reflexive) and also includes all types of reflexive clitics, as illustrated below (Example 3 contains an obligatory reflexive clitic).

- (3) ... *quieres, este, involucrarte en ello* (F50,⁴ Roswell, coded as reflexive)
‘... you want, umm, to get involved in it’
- (4) ... *pero creo que todavía lo puedo hacer ...* (007, CESA, coded as non-reflexive)
‘... but I think that I can still do it ...’

3.3.2 Non-finite verb form

This factor also has a binary categorization and was coded as either gerund or infinitive. The examples below illustrate this factor.

- (5) ... *pero ya después se va normalizando* (M43, Roswell, coded as gerund)
‘... but then later it becomes normal’

4. This label indicates the gender and age of the speaker.

- (6) ... *ya podía escribirlo pero ...* (003, CESA, coded as infinitive)
 ‘... I could already write it but ...’

3.3.3 Construction

Following Torres Cacoulllos and Schwenter (2009), I included seven predictor variables for Construction: Movement *ir a*, Future *ir a*, *poder*, *querer*, *tener que* + Infinitive, *estar* + Gerund, and *Other*.

3.3.4 Frequency

Following Schwenter and Torres Cacoulllos (2014a), I coded constructions for which there were fewer than 30 tokens as *less frequent* and those that had 30 or more tokens as *more frequent*. The latter category included constructions such as *ir a*, *poder*, *querer*, *tener que* + Infinitive, and *estar* + Gerund, and the former constructions such as *tratar de* ‘try’, *empezar a* ‘begin’, and *saber* ‘know’ + Infinitive.

3.3.5 Social variables

In the present study, gender was coded as M or F. Both LOR and AOA were coded categorically: LOR (16+ years vs. <16 years), AOA (26+, <26, US-born).

3.4 Predictions

Based on previous findings, I predict the following with regard to CP in the present study:

- a. No significant difference will be observed between US-born and Mexican-born speakers concerning overall clitic frequencies.
- b. Reflexive clitics will disfavor proclisis when compared to non-reflexive clitics.
- c. Gerund forms will favor proclisis.
- d. The following constructions will favor proclisis: Future *ir a* + Infinitive, *poder* + Infinitive, and *estar* + Gerund. However, Movement *ir a*, *querer*, and *tener que* + Infinitive, and all other constructions will favor enclisis.
- e. More frequent constructions will favor proclisis while less frequent constructions favor enclisis.
- f. Neither LOR nor AOA will be significant predictors of variable CP.
- g. The speaker’s gender may play a role in clitic variation for certain constructions, such as *querer* + Infinitive.

4. Results

4.1 Clitic rates

As seen in Table 4, out of 417 total constructions, 281 occurred as proclitic and 136 were enclitic, indicating an overall proclisis rate of 67% for Mexicans in the two corpora.⁵

Table 4. CP distribution in Arizona and Georgia as compared to Mexico City

	Arizona	Georgia	Mexico City (Schwenter & Torres Cacoulios, 2014a)
% Proclitic	71% (164/231)	63% (117/186)	73% (478/652)
% Enclitic	29% (67/231)	37% (69/186)	27% (174/652)

This rate is similar to the rates reported for monolingual Mexicans, although there is variation within Mexico. For example, Michoacán speakers (Gutiérrez, 2008) had a higher proclitic rate (78%) than Mexico City speakers (66%, Davies, 1995; 73%, Schwenter & Torres Cacoulios, 2014a). Nonetheless, both the average (67%) as well as the rates of each of the two regions (Georgia, 63% and Arizona, 71%) fall along the general monolingual range. There is, however, a notable difference between Georgia and Arizona speakers, namely, the proclisis rate for Georgia is substantially lower than that of Arizona.⁶ This actually goes in the opposite direction of what an English-contact hypothesis would predict since Arizona speakers (US-born) show lower enclitic rates than speakers in Georgia (recent arrivals). Next, I discuss the factors that significantly influence CP in the present data.

4.2 Conditioning factors of CP

For the multivariate analysis (*step-up/step down*) in Rbrul, I included all linguistic and social variables mentioned above. Nevertheless, some methodological modifications must be noted. Regarding *construction*, because there were such a low number of tokens ($N = 7$) for Movement *ir a* + Infinitive, I combined this category with Future *ir a* + Infinitive, which resulted in one category (*ir a* + Infinitive). Additionally, since all but one (98%) of the *estar* + Gerund constructions were

5. The initial total ($N = 464$) had to be reduced because the *estar* + Gerund construction barely exhibited variation (98% proclitic) and was excluded.

6. *Corpus* was included in a separate regression model, but was not selected as significant.

proclitic, I removed all cases from the analysis.⁷ In other words, since proclisis was near-categorical in this context and essentially did not exhibit variation, it was excluded. Further, I combined the *tener que* + Infinitive and *Other* categories for *Construction* because of observed overlap of these two categories.⁸ Lastly, I included both speaker and corpus as random effects.

Out of the four linguistic variables analyzed, two of them were selected as significant: *construction* and *non-finite verb form* ($p < 0.01$ for both factors). *Reflexivity* and *frequency*, however, were not significant ($p > 0.05$). *Non-finite verb form* had the most powerful effect (Range = 58), closely followed by *Construction* (Range = 57). Regarding the social variables, AOA was selected as significant but LOR and gender were not. Each of the significant factors will be discussed in the following section. Below I present the overall distribution of proclisis and enclisis for each factor group (see Table 5) and then show the results of the multivariate analysis including the specific constraints for each significant factor group (see Table 6).

Table 5. Frequencies of proclisis and enclisis for each factor group (both regions combined)

Factor group	% Proclitic	% Enclitic
Non-finite verb form		
Gerund	89%	11%
Infinitive	67%	33%
Construction		
<i>ir a</i> + Inf.	89%	11%
<i>poder</i> + Inf.	77%	23%
<i>querer</i> + Inf.	58%	42%
Other	48%	52%
Frequency		
More frequent	74%	26%
Less frequent	49%	51%
Reflexivity		
Non-reflexive	70%	30%
Reflexive	64%	36%

7. Since this construction often has a non-locative (grammaticalized) meaning, it is unsurprising that proclisis is near-categorical; this is very much consistent with Myhill's (1988) proposal.

8. The % proclitic did not descend in order with the factor weights for *tener que* + Inf. and *Other*; the former showed a factor weight of .28 with 45% proclitic while the latter had a factor weight of .25 with 50% proclitic. As revealed by a chi-square test, these two categories were not significantly different from each other concerning proclitic rates ($p > 0.05$). For further discussion of overlap, see Tagliamonte (2012).

Table 5. (*continued*)

Factor group	% Proclitic	% Enclitic
AOA		
US-born	74%	26%
Younger Arrivals	69%	31%
Older Arrivals	48%	52%
LOR		
Longer	73%	27%
Shorter	61%	39%
Gender		
Male	70%	30%
Female	66%	34%

Table 6. Constraint hierarchy for CP (both regions combined)

Factor group	Probability weight	% Proclitic	N	<i>p</i> -value
Non-finite verb form				1.16e-06
Gerund	.79	89	26	
Infinitive	.21	67	391	
RANGE 58				
Construction				2.24e-16
<i>ir a</i> + Inf.	.79	89	109	
<i>poder</i> + Inf.	.62	77	120	
<i>querer</i> + Inf.	.37	58	38	
Other	.22	48	150	
RANGE 57				
AOA				0.00372
US-born	.63	74	211	
Younger Arrivals	.58	69	137	
Older Arrivals	.30	48	69	
RANGE 33				
Speaker (random) Std. Dev	.37			
Corpus (random) Std. Dev	0			

4.2.1 *Non-finite verb form*

In line with Gutiérrez (2008), the present study found that gerunds favored proclisis (probability weight [PW] = .79) while infinitives disfavored proclisis ($PW = .21$). In fact, the percentages are virtually identical in both studies, with 89% of gerunds being proclitic and 67% of infinitives being proclitic (compared to 88% and 68% overall for the three Houston groups in Gutiérrez, 2008). As noted above, the

aspectual feature of these constructions, namely progressive meaning, as well as the grammaticalization of these constructions could be accounting for their favoring of proclisis (Myhill, 1988). Moreover, given that the majority of the gerund tokens in the present study comprise *ir* + Gerund (e.g. *porque como se van acomodando las cosas* [CESA018] ‘because as things get adjusted’; *Me fui adaptando por trabajar en restaurantes* [M44] ‘I gradually got adapted from working in restaurants’) and that this particular construction is also grammaticalized (i.e. commonly has a non-movement meaning), the construction itself could largely be accounting for the observed pattern of proclisis in gerund forms. The other gerund forms observed in the data include *seguir* ‘continue’ + Gerund and *andar* ‘go around’ + Gerund. Additionally, as mentioned above, *estar* + Gerund was discarded from this analysis due to essentially showing categorical proclisis. Interestingly, this suggests that although gerund forms as a whole favor proclisis, there is a relatively greater preference for proclisis depending on the particular gerund construction being used (e.g. *estar* + Gerund favors proclisis more strongly than *ir* + Gerund).

4.2.2 Construction

The constructional effects on CP are also very strong (Range = 57), which agrees with previous research (e.g. Torres Cacoullos & Schwenter, 2009). Concerning the particular construction used, certain finite verbs favored proclisis over others. Specifically, *ir a* + Infinitive and *poder* + Infinitive favored proclisis the most with PWs of .79 and .62, respectively. In contrast, the *Other* category, which included *tener que* + Infinitive as well as other, less frequent constructions (e.g. *tratar de* + Infinitive, *empezar a* + Infinitive), disfavored proclisis (PW = .22), occurring as proclitic only 48% of the time. Lastly, *querer* + Infinitive also disfavored proclisis with a PW of .37. These results are generally consistent with the findings of Torres Cacoullos and Schwenter (2009), particularly for *ir a* + Infinitive, which favored proclisis the most, and both *querer* and *tener que* + Infinitive, which favored enclisis. However, *poder* + Infinitive patterns differently in that it showed a neutral effect in their study (PW = .49), but slightly favored proclisis in the current analysis (.62). Nevertheless, the proclitic frequencies are comparable in both studies (77% and 74%). These constructional effects are also in line with the findings of both Silva-Corvalán and Gutiérrez (1995) and Gutiérrez (2008), who observed the highest rates of proclisis for constructions such as *estar* + Gerund, *ir a* + Infinitive and *poder* + Infinitive. A potential explanation for these findings has to do with Myhill’s (1988) observation that more grammaticalized forms favor proclisis. That is, the more grammaticalized a construction is as a tense-mood-aspect expression (i.e. the verb has acquired an auxiliary function), the more likely it is that proclisis occurs. When its meaning is less grammaticalized (i.e. more lexical), however, proclisis is less likely to occur. The abovementioned patterns shown in the present data for *ir*

a + Infinitive (more grammaticalized) and *querer* + Infinitive (less grammaticalized) support this explanation.

It also must be highlighted that these constructional effects are most likely tied to the frequency of the constructions. As highlighted above, the study of Schwenter and Torres Cacoullós (2014b) revealed that the three most grammaticalized constructions (*estar* + Gerund, Future *ir a* + Infinitive, *poder* + Infinitive) were also the most frequent constructions in their data. The same is true for the current data ($N = 102$ for Future *ir a*; $N = 120$ for *poder*), although, as mentioned above, *estar* + Gerund was excluded due to near categoricity of proclisis. Therefore, I suspect that frequency plays an important role despite it not being selected as significant in the multivariate analysis.⁹

4.2.3 AOA

The third variable that had a significant influence on CP was AOA. Specifically, US-born speakers, who all came from the Arizona corpus, most strongly favored proclisis with a PW of .63, producing proclisis 74% of the time. Those who were born in Mexico and who arrived to the US at a relatively young age (before age 26), also favored proclisis, although to a lesser degree ($PW = .58$, 69% proclitic). However, older arrivals to the US (26+ years old) disfavored proclisis ($PW = .30$), with only 48% of their constructions being proclitic. This general finding contradicts an English-contact hypothesis since it is the older arrivals that favor enclisis the most and not the younger arrivals. As stated above, younger arrivals may be more susceptible to external influence than older arrivals. Nevertheless, the present findings point in the opposite direction. This pattern is similar to what was found by Silva-Corvalán and Gutiérrez (1995). In their analysis, speakers who were born in the US or arrived before age six generally showed higher rates of proclisis than speakers who arrived to the US after age 11. Gutiérrez (2008, p. 304), however, found no significant differences in proclisis rates among the three generation groups in his study (70%, 72%, 72%). Thus far, it is unclear why younger arrivals would use significantly more proclitic constructions than older arrivals.

4.2.4 Comparing constraints between the two varieties

In order to determine if there were any differences regarding the variable and constraint hierarchies for CP between Arizona and Georgia speakers, I carried out independent Rbrul analyses for the two data sets and, in fact, observed some

9. An individual chi-square test for Frequency revealed that it does in fact have a significant effect on CP ($p = 2.155e-06$).

differences (see Table 7 below).¹⁰ For instance, whereas Construction has the highest magnitude of effect for Arizona, it is the non-finite verb form that has the strongest effect for Georgia. Further, there is a slight difference in the constraint ranking for Construction between the two varieties: while both *tener que* + Infinitive and *Other* disfavor proclisis in both data sets, the former is more strongly disfavored for Georgia speakers (33% proclisis for Georgia compared to 54% for Arizona). Lastly, while LOR was not significant for Arizona speakers, it was selected as significant for Georgia speakers. However, all these results are tentative and should be interpreted with caution due to the low number of tokens in each of the data sets.

Table 7. Comparison of constraint hierarchies between Arizona and Georgia

Arizona				Georgia			
Factor group	PW	% Proclitic	N	Factor group	PW	% Proclitic	N
Construction				Construction			
<i>ir a</i> + Inf.	.84	91	56	<i>ir a</i> + Inf.	.83	87	53
<i>poder</i> + Inf.	.67	81	73	<i>poder</i> + Inf.	.67	70	47
<i>querer</i> + Inf.	.45	62	29	<i>Other</i>	.27	49	68
<i>tener que</i> + Inf.	.32	54	24	<i>tener que</i> + Inf.	.22	33	18
<i>Other</i>	.19	49	49				
RANGE 65				RANGE 61			
Non-finite verb form				Non-finite verb form			
Gerund	.75	85	13	Gerund	.85	90	10
Infinitive	.25	71	218	Infinitive	.15	59	169
RANGE 50				RANGE 70			
				AOA			
				Younger	.72	73	117
				Older	.28	48	69
				RANGE 44			
				LOR			
				Longer	.67	64	25
				Shorter	.33	63	161
				RANGE 34			
Speaker (random) Std. Dev .55				Speaker (random) Std. Dev 0			

10. For the analysis of the Georgia data, I combined *querer* + Infinitive with *Other* due to overlap between the two categories as well as the low number of *querer* + Infinitive tokens ($N = 9$). In addition, AOA was not included in the Arizona analysis since all speakers were US-born.

5. Discussion

Is English contact an influential factor on variable CP in the communities of Arizona and Georgia? The above findings, although tentative, do not seem to indicate such influence. First, there were no substantial divergences in proclitic rates from monolingual Mexican varieties, that is, a significant decrease in proclisis was not observed in either of the US communities individually or both communities as a whole. Moreover, when comparing the proclisis rates between Arizona and Georgia, it is not the case that Arizona speakers, being born in the US and having more contact with English, exhibit lower rates than Georgia speakers. In fact, the results are the exact opposite (71% for Arizona, 63% for Georgia) and point in the opposite direction of an English-contact hypothesis. Further, when considering the social factors of AOA and LOR, these findings present further evidence against English influence: first, LOR was not a significant factor at all regarding clitic variation (although it was for Georgia individually, but these results are very tentative due to a small data set); second, AOA was a significant factor, but the results were opposite of what an English-contact hypothesis would predict. Younger arrivals and US-born speakers favored proclisis while older arrivals to the US favored enclisis. There is no clear reason at this time for these particular patterns, but it is clear that they do not exhibit clitic use that favors English influence.

6. Conclusion

In this paper, I have attempted to describe the behavior of variable object CP in the Spanish of Georgia and Arizona, regions which had previously not been studied with regard to this phenomenon. Through a variationist sociolinguistic analysis of the factors contributing to the position of clitics in these particular varieties of Spanish, I have been able to answer important questions and draw some conclusions. First, I was able to determine the overall rates of clitic use in these two regions and to compare them with other Mexican varieties. Although there seems to be some variation among monolingual Mexican Spanish, the two varieties of US Spanish examined in the present analysis still fall within the general frequencies of proclisis (63% for Georgia, 71% for Arizona) and do not seem to differ substantially from Spanish in Mexico in general. For example, the rates are comparable to those reported in Mexico City (Davies, 1995; Schwenter & Torres Cacoullós, 2014a) and Michoacán (Gutiérrez, 2008). There was somewhat of a lower proclisis rate, however, observed in Georgia as compared to Arizona. It is not clear what these patterns suggest, but concerning contact-induced language change due to English, these differences trend in a direction that does not lend support for such a hypothesis

given that Arizona speakers, being born in the US, actually exhibit higher rates of proclisis than Georgia speakers.

Second, I have found that the significant language internal and external factors, from strongest to weakest, that constrain CP for Arizona and Georgia overall are the following: form of the non-finite verb used, the particular periphrastic construction used, and the speaker's AOA to the US. The relative frequency of the construction and reflexivity, however, were not found to be significant. These findings concerning the relative impact of independent factors are only partially consistent with previous studies since both reflexivity and frequency were found to be significant by other researchers (Gutiérrez, 2008; Schwenter & Torres Cacoullós, 2014a). Further, the above-mentioned frequency patterns as well as the findings for AOA and LOR of the speakers lend support to Silva-Corvalán and Gutiérrez's (1995) argument that variable CP is resistant to external language change. Moreover, I have observed some differences in the independent factors conditioning clitic use between the two regions such as the magnitude of effect for construction and non-finite verb form as well as differences in the constraint hierarchy for construction. However, due to such a small data set, these findings are tentative.

While useful findings were obtained from this study, there were also some limitations. Future research should employ a larger data set and also take into account additional linguistic variables such as person/number, animacy, and priming. Additionally, it would be useful for future studies to employ a more balanced speaker sample regarding levels of education: While speakers from the Georgia data had a wide range of education levels, the Arizona speakers' levels of education were not representative of the Spanish-speaking community since nearly all completed (or partially completed) post-secondary education. Furthermore, considering information concerning the speakers' English proficiency, frequency of use, and amount of exposure to the language would be very beneficial for future research. In sum, incorporating a wider range of variables as well as a larger and more balanced sample of speakers would be valuable for obtaining a more in-depth and complete picture of clitic usage in US Spanish.

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Variable negative concord in Brazilian Portuguese

Acceptability and frequency

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We provide empirical evidence that colloquial Brazilian Portuguese (BP) is a variable negative concord language, which allows negative indefinites (NIs) to occur in postverbal position without a preverbal negative licensor, as in *Vi nada ontem* ‘I saw nothing yesterday.’ The results of an online survey ($N = 443$) distributed via Facebook show that speakers’ acceptability judgments toward the lack of negative concord in BP are closely connected to the frequency of the individual NIs, and in particular to the frequency of V + NI collocations. Speaker judgments are also sensitive to the type frequency and token-type ratio of individual NIs. We conclude that variable negative concord in BP is paradigmatically constrained by the identity of the NI in question.

Keywords: Brazilian Portuguese, negation, negative concord, morphosyntactic variation, frequency

1. Introduction

Negative concord (NC) is the phenomenon whereby multiple negative words (such as *never*, *nothing*, *no NP*, *nobody*, and their cross-linguistic equivalents) in the same sentence are interpreted as expressing a single negation.¹ Standard examples of NC are given in (1), from Portuguese, as they would be rendered in both Brazilian (BP) and European (EP) varieties:

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- (1) a. A menina não come nada no jantar.
 the girl not eats nothing in:the dinner
 ‘The girl doesn’t eat anything at dinner’
 b. Os meus vizinhos **nunca** abrem a porta para **ninguém**.
 the my neighbors never open the door for nobody
 ‘My neighbors never open the door for anyone’

In (1) the negative indefinites (NIs; cf. Haspelmath 1997; Penka 2011) *nunca* ‘never’, *nada* ‘nothing’, and *ninguém* ‘nobody’ are interpreted as conveying only one negation, instead of two. In (1a), the postverbal NI *nada* co-occurs with preverbal *não* which “licenses” the postverbal negative. In (1b), there are two NIs, one in preverbal (*nunca*) and one in postverbal (*ninguém*) position, and again there is a licensing relation such that the former permits the occurrence of the latter, and if *nunca* were removed then the sentence would (at least normatively) be considered ungrammatical. NC is therefore distinct from the phenomenon of double negation (DN), wherein a sentence with two negatives is interpreted literally as in logic, and one of the negatives “cancels out” the other negative, as in the English example in (2).²

- (2) The girl never eats nothing → ‘The girl (always) eats something’

Languages are typically classified as either NC or DN, even though there is some inaccuracy inherent in such binary classifications. Thus, English, or at least standard varieties of English, are considered to be DN, and when NC occurs in this language it is widely considered to be non-standard and characteristic of rural and/or uneducated speakers, despite the fact that speakers of standard varieties of English have no problems interpreting NC when they hear it or read it. By contrast, languages like Portuguese, Spanish, or Italian are considered NC languages and are not typically considered to allow DN readings in any context. In work on Romance negation, for instance (cf. de Swart, 2010), there is no mention of the possibility that NC does not hold across-the-board for any dialect of Portuguese.

Following Giannakidou (1998), NC languages can be further classified into having “strict” or “non-strict” concord. Strict NC languages require that negative words be accompanied by another negative, such as the canonical sentence negator (e.g. *não* in Portuguese or *no* in Spanish), in order to be licensed at the sentence level. In other words, when a negative indefinite occurs in a sentence in a strict NC language, it must co-occur with another negative word, no matter where the negative indefinite occurs in the sentence structure. Examples of these languages are

2. Clearly, (2) could also be understood as NC, and is used and interpreted as such by many speakers of non-standard varieties of English (cf. Labov 1972a). In order to ensure the DN reading, a focal pitch accent would be placed on the initial syllables of both *never* and *nothing*.

Romanian and Greek. On the other hand, non-strict NC languages like Portuguese (3) and Spanish (4) show a hybrid behavior, whereby a NI in preverbal position does not require (and indeed cannot co-occur with) an additional preverbal licenser, but requires this licenser when the NI occurs in postverbal position. The judgments given for both Portuguese and Spanish are in accordance with the rules of normative grammar.

- (3) a. Nada (*não) aconteceu aqui ontem
 nothing (*not) happened here yesterday
 ‘Nothing happened here yesterday’
 b. *(Não) aconteceu nada aqui ontem
 ‘Nothing happened here yesterday’
- (4) a. Nada (*no) ocurrió aquí ayer
 Nothing (*not) occurred here yesterday
 ‘Nothing happened here yesterday’
 b. *(No) ocurrió nada aquí ayer
 ‘Nothing happened here yesterday’

The explanation for this asymmetrical behavior is standardly attributed to Jespersen’s (1917; cf. Horn 1989) “Neg-first” principle, which states that in a negated sentence the negative element should appear as early as possible, and particularly before the finite verb. Thus, when the negative indefinite as in (3b) and (4b) occurs in postverbal position, it is necessary that it co-occur with the preverbal negative in order to license its grammaticality. As was also noted by Jespersen (1917) and by many others since, however, the Neg-first principle is at odds with cyclical tendencies by which preverbal negatives are first strengthened by postverbal elements and then lost (cf. spoken French), thereby violating Neg-first. While Jespersen was referring mainly to sentential negation in his description of this cycle (now widely known as Jespersen’s Cycle; cf. Dahl 1979), it also applies to NC or lack thereof.

In a recent paper, van der Auwera and Van Alsenoy (2015) classify the myriad ways that languages can display NC, extending the discussion beyond the binary strict/non-strict division proposed by Giannakidou (1998) and adopted by most authors since. They go on to distinguish NC from what they call Negative Quantification (NQ). Diachronically, NQ is a logical next step past NC, in that postverbal negative words in NQ can occur without a preverbal licenser, i.e. they can now express negation on their own without the aid of any preverbal negative element. In their typology, therefore, Standard English is a clear example of a language showing NQ:

- (5) I have read **nothing** on this topic before.

The negative indefinite *nothing* in English can occur in postverbal position as in (5), without a preverbal negative element to license its occurrence. The same holds for French. As van der Auwera and Van Alsenoy (2015) note, as syntagmatic patterns, NC and NQ can actually both be found in one and the same language. And indeed, we know that many speakers of English around the world allow not only the normative sentence in (5), but also its nonstandard NC version *I haven't read nothing on this topic before* (cf. Labov 1972a) as well as others. This, we will argue, is a relevant finding for the case of colloquial BP, which permits negative indefinites in postverbal position both with and without a preverbal negative licenser.

In this paper we place our primary focus on the paradigmatic side of the NC coin, which nevertheless has implications for the syntagmatic differences and regularities that have already been presented in the literature. Specifically, we show that lack of NC in BP is not an all-or-nothing phenomenon, but rather a variable one (Section 2). Indeed, there is substantial gradience in speaker acceptance of NC in BP, as shown by the results of an online survey of native speakers that we conducted (Section 3). This gradience, furthermore, is tied closely to two correlational measures of productivity: the first of these comes from corpus frequencies taken from the *Corpus do Português*, and in particular to the postverbal frequency of individual negative words (Section 4). The second measure is the token-to-type ratio of the combinations of verb and negative word when the latter occurs in postverbal position (Section 5). The resulting picture of variable NC in BP is one that supports a usage-based characterization of this grammatical phenomenon (cf. Bybee 2007, 2010), and specifically one that suggests that the contexts in which speakers find lack of NC more acceptable are predictable based on the frequency and productivity of V + NI in NC contexts. Our overarching goal is to provide a clearer picture of the paradigmatic variability involved in (lack of) NC, thereby complementing the well-known syntagmatic variation in NC found cross-linguistically.

2. (Lack of) negative concord in Brazilian Portuguese

According to all grammars of Portuguese, no matter which of its main varieties (European or Brazilian) constitute their descriptive focus, the lack of NC is ungrammatical. Even Perini (2002), which is otherwise a very “liberal” reference grammar in the sense of making reference to a wide range of colloquial phenomena in spoken BP, does not mention the possibility of lack of NC. Among linguistic studies, to our knowledge only Fonseca (2004) and Biberauer and Cyrino (2009) mention the possibility of lack of NC, though in both cases this is done merely in passing. We have found, however, that in colloquial spoken/written BP (e.g. in conversations among friends and on social media), postverbal NIs are found quite frequently

both with “normative” preverbal licensing, as in Example (6a) from Twitter,³ and also non-normatively without preverbal licensing, as in (6b) from a Facebook post.

- (6) a. Depois de duas semanas sem celular, acho um iPhone 5? Pra que? Não serve pra **nada** essa merda ...
(Twitter, @GustavooMoraes_, 7-March-2015)
‘After two weeks without a cell phone, I find an iPhone 5? What for? That piece of shit isn’t worth anything ...’
- b. De que adianta esse icloud se não consigo acessar minhas fotos! serve pra **nada** essa merda
(Facebook post by a university professor, 7-March-2015)
‘What’s the use of this iCloud if I can’t access my photos! That piece of shit isn’t worth anything’

As these two examples show, a postverbal NI like *nada* can occur not only with or without preverbal licensing (such as that by *não* ‘not’ in [6a]), but it can also occur in exactly the same constructions with the same verb. This is important, since it could possibly be the case that the lack of negative concord as in (6b) occurs only as a feature of certain fixed phrases, but that is not the case. Additional examples with *nada* ‘nothing’ and other NIs are shown in (7) and (8), all of which have been taken from Twitter:

- (7) a. **fiz nada** hoje só dormir
‘I did nothing today only sleep’ @wesleyassis00
- b. **Beije ninguém** ainda
‘I’ve kissed nobody yet’ @aleemeneses_
- c. Tenho amigos no twitter, mas aqui na cidade **tenho nenhum**
‘I have friends on Twitter but here in the city I have none’ @aleemeneses_
- (8) a. **Sei quase nada** de inglês e o povo me pedindo aula ...
‘I know almost no English and everyone asking me for help’ @_ananatal
- b. Não assisto novelas, **entendo nada** q esse pessoal tuita
‘I don’t watch soap operas, I understand nothing that those people tweet’ @isapiresr
- c. **entendo nada** de signo mas, por experiência, escorpião nasceu pra ser otario
‘I understand nothing about horoscopes but, from experience, scorpions were born to be stupid’ @vitordhd

3. We have chosen to leave users’ Twitter handles with the corresponding examples, insofar as this information is publicly available and easily findable via a Twitter search. Identifying information from Facebook, however, has been deleted, since this information is not necessarily available to the public at large.

Examples like these are easy to find on Twitter, which permits advanced searches where it is possible to exclude certain words in the search query. As a result, it is feasible to search for a particular NI in individual tweets while at the same time excluding other co-occurring negatives. The problem that we encountered when performing our searches, however, is that since the tweets that comprise the database in Twitter are not tagged for part of speech, the only way to carry out a search for lack of NC is by searching for **specific combinations** of verb plus NI (e.g. *fiz nada* 'I did nothing'). Unfortunately, then, it is impossible to collect all possible tweets or even a delimited subset thereof including both NC and lack of NC tokens. This shortcoming means that a variationist study, which must respect the Labovian Principle of Accountability (essentially, that all variants of a linguistic variable must be counted in quantitative analysis, see Labov 1972b), is not currently possible for NC in Twitter, which is by far the most fertile ground for encountering occurrences of the lack of NC.

Thus, while Twitter, along with naturally-occurring conversations, provided empirical verification of the existence of the phenomenon of lack of NC in BP, it could not serve as our only data source for this study. Although there are many existing conversational corpora of BP, these were also inadequate for our means, since nearly all of them consist of classic sociolinguistic interview formats, where an interviewer is asking an interviewee a series of questions, with no prior relationship holding between interviewee and interviewer. In addition, the 45 million word online *Corpus do Português* also lacks language from suitable registers, styles, or genres. Lack of NC is highly colloquial and as a result it is also a linguistic variable in BP found often in in-group communication, such as that between friends and family. Such contexts are difficult if not impossible to come across in existing computerized corpora of BP.

3. Online survey of the acceptability of lack of NC

As a result of the difficulties encountered while trying to compile a corpus of lack of NC data in BP, we decided to investigate the acceptability of lack of NC from a different angle. We took examples culled from Twitter, such as those in (7) and (8) above, and modified them when necessary (e.g. to delete names or change spelling), in order to create an online survey distributed through Facebook using the social networks available to the authors on this platform. The survey was built in Google Forms and included 15 different sentences that respondents rated for acceptability on a Likert scale from 0 (least acceptable) to 6 (most acceptable). Respondents were instructed not to pay attention to prescriptive norms and instead rate the sentences according to how acceptable they found them in everyday speech. Relevant to the

discussion below, this method of survey distribution resulted in three main regional groupings of speakers: Northeastern Brazil, São Paulo (both city and state), and Rio Grande do Sul (mainly from in and around the city of Porto Alegre). The difficulty of obtaining a fully diversified sample of lack of NC from Twitter did not mean that we were not able to derive some clear generalizations from the data that we did collect. It was abundantly obvious, for example, that *nada* was the NI that occurred in postverbal position most often in tweets that lacked a preverbal negative. At the same time, examples of *nunca* without a preverbal negative licenser were extremely rare, while tweets containing *ninguém* and *nenhum* without NC were more common than those with *nunca* but considerably less frequent than those with *nada*.

From Davies' *Corpus do Português* (corpusdoportugues.org), we obtained frequency information for the four NIs in BP included in our analysis: *nada* 'nothing'; *ninguém* 'nobody'; *nenhum(a)* 'no X'; *nunca* 'never'. We also included three distinct measures of frequency. First, we determined the overall frequency of each NI in the Brazil section of the *Corpus*. Second, we found the frequency of the collocation of each NI + V, i.e. the frequency of the NI in preverbal position. Complementing this measure, we also determined V + NI frequency, i.e. the frequency of the NI in postverbal position. Importantly, this last measure of postverbal NI frequency was calculated independently of the frequency with which each NI occurred with or without a preverbal negative element. Since there are very few clear cases of lack of NC in the *Corpus do Português*, it can be safely assumed, however, that the frequency measure is nearly exclusively based on the NI in cases of normative NC.

The three frequency measures are shown in graphical form in Figure 1 below. All three measures have been normalized to frequency per million words in order to facilitate comparison among the different expressions. Among the NIs, in terms of their individual frequency, *nada* has by far the highest overall frequency per million, followed by *nunca*, *nenhum(a)*, and *ninguém*. As regards the frequency of the collocation of NI + verb, *nunca* is the most frequent, followed by *ninguém*, *nada*, and *nenhum(a)*. Lastly, for the case of verb + NI collocations, *nada* is once again by far the most frequent of the four NIs, followed in order by *nenhum(a)*, *ninguém*, and *nunca*.

As we will show in detail below, there are clear patterns obtaining between BP speaker judgments of the acceptability of the lack of NC and frequency measures, especially the frequency of verb + NI collocations as found in the *Corpus do Português*. But some of the other patterns are also intriguing and merit more comment. For instance, when compared with the other NIs, the temporal adverb *nunca* rarely occurs in postverbal position, even though there is no grammatical stipulation against its appearance in that syntactic slot: both *Eu nunca assisto filmes de terror* and *Eu não assisto nunca filmes de terror* (both meaning 'I never watch horror movies') are perfectly grammatical sentences in Portuguese. In an attempt

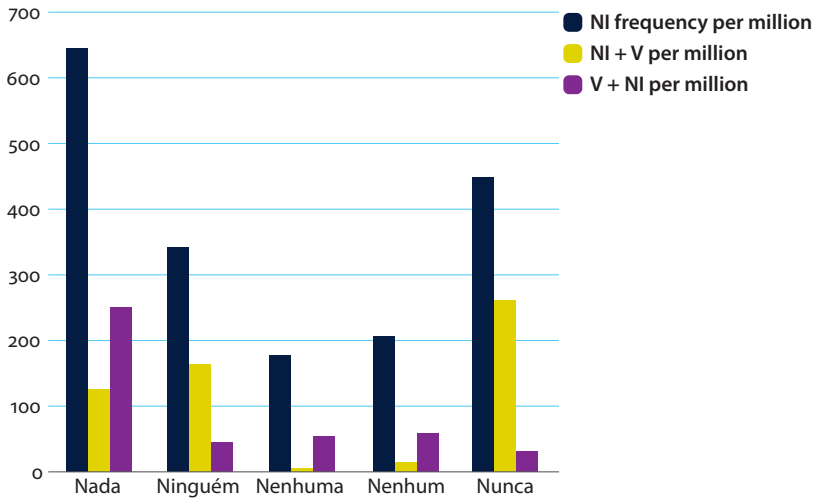


Figure 1. Three frequency measures, per million words

to explain this clear asymmetry, we decided to look as well at the frequency of the likewise temporal adverb *sempre* ‘always’. Although *sempre* is not an NI, we hypothesized that it might show the same asymmetry between preverbal and postverbal position as its negative counterpart *nunca*, given that both are temporal adverbs and, in addition, are antonyms of each other. This hypothesis was not borne out by the data, however, which showed that *sempre* occurs at nearly equivalent rates per million words in both preverbal (266.60 per million words) and postverbal (259.34 per million words) positions. The extremely low postverbal frequency of *nunca*, then, appears to be a unique feature of this particular NEG-word, which instead shows a strong preference for preverbal position.

4. Results: Acceptability and postverbal frequency

Our overall results included data from 443 respondents, of whom 296 (67%) were female and 147 (33%) were male. Since each respondent read and gave a rating for 15 sentences without negative concord, this means that we ended up with a total of $443 \times 15 = 6645$ total ratings. Note that we did not include any examples with NC, since we felt that such “normative” examples would potentially bias the respondents against the examples that did not contain NC. While it could be argued that ratings of normative examples would have potentially provided a baseline for comparison with sentences lacking NC, we felt that that benefit was far outweighed by the potential priming of normative grammatical rules that could have jeopardized

speaker judgments of the non-NC sentences. We have no reason to believe that any sentence with NC would be considered anything less than perfectly grammatical by BP speakers, and there is likewise no prior mention of varying judgments in the literature with regard to NC (or lack of NC, for that matter).

In Figure 2 below we provide the raw mean ratings for each of the NIs included in the online survey. Recall that these ratings were made using a Likert scale ranging from 0 at the least acceptable end to 6 at the most; every sentence in the survey received at least one 0 and one 6 rating. As can be seen, there are two clear endpoints for these ratings, constituted by *nada* at the high end and *nunca* at the low end. The other two NIs, *ninguém* and *nenhum(a)* (note that here *nenhum* and *nenhuma* are collapsed into one, due to a lack of significant differences between them), are found in between these two endpoints.

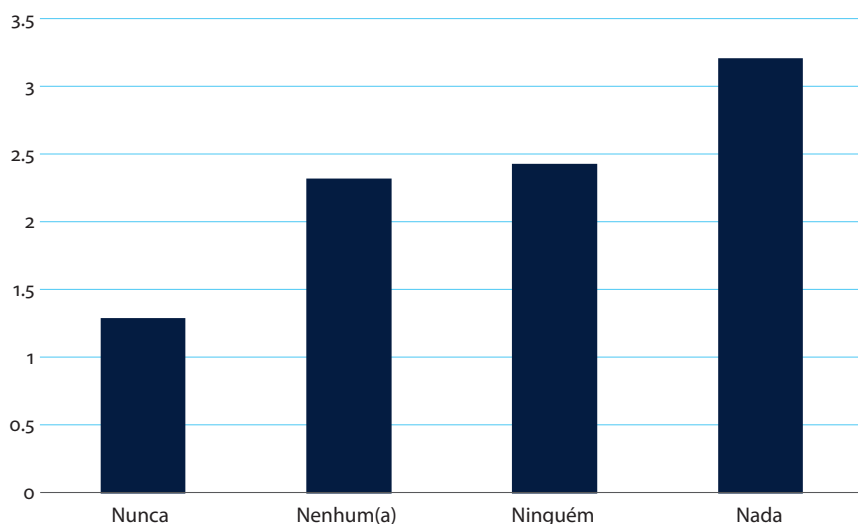


Figure 2. Average acceptability rating, by NI

In order to account for possible respondent variation in use of the scale (cf. Gravano et al. 2008; Schütze & Sprouse 2014), individual ratings were normalized using z-score transformation. As noted by Schütze and Sprouse (2014), z-score transformation is an important part of any analysis using a Likert-type scale, since speakers may sometimes only use part of the scale (e.g. only the range of 3–5), may score some class of items higher or lower than others, or they may systematically give either high or low scores relative to other speakers. Thus, by transforming the scores so that they are all effectively on the same scale we have ensured comparability among all the pairings of speakers and ratings.

In Figure 3, we provide the mean normalized ratings for the four NIs examined in our study. Once normalized as z-scores, the neutral mean rating for these results becomes zero, and a maximally positive or maximally negative mean rating is set at one or negative one, respectively. Any deviations from the neutral rating are shown as either greater than or less than zero (in Figure 3, as either above the zero line or below it). As can be seen, among the four NIs only *nada* received an overall positive normalized mean rating when averaged across the respondents. Both *ninguém* and *nenhum(a)* received marginally negative normalized mean ratings, while *nunca* received by far the worst overall average normalized ratings, at approximately -0.9 . Thus, while all four NIs are attested on Twitter and in colloquial conversations as occurring both with and without NC (though obviously not with the same frequency or productivity), respondent ratings of their acceptability with lack of concord are extremely diverse, showing clear asymmetries in judgments among the NIs in non-NC contexts.

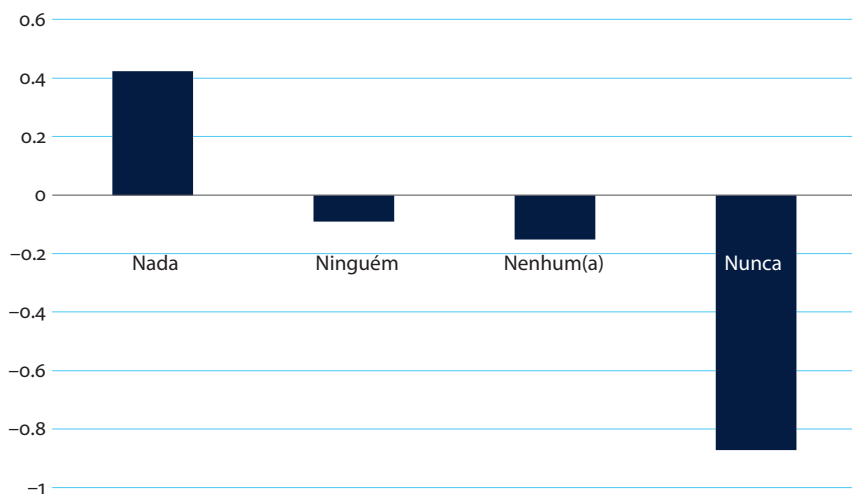


Figure 3. Mean normalized rating by NI

In order to test the statistical significance of the asymmetries between the NIs under analysis, both non-normalized (raw) and normalized (z-score) ratings were compared using Welch's t-tests in R. The results showed that in each case (non-normalized and normalized) the mean rating of *nada* (non-normalized mean rating 3.19) was significantly different from the respective mean ratings of *ninguém*, *nenhum(a)*, and *nunca* at the $p < .01$ level. Likewise, the mean rating of *nunca* (1.29) was significantly different from the respective mean ratings of *nenhum*, *ninguém*, and *nada* at $p < .01$. However, the mean rating of *ninguém* (2.42) was not significantly different ($p = .08$) from that of *nenhum(a)* (mean rating 2.31).

The boxplot in Figure 4 below provides another way to visualize the significant differences obtaining among the average ratings of the different NIs included in our survey. Note again that both *nada*, at the high end of the average ratings, and *nunca*, at the low end, have average ratings that display a statistically significant difference when compared to those of the other NIs. This is shown in the boxplot by the lack of overlap between the notched areas of these two NIs and the others. In the middle of the plot, the three NIs *nenhum*, *nenhuma* (which elsewhere has been collapsed with *nenhum* due to their lack of statistically significant differentiation), and *ninguém*, show no significant differences between their average ratings, as illustrated by the overlapping notched areas of each of these NIs.

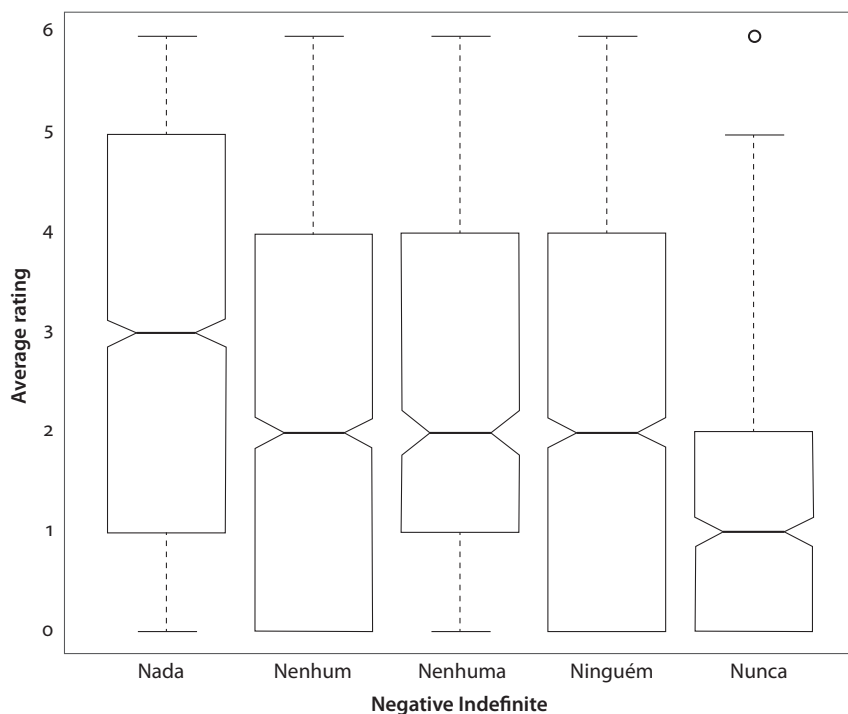


Figure 4. Average rating by individual NI

In Figures 5, 6, and 7, we provide boxplots showing the patterns that emerge between the three frequency measures presented in Figure 1 above. Table 1 is provided first as an aid for reading the boxplots, since the latter have only the frequencies per million words displayed on the x-axis. But note that the numbers in Table 1 correspond to the bars in Figure 1 above. As can be seen, there is a clear pattern obtaining between the frequency per million of V + NI collocations on the x-axis and the average rating of the NIs on the y-axis in Figure 5. At the far left end of

Figure 5 we find *nunca* with a relatively low frequency per million of 31.15, which contrasts with *nada* on the far right end and its relatively high frequency of 250.38. In between, from left to right, we find *ninguém*, *nenhuma*, and *nenhum*, which again show no significant differences in overall rating. In stark contrast to the orderly pattern in Figure 5, neither the frequency of NI + V collocations in Figure 6 nor the frequency of the individual NIs themselves in Figure 7 offer clear patterns with respect to speaker ratings of the survey sentences lacking NC.

Table 1. Frequencies per million words, by NI

NI	NI	NI + V	V + NI
<i>Nada</i>	645.36	125.99	250.38
<i>Ninguém</i>	342.14	164.10	43.89
<i>Nenhuma</i>	177.74	5.08	54.14
<i>Nenhum</i>	205.80	13.94	59.21
<i>Nunca</i>	448.62	260.93	31.15

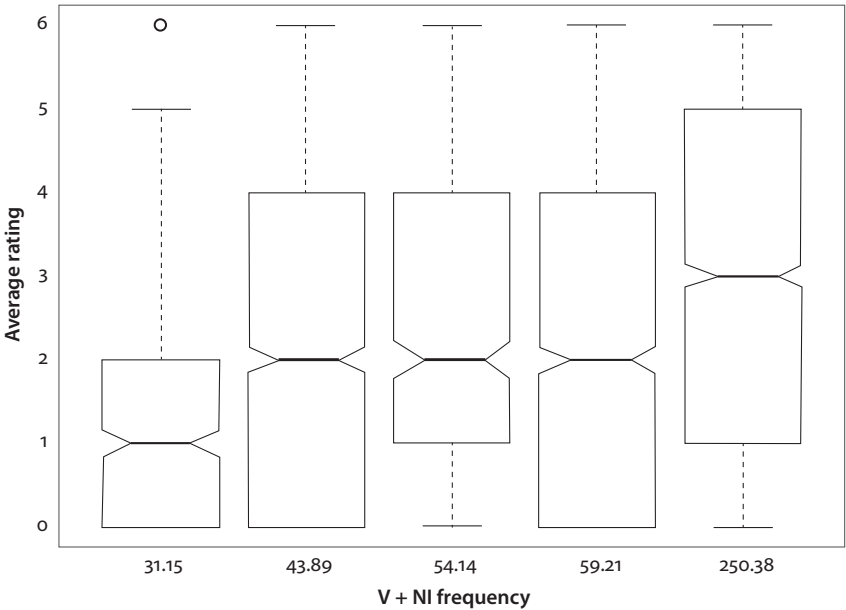


Figure 5. Average rating by V + NI frequency per million

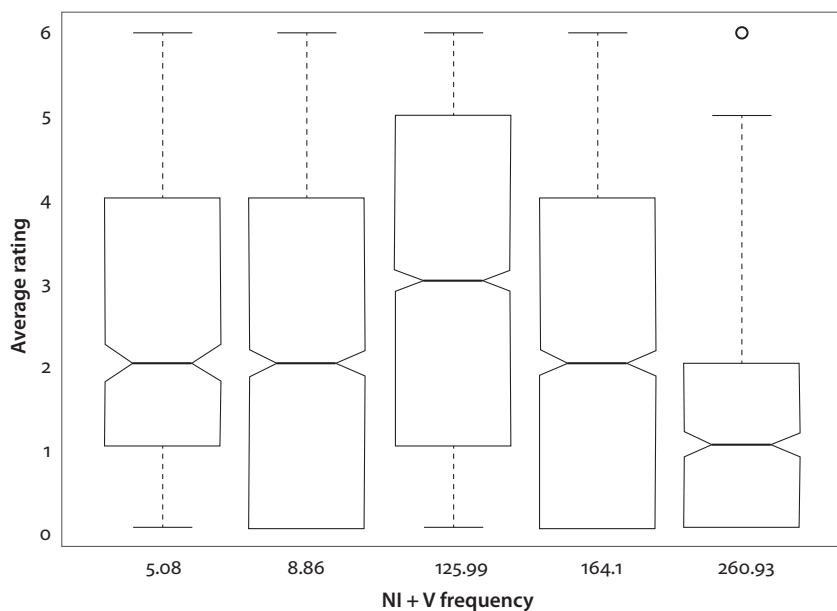


Figure 6. Average rating by NI + V frequency per million

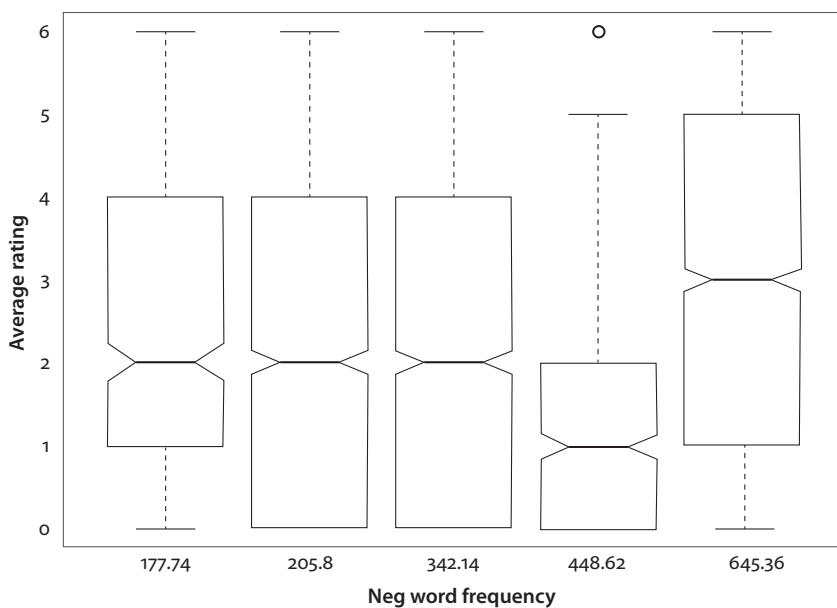


Figure 7. Average rating by NI frequency per million

Although it is tempting to interpret both the existence of the lack of NC in BP and also the patterns of acceptability in our survey as indicative of change in progress away from an NC language and toward an NQ language (cf. van der Auwera and Van Alsenoy 2015), the data from different age groups in the survey do not bear out this supposition in the least. Indeed, there were no significant differences between respondent age groups no matter how these were grouped together. Perhaps even more surprisingly, there were likewise no statistically significant differences between speakers with differing levels of education, or differences according to the (self-reported) sex of the speaker. A lack of significant differences for any of these social factors does not, in and of itself, mean that there is no ongoing change with regard to NC; it may simply be the case that the change is advancing at the same rate among the different social groups in question. But while this is a possible scenario, it is more likely that the variable lack of NC in BP is actually a case of stable variation, and speakers avail themselves of lack of NC on occasion in colloquial speech and/or writing.

Now, exactly what these “occasions” are is a question that we are still investigating, but the consensus view among the native speakers that we have queried is that they consider the non-NC version to be more “emphatic” than the NC version. Thus, in a minimal pair such as *Hoje não dormi nada* and *Hoje dormi nada* (both meaning ‘Today I didn’t sleep at all’), speakers invariably responded when asked that the second member of the pair is more “emphatic.” When pressed further on what exactly this means, given the non-explanatory value of an intuitive notion of “emphasis” (cf. Schwenter 2003), they said that in the second case it is more likely that the speaker had literally not slept at all during the day of the utterance. By contrast, the first, NC version, is compatible with a situation in which the speaker had slept at least some length of time, but a relatively small amount compared to some norm (note that the NC version is also compatible with the situation of having literally not slept at all). We find this interpretation to be of great interest for scholars of negation, since it is traditionally believed (since at least Jespersen 1917) that any reinforcement of sentential negation with additional lexical or morphological material (as in NC) necessarily equates to a more “emphatic” interpretation. These native-speaker intuitions suggest otherwise, and indeed indicate that what is relevant may be that the non-canonical version without NC is interpreted as a pragmatic deviation from the “default” interpretation associated with normative NC in BP. Though only tentative at this point, since we did not analyze relevant speaker intuitions systematically, the issue of possible distinct interpretations of the NC and non-NC versions is one that we hope to return to in future research.

Turning attention back to our survey results, the only social variable that showed a statistically significant effect was the region of the respondent, as shown in the raw ratings in Figure 8 below. As described above, because of the social

networks through which we distributed the survey, we were able to group our respondents into three broad geographic regions of Brazil: Rio Grande do Sul (far southern Brazil; $n = 103$), São Paulo (southeastern Brazil; $n = 258$), and Nordeste (northeastern Brazil; $n = 51$). The results of a Welch's t-test conducted in R revealed a significant difference at the $p < .01$ level between the average overall rating given in the survey between the Rio Grande do Sul respondents (mean rating 2.3), on the one hand, and the São Paulo and Nordeste respondents (mean rating 2.96 for both regions), on the other. There was no significant difference ($p = .99$) between the mean ratings of the São Paulo and Nordeste respondents.

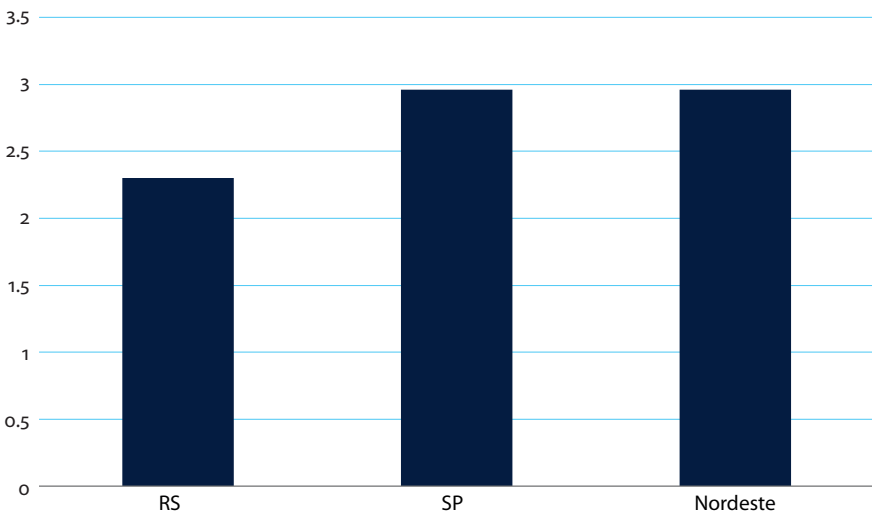


Figure 8. Mean overall ratings by region

Our interpretation of this result draws on other work on BP negation that has found clear differences between the far southern region of Rio Grande do Sul and other regions of Brazil. Goldnadel and Lima (2014) and Lima (2015), for instance, have found that strictly postverbal negation in this region is in general less acceptable than in other parts of the country.⁴ They consider the three well-known formal strategies of sentential negation found throughout Brazil, known as NEG1 (*não vou comer* ‘I’m not going to eat’), NEG2 (*não vou comer não*), and NEG3 (*vou comer não*) (cf. Cavalcante 2009; Schwenter 2005; Teixeira de Sousa 2011), which differ in pragmatic conditioning but not in propositional content (Schwenter 2005). Other authors (e.g. Cavalcante 2009 for NE Brazil; Schwenter 2005 for Rio de Janeiro) have found low but fairly stable rates of NEG3 in other regions, but Goldnadel and

4. Nunes (2014) reports similar findings for strictly postverbal negation in Portugal.

Lima find nearly no use of NEG3 in Rio Grande do Sul. We hypothesize, therefore, that speakers from this region are likewise less accepting of examples that display a lack of NC, since these also contain only one exponent of negation, which likewise occurs in postverbal position. Putting this in different terms, it appears that the Neg-first principle of Jespersen (1917) is stronger in the far southern region of Brazil than in other regions, where strictly postverbal negation is more common.

5. The role of NI productivity

The intersection of the (non-)acceptability of NIs in BP with frequency-based considerations sheds light on where and when speakers might be more or less prone to utter (or Tweet) a sentence with a postverbal NI but without a preverbal trigger. Token frequency alone, however, does not tell the whole story, since it is not necessarily a predictor of productivity, and can actually be an index of the conservation of an archaizing pattern (Bybee 2007). We would therefore also like to know which of the NIs under study occurs with the broadest range of contextual elements: in this case, with different verbs. In order to investigate this question, we looked at the token and the type frequency of the four different NIs in both postverbal and preverbal position, in order to correlate mean rating of acceptability from our survey with these measures. As with the frequency measures above, the token and type numbers were taken from the Brazil section of the *Corpus do Português*. In Table 2 below, we present the figures for token and type frequency for the four NIs in combinations of V + NI.

Table 2. Tokens/types for V + NI

	Tokens	Types	Token/Type
V <i>nada</i>	2516	741	3.40
V <i>nunca</i>	313	260	1.20
V <i>ninguém</i>	441	251	1.76
V <i>nenhum</i>	595	316	1.88

Table 2 shows that, as we saw above in terms of frequency per million words, *nada* is by far the most frequent in postverbal position, with nearly five times more tokens than its next closest competitor. In addition, and of more interest to this section, *nada* occurs with over double the amount of verb types of any of the other NIs ($n = 741$ versus $n = 316$ for its nearest competitor, *nenhum*). The combination of these two types of frequencies is shown in the token/type ratio column, as a measure

of the breadth of distribution of the distinct NIs. We use this ratio as the basis of correlation with the mean ratings of the different NIs in Figure 9:

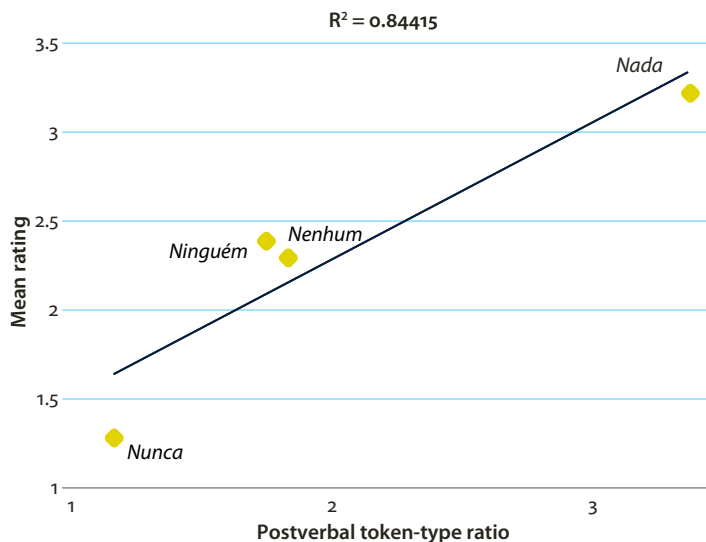


Figure 9. Mean rating by postverbal token-type ratio

As Figure 9 shows, there is a positive correlation between the postverbal token-type ratio of the NIs and their mean rating: the higher the ratio of tokens to types, the higher the mean rating. The R-squared value of 0.84 shows furthermore that the strength of the correlation is robust. Although *ninguém* and *nenhum* show a slight deviation from this generalization, recall from above (see Figure 4) that the difference in their mean ratings was not statistically significant. Thus, it is not only token frequency that helps predict whether an NI will be more or less acceptable in a non-NC sentence; type frequency matters as well, since it represents a way of measuring the productivity of the different V + NI combinations. As Bybee (2007, p. 15) points out, “[A] higher type frequency [...] gives a construction a stronger representation, making it more available or accessible for novel uses.” In order for lack of NC to be acceptable, a speaker must allow for the possibility that the NI in postverbal position is capable of expressing negation on its own, without the aid of the preverbal negator. The high token frequency of *nada* in postverbal position exposes native speakers to this NI with great regularity, and its high type frequency also exposes speakers to *nada* in collocation with a much wider range of verbs than its NI competitors. In concert, these two types of frequency contribute to speaker (re)analysis of *nada* as a relatively autonomous negative word (cf. Bybee 2007, pp. 13–14), which no longer invariably requires the co-occurrence of a preverbal

negative licenser. The other NIs, which all have lower token and type frequency measures in postverbal position than *nada*, are in essence “less negative” than *nada*, resulting in a greater reliance on preverbal negative licensing which is reflected in their lower average acceptability ratings in our survey.

For purposes of comparison with the postverbal token and type frequencies, we also obtained the numbers of tokens and types for each of the four NIs in preverbal position, i.e. NI + V. As the results of these counts in Table 3 show, *nunca* is the NI that shows by far the most tokens and the most types in preverbal position. When combined with its relatively low numbers of tokens and types in postverbal position, it suggests that *nunca* is much more heavily conventionalized in preverbal position, and as a result speakers not only use it less often in postverbal position, but also find it less acceptable in that position when occurring with lack of NC.

Table 3. Tokens/types for NI + V

	Tokens	Types	Token/Type
<i>nada</i> V	1266	496	2.55
<i>nunca</i> V	2622	841	3.18
<i>ninguém</i> V	1649	562	2.93
<i>nenhum</i> V	89	63	1.41

Figure 10 shows the correlation between mean rating of the four NIs and their corresponding preverbal token-type ratio. As can be seen, the regression line in this instance actually shows a **negative** correlation between this ratio and mean NI rating. In fact, the NI with the greatest preverbal token-type ratio is *nunca*, which shows the overall lowest mean rating from the survey. The R-squared value of 0.096 shows that the association between the two factors is extremely weak, thereby permitting the inference that preverbal token-type ratio is a very poor predictor of the acceptability of lack of NC, at least as regards the four NIs included in the study. The high preverbal token-type ratio of *nunca*, combined with its extremely low postverbal token-type ratio, could be envisioned as having a blocking effect on its acceptability in lack of NC contexts (where it necessarily occurs postverbally). While *nada* also has a relatively high preverbal token-type ratio, its postverbal ratio is much higher, making its acceptability in postverbal position without NC greater than that of *nunca* or the other NIs.

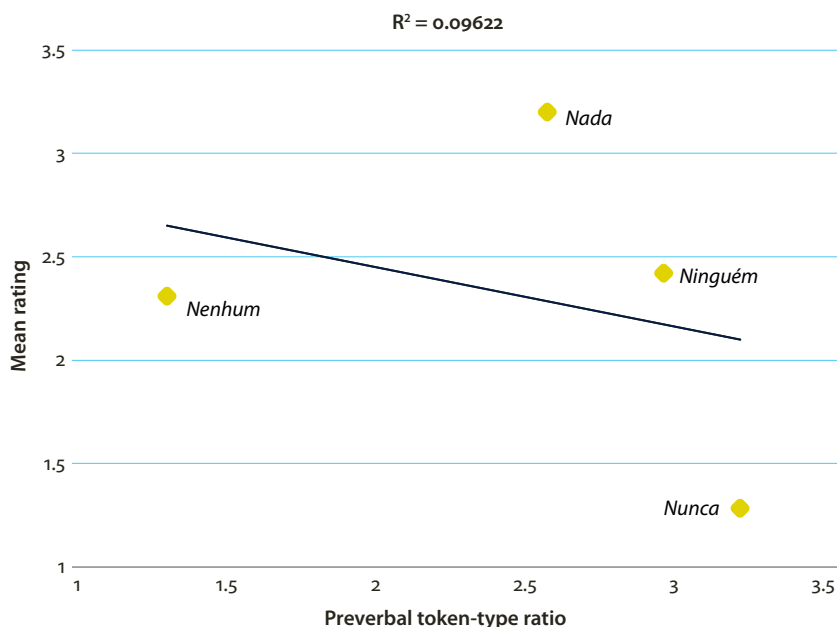


Figure 10. Mean rating by preverbal token-type ratio

So now we can ask an important qualitative question to complement the quantitative results that we have presented above: Why so much ado about *nada*? That is, what is it about this particular NI that makes it so much more amenable to lack of NC than the other NIs under study? We believe that its categorial flexibility contributes greatly to its frequency, and as a corollary, to native speaker acceptability judgments. Unlike *nunca*, which can only be a temporal adverb no matter what its syntactic placement, *nada* in postverbal position can be a pronoun (*Eles [não] comeram nada ontem* ‘They ate nothing yesterday’), a degree adverb (*A Maria [não] dorme nada* ‘Maria doesn’t sleep at all’), or even a noun (*O João chegou do nada* ‘João arrived from out of nowhere’). In addition, as described by Johnson and Schwenter (2016), *nada* is also found in BP in the (NEG)-NADA construction, where it occurs frequently without a preverbal negative in dialogic contexts:

- (9) A. O marido dela já morreu
 ‘Her husband already died’
 B. Morreu nada!
 ‘He did NOT die!’

These already-existing uses of *nada* and its categorial flexibility in postverbal position, which contribute greatly to its token and type frequency in V + NI

combinations, make it the optimal candidate among the NIs to occur in sentences without NC.

In Table 4 below, we have situated BP with respect to several other Romance varieties in terms of how the grammar of each of these treats NIs. As can be seen, the varieties are arrayed as a continuum where at the top sits a variety (Romanian) that requires a preverbal marker of negation to accompany the NI, no matter whether this NI appears in preverbal or postverbal position. The next variety in the table, Catalan, allows optionality of the preverbal negation marker when the NI also occurs in preverbal position. At the bottom of the table we find Québec French, where NIs in either preverbal or postverbal position may occur without an accompanying negator, even though recent research in Montréal (Burnett et al. 2015) has shown that postverbal negation in conjunction with a postverbal NI is now emerging as an innovative possibility (in effect, continuing the process in the NC > NQ > NC cycle). In broader cross-linguistic perspective, what this table reveals clearly is the syntagmatic variability that characterizes (lack of) negative concord and the syntactic requirements (or lack thereof) that are placed on NIs in the different varieties (for an OT analysis of the syntagmatic variability of negation and NC cross-linguistically, see de Swart 2010).

Table 4. Patterns of (lack of) NC in Romance varieties

	Preverbal	Postverbal
Romanian	NI neg V	neg V NI
Catalan	NI (neg) V	neg V NI
SpaNish/European Portuguese	NI V	neg V NI
Brazilian Portuguese	NI V	(neg) V NI
European French	NI (neg) V	(neg) V NI
Quebec French	NI V	V (neg) NI

What Table 4 does not reveal, however, is the **paradigmatic** variability found across Romance varieties or, at a maximum, it reveals this variability in only the most rudimentary of ways, by placing the sentential negation marker (neg) between parentheses to signal its optionality in certain varieties. Our results in this paper show that the paradigmatic reality behind that optionality is quite complex, and the degree to which speakers deem the preverbal (neg) to be optional in syntagmatic structure when co-occurring with a postverbal NI can crucially depend on the identity of that NI.

6. Conclusions

We have shown in this paper that, first of all, colloquial BP is a variable NC language, which sometimes allows NIs to occur in postverbal position without a preverbal negative as a licensor. In this sense, BP shows characteristics of a language with both NC and NQ (van der Auwera & Van Alsenoy 2015). As far as we have been able to determine, no grammars of the language have made prior mention of this possibility, and therefore, from an empirical and descriptive point of view, this is an important discovery about the morphosyntax of BP. Second of all, and more notably from a theoretical standpoint, we have shown the truth of the aphorism “not all negative words are created equal” when it comes to the possibilities that non-NC will actually occur. Indeed, there is a clear preference among BP speakers for *nada* to be the negative word that occurs in sentences that are lacking negative concord, and a clear dispreference for *nunca* in similar sentences. These possibilities, furthermore, are tied closely to the productivity of each of the four NIs as gauged by two different measures: V + NI frequency and token-to-type ratio. As regards the first, the more frequent the combination of V + NI, even in contexts where a preverbal negative licensor occurs, the more likely it is to be judged acceptable in non-NC contexts by native BP speakers. As for token-to-type ratio, the higher this ratio for a given NI, the higher the average rating for lack of NC with that word. These patterns of correlation holding between the acceptability of the NI in question and its productivity provide clear evidence for a usage-based conception of this variation: speakers are aware, at least at some subconscious level, of the degree of postverbal flexibility of the distinct negative words in NC environments, and they transfer that same flexibility – presumably via analogy (cf. De Smet 2012) – to non-NC contexts. As we noted above, the frequency measures and the token-to-type ratio are clearly not independent of the qualitative syntactico-semantic properties of the negative words: *nada* is more acceptable in non-NC contexts not only because it is more frequent and occurs with more distinct tokens in postverbal position, but also because it has greater categorial flexibility (both pronoun and degree adverb) in postverbal position than other members of the NI class. Moreover, it is also already found in BP in the non-canonical (NEG-)NADA construction, which provides another facilitating environment for its occurrence in sentences without NC.

The takeaway message of this paper is that along with the syntagmatic properties of NC and NQ (van der Auwera & Van Alsenoy 2015), a fuller understanding of these negation-related phenomena can only be gained by considering their paradigmatic dimensions as well. In this sense, our research is allied with that of Burnett et al. (2015) on Montréal French, who also found quantitative paradigmatic

differences between NIs,⁵ but in their case the innovation is from lack of NC to (a new kind of) NC. Whether the paradigmatic restrictions on cases of lack of NC, as in BP, or on cases of innovative NC, as in Montréal French, are similar or not is an empirical question we hope to tackle in further research. We hope for now that this focus on the paradigmatic aspects of NC will inspire future research on other variable NC language varieties in Romance and beyond.

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The simultaneous lenition of Spanish /ptk/ and /bdg/ as a chain shift in progress

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This study examines dialect differences in the simultaneous lenition of intervocalic /ptk/ and /bdg/ in Peruvian Spanish in Lima and Cuzco. Results from a read speech task show both sets of plosives are lenited significantly less in Cuzco than in Lima. Random forests demonstrate that differences in voicing best explain the distinction between /ptk/ and /bdg/, that differences in relative intensity best explain the distinction in Lima, and that in order to best distinguish Cuzco /bdg/ from Lima /ptk/, relative intensity must be given more importance than voicing. The results are consistent with the hypothesis that these lenitions constitute a chain shift in progress and offer insight into how these shifts may occur.

Keywords: phonetics, plosive lenition, chain shift, dialect differences, Spanish

1. Introduction

This study compares the phonetic realizations of the intervocalic plosives /ptk/ and /bdg/ in two dialects of Peruvian Spanish as spoken in Lima and Cuzco, in order to test whether the relationship between the lenition of the two sets is consistent with a push chain shift in progress. In many dialects of Modern Spanish (both Peninsular and Latin American), intervocalic /ptk/ are subject to significant voicing and spirantization (Hualde, Simonet, & Nadeu, 2011; Lewis, 2000, 2001; Machuca-Ayuso, 1997; Martínez-Celdrán, 2009; Munday, 2001; Oftedal, 1985; Poblete, 1992; Torreblanca, 1976; Torreira & Ernestus, 2011). Intervocalic /bdg/ are conventionally spirantized approximants [β ð ɣ₊] intervocalically in all dialects, and in most dialects, spirantization is regular also after glides and nonhomorganic consonants (Carrasco, Hualde, & Simonet, 2012; Hualde, 2005). Studies also show that /bdg/ are subject to constriction weakening and elision in the intervocalic environment (Carrasco, 2008; Carrasco et al., 2012; Cole, Hualde, & Iskarous, 1999;

Eddington, 2011; Hualde et al., 2011; Ortega-Llebaria, 2004; Soler & Romero, 1999; among others).

Dialects differ in the degree of lenition of /ptk/ (e.g. Lewis, 2000) and in the degree of lenition and frequency of elision of intervocalic /bdg/, with studies of Chilean Spanish (e.g. Cepeda, 1991; Pérez, 2007) showing some of the highest elision rates. Intervocalic plosive lenition is common cross-linguistically. In the case of voiceless plosives, intervocalic voicing is motivated by gestural overlap (e.g. Browman & Goldstein, 1986, 1992), and in the case of voiced plosives, intervocalic spirantization is motivated by the aerodynamic voicing constraint, whereby maintenance of voicing during full closure is articulatorily difficult to maintain (Ohala, 1983; Ohala & Riordan, 1979). It has also been observed that the simultaneous lenition of both sets allows voiced spirantized /ptk/ to remain distinct from approximant /bdg/ in terms of constriction degree as measured by intensity difference with the following vowel (Hualde et al., 2011), making their lenitions a possible push chain shift.

1.1 Push chain shifts

In a push chain shift (e.g. Carvalho, 2008; Martinet, 1952), two or more phonemes along an acoustic continuum change such that contrast between the phonemes is maintained, and each phoneme takes on the acoustic realization of the next phoneme in the chain, with the last phoneme in the chain taking on a new realization. One well known example is diachronic plosive lenition in Proto Western Romance (Penny, 2002). Latin had three sets of plosives: geminates /p: t: k:/, simple voiceless plosives /ptk/, and voiced plosives /bdg/ in intervocalic position. In Proto Western Romance, these sets underwent a chain shift by which the geminates simplified, the simple voiceless plosives voiced, and the voiced plosives spirantized; that is, /p: t: k:/ > /ptk:/; /ptk:/ > /bdg/; /bdg/ > /βðɣ/. Spanish underwent a further sound change where Western Romance intervocalic /ðɣ/ were lost but not /β/, as shown in Table 1.

Some authors argue that the change in the strongest set of consonants motivates the changes in the weaker sets in order to maintain contrast (Carvalho, 2008). Others propose accounts that do not rely on teleology (Labov, 1994), and accounts in Optimality Theory have also been proposed (Baker, 2006). This study does not argue for a particular interpretation of chain shifts, but rather tests whether the lenition of Modern Spanish intervocalic /ptk/ and /bdg/ is consistent with what we should expect to see in a chain shift in progress. Specifically, Gordon (2013) argues that both changes must occur simultaneously for neutralization to be prevented.

It is important to note that the contrast between intervocalic /ptk/ and /bdg/ in Modern Spanish is not a contrast between voiceless and voiced plosives, but

Table 1. Chain shift from Latin to Proto Western Romance, and further changes in Spanish

Latin	Proto Western Romance	Spanish
CUPPA [pɪ]	*kopa [p]	<i>copa</i> [p] ‘cup’
CŪPA [p]	*kuba [b]	<i>cuba</i> [β] ‘barrel’
CIBU [b]	*ʃevo [β]	<i>cebo</i> [β] ‘bait’
GUTTA [tɪ]	*gota [t]	<i>gota</i> [t] ‘drop’
ROTA [t]	*rɔda [d]	<i>rueda</i> [ð] ‘wheel’
CRUDĒLE [d]	*kruðele [ð]	<i>cruel</i> [--] ‘cruel’
BUCCA [kɪ]	*boka [k]	<i>boca</i> [k] ‘mouth’
DĪCO [k]	*digo [g]	<i>digo</i> [ɣ ₊] ‘I say’
LĒGĀLE [g]	*leyale [ɣ]	<i>leal</i> [--] ‘loyal’

between voiceless plosives [ptk] and voiced approximants [βðɣ₊]. In other words, dialects of Modern Spanish may be at different points along a lenition continuum exemplified in Table 2, with no attested dialects having fully reached the third stage.

Table 2. Possible ongoing chain shift in Spanish (‘strong’ and ‘weak’ refer to relative constriction)

	Intervocalic /ptk/	Intervocalic /bdg/
Stage I	[ptk]	[βðɣ ₊] (strong)
Stage II	[ptk] ~ [bdg] ~ [βðɣ ₊] (strong)	[βðɣ ₊] (weak) ~ elided
Stage III	[bdg] ~ [βðɣ ₊]	elided

If this is the case, then dialects that have comparatively more intervocalic /ptk/ voicing should also have comparatively more /bdg/ constriction weakening and elision, and Stage II /ptk/ should show significant acoustic overlap with Stage I /bdg/. In this study, this is tested by comparing two dialects that previous studies suggest may differ in their degree of lenition: Lima and Cuzco, Peru.

1.2 Lima Spanish

Caravedo (1990) finds that in Lima, intervocalic /ptk/ are usually realized as voiceless plosives, but can also be realized as voiced plosives or approximants, though no quantitative analysis is available. For intervocalic /bdg/, she finds that approximant realizations are the norm, with /b/ realized as a plosive 0.9% and elided 3.9% of cases, /d/ as plosive 2.9% and elided 16.2% of cases, and /g/ as plosive 0.1% and elided 5% of cases. It would thus seem that Lima patterns with other dialects of

Modern Spanish, but a more detailed phonetic analysis is warranted to determine the degree of lenition.

1.3 Cuzco Spanish

Cuzco is located in the Andes mountain range, and has a large number of Spanish-Quechua bilingual speakers (Escobar, 2011). Lipski (1994) claims that intervocalic Spanish /bdg/ can be realized as plosives in the speech of Quechua-dominant bilinguals in the Andes, though the claim is qualitative and, to the author's knowledge, no data on monolingual Cuzco Spanish /ptk/ and /bdg/ exist. However, Delforge (2009, 2012) finds that unstressed vowels in monolingual Cuzco Spanish tend to devoice between voiceless consonants and before a pause, which she argues is due to gestural overlap (e.g. Browman & Goldstein, 1986, 1992; Gafos, 2002; Ohala, 1983). Torreira and Ernestus (2011) compared intervocalic voicing of /ptk/ and the devoicing of vowels between voiceless plosives in Madrid Spanish and French and found that French had both significantly more vowel devoicing and significantly less /ptk/ voicing than Madrid Spanish. They argue that high rates of vowel devoicing indicate a coarticulatory strategy that is inconsistent with /ptk/ voicing, and vice versa. In other words, the timing of consonantal closure and the cessation of vocal fold vibration is unlikely to be perfect, and speech communities may conventionalize the direction in which the gestures overlap. In light of this, it is likely that Cuzco has less intervocalic /ptk/ voicing than Lima.

1.4 Motivation for the current study

To the author's knowledge, no study has systematically analyzed whether dialect differences in the degree of /ptk/ lenition in Spanish are predictive of dialect differences in the degree of /bdg/ lenition. Other studies have compared Spanish to another Romance language (Lewis, 1999; Torreira & Ernestus, 2011), compared /ptk/ and /bdg/ within the same dialect (Hualde et al., 2011), or examined more than one dialect but only in relation to one of either /ptk/ or /bdg/ (Carrasco et al., 2012; Lewis, 2000, 2001; O'Rourke & Fafulas, 2015). To test whether intervocalic /ptk/ and /bdg/ lenition are simultaneous, dialects must be compared for both lenitions, and differences between dialects' phonetic implementation of the /ptk/ ~ /bdg/ contrast must also be examined. This study performs these comparisons for Cuzco and Lima Spanish, and argues that our understanding of Modern Spanish /ptk/ and /bdg/ lenition can be increased through further dialectal comparisons of this kind.

2. Research questions and hypotheses

This study aims to answer four main questions:

1. Are there systematic dialect differences in intervocalic /ptk/ voicing and /bdg/ elision consistent with a chain shift in progress? Hypothesis (i): Cuzco Spanish will have both less /ptk/ voicing and /bdg/ lenition/elision than Lima Spanish.
2. Are there dialect differences in the realization of the voicing contrast? Hypothesis (ii): The difference between Cuzco /ptk/ and /bdg/ will be primarily a difference in voicing, while the difference between Lima /ptk/ and /bdg/ will rely more on the relative intensity of the consonant.
3. Are /ptk/ and /bdg/ better distinguished within-dialect than across dialects? Hypothesis (iii): While /ptk/ and /bdg/ will be well-distinguished within each dialect, increased acoustic overlap between Lima /ptk/ and Cuzco /bdg/ will result in lower classification accuracy.
4. What would the phonetic distinguishability be in a dialect that participated in the first lenition in the chain shift but not the second? Hypothesis (iv): A hypothetical dialect with un-lenited Cuzco /bdg/ and lenited Lima /ptk/ would rely on relative intensity due to the decrease in the usefulness of the voicing cue, with a lesser distinction between /ptk/ and /bdg/ than either the Cuzco or Lima dialect.

3. Methods

3.1 Participants

The data analyzed in this study were collected from 16 native monolingual speakers of Spanish in Peru in the summer of 2014 (8 in Cuzco and 8 in Lima, balanced for sex in both cities). The Lima participants were all born and raised in Lima (with the exception of one speaker born in Ica but raised in Lima since age 2) and none began learning another language besides Spanish until secondary school. None of the Lima participants' parents spoke any language other than Spanish. Participants were all university educated, with a mean age of 20 (range 18–25).

In the Cuzco group, all participants were monolingual speakers of Spanish born and raised in the city of Cuzco, with the exception of 1 participant who was born in the department of Cuzco but outside the city and moved to the city at age 5. One of the participants was exposed to some Quechua at home before attending school, but claimed to only know words and set phrases and did not consider himself a Quechua-speaker. The other 7 speakers were not exposed to Quechua at home,

but 5 of these 7 had at least one parent who could speak Quechua. Speakers with this language background were chosen to ensure that monolingual Cuzco Spanish would not be confused with Bilingual Spanish as defined by Pérez-Silva (1999). The Cuzco participants had a mean age of 28.8 (range 20–37). Four of the Cuzco speakers had a university education while the other 4 did not (2 work in restaurants, 1 in tourism, and 1 has his own business). Regressions run on only the Cuzco participants showed no significant differences for education level for any of the acoustic measures taken, and so in this study all 8 speakers are considered as a single group.

3.2 Materials

A demographic questionnaire was used to determine sex, age, education level, and language background and use. A list of words (see the Appendix) was created that put all six plosives in word-internal intervocalic environment balanced across 3 stress patterns (in the onset of the stressed syllable, i.e. *sacó* ‘s/he took out’, (henceforth “tonic”), in the onset of the syllable following the stressed vowel, i.e. *saco* ‘I take out’ (henceforth “post-tonic”), and between two unstressed vowels, i.e. *sacará* ‘s/he will take out’ (henceforth “unstressed”), for a total of 18 combinations. The post-tonic and unstressed conditions were considered separately because studies are inconsistent as to whether there is a significant difference between them (Hualde et al., 2011; Torreblanca, 1976). Three words were chosen for each combination, for a total of 54 planned observations per speaker, and a total of 864 tokens. The suffixes */-ado/* and */-iko/* were not used, as */-ado/* has been shown to have conventionalized deletion in many dialects and */-iko/* may be neutralized with */-igo/* for some speakers (Hualde et al., 2011). Words with */bdg/* after a glide were also not used, since some dialects exhibit fortition in this environment (Carrasco et al., 2012; Hualde, 2005). This list of words was then used to create 51 natural-sounding, meaningful sentences.

3.3 Tasks and recording

Before recording, participants filled out the linguistic and demographic questionnaire. Recordings were made using a ZOOM H4n recorder and AKG C520 head-worn unidirectional condenser microphone. The microphone was placed approximately 2 cm from the right corner of the participant’s mouth. Recordings were made at a sampling rate of 44.1 kHz with 16-bit resolution. Recordings in Lima took place at the Pontífica Universidad del Perú in a quiet room with no echo. Recordings in Cuzco took place in whatever quiet place was most convenient for the participant (usually this was their home or their place of work before the workday

started). The task was to simply read each sentence aloud two times. Participants were not compensated for participation.

3.4 Acoustic measures

3.4.1 *Constriction*

To measure /bdg/ constriction degree, various relative intensity measurements have been used in the literature comparing the minimum intensity in the consonant to the maximum intensity in the following vowel: (1) the difference between these two intensity values; (2) the ratio between these two intensity values; and (3) the maximum velocity of change in intensity between these two points. Parrell (2010) compared these three measures to EMA data for /b/ and found that all three measurements were significantly correlated with /b/ constriction, and Hualde et al. (2011) found that all three of these measures were expectedly highly correlated with each other, with all comparisons between acoustic measures having a correlation coefficient over 0.9. While this measurement does not rely on accurate segmentation of closure onset or release (only the minimum in the intensity contour), measures of duration and voicing used in previous studies do, which in the particular case of measuring the lenition of /ptk/ to [βɔ̞y̞] as a gradient process poses some issues discussed in the following section.

3.4.2 *Duration and voicing*

Turk, Nakai, and Sugahara (2006) provide a summary of segmentation criteria for plosives in VCV sequences that are widely used in acoustic studies. They argue that duration should be marked based on cues to closure rather than on cues to voicing, as voicing can often cease before or after plosive closure, with wide variation. Closure onset is marked at the cessation of F2, or, if recordings are taken in highly sensitive recording environments, the cessation of F3. Closure release is marked based on a burst when present. If there is more than one burst (as is often the case with velars), either the first or last burst may be chosen, as long as this is done consistently, though they argue that the first burst is a better option. If there is no burst (which can happen often, especially for anterior plosives; see also Lavoie (2001) who additionally finds that stops often have affricated releases), they suggest that F2 onset in the following vowel be used.

Analyses of Spanish /ptk/ have followed these segmentation conventions (Hualde et al., 2011; Lewis, 2001; Torreira & Ernestus, 2011; among others), classifying plosives as either having or not having complete closures in a binary fashion. In some cases (e.g. Torreira & Ernestus, 2011), incomplete closures are excluded from durational analyses while in others (e.g. Hualde et al., 2011), duration of

segments is based on decreases and increases in intensity. When analyzing the lenition of /ptk/ in terms of voicing, closure voicing has been measured as the duration of the voiced period of the closure (Torreira & Ernestus, 2011), as the percentage of the closure interval that had voicing (Lewis, 2001), or as a categorical variable based on the percentage of the closure that had voicing (Hualde et al., 2011). Voice onset time (or voiceless vowel duration) has also been measured as a correlate of /ptk/ lenition (Lewis, 2001; Torreira & Ernestus, 2011).

These duration and voicing measures all rely heavily on accurate placement of boundaries at landmarks that are assumed to correlate with articulatory gestures, specifically closure onset and release. However, these landmarks are often ambiguous (there is not a one to one articulatory to acoustic mapping; i.e. approximants do not always have F2 throughout their production) or altogether absent in the acoustic signal. This is especially problematic when voicing measures rely on these cues (i.e. to measure closure voicing you need to be sure that a closure occurred and know when it started and stopped) and a large number of tokens are classified as lacking full closure (as is the case in many studies on Spanish /ptk/), leading to the exclusion of a large portion of the dataset from voicing analysis. I argue that this discretization of tokens as either having or lacking complete closure is unnecessary since intensity difference captures this change as part of its gradient, and instead propose a voicing measure that is independent of assumptions about the precise timing of closure onset and release, and that encompasses the entire voiceless gesture in the VCV sequence (whether pre-aspiration, voiceless closure or VOT): voiceless period duration. While voiceless period duration does not directly measure what portion of a closure is voiced or how long a closure is, the measures are articulatorily correlated, since longer closures are less voiced due to the aerodynamic voicing constraint (Ohala, 1983; Ohala & Riordan, 1979), and will thus have longer voiceless periods.

3.5 Data segmentation

The planned observations from the sentence reading task were segmented in Praat (Boersma & Weenink, 2016). When both repetitions of the sentence were produced fluently (without false starts), the second repetition was segmented (majority of cases). If the first repetition was produced fluently but the second was not, the first repetition was segmented. If creaky voice caused perturbations in the intensity curve, or if the neighboring vowels were devoiced, the segment was discarded. A total of 16 tokens were discarded, leaving 848 tokens for analysis, distributed as in Table 3.

Table 3. Distribution of tokens for analysis

	Tonic		Post-Tonic		Unstressed	
	Lima	Cuzco	Lima	Cuzco	Lima	Cuzco
/p/	24	24	24	20	24	24
/b/	24	24	24	24	24	23
/t/	23	23	24	24	24	24
/d/	24	24	24	24	24	24
/k/	24	24	24	24	24	24
/g/	24	24	24	24	18	21

The observations were segmented using 3-tier TextGrids in Praat. First, the word containing a planned observation's boundaries were marked in tier 1. Boundaries were placed on tier 2 at the beginning and end of the VCV sequence. If evidence of a consonant was present (a dip in the intensity contour), additional boundaries were placed to contain the minimum intensity of the consonant (Carrasco, 2008; Hualde et al., 2011; among others), and the intervals were labeled with the vowel and consonant phonemes. If there was no dip in the intensity contour, boundaries were placed in the VCV sequence arbitrarily and the middle interval was marked with the consonant phoneme followed by '0'. On tier 3, the stress condition was labeled. See the Appendix for examples.

3.6 Data extraction

A Praat script written by the author was then used to extract speaker, city, sex, age, place of articulation (bilabial/dental/velar), underlying voicing (voiced/voiceless), stress (tonic/post-tonic/unstressed), the intensity difference between consonant minimum and following vowel maximum (set to zero for elided tokens), and the duration of the voiceless period in the VCV sequence (set to zero for elided tokens) for each observation, and all data was stored in a CSV file. Intensity difference was measured as the difference between the minimum intensity in the consonant and the maximum intensity in the following vowel. For each audio file, the Praat script created an Intensity object using a minimum pitch of 100 Hz and a time step of 0.001 seconds (Hualde et al., 2011). The minimum intensity in the consonant and maximum in the following vowel were both cubically interpolated and then the consonant minimum was subtracted from the vowel maximum (Torreira & Ernestus, 2011). A higher intensity difference indicates a more constricted consonant (Carrasco, 2008; Hualde et al., 2011; among others).

The voiceless period was measured using Praat's pitch-tracking algorithm. A cross-correlated pitch object was created using sex-specific pitch ranges of 70–250

for males and 100–300 for females (Vogel, Maruff, Snyder, & Mundt, 2009) and a time-step of 1 ms, with all other settings left at default values following Eager (2015) who found that these settings yield reliable results. For each VCV sequence, a gap between consecutive pitch points greater than 1 ms (the time-step) was recorded as a period of voicelessness. If no consecutive pitch points were separated by more than 1 ms, the voiceless period duration was set to zero. Boundaries were automatically placed around the voiceless period in a fourth tier in the TextGrids. The automatic boundaries produced by this script were then hand-checked in Praat to correct for two types of infrequent errors: (1) double-bursts being analyzed as periodic by the pitch tracker, and (2) clear indication of periodicity in the waveform that either fell below the pitch-trackers voicing threshold or out of the sex-specific pitch ranges.

3.7 Statistical analysis

All data analysis was run in R (R Core Team, 2016). To test for dialect differences in voiceless period duration and intensity difference, linear mixed effects regressions were run using *lmer* in the *lme4* package (Bates, Maechler, Bolker, & Walker, 2015), with *p*-values obtained using the Kenward-Roger approximation via the *mixed* function in the *afex* package (Singmann, Bolker, & Westfall, 2015). The maximal random effects structure for speaker and word supported by the data (Barr, Levy, Scheepers, & Tily, 2013) was used in each regression, and all factors were coded with sum contrasts, so that the intercept represents the grand mean rather than a reference level. Place of articulation, stress, sex, city, and the interaction between sex and city were included as fixed effects. When the interaction between sex and city was not significant, it was dropped to allow for a more complex random effects structure. Group least-squares means were computed using *lsmeans* (Lenth & Hervao, 2015) when the interaction between city and sex was significant.

Zero-valued tokens (voiceless period duration for fully-voiced observations and intensity difference for elided observations) were also included in the regressions, unlike in previous studies. This was done because the zero values represent the end of a continuum of lenition, not necessarily a categorically different pronunciation, and their inclusion does not violate the assumptions of linear mixed effects regression (the normality assumption applies to errors, not the data itself). In the case of /bdg/ elision, some cases may be due to online effects (articulatory undershoot) and others may be intended (Hualde et al., 2011), but from the acoustic signal these possibilities cannot be teased apart (Ohala, 1983). Thus the inclusion of observations with zero-valued intensity differences likely implies inclusion of some intended elisions, but their exclusion would likely imply exclusion of elisions due

to articulatory undershoot. From the perspective of the acoustic signal, both types of elisions provide information about the speakers' state of lenition.

To test for dialect differences in the way the two measures are used to distinguish /ptk/ from /bdg/, random classification forests were run using *randomForest* (Liaw & Wiener, 2002). Random forests are a set of classification trees fit to random samples of a dataset using a random subset of the total number of predictor variables. They offer a way of avoiding overfitting a dataset with a single regression or classification tree. In this case, random forests of classification trees were fit with underlying voicing (voiceless for /ptk/ and voiced for /bdg/) as the dependent variable, and voiceless period duration, intensity difference, stress and place of articulation as predictors.

4. Results

Results for /ptk/ are reported in Section 4.1, results for /bdg/ are reported in Section 4.2, and the random forest results are reported in Section 4.3.

4.1 /ptk/

A total of 426 tokens of intervocalic /ptk/ were analyzed. Results are given first for voiceless period duration and then for intensity difference.

4.1.1 /ptk/ voiceless period duration

Table 4 provides descriptive statistics by city, Table 5 shows the percentage of tokens that were fully voiced in each group (voiceless period duration of zero), and boxplots of /ptk/ voiceless period duration by sex and city are provided in Figure 1.

Table 4. Descriptive statistics for /ptk/ voiceless period duration (ms)

City	N	Minimum	Median	Maximum	Mean	SD
Cuzco	211	56	99	165	102.44	19.79
Lima	215	0	67	146	61.04	32.38

Table 5. Percentage of fully and not fully voiced /ptk/

City	Fully voiced	Not fully voiced
Cuzco	0 (0%)	211 (100%)
Lima	24 (11.2%)	191 (88.8%)

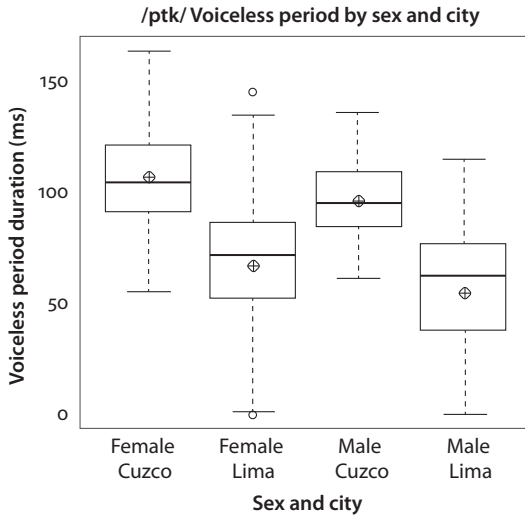


Figure 1. Boxplots of /ptk/ voiceless period duration by sex and city. Diamonds represent means

A linear mixed effects regression was run on voiceless period duration with place of articulation, stress, and the interaction between city and sex as fixed effects (see Table 6). The interaction between city and sex was not significant, and so it was removed to allow for a more complex random effects structure.

Table 6. Regression table for /ptk/ voiceless period duration

Fixed effect	Estimate (ms)	SE	F	p
Intercept	86.74	3.62		
Place, Bilabial	0.39	3.40	$F_{(2, 25.3)} = 1.19$	.320
Place, Dental	-4.55	3.19		
Stress, Post-Tonic	-3.67	3.15	$F_{(2, 23.4)} = 6.60$	.005
Stress, Tonic	11.60	3.23		
Sex, Female	3.69	2.11	$F_{(1, 8.6)} = 1.24$	.295
City, Cuzco	18.84	3.72	$F_{(1, 12.1)} = 19.26$	.001

There were significant effects of stress and city, but sex and place of articulation were not significant predictors, though the boxplots in Figure 1 do show a trend in both cities (females > males). Because sum contrasts were used, the difference between Cuzco and Lima is obtained by doubling the estimate: Cuzco has /ptk/ voiceless periods on average 37.69 ms longer than Lima. Additionally, there are no

fully voiced Cuzco /ptk/ while 11.2% of Lima /ptk/ are fully voiced even in read speech (Table 5).

4.1.2 /ptk/ intensity difference

There were no elided tokens of intervocalic /ptk/ (all 426 tokens had intensity differences greater than zero). Table 7 provides descriptive statistics by city for the intensity difference of /ptk/ and boxplots of /ptk/ intensity difference by sex and city are provided in Figure 2.

Table 7. Descriptive statistics for /ptk/ intensity difference (dB)

City	N	Minimum	Median	Maximum	Mean	SD
Cuzco	211	18.79	31.80	45.66	32.12	5.50
Lima	215	5.59	31.04	44.93	30.06	7.57

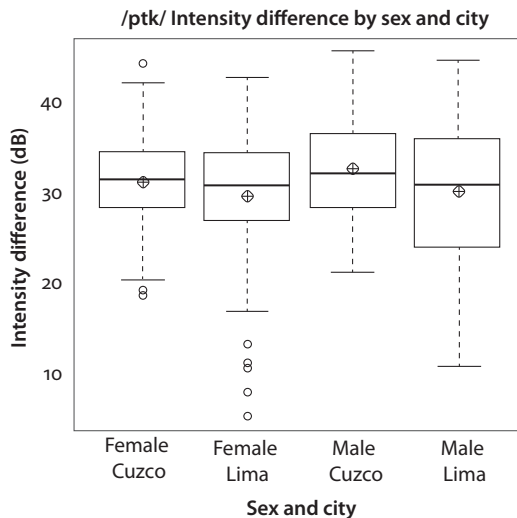


Figure 2. Boxplots of /ptk/ intensity difference by sex and city. Diamonds represent means

To test for differences, a linear mixed effects regression was run on intensity difference with place of articulation, stress, and the interaction between city and sex as fixed effects (Table 8). The interaction between city and sex was not significant, and so it was removed to allow for a more complex random effects structure.

Table 8. Regression table for /ptk/ intensity difference

Fixed effect	Estimate (dB)	SE	F	p
Intercept	31.11	1.13		
Place, Bilabial	−0.12	0.53	$F_{(2, 13.5)} = 0.60$	.565
Place, Dental	−0.35	0.42		
Stress, Post-Tonic	−0.63	0.43	$F_{(2, 13.4)} = 21.02$	< .001
Stress, Tonic	2.98	0.45		
Sex, Female	−1.25	0.87	$F_{(1, 13.1)} = 1.31$	.274
City, Cuzco	−0.01	0.98	$F_{(1, 18)} < 0.01$	.993

The regression shows a significant effect for stress, but no other significant effects were found. While the cities differ in range and variance, both of which can affect differences between /ptk/ and /bdg/ in terms of contrast, they do not differ significantly in their means. The reason why the cities differ in their mean /ptk/ voiceless period duration but not in their mean /ptk/ intensity difference may be due to a non-linear relationship between voicing and relative intensity measures, which would also explain the larger variance in the Lima group, but this possibility is left to further study.

4.2 /bdg/

A total of 422 tokens of intervocalic /bdg/ were analyzed. Results are given first for voiceless period duration and then for intensity difference.

4.2.1 /bdg/ voiceless period duration

Table 9 provides descriptive statistics by city and Table 10 shows the percentage of tokens that were fully voiced in each group (voiceless period duration of zero).

Table 9. Descriptive statistics for /bdg/ voiceless period duration (ms)

City	N	Minimum	Median	Maximum	Mean	SD
Cuzco	212	0	0	72	2.55	9.88
Lima	210	0	0	0	0	0

Table 10. Percentage of fully and not fully voiced /bdg/

City	Fully voiced	Not fully voiced
Cuzco	196 (92.5%)	16 (7.5%)
Lima	210 (100%)	0 (0%)

As Table 5 and Table 10 show, Cuzco /bdg/ are at least partially devoiced about as often as Lima /ptk/ are fully voiced (7.5% and 11.2% respectively). Because there is no variation within the Lima group, linear modeling is not appropriate. A chi-square test shows that the differences in Table 10 are significant ($\chi^2(1) = 16.47, p < .001$).

4.2.2 /bdg/ intensity difference

Table 11 provides descriptive statistics of /bdg/ intensity difference by city, Table 12 shows the percentage of tokens that were elided in each group (intensity difference of zero), and boxplots of /bdg/ intensity difference by sex and city are provided in Figure 3.

Table 11. Descriptive statistics for /bdg/ intensity difference (dB)

City	N	Minimum	Median	Maximum	Mean	SD
Cuzco	212	0	7.63	30.38	8.49	5.61
Lima	210	0	0.45	16.96	1.47	2.28

Table 12. Percentage of elided and not elided /bdg/

City	Elided	Not elided
Cuzco	5 (2.4%)	207 (97.6%)
Lima	96 (45.7%)	114 (54.3%)

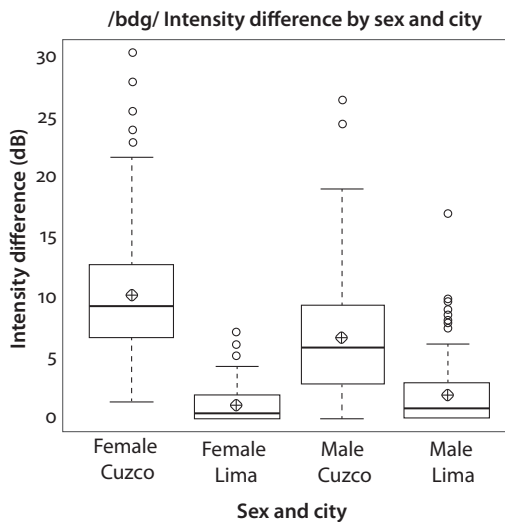


Figure 3. Boxplots of /bdg/ intensity difference by sex and city. Diamonds represent means

To test for differences, a linear mixed effects regression was run on intensity difference with place of articulation, stress, and the interaction between city and sex as fixed effects (Table 13).

Table 13. Regression table for /bdg/ intensity difference

Fixed effect	Estimate (dB)	SE	F	p
Intercept	4.85	0.37		
Place, Bilabial	0.10	0.38	$F_{(2, 21.9)} = 0.21$	.814
Place, Dental	-0.24	0.38		
Stress, Post-Tonic	-0.46	0.40	$F_{(2, 19.6)} = 3.96$	.036
Stress, Tonic	1.46	0.52		
Sex, Female	0.60	0.28	$F_{(1, 9.5)} = 2.69$	.133
City, Cuzco	3.24	0.29	$F_{(1, 9.7)} = 94.94$	<.001
Sex, Female: City, Cuzco	0.99	0.28	$F_{(1, 9.5)} = 7.34$	.023

The regression shows a significant effect for city, the interaction of city and sex, a significant effect for stress, but no significant effect for place of articulation or sex alone. Least-squares means for each combination of city and sex are given in Table 14, and corresponding pairwise comparisons are provided in Table 15 with Tukey-adjusted *p*-values.

Table 14. Least-squares means for /bdg/ intensity difference by sex and city

Group	Estimate (dB)	SE
Cuzco Female	9.67	0.90
Lima Female	1.22	0.53
Cuzco Male	6.50	0.90
Lima Male	2.00	0.53

Table 15. Pairwise comparisons for /bdg/ intensity difference by sex and city

Contrast	Estimate (dB)	SE	p (Tukey)
Cuzco Female – Lima Female	8.45	0.99	<.001
Cuzco Female – Cuzco Male	3.17	1.27	.157
Cuzco Female – Lima Male	7.67	0.99	<.001
Lima Female – Cuzco Male	5.28	0.99	.002
Lima Female – Lima Male	-0.78	0.72	.713
Cuzco Male – Lima Male	4.50	0.99	.005

The contrasts for city and sex show that there is no effect of sex within city, (Cuzco Female – Cuzco Male = 3.17, $p = .157$; Lima Female – Lima Male = -0.78, $p = .713$),

but that the difference between cities is nearly twice as large for females than males (Cuzco Female – Lima Female = 8.45, $p < .001$ vs. Cuzco Male – Lima Male = 4.50, $p = .005$), giving rise to the significant interaction.

4.3 Dialect differences in variable importance and classification accuracy

Three random forests were run: one using only Cuzco data as a training set, one using only Lima data as a training set, and one using Cuzco /bdg/ and Lima /ptk/ as a training set. The prediction error of each of these forests for each of the four data subsets (Cuzco /ptk/, Cuzco /bdg/, Lima /ptk/ and Lima /bdg/) was logged along with the importance of each variable to the forest (measured as the decrease in accuracy when the variable's values are shuffled). Table 16 shows the classification accuracies, Table 17 shows the raw variable importance (measured as the mean decrease in individual tree accuracy when the variable is shuffled), and Figure 4 plots variable importance scaled within each forest (obtained by dividing the raw importance by the standard deviation of the trees' individual decreases in accuracy).

Table 16. Random forest classification accuracy

Dataset	Forest		
	Cuzco	Lima	Cuzco /bdg/ Lima /ptk/
Cuzco /ptk/	99.5%	100.0%	99.5%
Cuzco /bdg/	99.1%	68.4%	92.5%
Lima /ptk/	73.5%	99.1%	94.0%
Lima /bdg/	100.0%	99.0%	100.0%

Table 17. Random forest variable importance (mean decrease in accuracy)

Variable	Forest		
	Cuzco	Lima	Cuzco /bdg/ Lima /ptk/
Voiceless Period	43.5%	6.0%	7.9%
Intensity Difference	5.1%	42.4%	34.9%
Stress	0.2%	0.1%	1.3%
Place	<0.1%	0.2%	0.2%

The Lima and Cuzco forests both performed at ceiling when predicting the underlying voicing of the observations of the city they were trained on (Cuzco forest predicting Cuzco /ptk/ and /bdg/ and Lima forest predicting Lima /ptk/ and /bdg/ in Table 16 all above 99%), showing that within-city the two sets are clearly distinct. However, the forests differed in the importance they assigned the variables. As can

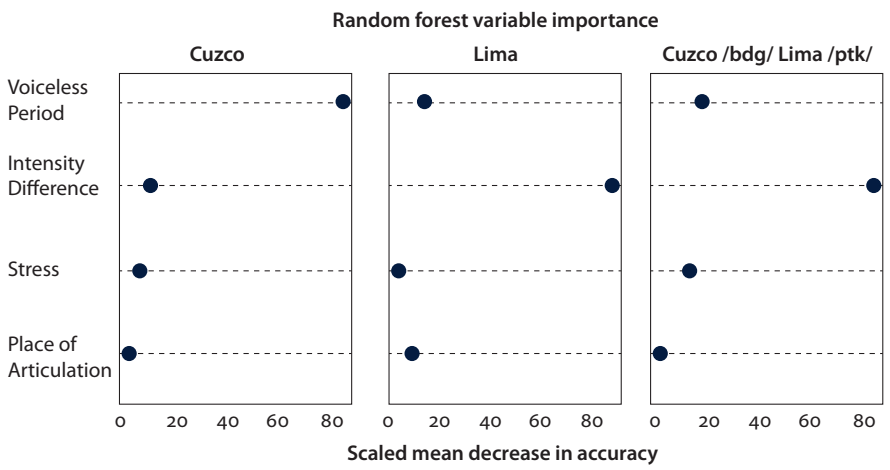


Figure 4. Random forest variable importance (scaled mean decrease in accuracy)

be seen in Table 17 and Figure 4, the Cuzco forest relies heavily on voiceless period duration, assigning little importance to intensity difference to distinguish /ptk/ from /bdg/, while exactly the opposite is true for Lima. Using these trees to predict the underlying voicing of the opposite city, the set more phonetically distant from the training set was still classified at ceiling accuracy (Cuzco forest predicting Lima /bdg/ and Lima forest predicting Cuzco /ptk/ in Table 16 both at 100%), which is to be expected. However, the Cuzco forest misclassified Lima /ptk/ as /bdg/ in 26.5% of cases and the Lima forest misclassified Cuzco /bdg/ as /ptk/ in 31.6% of cases.

These misclassification rates are based on using the forests optimized within-city, but an equally important question is how distinct the two classes of consonants would be in a dialect with Lima /ptk/ and Cuzco /bdg/, and how this hypothetical dialect would best distinguish between the sets. The third forest in Table 17 and Figure 4 provides an answer. The two sets can be distinguished fairly accurately (Lima /ptk/ and Cuzco /bdg/ correctly classified 94.0% and 92.5% respectively), but not at ceiling, and in order to attain this accuracy, greater importance is given to intensity difference than to voiceless period duration. So in a dialect that does not voice /ptk/, the distinction between /ptk/ and /bdg/ is best made using voicing cues, and /bdg/ can have very constricted approximant realizations (and even achieve a small degree of devoicing likely caused by full closure), as exemplified by the Cuzco. A hypothetical intermediary dialect where a Cuzco-like dialect began voicing /ptk/ would only achieve high classification accuracy by paying more attention to the relative intensity cue than the voicing cue, and then to reach ceiling classification accuracy would need enhance the effectiveness of this cue by weakening /bdg/ constriction, resulting in a Lima-like dialect where the two sets are distinguished

at ceiling accuracy, but by intensity cues rather than voicing cues, and where /bdg/ elisions become more common.

5. Discussion

5.1 Evaluation of hypotheses

Hypothesis (i)

Cuzco Spanish will have both less /ptk/ voicing and /bdg/ lenition/elision than Lima Spanish. This hypothesis is supported by the data. Cuzco /ptk/ have significantly longer voiceless periods than Lima /ptk/ and Cuzco /bdg/ have significantly higher intensity differences than Lima /bdg/. Lima additionally has 11.2% of /ptk/ with no voiceless period, while Cuzco has 7.5% of /bdg/ that are at least partially devoiced. No difference was found between Cuzco and Lima /ptk/ intensity difference, possibly due to the non-linear relationship between /ptk/ intensity difference and voicing (i.e. the voiceless period can decrease substantially before affecting intensity difference, but once reaching a tipping point, a strong correlation is obtained). The results for Lima are consistent with Caravedo's (1990) description of Lima Spanish, and provide a more quantitative account of the state of the dialect. The presence of highly constricted /bdg/ in Cuzco is consistent with Lipski's (1994) observation that bilingual Cuzco speakers sometimes produce plosive intervocalic /bdg/, and shows that this may also be present in monolingual Cuzco Spanish. The lower degree of /ptk/ voicing in Cuzco also further supports Torreira and Ernestus' (2011) finding that vowel devoicing is inconsistent with intervocalic /ptk/ voicing.

Hypothesis (ii)

The difference between Cuzco /ptk/ and /bdg/ will be primarily a difference in voicing, while the difference between Lima /ptk/ and /bdg/ will rely more on the relative intensity of the consonant. This hypothesis is supported by the data. The Cuzco forest assigns high importance to voiceless period duration and little importance to intensity difference, while exactly the opposite is true for the Lima forest.

Hypothesis (iii)

While /ptk/ and /bdg/ will be well-distinguished within each dialect, increased acoustic overlap between Lima /ptk/ and Cuzco /bdg/ will result in lower classification accuracy. This hypothesis is supported by the data. Classification accuracy is at ceiling within-dialect, but the Cuzco forest misclassifies Lima /ptk/ as /bdg/ in 26.5% of cases and the Lima forest misclassifies Cuzco /bdg/ as /ptk/ in 31.6% percent of cases.

Hypothesis (iv)

A hypothetical dialect with un-lenited Cuzco /bdg/ and lenited Lima /ptk/ would rely on relative intensity due to the decrease in the usefulness of the voicing cue, with a lesser distinction between /ptk/ and /bdg/ than either the Cuzco or Lima dialect. This hypothesis is supported by the data. A forest trained on Cuzco /bdg/ and Lima /ptk/ more accurately classifies Lima /ptk/ than the Cuzco forest and Cuzco /bdg/ more accurately than the Lima forest, but only by assigning a much higher importance to intensity difference than to voiceless period duration.

5.2 Simultaneous lenition of /ptk/ and /bdg/ in Spanish as a push chain shift

The results of this study are consistent with the hypothesis that the simultaneous lenition of /ptk/ and /bdg/ in Modern Spanish constitute a push chain shift. The linear mixed effects regressions show that Lima has both significantly more intervocalic /ptk/ voicing and significantly weaker intervocalic /bdg/ with higher elision rates than Cuzco, consistent with the comparison made between Spanish and Portuguese made by Lewis (Lewis, 1999). The random forest models offer insight into the possible perceptual implications for these lenitions. The Cuzco forest shows that when /ptk/ are not voiced, /bdg/ can be significantly more constricted, even resulting in partial devoicing, while still maintaining a robust distinction between the sets in terms of voicing. The hypothetical dialect forest trained on Lima /ptk/ and Cuzco /bdg/ shows that as /ptk/ become less voiceless (i.e. more voiced), the distinction between the sets is better made in terms of relative intensity, and the Lima forest shows that weakening /bdg/ constriction in the face of the loss of the voicing cue results in more reliable distinction between the sets. In other words, the simultaneous lenition of /ptk/ and /bdg/ may indicate a shift in the acoustic cues used to distinguish the two sets of consonants. Further dialectal studies of the type carried out in this study, perceptual studies that test for differences in the weighting of acoustic cues in the /ptk/ ~ /bdg/ contrast, and studies that look at individual speaker differences should be performed to further our knowledge of how and why these simultaneous lenitions occur.

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Appendix

Table 18. List of words containing planned observations

	Tonic	Post-Tonic	Unstressed
/p/	<i>apoyo</i> ‘help’ <i>principales</i> ‘principle’ <i>atrapado</i> ‘trapped’	<i>sopa</i> ‘soup’ <i>Europa</i> ‘Europe’ <i>tápala</i> ‘you top it!’	<i>separado</i> ‘separate’ <i>apartamento</i> ‘apartment’ <i>popular</i> ‘popular’
/t/	<i>patosa</i> ‘clumsy’ <i>inevitable</i> ‘inevitable’ <i>quitarse</i> ‘to remove’	<i>político</i> ‘political’ <i>admite</i> ‘you admit!’ <i>mito</i> ‘myth’	<i>atacarán</i> ‘they will attack’ <i>petición</i> ‘petition’ <i>matemático</i> ‘mathematical’
/k/	<i>mantequilla</i> ‘butter’ <i>sindicato</i> ‘union’ <i>salpicó</i> ‘it splashed’	<i>alpacas</i> ‘alpacas’ <i>secos</i> ‘dry’ <i>azúcar</i> ‘sugar’	<i>atacarán</i> ‘they will attack’ <i>sacará</i> ‘s/he will take out’ <i>guacamole</i> ‘guacamole’
/b/	<i>gobierno</i> ‘government’ <i>tobillo</i> ‘ankle’ <i>eventos</i> ‘events’	<i>cultivan</i> ‘they cultivate’ <i>sube</i> ‘s/he raises’ <i>aldaba</i> ‘door knocker’	<i>abogado</i> ‘lawyer’ <i>aventurera</i> ‘adventurous’ <i>inevitable</i> ‘inevitable’

(continued)

Table 18. (continued)

	Tonic	Post-Tonic	Unstressed
/d/	<i>cuidado</i> ‘careful’ <i>invadió</i> ‘s/he invaded’ <i>algodón</i> ‘cotton’	<i>abogado</i> ‘lawyer’ <i>puede</i> ‘s/he can’ <i>olvide</i> ‘you don’t forget!’	<i>medicina</i> ‘medicine’ <i>olvidaré</i> ‘I will forget’ <i>adolescente</i> ‘adolescent’
/g/	<i>abogado</i> ‘lawyer’ <i>según</i> ‘according to’ <i>pagar</i> ‘to pay’	<i>jugo</i> ‘juice’ <i>digo</i> ‘I say’ <i>antiguo</i> ‘old’	<i>albóndigas</i> ‘meatballs’ <i>pagaré</i> ‘I will pay’ <i>agarró</i> ‘s/he picked up’

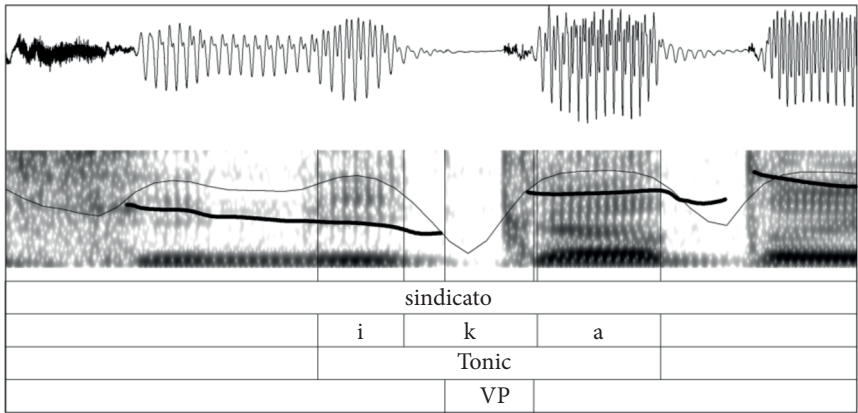


Figure 5. Underlyingly voiceless plosive with a voiceless period (break in pitch). The thick line is the pitch contour and the thin line is the intensity contour

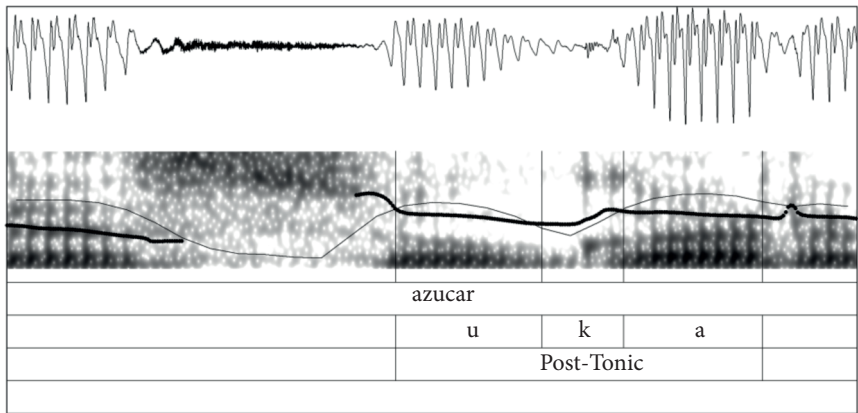


Figure 6. Underlyingly voiceless plosive produced as fully voiced (no break in pitch). The thick line is the pitch contour and the thin line is the intensity contour

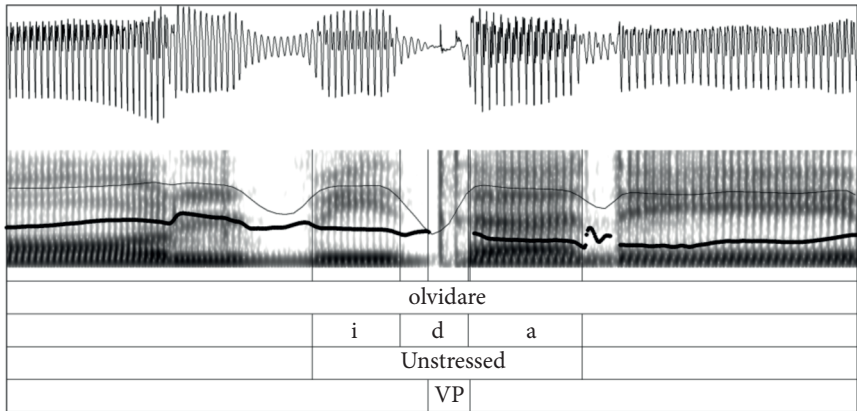


Figure 7. Underlyingly voiced plosive produced as partially devoiced (break in pitch). The thick line is the pitch contour and the thin line is the intensity contour

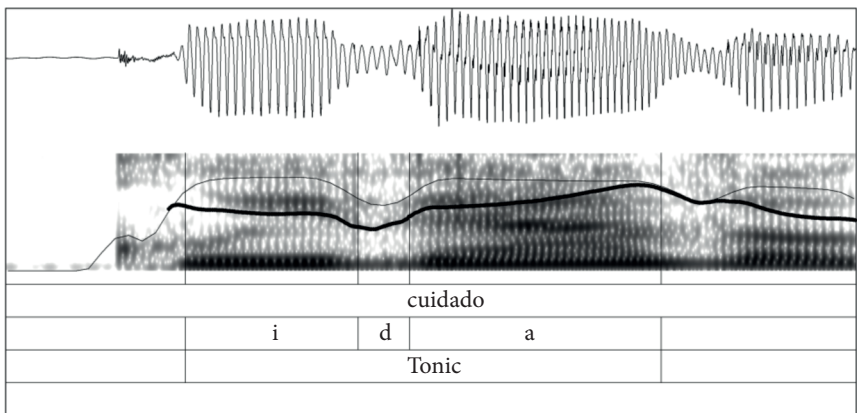


Figure 8. Underlyingly voiced plosive produced as fully voiced (no break in pitch). The thick line is the pitch contour and the thin line is the intensity contour

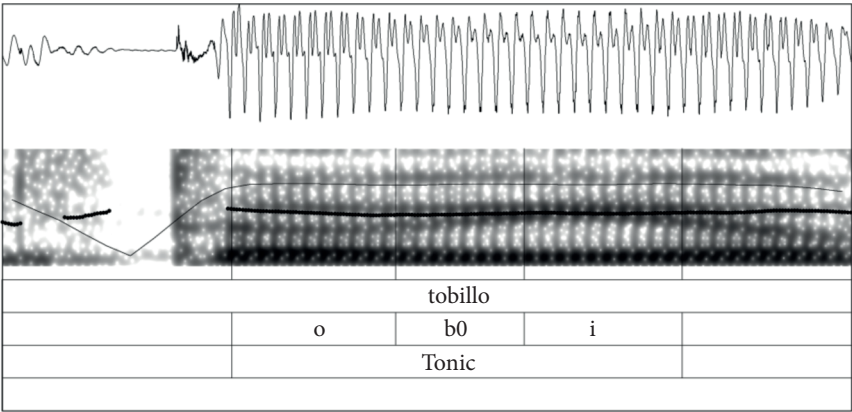


Figure 9. Elided underlyingly voiced plosive (no dip in intensity contour). The thick line is the pitch contour and the thin line is the intensity contour

Are Argentines *a*-blind?

Acceptability of *a*-marked inanimate direct objects

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I examine syntactic and discursive factors conditioning the variable *a*-marking of inanimate DOs in Argentine Spanish, using an online questionnaire which includes 16 contextualized discourse items recorded by native Argentines. Argentine respondents ($N = 140$) evaluated acceptability of the items using a 5-point Likert scale. Linguistic predictors analyzed include: definiteness, mono- vs. ditransitive constructions, and topicality, operationalized in terms of pre-/ post-verbal position and referential distance. Mixed-effects analyses in R showed that although participants assigned significantly higher ratings to normative unmarked inanimate DOs than to *a*-marked ones, *a*-marking was still widely accepted, with definite DOs, pre-verbal position, and monotransitivity as significant predictors of acceptance. Furthermore, in 10/16 cases, participant ratings showed no significant difference between marked and unmarked DOs, demonstrating that participants are, to an extent, “*a*-blind” or uninfluenced by marking.

Keywords: DOM, accusative *a*, inanimate, Argentine Spanish

1. Introduction

Differential object marking (DOM) is defined as the case marking of some direct objects (DOs) possessing specific semantic or pragmatic characteristics, while other DOs do not receive marking (Bossong, 1985; Aissen, 2003). This phenomenon has been documented in hundreds of the languages of the world, with Spanish receiving special attention among scholars. In Spanish, DOM is manifested through the use of the preposition *a* to mark some, but not all DOs. This marking, which is the subject of much debate among linguists, is exemplified in (1):

- (1) a. Busco mi libro.
‘I’m looking for my book.’

- b. Busco a mi madre.
'I'm looking for my mother.'
- c. *Busco a mi libro.

The sentences in (1) highlight one of the primary conditions of DOM in Spanish- in the simplest terms, animate DOs (e.g. *mi madre*) are generally *a*-marked (especially when definite and/or specific), whereas inanimates (e.g. *mi libro*) typically are not, rendering (1c) ungrammatical according to normative accounts.

While many linguists have examined the variable use of *a* preceding animate DOs in Spanish, much less scholarly attention has been paid to the *a*-marking of inanimates. When *a*-marked inanimate DOs are considered (cf. Weissenrieder, 1985), they are generally cases of personification (2a), subject vs. object disambiguation (2b), or the specific behavior of certain verbs (2c), all of which are prescriptively accepted contexts for *a*-marking.

- (2) a. El amor vence al odio.
'Love conquers hate.'
- b. En esta receta, la leche puede sustituir al huevo.
'In this recipe, milk can be used instead of an egg.'
- c. Las mañanas siguen a las noches.
'Mornings follow nights.'

However, there are many cases of *a*-marked inanimates which do not fall under these three categories. Montrul (2013) provides a preliminary examination of native speaker acceptability of some such cases in Argentine Spanish; my goal here is to build upon this prior work to explore inanimate *a*-marking more fully in a variety of syntactic and discursive contexts. The *a*-marked inanimate DOs in constructed sentences (3), (4), and (5) are just three examples of the types of contexts to be explored here.

- (3) A ese local lo cerraron hace rato.
'That store, they closed it a while ago.'
- (4) Ya la vi a esa película.
'I already saw that movie.'
- (5) Ya te lo di al regalo.
'I already gave you the gift.'

The remainder of this chapter is organized in the following way: in § 2, I offer a more nuanced description of the linguistic factors conditioning DOM, summarizing previous research on both animate and inanimate DOs; in § 3, I list the dependent and independent variables considered in the present study; in § 4, I present the research questions and corresponding hypotheses; in § 5, I describe the

methods used in the collection and analysis of the data; in § 6, I report the results of the statistical analyses; in § 7, I discuss these results and their implications for our understanding of DOM in Argentine Spanish; and in § 8, I offer some concluding remarks.

2. Previous literature

Accusative *a*-marking in Spanish is a complex phenomenon which, though it has been studied from a variety of perspectives, remains little understood. There has been extensive discussion among Hispanic linguists about its role, and there is still no consensus as to whether its use is most directly related to animacy, specificity, topicality, or a combination of these factors. Researchers from a variety of linguistic backgrounds have contributed to this debate, arguing for the primacy of one or more of these variables based on data from a variety of dialects (Bossong, 1985; Weissenrieder, 1985; Laca, 1995[1987]; von Heusinger & Kaiser, 2003, 2011; Leonetti, 2003, 2004; Tippetts & Schwenter, 2007; von Heusinger, 2008; Lizárraga Navarro & Mora-Bustos, 2010; Balasch, 2011; Tippetts, 2011; *inter alia*).¹

Aissen (2003) claims, by what has come to be known as the Markedness Approach, that cross-linguistically animate DOs are more marked (in the sense of being less common) than inanimates and are therefore much more likely to take *a*-marking. Tippetts and Schwenter (2007) express a similar idea- that the primary motivation for *a*-marking is deviation from prototypical transitive cases, where subjects have greater animacy than their DOs. Company (2002) claims that, “[DOs] usually undergo some change of state, provoked by the energy of the agent via the transitivity of the verb” and goes on to note that “A thing is easier to change than a human being; therefore a non-human entity seems to represent the prototype of a DO better than a human” (p. 206). According to Company (2002), it is precisely because of their non-prototypical nature as DOs that human objects take *a*-marking. Hopper and Thompson (1980) write that in order to be marked with accusative *a*, a DO must not only be animate, but also “either human or human-like” (p. 256). Other scholars have made similar statements, so much so that this marking has come to be known as the “*a* personal” among Spanish educators and Hispanists.

However, as some variationist literature on DOM has alluded to, being neither human-like nor animate is a required criterion for accusative *a*-marking, and this same marking can at times appear with inanimates. The question, then, is this: why do inanimate DOs, as prototypical unmarked objects, take *a*-marking in certain

1. For a more thorough review of the scholarly debate surrounding accusative *a*-marking in Spanish, see Fábregas (2013).

cases? The consideration of animacy alone leaves interested researchers without an answer to this question. Thus, while animacy is widely considered one of the most important factors in DOM, it is insufficient to explain the variation observed in Spanish because, as Tippets (2011) duly notes, “*a*-marking is not exclusive to the realm of animacy” (p. 116). Indeed, Tippets (2011) provides quantitative evidence to suggest that local factors, such as animacy, specificity, and form of the DO, as well as global factors such as relative animacy (see also García García, 2007), are involved in the use or non-use of DOM in Spanish. Montrul (2013) concurs, adding definiteness, topicality of the object, verb semantics, and lexical aspect, “among other things,” to the list of factors influencing the use of the preposition *a* (p. 207). Similarly, García García (2005, 2014) claims that telicity, verbal meaning shift, and agentivity may also be involved in *a*-marking.

Although the vast majority of variationist research has focused on the use of *a* with animate DOs, studies focusing on *a*-marked inanimate objects also exist. Dumitrescu (1997) notes key differences in the use of *a* with inanimate DOs between Buenos Aires Spanish and the dialect spoken in Madrid, while Company (2002) examines Spanish diachronically and notes an appreciable increase (from 2% to over 20%) in *a*-marked inanimates from the 13th to the 21st centuries. This finding leads her to conclude that *a* may be progressing toward use as a true accusative case marker. However, Company’s (2002) results should be interpreted with some caution as the data sources used include Peninsular and Mexican data and come from different registers (centuries-old texts vs. spontaneous speech from sociolinguistic interviews), which may account for the increases she observes.

Barrenechea and Orecchia (1977) and Tippets (2011) have observed that Argentine Spanish exhibits a higher rate of inanimate *a*-marking than other dialects. Dumitrescu (1997) documents the phrase *A esta plaza la cuida ... y usted* on a sign in Buenos Aires and notes that the preposition is not used this way in the Spanish of Madrid. Cases nearly identical to those presented in Dumitrescu (1997) can be found all over the city of Buenos Aires on government-issued signage or posted by local organizations - *A esta escuela la cuidamos entre todos*, *A esta esquina la cuida ...*, *A este parque lo cuidan usted y ...*, *A este espacio lo cuidan usted y ...*, etc. Similar cases of *a*-marked inanimate DOs can be found in large numbers on Argentine television programs, on social media and blogs, in the dialogue of novels, and even in academic publications and on government web pages.

The greater degree of inanimate *a*-marking seen in Argentine Spanish as compared to other varieties is represented graphically in Figure 1. As the figure illustrates, Argentine Spanish permits accusative *a*-marking in contexts where other varieties may not. Normative Spanish grammar permits *a*-marking only in contexts 1 and 2, though in some varieties of Spanish *a*-marking is also variably accepted in context 3 or even context 4, though to a limited degree. In Argentine Spanish,

however, *a*-marking is variably permitted in all five contexts.² However, as the present study will demonstrate, acceptance of *a*-marking in contexts 3 and 4 is highly variable and is conditioned by other syntactic factors.

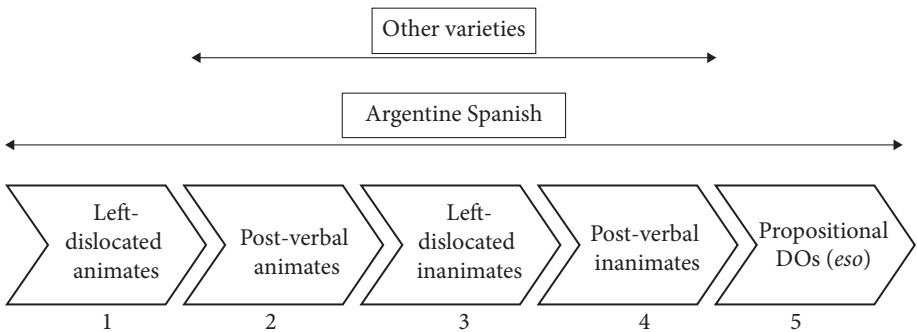


Figure 1. Acceptability of *a*-marking by syntactic context

At this point, a few brief comments about clitic doubling are in order since it has been shown to be relevant to the variable acceptability of *a*-marking. Clitic doubling, as defined by Colantoni (2002) is “the duplication of the clitic by a lexical expression” (p. 322). That is, a DO clitic is coreferential with a lexical NP in the same clause. In the case of *A esta plaza la cuida ...*, the DO clitic *la* represents a double instantiation of the NP *esta plaza*. As Examples (3), (4), and (5), as well as the examples from signage in Buenos Aires illustrate, the *a*-marking of inanimate DOs is nearly always accompanied by clitic doubling. (It is important to note that this is not the case for animate DOs; though Argentine Spanish is a dialect known for high occurrences of clitic doubling, animates in this dialect are not obligatorily clitic doubled and cases such as *¿Conocés a esa mujer?* ‘Do you know that woman?’ are acceptable, whereas *¿Viste a esa película?* ‘Did you see that movie?’ is unacceptable for most, if not all, speakers.)³ Therefore, the questionnaire used in the present study includes clitic doubling in all of the stimuli presented to participants, since the inclusion of non-clitic doubled *a*-marked inanimates would make the questionnaire unnecessarily longer and participants would almost certainly reject all such cases.

2. The *a*-marking of propositional DOs will not be discussed here, as they were not included in the questionnaire. Still, cases such as *Vos lo sabés a eso* ‘You know that’ or *Ya te lo dije a eso* ‘I already told you that’ are accepted by some speakers of Argentine Spanish.

3. Note also that Argentine Spanish requires that inanimate DOs be specific in order for clitic doubling to occur. For further details regarding clitic doubling in Spanish, see Suñer (1988) and Estigarribia (2003, 3006). Thus, though definiteness is manipulated in the questionnaire, all DOs presented as stimuli are specific.

To examine variable accusative *a*-marking, Montrul (2013) employs a written experimental questionnaire composed of 140 target sentences and 100 distractors. While her questionnaire includes both animate and inanimate DOs to examine the effects of clitic doubling and topicalization on *a*-marking, Montrul’s (2013) findings regarding *a*-marked inanimate DOs motivate the present study, which also makes use of a questionnaire in order to determine the effects of mono- and ditransitive constructions (to measure acceptance of *a*-marked DOs in cases of possible confusion with IOs), definiteness, and topicality (analyzed in terms of referential distance and pre- or post-verbal position of the DO) on native-speaker acceptability judgments of audio stimuli containing *a*-marked inanimates. However, key differences exist between the methodology employed in Montrul (2013) and the design of the present study. Some of these methodological differences are detailed in Table 1.

Table 1. Key differences between Montrul (2013) and the present study

Montrul (2013)	Present study
Written stimuli	Audio stimuli
Isolated, single-clause sentences without context	Contextualized, realistic conversations
Stimuli both with and without clitic doubling	All stimuli include clitic doubling
Topicality operationalized as left-dislocated position	Topicality operationalized with two criteria, analyzed independently- referential distance and pre-/ post-verbal position
Only monotransitive constructions considered	Both mono- and ditransitive (<i>dar</i>) constructions considered
24 participants from various regions, varying ages	140 participants from various regions, varying ages (majority are college-aged Bonaerenses)

A fundamental element of any study on accusative *a*-marking is topicality. Indeed, it is likely that DOM in Spanish was originally used with topical objects and that its use with animates is the result of grammaticalization. This claim is supported by diachronic data from Spanish (see Melis, 1995; Pensado, 1985; and Laca, 2002 for a more complete historical account), as well as by the observation that in other Romance varieties, such as certain dialects of Italian (Iemmolo, 2011) or Balearic Catalan (Escandell-Vidal, 2009), this is the only context in which inanimates admit *a*-marking. Although researchers often treat the notion of topic differently and no complete consensus exists among linguists regarding its definition or measurement, a referent is generally considered to be topical when it has previously appeared in the discourse and when the proposition provides information about it. This general

definition is expressed in Lambrecht (1994) as follows: “a referent is interpreted as the topic of a proposition if in a given situation the proposition is construed as being about this referent, i.e., as expressing information which is relevant to and which increases the addressee’s knowledge of this referent” (p. 131). However, topicality is a complex notion because it is scalar- a referent may be more or less topical. One means of measuring topicality that takes into account its scalar nature is referential distance (Givón, 1983; Bentivoglio, 1983), a method by which the number of clauses between the first mention of a referent (in this case, an inanimate DO) and its subsequent mention(s) is used to calculate its degree of topicality.

Montrul (2013) operationalizes topicality more simply, as left-dislocated position. Thus, all cases in her study where the inanimate DO appears before the verb (e.g. *A la casa la compró Mariela* ‘The house, Mariela bought’) are said to be topical (Montrul, 2013, p. 216). However, as Ocampo (2009) explains, while it is true that NPs with highly topical referents often do appear in preverbal position with less topical referents generally following the verb, position alone does not determine topicality and topics can be made more prominent or, in the words of Ocampo (2009), “highlighted” by other means. For this reason, topicality is controlled in the present study by means of two independent conditions- referential distance and position of the DO relative to the verb.

3. Variables

The dependent variable in the present study is the participants’ acceptability of each stimulus, as indicated by a score on a 5-point Likert scale. The values of the scale are as follows: 1 represents the least favorable rating with the description “This sounds odd to me,” whereas a rating of 3 means “This sounds OK, but I wouldn’t say it” and a score of 5 corresponds to the most favorable rating, “This sounds good and I would say it.” The linguistic independent variables examined include the argument structure of the clause (mono- or ditransitive), word order (whether the DO NP appears pre- or post-verbally), definiteness of the DO (definite or indefinite, determined morphologically by the preceding article), and referential distance (as determined by the number of turns, by Givón’s definition, between the first mention of the DO and the *a*-marked appearance).

Several social independent variables were also considered. These included the participants’ age, sex, province of origin and of current residence, and highest level of education completed. These variables allow for an examination of social factors which may condition participants’ acceptance or non-acceptance of *a*-marking within the same linguistic context. Though we must not assume that social variables will be significant a priori, differing behaviors by sex, age, or education could

provide valuable information about the status of non-normative *a*-marking in Argentine Spanish and how speakers perceive its use socially.

4. Research questions and hypotheses

The following research questions guide the present study:

1. In what syntactic/discursive contexts is the accusative *a*-marking of inanimates most and least accepted? More specifically, what effect (if any) do the following conditions have on participant acceptability ratings?
 - a. pre- vs. post-verbal position of the DO
 - b. mono- vs. ditransitive clauses
 - c. definiteness of the DO
 - d. referential distance (cf. Bentivoglio, 1983; Givón, 1983)

Based on Montrul's (2013) findings, it is hypothesized that DOs in pre-verbal position will be ranked as more acceptable than those appearing post-verbally, as the left-dislocated position is the preferred spot for topics cross-linguistically. Dumitrescu (1997) also claims that this is the position in which *a*-marked inanimates are most accepted in River Plate Spanish. Iemmolo (2011) makes a much stronger claim, that "the use of DOM is triggered by the topical, dislocated position of the direct object. If the direct object appears in post-verbal position, and is focal, DOM is impossible" (p. 263). While this claim is perhaps a bit strong as *a*-marked inanimates do at times appear post-verbally in Argentine Spanish and the effects of information structure on accusative *a* have not yet been fully explored, the linguistic literature does suggest that marking of left-dislocated DOs is more frequent.

Additionally, it is expected that monotransitive constructions will more readily permit *a*-marking than ditransitive constructions with *dar* 'to give' (e.g. *(A) uno de los libros se lo di ayer* 'One of the books, I gave it to him the other day' or *Ya se la di (a) la llave* 'I already gave him the key'), as the latter presents the potential for confusion of direct and indirect objects. Put another way, speakers may resist the use of the preposition *a* with inanimate accusative objects when there are animate dative objects, which more frequently (and normatively) take *a*-marking, in close proximity. However, as the possibility of *a*-marking inanimate DOs in ditransitive constructions has, to my knowledge, never before been documented

in the linguistic literature,⁴ this hypothesis is based upon my own intuitions and on preliminary consultation with native speaker informants.

Regarding definiteness, it is predicted that *a*-marked definites will be evaluated as sounding more natural to participants than indefinites. This prediction is in line with research on animate DOs, which has found that definites more readily accept *a*-marking than do indefinites. This hypothesis also follows from previous scholarship on topicality, where definiteness is associated with higher topical status. On a related note, it is expected that those discourse items with lesser referential distance (that is, where the second mention of the DO immediately follows the first, with no intervening turns) will admit *a*-marking more readily, as these are instances where the DO is highly topical.

2. Do the social factors of age, sex, province, or level of education influence acceptability judgments?

Finally, as the linguistic literature has not found accusative *a*-marking to carry clear social stigma or to bear strong social group associations (though this dimension of the variation has been almost entirely neglected), and based on the fact that non-normative accusative *a*-marking can be found in a wide variety of social contexts in Argentina ranging from formal to informal registers, it is predicted that social factors will be of secondary importance to linguistic factors. That is, while the personal characteristics and sociolinguistic backgrounds of participants are surely relevant, it is expected that the linguistic independent variables will be more reliable predictors of their acceptance of accusative *a*-marking.

5. Methodology

5.1 Instrument

The questionnaire was distributed online (using SurveyGizmo) and included 44 contextualized discourse items (16 target items and 6 distractors, each with 2 variants), as well as questions related to basic demographic information such as age, sex, province of origin and of current residence, and the highest level of education completed. The discourse items were invented, yet realistic conversations recorded by two native speakers of Bonaerense Spanish. Participants were asked to listen one time to each conversation, which included a target segment repeated at the end, and evaluate this repeated segment for acceptability. Evaluations were made

4. But see Fábregas (2013, § 2.4.1) for discussion on variably *a*-marked animate DOs in ditransitive constructions.

using a 5-point scale, where 1 represented the least acceptable score and 5 the most natural-sounding, as described above. The final questions of the instrument were open-ended and allowed participants to mention anything about the conversations that seemed odd to them or any specific linguistic phenomena they may have noticed. These free-response questions sought to determine to what extent participants were aware of the phenomenon being examined, as the use or non-use of *a* may be quite subtle to them.

Since the pilot phase revealed that the instrument was too long and participants were unwilling to listen to and evaluate all 44 conversations, the questionnaire was divided into two paths.⁵ Both paths included the demographic questions and free-response questions, as well as six distractors. The target discourse items were divided evenly so that Path A and Path B each contained an equal number of *a*-marked and non-marked cases (with no stimulus presented in both its marked and unmarked versions), which were presented in random order. Using SuveyGizmo's branching function, each participant, after reading the instructions, was randomly assigned to one of the two paths.

5.2 Speakers

The speakers providing the audio stimuli to be evaluated were two male native speakers of Bonaerense Spanish. Carlos⁶ was 23 years old at the time of recording and is from Castelar, just outside of Buenos Aires Capital Federal. He currently lives in the downtown neighborhood of Recoleta. Felipe was 22 years old at the time of recording and is from Boedo, in Capital Federal. At present he lives in the neighborhood of Villa Urquiza. Both speakers are currently in college and belong to the middle class. Carlos and Felipe, in addition to reading aloud the simulated conversations that served as the audio stimuli for the instrument, were also consulted to ensure that the language used was typical of their local variety and that the dialogues sounded natural.

5.3 Participants

All participants ($N = 140$) were native-born Argentines who had lived the majority of their lives in the country and resided there at the time of participation. Participants were recruited by word-of-mouth and by the sharing of the web address

5. This decision made it possible to recruit more participants, as well as to ensure that they did not grow tired or bored and assign ratings without considering their choices.

6. The names provided here are pseudonyms, not the speakers' real names.

for the questionnaire via social networks such as Facebook or student forums of the University of Buenos Aires. Because the questionnaire was accessible to anyone with the corresponding URL, a set of demographic questions was used to ensure that only respondents meeting the requirements for participation just described were included in the study; data from any respondent not meeting these requirements (e.g. not born in Argentina, having lived for many years in the US, etc.) were excluded from the sample. It should be noted that because forums for students of Filosofía y Letras were used to recruit participants, a large portion of the data came from a linguistically aware group of students educated in a highly prescriptive academic context. The importance of this fact will be discussed in greater detail in § 7.

The participant population is detailed in Table 2, according to each of the extralinguistic variables to be considered.

Table 2. Distribution of participants by extralinguistic variables

Province of origin	#	Current province	#	Education	#	Sex	#	Age	#
Buenos Aires	117	Buenos Aires	124	University	40	Male	34	18–24	59
Other	23	Other	16	Some univ.	83	Female	106	25–29	37
				Secondary	16			30–39	25
				Primary	1			40–49	13
								50–59	3
								60+	3
Total	140	Total	140	Total	140	Total	140	Total	140

The social variables of age, sex, province of origin and of current residence, and highest level of education completed were included in the first stages of statistical analysis, but none of them was selected as significant (perhaps because of their strongly uneven distributions). The reason for this result, as well as the possible implications of this finding for accusative *a*-marking in Argentine Spanish are treated in more detail in § 7. In order to avoid these social variables' influencing the statistical interactions between the linguistic factors, they were not included in the remaining analyses reported here. Therefore, the linguistic, rather than extralinguistic variables, will be the primary focus of the discussion to follow.

5.4 Data analysis

The data obtained from the questionnaire were analyzed using the freeware statistics environment R (R Core Team, 2013). First, a mixed-effects analysis (*glmer* function) was performed. Fixed effects included the extralinguistic variables of

participants' age, sex, level of education, province of origin, and province of current residence,⁷ as well as the linguistic variables of definiteness, pre- vs. post-verbal DO position, mono- vs. ditransitive constructions, *a*-marking, and referential distance. Participant and discourse item were included as random effects.

Next, random forests and the step function were used to calculate the relative importance of each predictor for explaining the observed variation. Following this, a log likelihood comparison (ANOVA function) was used to compare nested models and select the best one. Finally, an unpaired t-test was employed to compare Likert scale scores for each discourse item. This involved a comparison between the mean scores assigned to the normative (unmarked) and non-normative (*a*-marked) versions of each of the 16 discourse items. In order to ensure accurate interpretation of these scores and take into account the different ways in which participants used the 5-point scale provided to assign ratings, participant responses were normalized and the resulting z-scores, rather than participants' raw scores, were used for comparison.

The findings of each of these analyses, as well as their implications for DOM in Argentine Spanish, are discussed in the sections to follow.

6. Results

As mentioned above, random forests and the step function were used to determine the factors of greatest importance. Through these analyses, three of the four linguistic factors were chosen for inclusion in the statistical model: word order (pre- vs. post-verbal DO placement), argument structure of the clause (mono- vs. ditransitive), and definiteness of the DO. None of the extralinguistic factors was selected, nor was referential distance included. Possible explanations for these outcomes are provided in § 7.

A log likelihood comparison was used to determine the best-fitting model for the data. As seen in Table 3, definiteness, DO position relative to the verb, the argument structure of the verb, and *a*-marking were all highly significant ($p < .001$) predictors of the acceptability rating assigned by participants. Table 3 also shows the effects an individual value of each variable had on ratings – when a DO was indefinite, ratings dropped overall; when a DO was placed pre-verbally, ratings

7. Because many of the participants were both originally from Buenos Aires and currently living there, adjustments had to be made to the variables province of origin and province of current residence to avoid colinearity. First, both variables were coded as either 'Buenos Aires' or 'Other.' Then, province of current residence was removed entirely and only province of origin was analyzed. At no point was this variable chosen as significant.

rose; etc. It is important to note that these results reflect ratings of both *a*-marked and unmarked inanimate DOs. Thus, the changes in ratings just described reflect participants' reactions to clitic doubled inanimate DOs (as this condition was held constant for all stimuli), rather than to *a*-marked inanimates. However, the final row of Table 3 does make clear that, overall, *a*-marked DOs received lower ratings than their normative, unmarked counterparts.

Table 3. Selection of best-fitting model

	Estimate	SE	tValue	P-value
(Intercept)	−.004	.05	−.08	.933
Definiteness (Indefinite)	−.416	.04	−9.68	$p < .001$
DO position relative to verb (Preverbal)	.305	.04	7.09	$p < .001$
Argument structure of verb (Monotrans.)	.253	.04	5.89	$p < .001$
A-marking (A-marked)	−.225	.04	−5.23	$p < .001$

In order to better understand the hierarchical relationships between these variables and to examine graphically the effects of each variable on participants' acceptability ratings, a conditional inference tree was generated. As Figure 2 makes clear, definiteness is the primary determiner of acceptability, followed by the argument structure of the verb. Interestingly, whether an inanimate DO is *a*-marked is a predictor of relatively low importance for acceptability, as evidenced by its lower position on the tree.

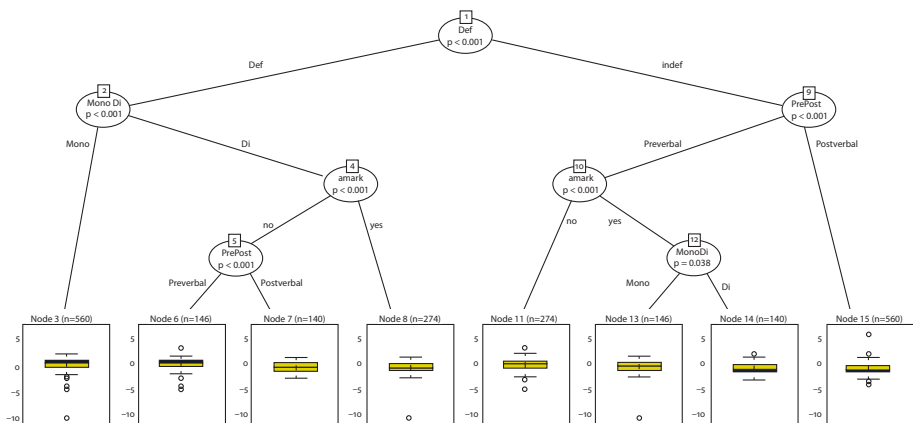


Figure 2. Conditional inference tree

To this point, all 16 discourse items have been discussed as a whole and *a*-marking has been treated as just one of the linguistic variables affecting acceptability ratings. However, looking at each discourse item individually and examining differences in ratings between the *a*-marked and unmarked versions of each stimulus provides additional insights into the effects of non-normative *a*-marking on participant responses.

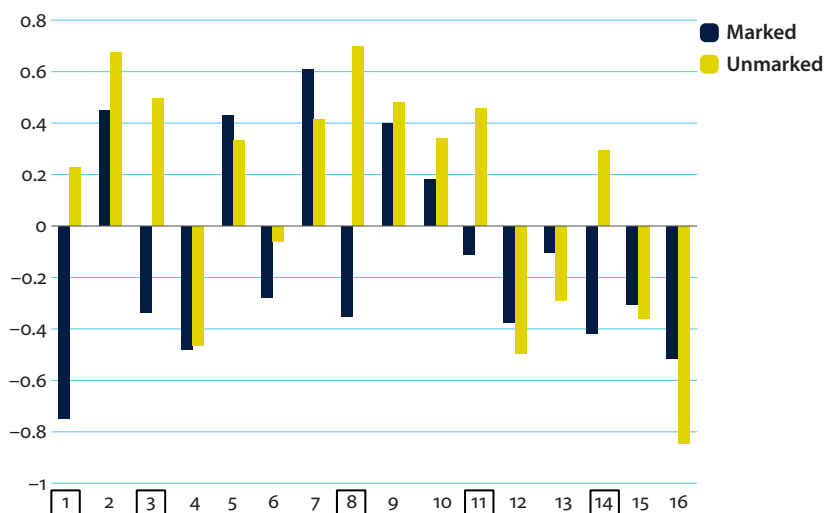


Figure 3. Comparison of z-score means for each discourse item

All cases in which the z-score mean for the normative (unmarked) variant is significantly higher are marked with boxes below the figure. In all five of these cases (#1, 3, 8, 11, 14), the difference is significant at the $p < .0001$ level. Discourse item #16 is the only item for which the *a*-marked variant was ranked significantly higher ($p = .0391$) than the unmarked variant. In the remaining ten discourse items, differences between the normative and non-normative variants were not significant. That is, participant ratings were not significantly affected by the non-normative use of *a* in these cases; this finding, which suggests a certain level of “*a*-blindness” on the part of these participants, is of great interest and will be discussed in depth in the next section.

It is also interesting to note what discourse items #1, 3, 8, 11, and 14 have in common, as these were the cases in which the normative, unmarked variant was most clearly preferred over *a*-marking. That is, these are the contexts in which the non-normative use of accusative *a* was most strongly rejected by participants throughout the questionnaire. All five of these discourse items share a clear commonality – the DO is either indefinite (e.g. *a uno de sus libros lo leí* ‘One of his

books, I've read'), is part of a ditransitive construction (e.g. *a esa foto se la di el otro día* 'That photo, I gave it to her the other day'), or both (e.g. *a uno de los libros se lo di ayer* 'One of the books, I gave it to him yesterday'). Therefore, these are the syntactic contexts in which this participant group as a whole found *a*-marking to be least acceptable.

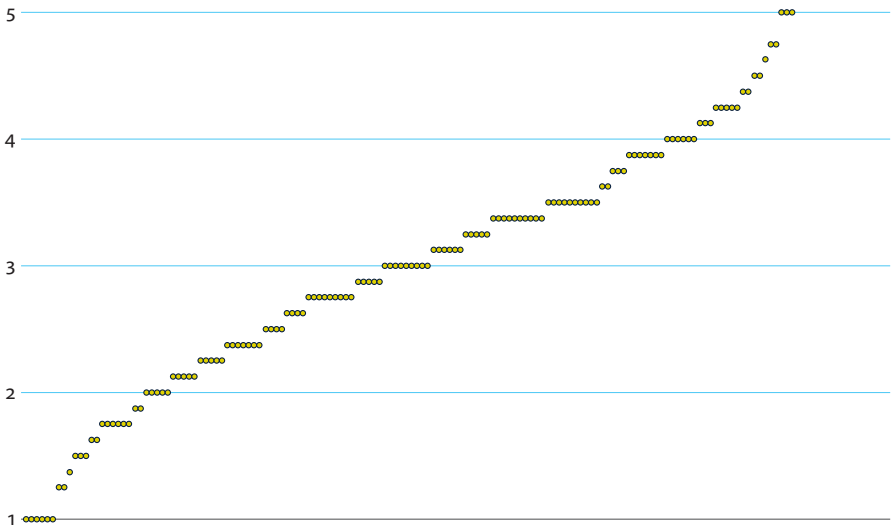


Figure 4. Mean ratings for non-normative (*a*-marked) stimuli

In Figure 4, where each of the 140 participants is represented by a point, six participants categorically rejected *a*-marked stimuli, assigning a rating of 1 to all non-normative stimuli. There were also three participants who assigned ratings of 5 to all of the *a*-marked stimuli. However, the vast majority of participants fell somewhere in between these two extremes. Thus, while participants could presumably be divided into three groups – something like “accepters,” “rejecters,” and “in-betweens” – this last group’s acceptability ratings are so variable that participants are perhaps best viewed as lying along a continuum of acceptance or rejection of *a*-marked inanimates.

7. Discussion

The goal of the present study was to identify the linguistic factors that condition the variable acceptability of *a*-marked inanimate DOs in Argentine Spanish. This type of research responded to a need in the field in that it examined inanimate

a-marking in syntactic contexts not previously studied in much, if any, detail (e.g. post-verbal DOs, ditransitive constructions, etc.). In general terms, the results show that although participants do prefer normative (unmarked) inanimate DOs as evidenced by their acceptability ratings, *a*-marked inanimate DOs are still widely accepted. What is more, for many discourse items the presence of *a*-marking did not significantly alter acceptability ratings, suggesting that some participants may not notice or may be unaffected by non-normative uses of *a*.

In order to address more thoroughly the importance and implications of this study's results, I now return to the research questions originally posed. The first research question was concerned with linguistic factors conditioning participants' acceptability of *a*-marked inanimate DOs:

1. In what syntactic/discursive contexts is the accusative *a*-marking of inanimates most and least accepted? More specifically, what effect (if any) do the following conditions have on participant acceptability ratings: pre- vs. post-verbal position of the DO; mono- vs. ditransitive clauses; definiteness of the DO; and referential distance?

The statistical analysis clearly demonstrated that these participants showed greatest acceptance of non-normative *a*-marking when the DO was definite, was left-dislocated (pre-verbal), or appeared in a monotransitive clause. On the other hand, participants identified as least acceptable those cases in which an indefinite DO appeared post-verbally or in a ditransitive clause. Additionally, as shown in the conditional inference tree (Figure 2) and log likelihood comparison (Table 3), all of the linguistic variables except referential distance were significant predictors of participant acceptability ratings.

It is at first somewhat surprising that referential distance, a means of measuring topicality, was not selected as significant, as *a*-marking is believed to be closely related to the topical status of the DO. However, it is likely that this finding says more about the means in which topicality was measured in the questionnaire than it does about the central importance of topicality for *a*-marking in Argentine Spanish. That is, because the *a*-marking of inanimates co-occurs almost categorically with clitic doubling and because the design of the questionnaire required that full lexical NPs be used in all discourse items, referential distance may not be the most appropriate metric of topicality in this instance. Furthermore, the importance of topicality for *a*-marking is clearly demonstrated here by the fact that pre- vs. post-verbal position was a highly significant predictor of acceptability ratings.

The second research question was concerned with social, rather than linguistic factors:

2. Do the social factors of age, sex, province, or level of education influence acceptability judgments?

Here, the results of the statistical analysis do not present as clear of answers. In fact, it may initially appear that social factors have no real effect on whether a participant will accept or reject *a*-marking in a given syntactic context. Put another way, it might seem that this participant group is homogenous in its acceptance or rejection of *a*-marked inanimates, such that social differences have no consistent effect on the ratings assigned. This is clearly not the case, however, as evidenced by the fact that some participants consistently assigned very low scores to *a*-marked DOs, while others accepted non-normative marking in nearly every case.

However, there are at least two possible explanations remaining. First, it may be the case that uneven distribution of participants by each extralinguistic variable is masking the importance these social considerations may have. In other words, the fact that the majority of participants are college-aged females from the province of Buenos Aires may be responsible for the fact that the variables of age, sex, and province of origin were not selected as significant. Though the uneven distribution of this sample no doubt had an effect on the statistical analysis, another piece of the puzzle may be of even greater importance.

As mentioned before, both the conditional inference tree and the comparison of *z*-score means for each discourse item show that *a*-marking is not the strongest predictor of participant ratings. Instead, it was the definiteness of the DO which most reliably predicted acceptance or rejection of *a*-marking. This suggests that the Argentine participants in the present study are, to some extent, “*a*- blind.” It is likely that participants from other dialects, where the use of accusative *a* is more restricted, would balk at many cases of *a*-marked inanimates and assign these discourse items less acceptable ratings based on the presence of *a*, making *a*-marking a stronger predictor of acceptability for such varieties. Yet what the data presented here seem to show is a somewhat reduced awareness of *a*-marking on the part of these participants- or, alternatively, it may be that they are aware of *a*-marking without this awareness affecting their linguistic judgments. Either way, it appears that because of its widespread and frequent use in their dialect, the *a*-marking of inanimates is not strongly stigmatized, despite the fact that it violates prescriptive norms.

The claim that many speakers are “*a*- blind” is supported by qualitative data obtained through the free-response questions at the end of the questionnaire. When asked if the conversations sounded native and natural, and if there was any particular linguistic form or use that sounded odd in the questionnaire, relatively few participants made mention of accusative *a*-marking. In fact, the majority of participants either responded that nothing stood out as odd to them or made mention of

the somewhat awkward repetition caused by expression of both a DO clitic and a lexical NP in every stimulus. Though a handful of participants did make mention of accusative *a*-marking, it is noteworthy that the non-normative use of accusative *a* with inanimates was not noticed by more participants. This is especially telling, given that many of these participants were linguists who, when given the task of evaluating non-normative uses of their local variety, adopted a highly prescriptive stance and sought to identify grammatical “errors” common to their dialect. Indeed, some participants even interpreted the questionnaire as a demonstration of “los típicos errores gramaticales que cometen los nativos y que están muy naturalizados” (‘the typical grammatical errors that native speakers commit and that are very naturalized’) or, in more condemnatory terms, “lo mal que hablamos sin darnos cuenta” (‘how badly we speak without realizing it’) or “como deformamos la lengua!” (‘how we butcher language!’).

8. Conclusions

Here I have provided a quantitative analysis of the accusative *a*-marking of inanimate DOs in Argentine Spanish. Though some variationist research on the topic already existed, this study improves upon previous analyses in several ways. First, a questionnaire with natural-sounding, contextualized audio stimuli was used. These considerations are important when eliciting acceptability judgments about non-standard forms and allow this study to serve as a first glimpse of how participants react to *a*-marked inanimates presented in an authentic way. Second, *a*-marking in ditransitive constructions with *dar* were analyzed for the first time in this study. This variable is of great interest to the study of *a*-marking as it allows us to observe how participants react to the potential processing issues *a*-marked inanimates can cause. Finally, the present study has the added benefit of a much larger sample size than previous analyses, and this more robust data set allows for more reliable and more easily generalizable results.

Additionally, the data presented here demonstrate the variation that exists between speakers, as well as the syntactic contexts in which accusative *a*-marking is most and least accepted. As was shown in Figure 1, Argentine Spanish permits *a*-marking in contexts where other varieties are less accepting, though even in Argentine Spanish acceptance is far from uniform across all speakers. Syntactic factors such as DO position relative to the verb, definiteness, and the argument structure of the clause were shown here to condition acceptance of *a*-marked inanimates. Thus, though Argentine Spanish could be considered, in some sense, a “radical” dialect in terms of *a*-marking, speakers’ use and acceptance of this non-normative phenomenon continues to vary widely.

The work presented here adds to our understanding of DOM not only in Argentina, but in Spanish as a whole. The data from the present study can serve as valuable points of comparison for other varieties, where the *a*-marking of inanimates may be limited, yet constrained by similar linguistic factors. Indeed, while this study provides novel insights about the influence of several discursive and syntactic factors on object marking in Spanish, its applications may extend to other languages with DOM. However, much work remains to be done. Future research should include ditransitive verbs other than *dar* to further examine acceptance in these constructions. Additionally, the present study paves the way for future exploration of possible connections between the acceptance of *a*-marked inanimates and that of variably *a*-marked animates (with relative clauses in the subjunctive, for example). Finally, closer inspection of the possible effects of social variables on the use and acceptance of *a*-marking is still needed.

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The importance of motivated comparisons in variationist studies*

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As the state of the field advances empirically, sociolinguists are increasingly expected to utilize statistics in their data analysis. Some researchers have limited formal statistical training, and even for the more experienced researcher, the focus of model construction is often on the independent variables, e.g. interactions or multicollinearity issues. However, dependent variables with three or more variants require careful consideration. Building on Paolillo (2002), I show that identical binomial logistic regression models yield disparate results given differential treatment of a complex dependent variable. I conclude by offering concrete, hands-on advice for linguists working with their data in R with the goal of promoting judicious analyses among Hispanic sociolinguists.

Keywords: model construction, treatment of data, motivated comparisons, dependent variable, Nicaraguan Spanish, variationist sociolinguistics

1. Introduction

Complex statistical models have become compulsory in modern variationist analyses,¹ and linguists are now expected to employ sophisticated statistical techniques in spite of what may be limited training. A number of books have emerged in the past decade to help train linguists in statistics, including Baayen (2008), Gries (2009, 2013), Johnson (2008), Paolillo (2002), and Tagliamonte (2006), among

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1. While this generalization is true for many sociolinguists, particularly variationists, Third Wave sociolinguistics (Eckert 2008, 2012) has introduced a critique of the hegemony of regression.

many others, but few sources offer practical, concrete guidance for Hispanic sociolinguists.² Many linguists utilize packages in R like Rbrul (Johnson, 2009) or programs like GoldVarb (Sankoff, Tagliamonte, & Smith, 2015) to facilitate data analysis, but our focus is generally on the results of the model – which factors emerge as significant and how the results contribute to linguistic theory – rather than the details of the dependent variable.

As a result, a disproportionate emphasis may be placed on the independent variables. In focusing on the predictors of the linguistic phenomenon at hand, linguists seek to discover what, if any, interactions between the independent variables emerge as significant, if there are any issues of multicollinearity, and whether to keep variables approaching significance in the model or not. As inadequate attention may be paid to the dependent variable in the model-construction phase, the present work seeks to draw attention to the statistical treatment of multiple linguistic variants in Hispanic sociolinguistics, demonstrating the disparate findings that can be produced as a result of different treatments of a complex dependent variable.

2. The treatment of linguistic variants in previous work

Because this paper addresses a specific methodological issue, namely the treatment of linguistic variants, a brief review of the linguistic variable, linguistic variant, and treatment of these variants is needed. As Labov explains, “... the linguistic variant is a particular item – a morph or a phone,” while “... the variable is a class of variants which are ordered along a continuous dimension and whose position is determined by an independent linguistic or extra-linguistic variable” (Labov, 1966, p. 15). It should be kept in mind that “the linguistic variable, itself an abstraction, is realized in actual speech behavior by variants, that is, individual members of a class of variants constituting the variable” (Wolfram, 1974, p. 47).

While the “class of variants constituting the variable” may seem straightforward at first glance, the determination of how many variants to include in one’s analysis can actually be a rather complicated question. For instance, in his analysis of morpheme-final /θ/ in East Harlem, e.g. *tooth*, Wolfram (1974) creates five categories of variants: “θ”, “f”, “t”, “ø”, and “s”, and three of these categories involve the conflation of different phonetic variants. As a case in point, the “t” category combines [t], [ʔt], [ʔ], and [ɾ]. Wolfram clarifies, “In setting forth a variable for investigation, it is essential to codify variants in a way that is consonant with the

2. In line with the rest of the volume, the present paper focuses on Spanish and common practices in Hispanic linguistics, but the conclusions drawn in this work could easily be extended to research on other languages as well.

goals of the study” (Wolfram, 1993, p. 208), and “practical considerations of reliability also have to guide the codification of variants” (Wolfram, 1993, p. 209). In other words, there is no one-size-fits-all approach to the codification of variants, and each researcher must consider practicality, replicability, and the relationship between the linguistic variants and social factors.

When the categories of variants have been operationalized and coded for potentially significant independent variables, the data-analysis phase begins. Earlier studies relied predominantly on raw data and percentages to draw conclusions about the variants’ correlation with social factors. For example, Wolfram’s (1974) quantitative analysis of the five categories of variants for /θ/ involves only raw data and percentages, simplifying what would otherwise be a complicated statistical analysis with multiple levels for the dependent variable. The advance of more sophisticated empirical techniques brings advantages and disadvantages: on the one hand, the analyses account for more factors than could ever be accounted for with simple percentages. On the other, researchers may run the risk of simply plugging numbers into a software analysis program without truly understanding the data or taking the time to observe linguistic and social patterns. Wolfram (1993, p. 203) writes of this danger, explaining, “... I personally feel that the current emphasis on variable manipulation simply through the production of more powerful computer programs runs the risk of turning variation studies into a type of methodological reductionism, camouflaged by the sophistication of the quantitative management programs” (Wolfram, 1993, p. 203). Empirical advances may help data analysis, but they should not be employed at the expense of researchers’ knowledge of their data.

However, in today’s market it is extremely difficult to publish a variationist paper with only percentages and raw data. Statistical analyses that compare one variant to others are commonplace, and such a comparison is not problematic for models involving only two variants, e.g. voiceless [ʃ] as compared to voiced [ʒ] in Argentine Spanish or intervocalic [s] as compared to intervocalic [z] (Chappell, 2011; Davidson, 2014). In such analyses, one variant (the voiceless fricative) is compared to the other variant (the voiced fricative) in a binomial logistic regression model, which elucidates under what conditions one variant is more likely as compared to the other.

Linguistic variables involving three or more variants often complicate matters, and less detail may be used in their analysis. Instead, “... the variants are grouped into two contrasting sets, perhaps excluding some of the less frequent categories from consideration. The reason for this is principally methodological: the analysis with two variants is better supported by software, and easier to conduct” (Paolillo, 2002, pp. 29–30). A classic example of this conflation of several variants into two categories for analysis involves the trifecta brought about by coda /s/ reduction in Spanish: [s], [h], and \emptyset . Previous work has conflated [h] and \emptyset into a single

category, as both represent reductions of /s/ (Carvalho, 2006; Chappell, 2016). An analysis of this sort seeks to answer when /s/ is retained and when it is lenited, be it partially or fully. A different research question, however, may result in unintended consequences if special care is not paid to the dependent variable's treatment. For example, if a study wants to determine the factors predictive of /s/ aspiration, aspiration may be pitted against all other realizations, i.e., [s] and \emptyset , even though [s] and \emptyset represent opposites poles of /s/ variants (full retention and full elision) and occur in opposite linguistic and social contexts (Carvalho, 2006, p. 93). In other words, the grouping of variants must be carefully considered in a binomial analysis.

Recently, Díaz Campos (2016) has encouraged a continuous analysis of phonetic variants that are often treated as binary, e.g. intervocalic /d/. Intervocalic /d/ is often elided across dialects of Spanish, and analyses often treat the variants as a binary division between approximant [ð] and \emptyset . However, Díaz Campos (2016, p. 1) argues that "... las categorías discretas de los análisis tradicionales no captan las sutilezas de los fenómenos de variación socio fonológica ni los patrones que describen los datos" [the discrete categories of traditional analyses do not capture the subtleties of the socio-phonological variation phenomena or the patterns that describe the data]. That is, the treatment of a dependent variable as binary when acoustic measures could be used is often flawed, because "la conceptualización de la variable dependiente como continua refleja de manera más precisa la forma como almacenamos la variación cognoscitivamente y los efectos del uso" [the conceptualization of the dependent variable as continuous more precisely reflects the way in which we store variation cognitively]. In his argument, Díaz Campos contends that the /d/ variants can best be accounted for within a more fluid exemplar-based approach (see Foulkes & Docherty, 2006).

This continuous approach has been applied to other gradient phenomena in Spanish as well. In the case of /s/ aspiration, the variants' duration and center of gravity, or the weighted average of frequency peaks in the spectrum, can be measured to determine degree of reduction in a more gradient, continuous way (cf. File-Muriel & Brown, 2011). Numerous authors have also provided continuous analyses of palatal fricative devoicing (Chang, 2008; Gradoville, 2011; Rohena-Madrado, 2011, 2015) and intervocalic /s/ voicing (Chappell & García, 2017; García, 2013; García, 2015; Hualde & Prieto, 2014; Erker, 2010; Fox, 2006; Schmidt & Willis, 2011, Strycharczuk, Van't Veer, Bruil, & Linke, 2013), which provides a more detailed account of the gradient and variable behavior of these fricative realizations. In these analyses, the continuous measurement of percent voicing ranges from fully voiced (100%) to fully voiceless (0%).

However, one must keep in mind that these continuous measurements often violate linear regression models' assumption that the data are normally distributed, as inflated values tend to appear at 0% voicing and 100% voicing. Rohena-Madrado

(2011) avoids this issue with an arcsine transformation of his data, and Chappell and García (2017) and García (2015) opt to conduct an inflated beta regression using the package *gamlss* in R (Stasinopoulos, Rigby, Akantziliotou, & Voudouris, 2015), which is designed to work with the inflated values associated with percentages (0 and 1). As continuous measures based on acoustic properties become more popular, linguists must ensure that their analyses respect the assumptions of linear regression, as the messiness of language-based data often complicates statistical tests (Johnson, 2009, p. 378).

For this reason, Díaz Campos cautions that each study should determine what type of analysis is appropriate, noting that “... la comparación de los análisis en los que se compara la variable dependiente como discreta o continua revela ventajas y desventajas de acuerdo con el objetivo del estudio” [a comparison of analyses in which the dependent variable is analyzed as discreet or continuous reveals advantages and disadvantages in line with the objective of the study] (2016, p. 1). A continuous analysis may not always be appropriate given the linguistic phenomenon under investigation, and the presence of three or more variants that do not clearly correspond to a continuum of acoustic properties raises additional questions about the proper treatment of the variable. For example, an analysis of variable /r/ production may include trills, taps, assibilated, and approximant rhotics, resulting in a complicated array of variants that may overlap to some extent in their production and distribution, rendering a continuous analysis less informative and potentially problematizing a statistical analysis comparing one of these variants to all the others. The same situation arises in an analysis of word-final, intervocalic /s/ in Nicaraguan Spanish. Rather than the sibilant, glottal fricative, deletion tríflecta common in other varieties, Nicaraguan Spanish also features glottal constriction and sibilance followed by glottal constriction (Chappell, 2014; Chappell, 2015a; Chappell, 2015b). A continuous analysis based on acoustic properties does not seem appropriate given these variants, particularly when hybrid variants involving both sibilance and glottal constriction emerge.

What should be done when a continuous analysis is not appropriate and grouping the many variants into two classes oversimplifies or glosses over the complexity of the phenomenon? Paolillo offers the following advice: “an analysis using the full set of variants may not be fully meaningful, where an analysis in which similar variants are grouped can be. The researcher is thus required to select the most useful comparison for analysis” (Paolillo, 2002, pp. 29–30). The present study builds on this idea, demonstrating the importance of the researcher’s treatment of the dependent variable. Using coda /s/ data from Nicaraguan Spanish, I prove that a model pitting one variant against several others yields different results than a more selective model in which a comparison of variants is linguistically motivated. Throughout this paper, I encourage deliberate and careful analyses of the dependent

variable in Hispanic sociolinguistics, and I conclude by offering concrete examples of statistically sound methods of treatment for complex dependent variables.

3. Previous work on coda /s/ lenition in Spanish

I will be exploring coda /s/ reduction in this work, and I provide a brief introduction to the topic in this section. As the most studied phonological variable in Spanish (Brown & Torres Cacoulllos, 2003), this literature review on coda /s/ is not intended to be comprehensive, and the reader is referred to Chappell (2015a) and Chappell (2015b) for a more detailed account of the phenomenon.

/s/ is the most frequently occurring consonant in Spanish (Navarro Tomás, 1968), and it undergoes a variety of phonological reductions throughout the Spanish-speaking world, including aspiration and deletion (Brown & Torres Cacoulllos, 2003; Cedergren, 1973; Chappell, 2014; Chappell, 2015a; Chappell, 2015b; Ferguson, 1990; Lipski, 1999; Morgan, 1998; Poplack, 1980, among many others), voicing (Chappell, 2011; Chappell & García, 2017; García, 2015), and rhotacism (Chappell & Martínez Ibarra, 2017). The aspiration and deletion of coda /s/ is of primary importance to the present study, a reduction that takes place in approximately 50% of Spanish dialects (Terrell, 1981).

Dialectal differences and the reduction's degree of diffusion throughout the community yield numerous possible production outcomes. To name a few, coda /s/ is consistently realized as [h] before a consonant but not before a vowel in middle-class Lima speech (Lipski, 1994, pp. 321–322), coda /s/ is regularly reduced to [h] before a consonant or a vowel in Buenos Aires, Argentina (Lipski, 1994, p. 169), /s/ in onset position may be reduced to [h] in Chihuahua Spanish (Brown & Torres Cacoulllos, 2003), coda /s/ is almost always entirely elided in Dominican popular speech (Morgan, 1998; Bullock, Amengual, & Toribio, 2014), and coda /s/ is realized nearly categorically as [h] or \emptyset in Puerto Rico and Cuba (Lipski, 1994, p. 232, p. 334). This is to say that the phenomenon is highly variable across the Spanish-speaking world, depending on dialectal, social, contextual, and personal factors.

Because of the many possible outcomes of this /s/ reduction, scholars investigating the production and distribution of the variants must take great pains to analyze the variation appropriately. When /s/ serves as the linguistic variable of interests, the researcher must decide (i) how many variants are produced in a given variety, and (ii) how those variants behave in relation to each other. If /s/ is variably produced as [s], [h], and \emptyset , the researcher may posit a lenition-fortition catena that looks like this:

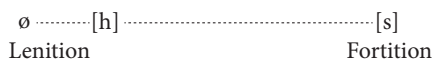


Figure 1. Traditional catena of /s/-reduction variants

In spite of the general acceptance of the /s/ lenition catena presented in Figure 1, the researcher should also investigate the linguistic contexts in which the variants arise to test the veracity of his or her assumptions. Does [s] principally take place before stressed syllables, while \emptyset and [h] take place before unstressed syllables, supporting the notion that [h] and \emptyset are lenited but [s] is not? Such an investigation is important for any variety, but it is crucial in Nicaraguan Spanish, as additional variants complicate the picture even more. Section 4 describes the dataset used in the present study, and Section 5 summarizes the somewhat different /s/-reducing situation in Nicaraguan Spanish.

4. Methodology: The variable and dataset

As noted in Section 1, the purpose of this paper is to clearly illustrate the extent to which statistical results may change based solely on differential treatments of a complex dependent variable. To demonstrate this point, I use data from Chappell (2015a; 2015b) to explore intervocalic coda /s/ reduction in Nicaraguan Spanish. This section explains the variable of interest and its many variants, the data collection process, and the coding of the variables.

The dataset consists of 36 sociolinguistic interviews that were conducted with monolingual Spanish speakers in Managua, Nicaragua in 2011 and 2012. All participants had been born and raised in Managua with minimal travel outside of the region. The sociolinguistic interviews were recorded using a unidirectional microphone connected to a PC, and each interview lasted between 30 and 45 minutes. In order to establish the behavior of the variants across broad social categories, an even distribution of gender, age range, and education level was used. This involved 18 men and 18 women; 12 younger participants, 12 mid-aged participants, and 12 older participants;³ and 12 participants with an elementary education, 12 with a high school diploma, and 12 with a college degree. Table 1 illustrates the distribution of gender, age, and education level among the participants in the study.

Each participant completed three tasks. First, an informal sociolinguistic interview took place to elicit word-final, intervocalic /s/ in casual speech, in which the

3. The younger participants were under the age of 30, the middle age group ranged from 30–50 years of age, and the older participants were over the age of 50.

Table 1. Distribution of age, gender, and education level among the participants

	Youngest (18–29)		Middle (30–49)		Older (50+)	
	M	W	M	W	M	W
No high school diploma	2* ⁴	2	2	2*	2	2*
High school diploma	2	2	2	2	2	2
College degree	2	2	2	2	2	2
Total participants	36					

researcher asked each participant questions about his/her daily life, travels, family, and opinions about local and political matters. Following the interview, participants were presented with a list of 45 sentences and asked to read each sentence aloud. This task was designed to target specific instances of word-final, intervocalic /s/ in a formal setting. Finally, participants were given an image identification task to target the variable of interest in a somewhat formal task without any orthographic influence. Examples of the stimuli used in each task are provided in (1), (2), and Figure 2.

- (1) Example question from the sociolinguistic interview:
¿Qué te gusta hacer en tu tiempo libre? ¿Cuáles son tus pasatiempos o pasiones? Explicame cómo es/son. ¿Por qué te llamó la atención eso?
‘What do you like to do in your free time? What are your hobbies or passions? Tell me what it is/they are like. Why did this catch your attention?’
- (2) Example sentence from the reading task with the target /s/ underlined:
Los ogritos no te van a molestar en la isla.
‘The little ogres will not bother you on the island.’

After collecting the data, the recordings were analyzed in Praat, and based on an acoustic analysis, 3,658 tokens of word-final, intervocalic /s/ were coded as [s], [h],⁵ ø, [ʔ] or [sʔ]. A token was coded as [s] if it involved high frequency noise in the spectrogram, [h] if the noise was distributed throughout the spectrogram, ø if there was no discernible division between the neighboring vowels, [ʔ] if an extended period of silence appeared in the spectrogram with a burst indicative of gestural release

4. The participants marked with an asterisk were illiterate or had great difficulty reading. Consequently, they were unable to complete the reading task.

5. In this paper, the [h] transcription is used to refer to all cases of glottal frication, but it should be noted that the realization of aspiration as [h̥], a voiced fricative, is nearly categorical between vowels in my corpus. Due to the small number of [h] tokens and their linguistic behavior that parallels [h̥], the two variants are conflated.



Figure 2. Example picture from the image identification task of *unos elefantes* ‘some elephants’

before the onset of the following vowel, and [sʔ] if the token involved a period of high frequency noise followed by silence and a burst preceding the following vowel. Aspiration and deletion are of primary importance to the coming sections of this work, and the waveforms and spectrograms associated with both allophones are presented in Figures 3 and 4.

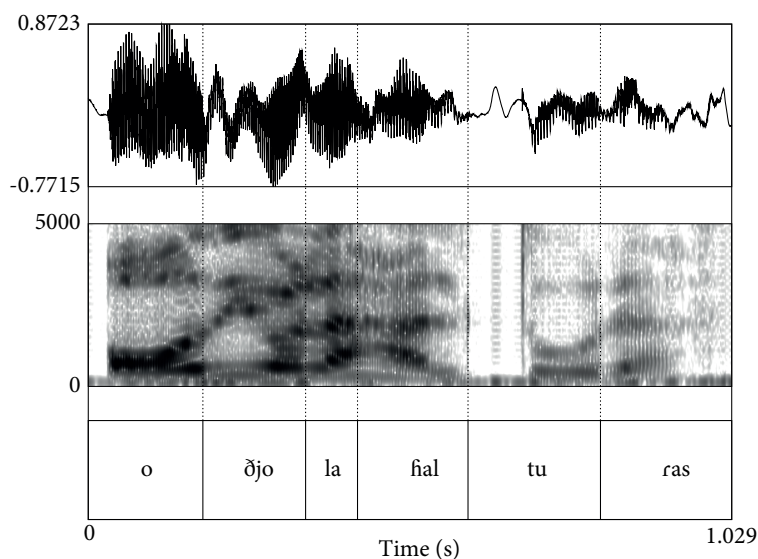


Figure 3. Aspiration of word-final, intervocalic /s/ in *las* from *odio las alturas* ‘I hate heights’

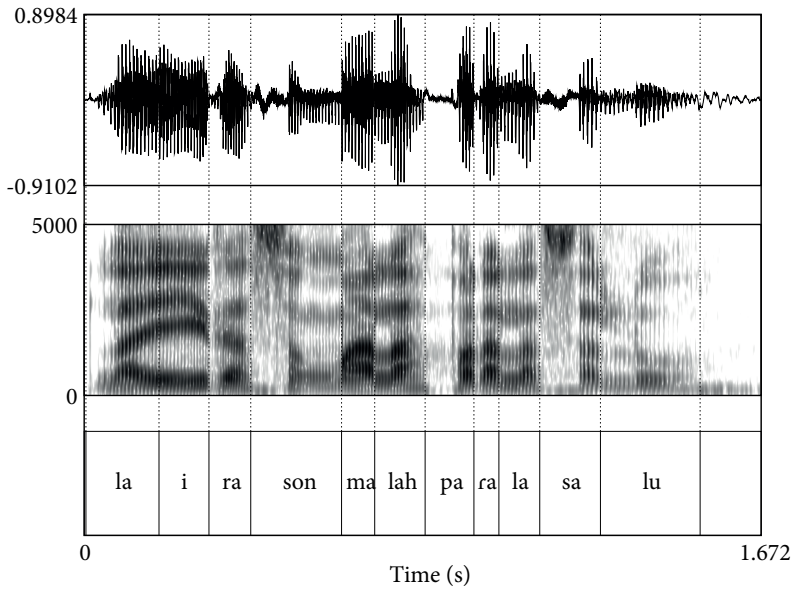


Figure 4. Deletion of word-final, intervocalic /s/ in *las* from *las iras son malas para la salud* ‘wrath is bad for one’s health’

Each token was also coded for linguistic factors previously found to be predictive of /s/ reduction. These factors include the type of /s/ (verbal marker, plural marker, or lexical /s/), the preceding word class, the following word class, the preceding vowel, the following vowel, the preceding vowel stress, the following vowel stress, the sameness of the preceding and following vowel, and the target word length in syllables. Non-linguistic factors were coded as well, including gender, age of the participant, education of the participant, and task in which the /s/ was produced.

Two binomial mixed effects models using R’s `glmer` function (Bates, Maechler, Bolker, & Walker, 2014) were then constructed fitting this dataset to [h] and two binomial mixed effects models were also fitted to deletion; the only difference in these models is the treatment of the dependent variable. The results of the two pairs of models will be presented in Sections 6 and 7 following a discussion of the general findings for the behavior of /s/ reduction in Nicaraguan Spanish, as outlined in Section 5.

5. The case in Nicaragua

As noted in Section 4, the reduction of coda /s/ in Nicaragua is more complicated than in other dialects and requires a careful analysis on the part of the researcher. In

this variety, lenition of coda /s/ to glottal frication or deletion is nearly categorical, e.g. *pasta* ‘paste’ as [pahta] or [pata], with reduction rates similar to those found in the Caribbean (Lipski, 1994, p. 291). In the word-final, intervocalic environment, in addition to [s], [h], and \emptyset , glottal constriction is also produced, particularly before a stressed vowel, e.g. *más alto* ‘higher’ as [maʔ alto], and a hybrid realization of sibilance followed by glottal constriction, [sʔ], is found in formal tasks in a similar environment (Chappell, 2014). This means that in the word-final, intervocalic environment in Nicaraguan Spanish, five distinct variants may be produced differing in place and manner of articulation (see Chappell, 2014; Chappell, 2015a; Chappell, 2015b). The variable of interest and the variants produced in this envelope of variation are shown in (3).

(3)	Variable of interest	Variants produced
	Word-final, intervocalic /s/	[s], [h], \emptyset , [ʔ], and [sʔ]

The traditional lenition-fortition catena for coda /s/ variants presented in Figure 1 is more convoluted given the presence of [ʔ] and [sʔ]. Should glottal constriction be considered a variant on par with aspiration, as the two share the same place of articulation? Should it be conflated with deletion, as it was categorized by Cedergren (1973) in her analysis of Panamanian Spanish? Spatial limitations preclude a comprehensive examination of the variants’ behavior in Nicaraguan Spanish as they were outlined in Chappell (2014, 2015a, 2015b), but the raw data presented in Table 2 elucidate one important observation about their distribution.

A rather simple way to glean the status of a variant as fortition or lenition in this case is to explore the stress of the following syllable. Generally, stronger variants appear before a stressed syllable and weaker variants appear before an unstressed syllable (Alba, 1982).

Table 2. Cross-tab of variant by following stress, showing weaker and stronger variants

		Following unstressed vowel	Following stressed vowel	Total (N)
Weak	\emptyset	77.4% (N = 604)	22.6% (N = 176)	780
	[h]	83% (N = 756)	17% (N = 155)	911
	[s]	71.3% (N = 555)	28.7% (N = 223)	778
Strong	[ʔ]	46.5% (N = 258)	53.5% (N = 297)	555
	[sʔ]	43.5% (N = 276)	56.5% (N = 358)	634
Total (N)		2,449	1,209	3,658

Table 2 demonstrates that \emptyset , [h], and [s] all tend to emerge in weaker environments, appearing with 71.3–83% frequency before unstressed vowels. In other words, even the strongest variant presented in the traditional lenition-fortition catena in Figure 1 appears in weaker environments in Nicaraguan Spanish. On the other hand, glottal constriction and sibilance followed by glottal constriction show a markedly different pattern, both emerging more frequently in a more prominent prosodic position, i.e., before a stressed vowel. In fact, Chappell (2014) concludes that the reduction in Nicaraguan Spanish is so widespread that /h/ actually represents the underlying form for most Nicaraguans, with [s] insertion taking place for social reasons rather than linguistic motivations.

That is, due to the decreasing rates of coda [s] production over time, the aberrant behavior of coda [s] in Nicaragua compared to other /s/-reducing varieties of Spanish, and [s] hypercorrections, Chappell (2014) argues that /s/ no longer serves as the underlying representation for most Nicaraguans and sibilance is only inserted to signal social prestige, much like *hablar fisno* [s] production in the Dominican Republic (Morgan, 1998). With coda /h/ as the underlying representation of what was once coda /s/, glottal constriction, which shares the same place of articulation as glottal frication, serves as a fortition of the underlying /h/ in prominent environments as it more saliently demarcates between adjacent vowels. Figure 5 presents two catenae based on Chappell (2014). The first shows variants of /h/ produced for linguistic reasons, and the second shows the variants inserted in the same environment for social prestige. [sʔ] appears to be a hybrid realization, with [s] inserted for social prestige and glottal constriction creating maximal division between vowels.

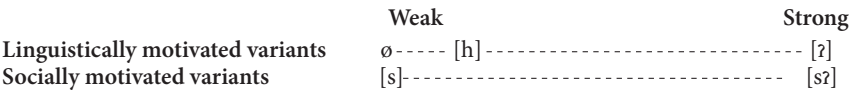


Figure 5. Catenae of weaker to stronger word-final, intervocalic /s/ variants in Nicaragua

The catenae proposed in Figure 5, while far from traditional, more successfully account for the behavior of the variants in Nicaraguan Spanish based on Chappell (2014, 2015a, 2015b). As a result, a researcher who seeks to determine which linguistic and social factors condition [h] in the variety should consider the ramifications of pitting [h] against all other variants in a statistical analysis; this would entail comparing [h] to both stronger variants like [ʔ] and [sʔ], on the one hand, and to other weak variants that appear in overlapping linguistic environments, on the other. In the following sections, I show exactly how these different levels of comparisons yield distinct results.

6. Models fitted to aspiration

In order to determine the factors most predictive of aspiration, a simple binomial mixed effects model was fitted to aspiration. This model includes the independent variables of education level, target word length, following stress, and gender, with speaker as a random effect. The dependent variable is treated as aspiration vs. all other coda /s/ realizations, i.e., deletion, sibilance, glottal constriction, and sibilance followed by glottal constriction. Table 3 shows the results of this model including the estimate, standard error, *z*-value, and *p*-value, and the significant predictors of aspiration have been bolded. A negative estimate indicates that aspiration is less likely with the listed level than the reference level, and a positive estimate indicates that aspiration is more likely given the level listed than the reference level. The alpha value is considered 0.05 in all the following models.

Table 3. Model A, fitted to aspiration pitted against all other variants

	Estimate	Sth. error	<i>z</i> -value	<i>p</i> -value
(Intercept)	0.481	0.34	1.413	0.158
Low education	-0.632	0.418	-1.512	0.13
High education	-1.007	0.418	-2.408	<0.02
Ref. level = Mid education				
2-syllable word	-0.599	0.101	-5.926	<0.001
3-syllable word	-0.445	0.134	-3.307	<0.001
4+-syllable word	-1.118	0.152	-7.373	<0.001
Ref. level = 1-syllable word				
Foll. stressed vowel	-1.371	0.105	-13.081	<0.001
Ref. level = Following unstressed vowel				
Male speakers	-1.393	0.344	-4.048	<0.001
Ref. level = Female				

In this model, speakers with a mid-level of education are the most likely to aspirate, and the difference between these speakers and the most educated group is significant ($p < 0.02$). Also of note in this model is the fact that male speakers are significantly less likely to aspirate than female speakers ($p < 0.001$). In terms of linguistic findings, aspiration is most likely given shorter target words and a following unstressed vowel, but the social findings are of primary interest as we transition into the second model.

In Model B, shown in Table 4, all parameters, independent variables, and random effects are kept exactly as they appeared in Model A. The only difference between Model A and Model B is the treatment of the dependent variable. In this model, rather than comparing [h] to all other variants of word-final, intervocalic /s/,

[h] is only compared to clear cases of fortition that appear in the most prominent prosodic environments: [ʔ] and [sʔ].

Table 4. Model B is fitted to aspiration with only motivated comparisons

	Estimate	Sth. error	z-value	p-value
(Intercept)	1.796	0.419	4.283	<0.001
Low education	−0.235	0.513	−0.457	0.647
High education	−0.678	0.51	−1.328	0.184
Ref. level = Mid education				
2-syllable word	−0.509	0.142	−3.598	<0.001
3-syllable word	0.305	0.226	1.348	0.178
4+-syllable word	−1.378	0.197	−7.0	<0.001
Ref. level = 1-syllable word				
Foll. stressed vowel	−2.497	0.137	−18.279	<0.001
Ref. level = Following unstressed vowel				
Male speakers	−0.796	0.422	−1.886	0.059
Ref. level = Female				

A comparison between Model A and Model B shows that the linguistic factors predictive of aspiration do not change a great deal: aspiration continues to be more likely given shorter target words and a following unstressed syllable. On the other hand, both of the social factors predictive of aspiration in the preceding model are no longer found to be significant. Female speakers are not significantly more likely to aspirate than men in this model, and mid-education speakers are not significantly more likely to aspirate than the most educated speakers either. A researcher using Model A would draw very different conclusions about aspiration in Nicaraguan Spanish than a researcher using Model B, which is why a nuanced approach is necessary in the data analysis stage.⁶

To clarify exactly how much the results of these two models differ, I provide two random forests (Hothorn, Buehlmann, Dudoit, Molinaro, & Van Der Laan, 2006). Random forests show the relative importance of each factor by producing numerous bootstrapped trees and ultimately determining the predicted outcome based on the combined results.⁷ Figure 6 corresponds to the way the dependent

6. Models B and D should not be oversimplified as “better” models resulting from a direct comparison with Models A and C. Rather, the point of these model comparisons is to demonstrate how much the results of a statistical analysis can change when a multiplex dependent variable receives differential treatment and, consequently, how different the conclusions of a paper describing the linguistic phenomenon might be as well.

7. These random forests do not take random effects into account. However, when Models A and B were run without the random effect of speaker (as well as Models C and D, respectively), the

variable was treated in Model A: [h] is compared to all other variants, resulting in following stressed vowel and gender as the two best predictors of [h], with education and target word length as less important factors.

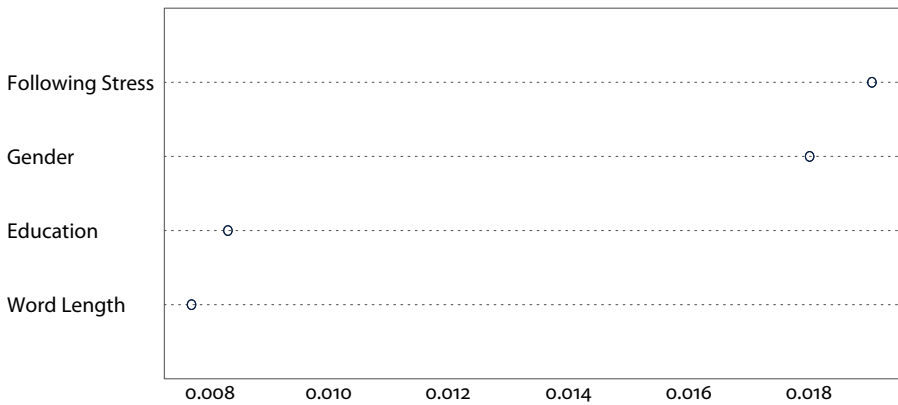


Figure 6. Random forest with [h] compared to all other /s/ allophones

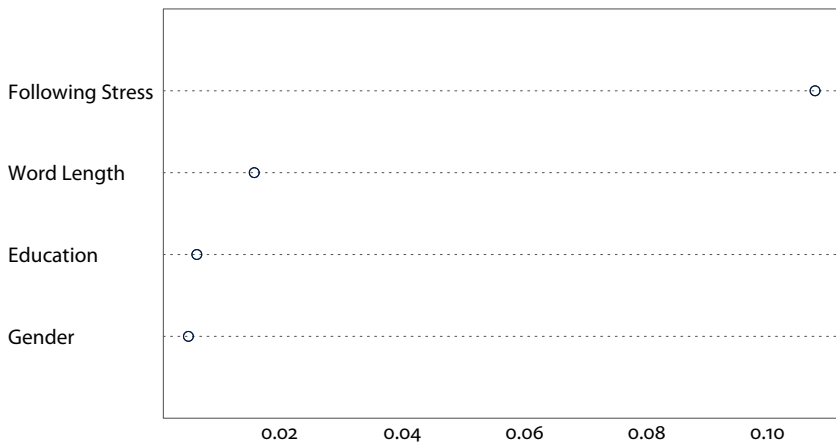


Figure 7. Random forest with [h] compared to only motivated comparisons

Figure 7, on the other hand, follows the dependent variable treatment applied in Model B, in which [h] is only pitted against strengthened variants. The R code used to produce the random forest is the same as the code used in Figure 6; the only difference involves the dataset used. This random forest shows a disparate ranking

same factors emerged as significant. For that reason, the lack of random effects in the random forests is not expected to seriously impact the interpretation of the results. The same is true for conditional inference trees, discussed later in the paper.

of the factors' importance: following stress becomes the most important factor by far, with gender falling to the final position. Target word length and education level are also inverted in their relative importance. These random forests clearly illustrate the effect of different treatments of the dependent variable, highlighting the importance of carefully analyzing a complex dependent variable before conducting statistical analyses.

7. Models fitted to deletion

Thus far, we have explored how the results of two models fitted to aspiration differ based on the treatment of the dependent variable. It is possible that the results for aspiration represent an anomaly rather than the norm, and for this reason, I present the same comparison for models fitted to deletion in Model C and Model D. In Table 5, Model C is fitted to deletion as compared to all other variants, i.e., aspiration, sibilance, glottal constriction, and sibilance followed by glottal constriction. The independent variables included in Models C and D differ somewhat from the variables used in Models A and B, as they involve the best fit for deletion rather than aspiration. These independent variables include following stress, task, gender, age, and an interaction between gender and task. As before, speaker serves as a random factor, the alpha value is 0.05, the reference level is provided, and significant predictors of deletion are bolded.

Model C shows an effect of following stressed vowel, task, and gender, with deletion significantly more likely before an unstressed vowel, in the casual

Table 5. Model C fitted to deletion, with deletion pitted against all other variants

	Estimate	Sth. error	z-value	p-value
(Intercept)	-3.208	0.487	-6.589	<0.001
Foll. stressed vowel	-0.63	0.115	-5.503	<0.001
Ref. level = Following unstressed vowel				
Image identification task	-1.432	0.363	-3.939	<0.001
Reading task	-1.823	0.228	-8.014	<0.001
Ref. level = Sociolinguistic interview				
Male speakers	1.56	0.341	4.569	<0.001
Ref. level = female				
Mid-aged speakers	-0.138	0.412	-0.336	0.737
Older speakers	0.584	0.406	1.438	0.151
Ref. level = Young speakers				
Reading task: Male	0.068	0.269	0.252	0.801
Socioling. interview: Male	-0.17	0.412	-0.413	0.679

Table 6. Model D fitted to deletion, pitting deletion against only motivated comparisons

	Estimate	Sth. error	z-value	p-value
(Intercept)	1.987	0.421	4.723	<0.001
Foll. stressed vowel	-2.189	0.185	-11.825	<0.001
Ref. level = Following unstressed vowel				
Image identification task	-4.028	0.48	-8.388	<0.001
Reading task	-4.432	0.339	-13.061	<0.001
Ref. level = Sociolinguistic interview				
Male speakers	0.986	0.44	2.236	<0.03
Ref. level = Female				
Mid-aged speakers	0.139	0.453	0.308	0.758
Older speakers	1.152	0.454	2.539	<0.02
Ref. level = Young speakers				
Reading task: Male	-0.477	0.543	-0.878	0.3799
Socioling. interview:	-1.267	0.573	-2.211	<0.03
Male				

sociolinguistic interview, and among male speakers. However, neither age nor an interaction between age and task emerges as significant in this model.

With these results in mind, let us turn our attention to Model D, presented in Table 6, to see how the results differ when \emptyset is only compared to [ʔ] and [sʔ]. Model D does not differ in Model C from any way other than the treatment of the dependent variable.

Some of the results do not change from Model C to Model D. For instance, the same effects are observed for following stressed vowel, task, and gender: deletion is more likely before unstressed vowels, in the casual sociolinguistic interview task, and in male speech. However, some results do differ. Model D shows that older speakers are significantly more likely to delete word-final, intervocalic /s/ than young speakers, and an interaction emerges between male speakers and the sociolinguistic interview, meaning that women are more likely to delete /s/ in the sociolinguistic interview than in other tasks.

To see how the constraints are ranked in terms of relative importance in Model C and Model D, random forests are presented. Figure 8 shows the ranking of factors' importance when \emptyset is compared to all realizations, including aspiration, sibilance, glottal constriction, and sibilance followed by glottal constriction, and Figure 9 shows the factors' importance when deletion is only compared to glottal constriction and sibilance followed by glottal constriction.

Although task remains the most important factor in both random forests, the other factors' positions are upended by the different treatment of the dependent variable. Following stress is the least important factor when deletion is compared

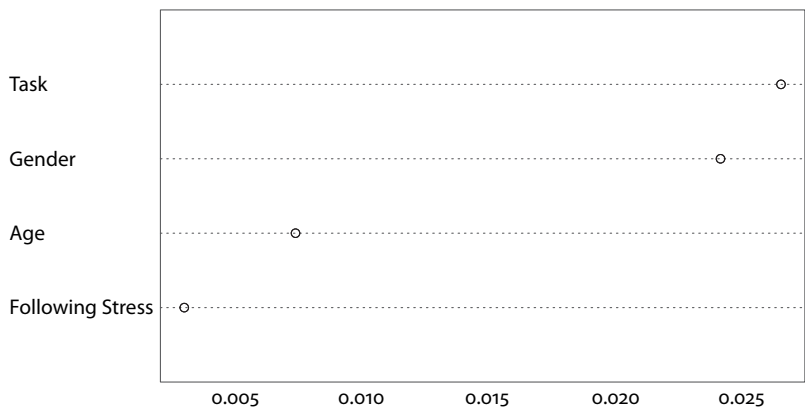


Figure 8. Random forest for deletion as compared to all other variants

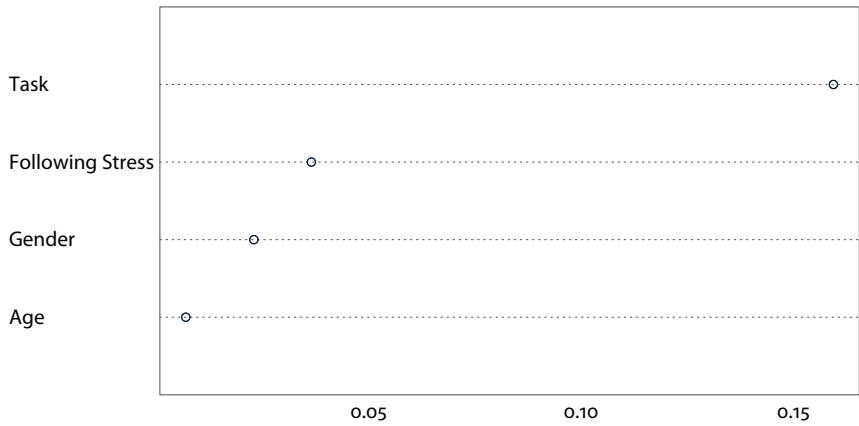


Figure 9. Random forest for deletion as compared to motivated comparisons

to all other variants, but it becomes the second most informative when less motivated comparisons are removed from the data set. This reordering makes sense if we consider the environments in which the variants occur. Deletion, aspiration, and sibilance tend to appear before an unstressed vowel, and comparing deletion to other factors that appear in the same environment decreases its perceived importance for deletion. When the overlapping environment is properly accounted for, following stress is shown to be a much more important factor.

8. Recommendation for treatment of the dependent variable

The preceding sections have shown that it is crucial to carefully consider our treatment of a dependent variable with three or more variants, and in this section, I provide recommendations to appropriately handle our data design in future work. To improve our treatment of the dependent variable, I present several options for researchers with varying levels of statistical knowledge. The simplest solution for researchers using GoldVarb or other exclusively binary analysis programs involves simply eliminating the variants that are unmotivated from the data frame. Saving a new Excel file that only includes the variants the researcher would like to directly compare in his or her statistical analysis is an easy way to avoid unmotivated comparisons.

If the researcher is using R to analyze his or her data, there are two other options. First, he or she could create a subset of the data in R that includes only the variants he or she would like to consider and use this subset when constructing the model. For example, if the researcher wants to compare aspiration (`data$h`) to clear cases of fortition, including glottal constriction (`data$gc`) and sibilance followed by glottal constriction (`data$sgc`), he or she could create and save a subset in the following way:

```
(4)8 data$Temp1 <- data$gc+data$h+data$sgc
      data1 <- data[which(data$Temp1==1),]
```

Instead of using the original data frame with all variants (“data”), “data1” only includes aspiration and two clear cases of fortition, allowing the researcher to easily pit aspiration against strengthened variants. When the different data frames have been created, the researcher should play with several models to see how they change given different treatments of the dependent variable. In line with the current work, the code for Model A, pitting aspiration against all other variants is presented in (5), and the code used for Model B would differ only in terms of the dataset, utilizing “data1” rather than “data”.

8. R code can be difficult to interpret for the uninitiated, but with a little practice, the language becomes more familiar and easier to use. In this example, “data” is the name of the entire data frame. The \$ symbol following the data frame serves to call a subset list within that data frame, in this case calling only certain variants, including aspiration, glottal constriction, and sibilance followed by glottal constriction. The <- symbol gives the called list a new title (a temporary subset within the data frame). In the second line, the code calls for all instances in which the temporary subset follows the parameters outlined in line one (==1) to create a new data frame, named “data1”. For more help with the basic language used in R, see R Core Team (2016).


```
(5)9 library("lme4")
      modelhall <- glmer(data$h ~ Education + Syllable.Count + Following.Stress
      + Gender + (1|Speaker), data=data, family=binomial)
      summary(modelhall)
```

Of course, the models should not be constructed *prima facie* without a careful investigation of all the variants' linguistic and social behavior. The dependent variable requires nuanced thought and the levels selected for analysis must make sense with the data.¹⁰ To determine if the variants selected in a binomial analysis should be conflated, separated, or excluded from analysis, the researcher could also conduct a multinomial logistic regression model in R, which shows how the variants behave in relation to each other. Using package "nnet" in R (Ripley & Venables, 2015),¹¹ the following code will create the multinomial logistic regression model and then manually calculate the *p*-values.

```
(6)12 library("nnet")
      multimodel <- multinom(Variant ~ Education + Syllable.Count + Following.
      Stress + Gender, data = data)
```

9. First, the package named "lme4" must be installed in R using the Package Installer. The package may then be opened with the code provided in line one. Line two creates a generalized regression model with the function `glmer` fitted to aspiration (`data$h`). Following the `~` symbol, the independent variables are listed, and the random effect is written as `(1|Speaker)`. The name of the data frame must be listed after `data=` and the family should be binomial, as aspiration is being compared to all other /s/ variants in the data frame. The model is named `modelhall`, and the summary command produces the results of the model in the R Console.

10. These approaches are not appropriate for ordinal dependent variables and should only be applied to categorical dependent variables.

11. The `nnet` package employs the feed-forward artificial neural network with a single hidden layer rather than a classical statistical approach for estimation and prediction. As a result, the inferential results may differ from those obtained from classical techniques. The `mlogit` package (Croissant, 2013) is an alternative for fitting the multinomial logit model but requires certain formatting of the data prior to model construction.

12. After installing the package named "nnet" using the Package Installer, the `multinom` function runs a multinomial regression on the factors listed in parentheses. `Variant` serves as the dependent variable, and the independent variables are listed after the `~` symbol. The model is named `multimodel`, and the command `summary(multimodel)` will produce the model's results in the R Console. The penultimate line contains the code to conduct a Wald Test, and the final line manually calculates the *p*-values. Only the model name needs to be replaced for these two lines of code to work with other data. It should be noted that the Wald test is based on a large-sample theory, and the `pt` function, which implements the Student's *t*-distribution, is recommended over the `pnorm` function with very small sample sizes to better manage the false positive rate.

```

WaldTest <- summary(multimodel)$coefficients/summary(multimodel)$
standrd.errors
pVal <- (1-pnorm(abs(WaldTest),0,1))*2

```

A multinomial analysis is helpful in that it allows the researcher to instantly see the variants' behavior side by side, but the results are more difficult to interpret than a simple binomial analysis. To provide an example of what the researcher might encounter when he or she explores multinomial models, a simplified multinomial analysis considering only following stress is provided in Table 7.¹³

Table 7. Multinomial logistic regression results with \emptyset as the reference level

	Coefficients		Sth. errors		Wald Test		p-val
	(Intercept)	Foll. Stress	(Intercept)	Foll. Stress	(Intercept)	Foll. Stress	
[h]	0.22	-0.35	0.05	0.12	4.11	-2.86	<0.01
[s]	-0.08	0.32	0.06	0.12	-1.44	2.75	<0.01
[ʔ]	-0.85	1.37	0.07	0.12	-11.44	11.38	<0.001
[sʔ]	-0.78	1.49	0.07	0.12	-10.78	12.73	<0.001

The multinomial results indicate that [ʔ] and [sʔ] are the most likely to occur when the following vowel is stressed, as shown by the raw data in Table 2. This analysis allows for a clear comparison of the variants, which helps establish similarities and differences among the variants. Consequently, conducting both multinomial and binomial analyses with motivated comparisons as well as utilizing other tools is recommended to more fully understand the data. These other tools involve random forests, for example, and cross-tabulations, or data tables showing the relationship between two or more variables. The R code needed to create random forests (Hothorn, Hornik, & Zeileis, 2006) is provided in (7), and again, only the dataset would need to be changed to differentiate between Model A and Model B. (8) shows the simple code needed to conduct cross-tabs.

13. For spatial reasons, other factors were not considered here but would be interpreted in the same way.

```
(7)14 library("party")
      r.cforest <- cforest(h~Education+Syllable.Count+Following.Stress+Gender,
                          data=data)
      r.cforest.varimp = varimp(r.cforest)
      dotchart(sort(r.cforest.varimp))

(8)15 crosstabs <- xtabs(~data$Variant + data$Following.Stress)
```

Additionally, conditional inference trees may shed light on the behavior of the variables in relation to each other, as they determine whether “an independent variable is a useful predictor of the two possible responses of the dependent variable and divides each of the predictors into subsets that are further evaluated, considering the effect of subsequent factors” (Johnson & Barnes, 2013, p. 36). The code needed to create conditional inference trees (Hothorn, Buehlmann, Dudoit, Molinaro, & Van Der Laan, 2006) is shown in (9).

```
(9)16 library("party")
      condinftree1 <- ctree(h~Syllable.Count + Education + Following.Stress +
                          Gender, data=data)
      plot(condinftree1)
```

Taken together, these tools enhance our ability to understand complex linguistic variables and handle their variants appropriately in our statistical analyses. As always, the best treatment of the data depends on the specific goals of the study in question and practical considerations. There is no single best-fit model for all variationist phenomena, but a thorough understanding of the data as a result of thorough data exploration is always a good place to start.

14. After installing and opening the package called “party” using the Package Installer in R, the `cforest` function implements Breiman’s random forests (Breiman, Cutler, Liaw, & Wiener, 2015) using the factors listed in the parentheses. The `varimp` function scales the results, and the `dotchart` function plots the results.

15. This simple code uses function `xtabs` on two factors in the data frame, naming the results `crosstabs`. The command `summary(crosstabs)` shows the results in the R Console. The `prop.table` function, e.g. `prop.table(crosstabs, 2)`, generates a frequency table.

16. After installing and opening the package called “party” with the Package Installer, the `ctree()` function creates a tree-structured regression model using conditional inference procedures. The `plot()` function then generates the visual depiction of the conditional inference tree.

9. Conclusion

The preceding discussion has explored the ramifications of different treatments of a complex dependent variable, and I have shown that the results of two models diverging only in their treatment of the dependent variable can be vastly disparate. As the conclusions drawn from our models' results are ultimately used to inform sociolinguistic theory, we must take great pains as responsible sociolinguists to ensure the appropriate treatment of both independent variables and the dependent variable. As conscientious variationists, we must consider (i) the type of variable being analyzed and (ii) the environments in which each variant occurs. That is, if we know our data and understand how a variant behaves in relation to other variants, the conclusions gleaned from our studies will be more robust.

While this paper has dealt exclusively with phonological variation, the same principle applies to morphosyntactic variables. Based on her work with variable object clitic placement in Brazilian Portuguese, in which the clitic can appear (i) before two verbs, (ii) between two verbs, or (iii) after two verbs, H. Washington notes that the results of her models differed given which levels of the dependent variable were included in her analyses (personal communication, 9/26/2015). For morphosyntacticians as well as phonologists and phoneticians, the implementation of cross-tabs, simple model construction, random forests, and conditional inference trees are helpful tools to explore our data's behavior and determine which variants should be pitted against the variant of interest. Ideally, we should always know our data, and we should make attempts to eliminate unmotivated comparisons among levels of the dependent variable. In doing so, we ensure a more scientifically sound methodology in our research and help prevent distorted interpretations of the linguistic data in future work. In the wise words of Walt Wolfram, "I personally think that it is important for language variationists to be good linguists and good sociolinguists, not simply good collectors of data or good number crunchers" (1993, p. 203).

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The past persists into the present

A multivariate analysis of present perfect and preterite in Southern Arizona Spanish narratives

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The purpose of this paper is twofold: first, adopting a variationist approach, it examines the relative frequency of the present perfect and preterite alternation and the particular conditioning factors that might favor the use of the PP in Southern Arizona Spanish; secondly, it attempts to situate the use of Southern Arizona PP in the scope of the typology of periphrastic pasts proposed in Harris (1982). A multivariate analysis reveals that frequency and approximate adverbs, stative predicates, and indeterminate reference favor the PP in this variety, meaning that the PP shows characteristics of a continuative perfect. This in turn suggests that the PP in this variety situates at stage II in Harris's developmental stages.

Keywords: tense & aspect, present perfect, Southern Arizona Spanish narratives

1. Background

This paper concerns the use and distribution of the Present Perfect (henceforth PP) and the Preterite (henceforth PRET), two tense-aspect semantic categories, in Southern Arizona Spanish, a U.S. Spanish variety. The analysis of Spanish PP illustrated in (1) and PRET in (2) has been a major focus in variationist research on tense and aspect exploring the PP and PRET variation throughout the Spanish-speaking world, and the Romance languages in general (examples were extracted from *Corpus del Español en el Sur de Arizona (CESA)* (Carvalho, 2012)).

- (1) Siempre me *he llevado* bien con todos
I *have* always *gotten* (PP) along with everyone (CESA030)
- (2) So, la casa está chica pero siempre allí *estuvimos*
So, the house is small but we *were* (PRET) always there (CESA001)

In the examples above, the PP and the PRET make reference to situations located in the past. More specifically, the PP in (1) indicates persistent relevance of a past situation, while the PRET in (2) makes reference to a perfective event in the past. In other words, with the PP in (1) there is an implication that the speaker still gets along with everyone, whereas with the PRET there is no implication of current presence at the small house.

Perfects and perfectives have been of great interest in the literature of tense and aspect (Comrie, 1976; Bybee et al., 1994; Dahl & Hedin, 2000, among others). According to Bybee et al. (1994, p. 54), perfects signal that the situation occurs prior to reference time and is relevant to the situation at reference time, while perfectives signal that the situation is viewed as bounded temporally. Comrie (1976) notes, for example, that the PP “expresses a relation between two time-points, on the one hand the time of the state resulting from a prior situation, and on the other the time of that situation” (p. 52). As a result, cross-linguistically, the PP bears on both the present and the past.

In Spanish, the PP is a perfect aspect category employed to express a relation between two time-points: it refers to an action or state situated in the past, and it expresses the relevance of such action or state at utterance time (Harris, 1982; Comrie, 1976; Schwenter & Torres Cacoullos, 2008 (henceforth S&TC)).¹ Present relevance can be understood as a discourse condition which guides speakers to employ the PP “to present the consequences of a past event as important to what they are saying” (S&TC, 2008, p. 4). Although the concept of “present relevance” is mainly left at an intuitive level in the literature, cross-linguistic studies concerning the PP have explored a range of distinct functions including resultative, experiential, continuative, and “hot news” (Comrie, 1976; Dahl, 1984; Schwenter, 1994a; Rodríguez Louro & Jara Yupanqui, 2011).

On the other hand, the PRET is a perfective aspect category that “conveys strictly that the situation is ‘viewed as bounded temporally’” (S&TC, 2008, p. 4). This temporal category “is employed to describe an event or series of events designated by the verb that took place within a period of time, which is wholly in the past, and is not represented by the speaker as having present relevance” (Harris, 1982, p. 43). Unlike perfects, which “are not used for the foregrounded events in sequenced narratives” (S&TC, 2008, p. 4), cross-linguistically, the PRET is used for narrating sequences of discrete events in the past. In sum, the PRET is a narrative tense describing a sequence of events, and it is frequently employed in most of Spanish America (Kany, 1951).

1. See Dahl & Hedin (2000) for a discussion on *current relevance*.

Previous studies concerning the temporal and aspectual system of the PP and the PRET in Spanish have specifically focused on the grammaticalization paths of the PP (Schwenter, 1994a, 1994b; Serrano, 1994; S&TC, 2008); others, in contrast, have paid particular attention to contact situations that appear to have produced innovative evidential uses of the PP (Klee & Ocampo, 1995; Escobar, 1997; Rojas-Sosa, 2008; Dumont, 2013). Employing a multivariate analysis, this paper examines the specific linguistic factors that contribute to the PP and PRET variation in Southern Arizona Spanish, and thus, aims to expand the typological literature on periphrastic pasts by adopting the current data to Harris's (1982) developmental stages. In addition, this paper attempts to offer an account of the development of the PP-PRET alternation in the present data.

As far as we are aware, this is the first study to provide a variationist analysis of the PP and PRET alternation in a U.S. Spanish variety, bringing new data to the fore on the tense-aspect system in an unexplored variety of Spanish. The study directly addresses the following questions:

- a. What are the constraints that determine the distribution of the PP in contrast to the PRET in Southern Arizona Spanish?
- b. How does this distribution compare with other varieties, especially those spoken in Mexico?

2. The distribution of PP in Spanish varieties

It has long been noted that the PP in several Romance varieties has encroached on the semantic domain of the PRET (Harris, 1982; Bybee et al., 1994; Schwenter, 1994a). In his developmental stages of past tenses in the Romance languages displayed in Table 1, Harris (1982) describes that, diachronically, the PP in French and Northern Italian has gone through a grammaticalization path – that is, the process by which “lexical items and constructions come into certain linguistic contexts to serve grammatical functions or how grammatical function items develop new grammatical functions” (Hopper & Traugott, 2003, p. 1). French *passé composé* and the *passato prossimo* in Northern Italian, placed in stage IV, are two examples of a grammaticalization path in which perfect constructions carry out many functions previously expressed by the simple past forms in these languages (Squartini & Bertinetto, 2000).

Table 1. Developmental stages of Romance PP and PRET (Harris, 1982)

Stage	Present Perfect	Preterite
I. Sicilian	Present states resulting from past actions	All past perfectives
II. Mexican Spanish & Portuguese	Past situations still ongoing in present	Most past perfectives
III. Peninsular Spanish, Catalan	Past situations with current relevance	Past situation w/out current relevance
IV. French, Northern Italian	Past situations – all	Formal, written

Table 1 illustrates Harris's (1982) well-known and influential point of reference on the distribution of the PP and the PRET in Romance; it shows the four synchronic stages corresponding to different ways of conceiving the PP and PRET alternation. Harris conceives these stages as representing the pattern of evolution of the PP in Romance, ranging from a resultative value (stage I) to a purely perfective reading (stage IV). Relevant to the present study is stage II in Table 1. According to Harris (1982), this stage is characterized by stating the relevance of a past situation up to the utterance time. In other words, one could think of stage II as an intermediate step in the development of PP in Romance, although this particular conception may be problematic (see Squartini & Bertinetto, 2000).

In the case of Spanish, extensive literature on Peninsular Spanish has shown that the PP is moving along the same path of grammaticalization attributed to French and Northern Italian, although the process has not gone to completion (Harris, 1982). Studies suggest that the PP in Peninsular Spanish has become increasingly compatible with uses normally employed only to the PRET (Schwenter, 1994a; Serrano, 1994; Schwenter & Torres Cacoullos, 2008).² In fact, S&TC (2008) report that the PP is becoming the default exponent of past perfective in Peninsular Spanish.

In contrast to Peninsular Spanish, it is generally assumed that the PP is contextually restricted in Latin American Spanish; for example, it is used when describing situations leading into the present time in most dialects of Latin American Spanish (Westmoreland, 1988). In this case, the PP describes a situation that started in the past but continues (persists) into the present (Comrie, 1976). In other words, aspect rather than tense/time determines the use of PP in Latin American Spanish. Situations that begin in the past and continue into the present are classifiable as *continuatives* (Comrie, 1976, 1985; Schwenter, 1994a). The Spanish PP covers grammatical territory bordering on resultatives at one-end and perfectives at the

2. Regional exceptions to this generalization are to be found in Northern Spain and the Canary Islands (S&TC, 2008).

other – continuative situations are placed in between the two, at stage II in Harris’s developmental stages displayed in Table 1.

Mexican Spanish is one example in which the main interpretation of the PP is that of a continuative situation that comes up to the present utterance time. For instance, Lope Blanch (1983, p. 133) notes that the difference between PP and PRET in Mexican Spanish is “fundamentalmente aspectual” (fundamentally aspectual). Specifically, Lope Blanch points out that the PRET in Mexican Spanish is used for all completed or temporarily bounded actions, while the PP “enuncia acciones imperfectas” (enunciates imperfect actions) (1983, p. 134).

Moreno de Alba (1978) provides another detailed study concerning the use of the PP and PRET in Mexican Spanish. In agreement with Lope Blanch, Moreno de Alba (1978, p. 57) points out that the main difference between Mexican PP and PRET is “esencialmente aspectual” (essentially aspectual); Moreno de Alba’s analysis of all verb forms occurring in collected data from Mexico City revealed that the PP made up only 2.5% (404/15,880) of all verb forms used in the corpus. Essentially, the analysis shows that the PRET expresses perfective aspect while the PP overwhelmingly (90% [364/404]) accounts for the use of durative or repeated situations. In sum, Lope Blanch and Moreno de Alba’s studies suggest that the original “presentness” of the *haber* + PP source construction is well retained in Mexican Spanish.³

Adopting a variationist approach, S&TC (2008) have also examined the distribution of the PP in Mexican and Peninsular Spanish. The results support the idea that the Mexican PP encodes durative and iterative values in describing situations initiated in the past that continue up to utterance time. In S&TC’s study, the frequency of the PP relative to the PRET is 15%. The authors note that the use of PP in Mexican Spanish is highly restricted to irrelevant temporal reference, frequency and proximate adverbs, plural objects, yes-no questions, and relative clauses. Non-specific temporal reference is a conditioning factor as the PP was used most frequently in contexts where the time period is irrelevant or indeterminate. The analysis also suggests that the PP is sensitive to Aktionsart in Mexican Spanish; namely, PP is favored with durative predicates and disfavored with achievement (punctual) predicates – the latter results are consistent with a continuative perfect that characterizes Mexican PP (S&TC, 2008, p. 20–23).

Summarizing, previous studies concerning Mexican Spanish discussed here seem to agree in situating Mexican PP at a stage prior to the Peninsular PP in Harris’ developmental stages. More specifically, the Mexican PP is situated at stage II in Table 1, which is characterized by the inclusive meaning of the perfect, in which a

3. See also Company (2002) for a semantic/pragmatic discussion of the PP in Mexican Spanish.

situation initiates in the past but is viewed as still ongoing at utterance time (Harris, 1982). To put it differently, according to Comrie's (1976) types of perfects, the Mexican PP is a continuative perfect or a perfect of persistent situation.

Building on previous work on the PP and PRET alternation, this paper examines these temporal semantic categories in Southern Arizona Spanish narratives from a variationist perspective. Tagliamonte (2012) notes that narratives provide an excellent way of viewing tense/aspect features: "they provide a naturally bounded speech act where events are understood to have occurred prior to the moment of speaking" (p. 310). In particular, employing a multivariate analysis, the study seeks to tease apart particular factors that constrain the PP-PRET alternation in this variety of Spanish.

3. Methodology and data

Data for the current study were extracted from 37 sociolinguistic interviews from the *Corpus del Español en el Sur de Arizona (CESA)* (Carvalho, 2012). This corpus aims to document and disseminate information about the Spanish varieties spoken in Southern Arizona. In particular, the current data were extracted from narratives in these interviews, which were interpreted as transcribed paragraphs consisting of more than three sentences. The informants' age ranges from 19–58. All the informants are residents of Tucson, Arizona.

The sociolinguistic interviews were conducted by graduate and undergraduate students under a principal investigator's supervision. The interviews were all conducted in Spanish and consisted of approximately one hour each. The interviewers, the researcher included, followed a typical sociolinguistic interview protocol as discussed in Labov (1972, 1982). Informants were asked about their families and childhood, current issues, memories, and specific questions about language use in their families and in the Tucson area in general. Interviews were conducted in an informal environment.

3.1 The envelop of variation

The focus of the present work is to examine the conditioning of variability between the PP and PRET in Southern Arizona Spanish. The verb form determined each token included in the analysis: all periphrastic (*haber* 'have' plus past participle form) instances of the PP and morphological instances of the PRET. However, any instance of the progressive form or tense ambiguity was excluded from the analysis.

Progressive form

- (3) a. Y aparte de eso siempre, como *he estado trabajando* en restaurantes
And apart from that, always, like I *have been working* in restaurants
(CESA002)
- b. [C]omo dos años *estuve trabajando* con señores
Like two years I *was working* with men
(CESA018)

Ambiguity with present tense

- (4) Cuando -stamos, como se le, *vivimos* bien cerca de la Universidad
When, -stamos, like *SE LE*, we *lived/live* very close to the University
(CESA011)

The following data were considered relevant for this study, and thus, instances like those in (5) and (6) were included in the analysis.

Repeated forms of PP

- (5) Sí: um, *hemos ido* a San Diego, *hemos ido* a Las Vegas
Yes, um, we *have gone* to San Diego, we *have gone* to Las Vegas (CESA021)

Unexpected forms of past participle

- (6) Yo *he visto* niños que se *han murido* de spice
I *have seen* children that *have died* of spice
(CESA008)

3.2 Data coding

The linguistic variable in this study is the PP and PRET alternation in the domain of perfective past reference. A total of 1959 tokens were extracted from CESA. All tokens were subsequently coded in seven factor groups and their corresponding individual levels. Factor groups and their corresponding levels, which are well established in the literature, were selected following previous variationist studies (S&TC, 2008; Howe & Schwenter, 2008; Dumont, 2013).

The first factor group is *temporal reference*. S&TC (2008) show that the PP has a hodiernal perfective function in Peninsular Spanish but not in Mexican Spanish. Thus, we are interested in whether temporal distance constrains the PP-PRET alternation. The Examples (7)–(11) illustrate situations temporally anchored to reference points in the past with respect to utterance time. For this factor group, we coded for hodiernal (today), hesternal (yesterday) and before yesterday (prehesternal) past situation.

Following S&CT (2008), we coded for past situations for which temporal location is irrelevant (which cannot be queried by *when?*) and indeterminate reference – the criterion for which was based on the fact that “the analyst and possibly

the interlocutor cannot resolve the temporal distance of the past situation with respect to utterance time” (S&TC, 2008, p. 18). That is, temporal reference is not specified, but, unlike irrelevant reference, one can query *when?* in order to determine the reference time.

Hodiernal (today)

- (7) Eso *empezó* hoy (CESA030)
That *started* (PRET) today

Hesternal (yesterday)

- (8) [C]omo ayer yo *cociné* para mi familia (CESA014)
Like yesterday I *cooked* (PRET) for my family

Prehesternal (before yesterday)

- (9) Y en los últimos meses *he visto* que Tucson *ha crecido* muchísimo más
And over the last few months, I *have seen* (PP) that Tucson has grown a lot more (CESA030)

Irrelevant Temporal Reference (cannot ask ‘when?’ to disambiguate)

- (10) Y es que nunca *he sido* de impulsos (CESA023)
And I *have* never really *been* (PP) impulsive

Indeterminate Temporal Reference

- (11) Yo *he entendido* muchas cosas ahora le digo (CESA012)
I *have understood* (PP) many things now, I tell to you

The second factor group is presence of temporal adverbials and type of adverbials. S&TC (2008) point out that, “if the Mexican PP is a continuative perfect, then ‘current temporal frame’ adverbials referring to periods that extend up to the moment of speech (Dahl, 1984, p. 137) should favor PP over the PRET” (p. 15). Similarly, S&TC also note that frequency adverbs are constant with both experiential meaning and iterative situations persisting into the present. Thus, adverbs such as *siempre* ‘always’ and *nunca* ‘never’ should also favor the PP. In contrast, connective adverbs (e.g., *después* ‘after’, *entonces* ‘then’, *luego* ‘later’) and time specific adverbs (e.g., *en diciembre* ‘in December’ & *ayer* ‘yesterday’) are typically employed in narrative sequences, which are normally expressed with the PRET, and thus, we expect these adverbs to disfavor the PP. The level no adverb is important here to compare instances lacking an adverb with the presence of adverbials.

Frequency adverbs

- (12) Bueno, me *ha tocado* varias veces de que vamos, por ejemplo, voy yo solo (CESA021)
Well, it *has been* (PP) my turn many times since we go, for example, I go alone

Connective adverbs

- (13) Y después todos *salimos* para un restaurante (CESA006)
And then we all left (PRET) to a restaurant

Proximate Adverbs

- (14) Y en los últimos meses *he visto* que Tucson *ha crecido* muchísimo más (CESA030)
And over the last few months, I *have seen* (PP) that Tucson *has grown* (PP)
more

Specific Adverb

- (15) Ayer *fui* con el doctor y me *dilataron* la pupila (CESA026)
Yesterday I *went* (PRET) with the doctor and they *dilated* (PRET) my pupil

No adverb

- (16) No sé, sí *he tenido* sueños raros y que digo (CESA004)
I don't know, yes I *have had* (PP) strange dreams and what can I say?

The third factor group is *lexical aspect*. The characterization of a verb's lexical aspect was determined following Vendler's (1967) well-known verb classes: states, activities, achievements, and accomplishments. In terms of time schemata, states, which are non-dynamic, involve only a period of undifferentiated moments without an endpoint, while achievements consist of a unique and definite time; similarly, activity/durative predicates call for periods of time that are not unique or definite, and accomplishments imply the notion of unique and definite time periods (Vendler, 1967, p. 106–107).

Events such as *knowing*, *loving*, and *believing* are states in Vendler's terms. Comrie (1976) notes that "states are situations that may or may not involve changes" (p. 49). On the other hand, verbs like *running*, *walking*, and *swimming* are almost unambiguous cases of activity/durative, meaning that the given situation lasts – or is conceived to last – for a certain period of time (Comrie, 1976).

Unlike dynamic predicates, accomplishments, like *building a house* and *writing an article*, consist of a process and an outcome, or change of state; they involve a clear final point (Comrie, 1976). Instantaneous events such as *recognize*, *realize*, and *reach* fall into the class of achievement. Unlike accomplishments, achievements occur at a single moment, meaning that they occur with simultaneous initial and final points in the temporal schemata (Smith, 1991). Achievements are atelic, while accomplishment are telic – a telic situation is one that involves a process that leads up to a well-defined terminal point and is normally modified by temporal adverbials such as *in an hour*, while achievements occur at a single moment (Comrie, 1976).

Following S&TC's (2008, p. 14) study, the presence of an object was the main contextual element we took into consideration to code for telicity. For example, a verb such as "agarrar" in (17) was classified as 'atelic' but *telic* in Example (18).

- (17) [Y] pues allí *agarré* la onda pues mejor (CESA016)
And then I *realized* (PRET), well better

- (18) Nunca *he agarrado* un libro en español así que digas tú que me interese (CESA029)
I *have* never *picked up* (PP) a book in Spanish of my interests

Both verbs have an object, although only (18) can be interpreted as a direct object because one can cliticize [*un libro en español* 'a book in Spanish'], but it is difficult to cliticize [*la onda*] in (17). Moreover, the telic event in (18) has an intrinsic goal, constituting its natural final point, whereas the atelic event in (17) has an arbitrary final point, meaning that the event has a single process that is realized as soon as it begins (Smith, 1991).

In sum, according to Vendler (1967, p. 104), the lack of continuous tenses distinguishes stative predicates from activities and accomplishments, and the form of time determination is sufficient to separate states from achievements. The aspectual classification is a perplexing matter. However, considering some particularities discussed in S&TC (2008), we tried our best to be consistent on our classification with previous literature.

Stative Predicates

- (19) Yo siempre *he querido* (...) jugar con, cerámicas (CESA020)
I *have* always *wanted* (PP) to play with ceramics

Achievement (atelic)

- (20) [Y] pues allí *agarré* la onda pues mejor (CESA016)
And, then I *realized* (PRET), well better

Accomplishment (telic)

- (21) Y he, *he tomado* clases en uh XY (CESA001)
And I have, I *have taken* (PP) classes in XY

Activity (durative)

- (22) [P]ero todavía no *he ido* a ver la película de Batman (CESA004)
But I *have* not yet *gone* (PP) to see the Batman movie

The fourth factor group is clause type. Givón (1982) suggests that the function of perfects in narratives is to present background information that is relevant to a situation at a given point. If relative clauses are taken to encode background information, the PP then should be favored with relative clauses. The corresponding

individual levels are temporal, matrix, relative and other – the level ‘other’ includes instances which occur in sentence fragments or stylistic usages such as *he dicho* ‘I have said it’.

Temporal clauses

- (23) Siempre- siempre, um, cuando *he salido* (CESA005)
Always, always, um, when I *have left* (PP)

Matrix

- (24) [P]ero nunca *he escuchado* esa palabra (CESA005)
But I *have* never *heard* (PP) that word before

Relative clauses

- (25) Son otras amigas que *he conocido* después de la preparatoria (CESA005)
They are other friends I *have met* (PP) after high school

Other

- (26) Pues fíjate que yo *he oído* que sí dicen (CESA013)
Well, it is interesting that I *have heard* (PP) that they do say

The fifth factor group is plurality. According to S&TC (2008), “plural objects are more congruent with experiential as well as continuative (perfect of persistent situation) uses than singular objects and so should favor the PP” (p. 16). The corresponding individual levels in this factor group are singular, plural, or no object.

Singular direct object

- (27) [P]ero en otros aspectos no pienso que *he tenido* miedo de algo (CESA005)
But in other ways no I don’t think that I *have had* (PP) afraid of something

Plural direct object

- (28) [E]s que mi familia siempre *ha tenido* caballos (CESA006)
Well, my family *has* always *had* (PP) horses

No direct object

- (29) [Y]o siempre *he sido* muy reservado (CESA003)
I *have* always *been reserved* (PP)

The sixth factor group is *polarity*, and its corresponding individual levels are *affirmative* or *negative*. Squartini and Bertinetto (2000) note that Mexican Spanish shows a peculiarity regarding negation: “in negative context, the verb undergoes (in cases like [(31)] an actional reclassification, i.e., it is turned into a durative predicate” (p. 412) (see also Company, 2002 for a discussion on negation in Mexican Spanish). In other words, negation yields a continuative perfect meaning, and thus, we predict negative polarity to favor the PP in the present data.

Affirmative

- (30) Tengo diferentes uh cosas que *ha sido* enfermería (CESA008)
I have different, uh, things that *have been* (PP) nursing

Negative

- (31) Y le dijo XY, toda-no, todavía no *hemos fijado* la fecha (CESA006)
And I tell you, *toda-no*, we *have not yet agreed* (PP) on a date

The last factor group is the presence or absence of *ya* ‘already’. This adverb normally denotes a completed event, but it could also refer to a reference time coinciding with utterance time. Lope Blanch (1983) notes that *ya* expresses a recent past with current relevance in Mexican Spanish, and thus, the PRET is used in this variety. Thus, it is reasonable to expect *ya* to disfavor the PP in the present data.

Presence of ‘ya’

- (32) Sí ya como que *he aprendido* un poco más (CESA018)
Yes, I *have* somehow *learned* (PP) a bit more

Absence of ‘ya’

- (33) Sí no más estaban trabajando, pero aquí *hemos vivido* (CESA018)
Yes, they were just working, but we *have lived* (PP) here

All instances of PP and PRET extracted from the 37 sociolinguistic interviews were subsequently coded and submitted for a multivariate statistical analysis using *GoldVarb X* (Tagliamonte & Smith, 2005). The following section presents the results.

4. Results

Table 2 shows the overall distribution of the PP & PRET alternation in three Spanish varieties.

Table 2. Overall distribution of PP and PRET in Southern Arizona, Mexican, and Peninsular Spanish (Schwenter & Torres Cacoullos, 2008)

Southern Arizona Spanish		Mexican Spanish		Peninsular Spanish	
PP	PRET	PP	PRET	PP	PRET
20.6%	79.4%	14.8%	85.2%	54%	46%
(404)	(1555)	(331)	(1903)	(956)	(1783)
Total N of tokens: 1959		Total N of tokens: 2234		Total N of tokens: 2739	

Table 2 illustrates that there is a robust difference in terms of the overall distribution of the PP and PRET in Southern Arizona Spanish. That is, the PRET is relatively higher in frequency (79.4%) than the PP (20.6%) in this Spanish variety. The overall PP frequency aligns with the frequency reported in S&TC (2008) for Mexican Spanish.

The multivariate analysis of the present data was carried out using *GoldVarb X*, a variable rule program capable of modeling binary variables with multiple factors influencing them (Tagliamonte & Smith, 2005). As mentioned in the methodology section, seven factor groups were submitted for a statistical analysis. Table 3 shows the factor weights/probability revealed by *GoldVarb X*. These factor groups are: Temporal adverbials, Lexical Aspect, and Temporal Reference.

Table 3. Multivariate analysis of factors contributing to choice of PP over PRET in Southern Arizona Spanish narratives

Factor	Probability	% PP	N	% Data
Temporal Adverbials				
Frequency Adverbs	.76	38.8	374	19.1
Proximate Adverbs	.55	18.8	48	2.5
No Adverbs	.52	21.7	983	50.2
Specific Adverbs	.31	7.4	311	15.9
Connective Adverbs	.22	5.8	243	12.4
RANGE	54			
Lexical Aspect				
Stative	.62	29.1	419	21.4
Accomplishment (telic)	.58	27.3	479	24.5
Achievement (atelic)	.42	13.5	460	23.5
Durative (activity)	.40	14.8	601	30.7
RANGE	22			
Temporal Reference				
Indeterminate	.53	21.4	989	50.5
Irrelevant	.50	23.2	740	37.8
Prehesternal	.36	8.7	230	11.7
RANGE	17			
			Total Input	Total %
			1959	100
<i>Log Likelihood</i> = -884.19				
<i>Significance</i> = 0.037				

Table 3 shows that the *temporal adverbial* factor group has the highest magnitude of effect with a range of 54. Within this factor group, frequency adverbs (such as *siempre* ‘always’, *nunca* ‘never’, *varias veces* ‘many times’, etc.) and proximate

adverbs (e.g., *ahora* ‘now’, *últimamente* ‘lately’, etc.) favor the PP, while connective adverbs (e.g., *después* ‘after’, *entonces* ‘then’, etc.) disfavor the PP. This observation confirms our prediction: *current temporal frame* adverbials referring to periods that extend up to utterance time favor the PP in CESA. Moreover, the use of the PP is subject to *lexical aspect* restrictions; namely, it is disfavored, as predicted, by achievement predicates (.42) and durative aspect (.40); on the contrary, states (.62) and accomplishments (.58) favor the use of the PP – we provide an interpretation of these results in the Discussion section.

The weakest factor group in Table 3 is *temporal reference*, the temporal distance of the past situation with respect to utterance time, with a range of 17. Within this factor group, marginal results showed no PP occurrences either in hodiernal (today) or hesternal (yesterday); and prehesternal (before yesterday) highly disfavored (.36) the use of the PP. On the other hand, the PP is favored in indeterminate temporal reference contexts (.53), while irrelevant temporal reference is in a neutral position (.50); a possible interpretation is to suggest that the PP is favored in contexts where temporal anchoring is left unspecified by the interlocutor. The next section provides an interpretation of the present results.

5. Analysis & discussion

The frequency of the PP relative to the PRET is 20.6% compared to 79.4% in the present data. This distribution aligns with the frequency reported for Mexican Spanish in S&TC (2008) and Moreno de Alba (1978). The factor group with the highest effect on the choice of the PP over the PRET is temporal adverbials with frequency and proximate adverbs favoring the PP, and specific and connective adverbs disfavoring the PP. The ‘no adverb’ level in the temporal adverbials group factor was included to tease apart whether or not ‘no adverb’ influences the use of PP. The level ‘no adverb’ slightly favors the PP (.52).

It has been pointed out that frequency adverbials “are constant with both experiential meaning and iterative situations persisting into the present” (S&TC, 2008, p. 15). Consider the following examples.

- (34) Los juegos de fútbol americano, de básquetbol siempre *han sido* mi pasión (CESA036)
American football games, basketball *have* always *been* (PP) my passion
- (35) Nunca me *he puesto* a pensar pero es algo que me afectó es el bully (CESA006)
I have never *thought* (PP) about it, but something that affected me was bullying
- (36) Sí me *ha tocado* varias veces de que como hay mucha gente (CESA021)
Yes, to-me *have-taken* (PP) many times that there are many people

Moreover, Dahl (1984, p. 137) points out that “current temporal frame” adverbs should favor the use of PP over the PRET. The results of the present analysis support this claim; approximate adverbs favor the PP (.55). In these data, frequency and proximate adverbs seem to function as discourse mechanisms encoding durative and iterative characteristics of past situations leading up to present utterance time. That is, the PP is constrained to the presence of temporal adverbs (frequency and approximate) with an unspecified temporal framework. This analysis shows that the internal linguistic constraints governing the PP and the PRET in Southern Arizona Spanish exhibit increased PP usage in continuative contexts, similar to the use of the PP in Mexican Spanish (S&TC, 2008) and Peruvian Spanish (Rodríguez Louro & Jara Yupanqui, 2011). Moreover, one can quite plausibly suggest that the presence of temporal adverbials might be the source leading to perfective uses of the PP in this variety, which in turn supports the idea that there are multiple paths of PP grammaticalization in Spanish (Howe & Schwenter, 2008).

The PP in Southern Arizona Spanish is also sensitive to lexical aspect restrictions. Following Comrie’s (1976, 1985) observations about stative predicates, this analysis considered stative situations as non-dynamic events that involve only a period of undifferentiated moments without an endpoint, and the situation may or may not involve state changes. Stative predicates favor the PP (.62), whereas durative predicates disfavor the PP (.40). S&TC’s (2008) study shows that durative predicates slightly favor the PP (.52) in Mexican Spanish, but not in Peninsular Spanish (.51). Durative predicates have a duration feature, which seems to be absent in PP contexts in these data. This finding can be taken to suggest that dynamic events are normally expressed in the preterit in this variety. The results for statives deviate from S&TC’s study of Mexican Spanish. However, the favoring of the PP with statives in these data ought to be seen as cross-linguistic behavior. For instance, Dumont’s (2013) study of Quiteño Spanish reveals that states favor the PP (.64), whereas durative predicates (activity) disfavor the PP (.47), Dumont’s study also follows Vendler’s four types of lexical aspect.

Furthermore, the current analysis reveals that accomplishments favor the PP (.58), whereas achievements disfavor the PP (.42). While disfavoring of the PP with atelic predicates is expected, the results for accomplishments need further discussion. Following S&TC’s (2008) study, this study considered the presence of an object as the main contextual element to code for telicity. Typical examples of telic events require an object in the present data (e.g., *hacer Navidad* ‘have a Christmas Party’, *comprar algo* ‘buy something’, *fijar una fecha* ‘schedule a date’, etc.). In addition, telic events have successive stages in which the process advances towards its conclusion and results in a new state. These observations can be taken as a way to determine that the examples in (37)–(39) are telic.

- (37) Y le dijo XY, toda- no, todavía no *hemos fijado* la fecha (CESA026)
And I tell you, toda-no, not yet we *have agreed* (PP) on a date
- (38) Y todo el tiempo le *he comprado* su casco todo (CESA006)
And all the time I *have bought* (PP) him his helmet
- (39) Navidad, siempre *hemos hecho* Navidad (CESA003)
Christmas, we *have always done* (PP) Christmas

Notice that the accomplishment situations in the examples above are presented within a larger temporal perspective. That is, these situations are contained within the frame of temporal modifiers (Comrie, 1976). The presence of temporal modifiers is expected given that accomplishments include a temporal process leading toward a final point. A cross-tabulation between categories of aspectual class and adverbials was run and no interaction was found, meaning that it is the aspectual class favoring the PP effect and not aspectual class cum temporal modifiers.⁴

The temporal reference group factor is also significant in the present data, with a range of 17. As expected, the PP is favored with indeterminate reference (.53), while irrelevant reference has a weight of (.50). In contrast, no instances of PP occurred in either the today or yesterday contexts, and prehesternal contexts are highly disfavored (.36). Although low in frequency, the prehesternal factor serves as evidence to argue that in Southern Arizona Spanish, situations are temporally anchored to past time reference points located with respect to utterance time.

In this study, indeterminate contexts were determined on lack of temporal anchoring, which is left unspecified by the interlocutor because it does not seem to matter from the perspective of the speaker. The results for indeterminate reference align with those reported for Mexican Spanish. For instance, S&TC (2008) suggest that “indeterminate contexts are more open to the generalization of the PP than determinate (specific, definite) temporal reference, due to their lack of temporal anchoring” (p. 31). Furthermore, the authors make the claim that “the Present Perfect’s shift from hodiernal to general perfective advances in temporally indeterminate past contexts” (p. 1).

Cross-linguistically, tense and aspect variables are a prime context to study grammaticalization paths (Tagliamonte, 2012). For instance, the PP in Peninsular Spanish is moving along the same path of grammaticalization attributed to French and Northern Italian (Harris, 1982), while the PP in Mexican Spanish maintains “*experiential and continuative (perfect of persistent situation) uses*” (S&TC, 2008, p. 32). The fact that indeterminate contexts favor the PP in the present data may be taken as an instantiation of the PP advancing to perfective functions in temporally indeterminate past contexts similar to what has been reported for Mexican Spanish

4. I would like to thank an anonymous reviewer for pointing this out to me.

(S&TC, 2008) and Lima Spanish (Howe & Schwenter, 2008), albeit a premature observation. Instead, we agree with S&TC (2008): “it remains to be discovered whether indeterminate reference is a locus of change in temporal systems more generally” (p. 33). Cross-linguistic studies will shed new light on this observation.

It is important to note that continuativity is not only restricted to the PP in the present data. The PRET may also appear in continuative contexts as illustrated in (40).

- (40) Y eso *duró* hasta recientemente, hasta el dos mil doce (CESA030)
And that lasted (PRET) until recently, until two thousand twelve

While the present analysis suggests that the PP has a continuative meaning/function, instances like that in (40) show that either the PP or the PRET may express a continuative function in this Spanish variety. In other words, as pointed out in S&TC (2008, p. 7), there is no “one-to-one isomorphism” between a perfect function (e.g., continuative) and the form (the PP or the PRET) in the present data.

Summarizing, the results for the adverbial factor group led us to suggest that internal linguistic constraints governing the PP and the PRET in Southern Arizona Spanish exhibit increased PP usage in continuative contexts. The presence of temporal modifiers with accomplishments provides further support for the claim that the PP shows characteristics of a continuative perfect in this variety. In other words, there is strong evidence to suggest that the presence of temporal adverbs must be key in the development of the PP’s inclusive continuative meaning/function in this bilingual community. This is the first study to examine this variable in a U.S. Spanish variety, but it might quite possibly be that this observation holds for U.S. Spanish in general. One may also wonder whether English may impact the distribution of this variable. However, we have noted that Spanish and English share similar conditionings for the use of the PP (Harris, 1982). In fact, Silva-Corvalán (1990) noted that the impact English may have on the verb system of Spanish is only indirect. This study, instead, pursued a typological perspectives of periphrastic pasts in the Spanish speaking world.

The present study closely followed S&TC’s (2008) study in terms of data coding. Thus, a comparison of the linguistic conditioning probabilities of the present study with those of S&TC’s study of Mexican Spanish is relevant to address the second research question (Table 4). First, temporal reference has the highest magnitude of effect with a range of 77 in S&TC’s study, while this same factor group has the weakest effect (range = 17) in the present data. However, as Table 4 shows, indeterminate reference was favored in both varieties. Again, as S&TC suggest, whether indeterminate reference is a locus of change in temporal systems remains to be discovered.

Secondly, in S&TC’s study, the temporal adverbial factor has the second highest magnitude of effect (range = 35), whereas this same factor shows the highest magnitude of effect (range = 54) in the present data. As Table 4 illustrates, frequency and proximate adverbs favor the PP in both varieties. The high effect of frequency adverbs in the present data can be seen as an instantiation of the PP functioning as a continuative perfect or perfect of a persistent situation in Southern Arizona Spanish.

Table 4. Tendencies of probability for the adverbial and temporal reference factor groups in Arizona Spanish and Mexican Spanish (Schwenter & Torres Cacoullos, 2008)

	Southern Arizona Spanish	Mexican Spanish
<i>Temporal Adverbials</i>		
Frequency adverbs	✓	✓
Proximate adverbs	✓	✓
No adverbs	✓	✓
Specific adverbs	x	N/A
Connective Adverbs	x	N/A
<i>Temporal Reference</i>		
Indeterminate	✓	✓
Irrelevant	✓	✓
Hordiernal	x	x
Hesternal	x	x
Prehesternal	x	x

The particular linguistic factors favoring the PP in Mexican and Southern Arizona Spanish serve to widen the cross-linguistic perspective. The functions of Mexican PP are well established in the literature, but no data have yet been reported for Southern Arizona Spanish. Like in most Latin American Spanish varieties, the present data show that the semantic/pragmatic functions of the PP in Southern Arizona Spanish have strong characteristics of a continuative perfect (or a perfect of persistent situation” in Comrie’s terms). In sum, the study shows that use of the PP in U.S. Spanish remains quite close to that of its ancestor variety.

This is the first study to examine the PP and PRET alternation in a U.S. Spanish variety, and it is important to analyze whether the present data is suitable to Harris’s (1982) typology of periphrastic pasts in Romance. For example, the Mexican PP is located at stage II in Harris’s developmental stages illustrated in Table 1. Stage II is characterized by the inclusive meaning of the perfect: situations that commence in the past but are viewed as still ongoing at utterance time. The results of the present study provide quite plausible evidence to argue that the PP in Southern Arizona Spanish situates at stage II as well. That is, in this variety, the PP describes

unbounded, durative situations that started in the past but continue (persist) into the present. Only time will tell whether the PP in Southern Arizona Spanish will follow a grammaticalization path in line with Harris's proposal for the PP in Romance.

6. Conclusion

This paper was concerned with the distribution of Present Perfect and Preterite in a sample of Southern Arizona Spanish, hence bringing new data on a U.S. Spanish variety. Adopting a variationist approach, the study aimed to investigate the constraints that determine the distribution of PP in contrast to the PRET. The PRET is relatively higher in frequency (79.4%) than the PP (20.6%) in this variety. Furthermore, a multivariate analysis using *GoldVarb X* revealed three conditioning factors as statistically favoring the use of the PP: Temporal adverbials, Lexical Aspect, and Temporal Reference. The *temporal adverbial* factor group had the highest magnitude of effect with a range of 54.

Within this group, frequency and approximate adverbs favored the PP, while connective adverbs disfavored the use of PP (.22). The use of the PP in Southern Arizona Spanish is also sensitive to lexical aspect restrictions; namely, it was disfavored by achievement (punctual) predicates and durative aspect, while stative and accomplishment predicates favor the PP. Finally, temporal reference shows the weakest effect on the analysis with a range of 17. Within this group, the PP is favored in indeterminate temporal reference contexts, in which the temporal anchoring is left unspecified by the interlocutor.

Overall, the results align with previous studies concerning Mexican Spanish and Latin America Spanish in general. That is, in this variety, the PP describes unbounded, durative situations that started in the past but continue (persist) into the present. The study also compared the weights/probabilities in the current data with that of Mexican Spanish for temporal adverbials and temporal reference. Interestingly, frequency and approximate adverbs as well as indeterminate reference favor the PP in both varieties. While we do not aim to argue that Southern Arizona Spanish shares the same types of features as Mexican Spanish, which would imply all varieties of Mexican Spanish, instead we aim to show that the semantic/pragmatic function of the PP in Southern Arizona Spanish has strong characteristics of a continuative perfect, which has also been suggested for Mexican Spanish. Hence, we quite plausibly suggest that the PP in Southern Arizona Spanish situates at stage II in Harris's (1982) developmental stages.

This study ought to be taken as a further contribution to the extensive research on tense and aspect in the Spanish-speaking world. But most importantly, the study offers relevant data on a U.S. Spanish variety, and seeks to shed light on

the consistent research of Spanish in the U.S. The study provides new data on the variation of the PP and PRET, and aims to contribute to the typology of periphrastic pasts in Romance – hence providing further support for Harris’s developmental stages of the Present Perfect and the Preterite in Romance.

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“El *vos* nuestro es, ¡Ey *vos*, chigüín!”

Honduran *vos* as a marker of national identity

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This qualitative study takes the analysis of Honduran *voseo* beyond the examination of ‘who’ uses *vos* to include answers to ‘why’ speakers use *vos* the way they do. To that end, thirty informants shared their attitudes toward address forms through semi-directed interviews from which three themes emerged: (1) *vos* belongs to the Honduran norm; (2) *vos* indexes Honduran national identity; and (3) innovative uses of *vos* reflect its greatly rooted status in Honduran Spanish. It was evident that *voseo* is not stigmatized in this variety, as it is part of the Honduran linguistic *habitus*. Adopting Billig’s (1995) theory of *banal nationalism*, I conclude that *vos* is preponderant in Honduran Spanish because it functions as a marker of Honduran national identity.

Keywords: formas de tratamiento, *vos*, *voseo*, address forms, nationalism, national identity

1. Introduction

Address forms, both nominal and pronominal, have been extensively investigated, since they present wide variation in usage patterns in the languages of the world (cp. Braun, 1988). Pronominal forms, in languages that exhibit systems of more than one pronoun, have received special scholarly attention that has traditionally been descriptive in nature. In an attempt to corroborate that pronoun use is governed by two sociopragmatic dimensions, status/power and solidarity, (and other theoretical postulations) proposed by Brown and Gilman in their 1960 seminal work, most studies have focused on describing address form use between two interlocutors in specific types of relationships, hierarchical (e.g. parent-children) and horizontal (e.g. between friends). Following in this tradition, investigations concerning the pronominal systems, involving the singular pronouns *vos*, *tú* and *usted*, found in Spanish abound: e.g. Carricaburo (1997), Fontanella de Weinberg (1995), Hummel,

Kluge, & Vázquez Laslop (2010), Kapović (2007), Moyna & Rivera-Mills (2016), Páez Urdaneta (1980), and Rojas (1998). Even though some of the previous research has explored multiple varieties of Spanish, most studies have focused on certain dialectal regions, such as Argentina and Colombia, but has greatly ignored others, such as Honduras. Accordingly, by examining the general formulation of the pronominal system of address forms in Honduran Spanish (HS), the present study contributes to the recently growing body of research emerging from this understudied variety.

Taking the usage patterns already documented for HS (presented in § 2.3), this investigation goes further into how pronominal forms may be used in identity work with the objective of uncovering the sociological motivations driving said patterns. More specifically, this study centers on the spoken variety, dominated by *vos* and *usted*, in an attempt to explain the preponderance and unique sociopragmatic functions of the former. Based on Michael Billig's (1995) theory of *banal nationalism* (discussed in § 3), it is proposed here that *voseo* functions as a marker of Honduran national identity.

The article is structured as follows. § 2 provides a brief description of *voseo* as a linguistic feature of Latin American Spanish, summarizing previous research on its sociopragmatic usage patterns in the principal *voseante* dialects, paying special attention to HS. § 3 reviews Billig's (1995) theory of banal nationalism as the theoretical framework that will help explore the connection between *voseo* and Honduran national identity. § 4 details the methodology implemented for participant selection and data collection. § 5 concludes the article with a discussion of how *vos* indexes Honduran nationalism, which explains its prevalence in HS and ongoing changes in the address system of this variety.

2. Sociopragmatic usage patterns of *vos* in Latin America

Address forms in Spanish have undergone multiple socio-historical changes since Vulgar Latin and its descendants became widely spoken in the Iberian Peninsula. Consequently, second person pronouns are currently one of the linguistic features in which European Spanish differs from Latin American Spanish. *Voseo* is nonexistent in Spain, but in Latin America, there are regions that are exclusively *tuteante*, others that are exclusively *voseante*, and others that are 'hybrid' in the sense that both *tuteo* and *voseo* are found in the same discourse (Benavides, 2003; Moreno de Alba, 2010; Penny, 1991). *Usted* is found in all regions of the Spanish-speaking world. The following sections provide a review of the research on *voseo* that has been conducted in regions where it is present at a national level, following Benavides' (2003) classification.

2.1 Río de la Plata

Argentina is perceived as the *voseante* country *par excellence* because it is where the use of *vos* is the most widespread (Rojas, 1998), and where it belongs to the national standard, observed in any context – formal or informal, and oral or written –, recognized by *La Academia Argentina de Letras* since 1982. *Tú* and *usted* are very minimally used (Fontanella de Weinberg, 1987). According to Kapović (2007), *vos* has been gradually taking over the domains of *usted* since the 1960s; a shift that, according to Carricaburo (1997), was driven by leftist politics promoting equality in society, especially between politicians and the people.

Like Argentina, Uruguay is considered a *voseante* country, but unlike its neighbor, *tú* has been demonstrated to be a strong competitor alongside *vos* (Kapović, 2007; Weyers, 2009, 2013). According to Weyers (2009, 2013), the traditional pronominal system in Uruguay is tripartite: *vos* denotes intimacy/closeness, *tú* denotes some distance in close relationships, and *usted* denotes deferential social distance. This system allows multiple pronominal/verbal combinations to emerge in different social interactions since both ‘pure’ and ‘mixed’ (i.e. use of *tú* with *vos* verbal inflections and vice versa) forms are possible (Weyers, 2009, 2013). However, it appears that *vos* is becoming the standard form of address, following the general Porteño norm established in Argentina, as it has started to appear in grammar textbooks alongside *tú* as “accepted and standard in Uruguay” (Weyers, 2013, p. 177). Furthermore, varieties once described as categorically *tuteante*, such as border Spanish in Rivera, have recently seen the incorporation of *voseo* in daily speech (Carvalho, 2010).

2.2 Central America

Guatemala and El Salvador have been described as countries with a tripartite address system, where *vos* and *usted* are the preferred forms and *tú* is used in specific domains as a formally intermediate form (Kapović, 2007; Lipski, 1994; Moser, 2010; Pinkerton, 1986; Úbeda, 2013). According to Pinkerton (1986) and Kapović (2007), *tú* is less formal than *usted*, but does not signal familiarity/camaraderie with the same level of *confianza* that *vos* carries. Carricaburo (1997), Kapović (2007), Moser (2010), Pinkerton (1986) and Úbeda (2013) note that gender is strongly correlated to pronoun use in Guatemalan Spanish. Either *usted* or *tú* is used in conversation among women, and between women and men; *vos* is also used among women, especially among young educated women. Among men either *usted* or *vos* is used, never *tú*. What this means is that *voseo* is not gender exclusive, but rather gender preferential, whereas *tuteo* is gender exclusive, indexing femininity when used by

either a man or a woman. This, however, has not been observed in El Salvador. In fact, according to Quesada Pacheco and Rivera Orellana (2013) and Quintanilla Aguilar (2009), *tú* is not used orally in El Salvador, only in certain contexts such as advertising, television programs and with foreigners. According to Quintanilla Aguilar (2009), this is explained by the fact that *vos* and *usted* are not taught in school, but are replaced by *tú* and *vosotros*, and by the attitudes Salvadorians exhibit toward pronoun use. *Vos* and *tú* are not viewed as incorrect, pedantic or uneducated; however, *tú* is mostly appropriate when used in the media and partially with foreigners (where *usted* is normally preferred).

Unlike their neighbors, Nicaragua and Costa Rica have been described as countries characterized by a bipartite system, in which *vos* expresses solidarity/familiarity and *usted* expresses deference, but also solidarity/familiarity in certain contexts (Castillo Venegas, 2013; Christiansen, 2014; Díaz & López, 2013; Kapović, 2007; Lipski, 1994; Moser, 2010). In Nicaragua, *vos* is mostly used in the familial domain (e.g. among siblings) and among friends, whereas *usted* is only used to address elders and, in some cases, between spouses, and in public to show respect (Carricaburo, 1997; Lipski, 2004; Quesada Pacheco, 2002). In fact, according to Lipski (2004), Nicaraguans have earned the reputation of being overly familiar, or *confianzudos*, for being more prone to using *vos* with strangers than other Central Americans. Costa Rican Spanish, however, has recently experienced the incursion of *tú* in oral speech (Cabal, 2012; Thomas, 2008). Cabal (2012) and Thomas (2008) note that all three pronouns are in constant competition and covary, as all three can be used in the same type of relationship and in the same context. For example, *usted* can be used to denote solidarity/intimacy, similarly to *tú* and *vos*, in addition to its usual use as the deferent form.

2.3 Honduras

Previous research agrees that Honduras is a region where *voseo* predominates (Benavides, 2003; Castro, 2000; Kapović, 2007; Lipski, 1994; Melgares, 2014; van Wijk, 1990). van Wijk (1990) states that *voseo* “is completely generalized among the working classes (urban and rural) as much as among the semi-educated groups, and is even used in the informal, educated speech of those of social distinction” (pp. 114–115; my translation). Benavides (2003), Kapović (2007) and Lipski (1994) explain that *vos* is used in oral speech as the exclusive pronoun that expresses solidarity/intimacy and that *tú* is very rarely used. This was corroborated in a recent study on forms of address used by Honduran adolescents by Melgares (2014), where it was found that *vos* is the most widely used form in Honduras (57.7%) followed by *usted* (39.7%). In spoken language, *vos* is used almost exclusively to

express solidarity/intimacy, but was considered inappropriate in formal and written contexts. Like in Nicaragua and Costa Rica, *usted* is used to express respect and/or social distance in any context and sometimes intimacy in familiar contexts, as an ‘intimate/familiar *usted*.’ Very rarely is *tú* used in oral speech (2.60%). In fact, the use of *tú* is restricted to specific contexts not found in daily spoken conversation: written documents, specific religious practices (e.g. prayer), and some other oral contexts, such as television programs.

These patterns reflect the fact that *tú* seems to hold a more prestigious status in HS than *vos*. *Tú* belongs to the written/academic/religious norm, as it is taught in grammar courses at every educational level and is present in religious texts and ceremonies, whereas *vos* belongs to the oral/vernacular norm, as it is absent from grammar curricula and religious rituals in general. *Usted* belongs to any context. In a sense, putting it in Bourdieuan terms, the *tú-vos* dichotomy reflects an ideology where *tú* is the legitimate/standard form of address and *vos* the illegitimate/nonstandard form, bolstered by the Honduran education system and religion – two institutions that exert a powerful influence over the perpetuation of legitimate language (Bourdieu, 1991). Nonetheless, *vos* is used extensively in Honduras, a fact explored here within the theoretical framework of banal nationalism, discussed in the following section.

3. A practical theory of nationalism

Most contemporary definitions of nationalism have associated the term with extreme movements of nation-State formation or with extreme right-wing politics. As Billig (1995) points out, separatists such as those found in Serbia, Russia or Spain, and guerrilla figures seeking their own national homeland are seen as nationalists, whereas political leaders of established nation-States are not. Such a restricted conceptualization overlooks any sense of nationalism that might be present in the citizenry of established nations, especially those found in the West. He states, “by restricting the term ‘nationalism’ in this way, academics often overlook the general problem of how the general world of nation-States is reproduced” (Billig & Núñez, 1998, p. 37). With this in mind, Billig proposes a new interpretation of nationalism, which he calls banal nationalism, sustaining that nationalism should be viewed as “the complex of ideologies, practices and routines that reproduce the world of nation-States” (Billig & Núñez, 1998, p. 37; my translation).

Once the nation-State has been established, there has to be a way to maintain it. If nationalism was only valid during the inception of a nation-State, then, what keeps it from falling apart in a globalized world? Billig (1995) asserts that it is through a continual reminding or ‘flagging’ of nationhood in the daily lives of the citizenry that

nationality is perpetuated. The author metonymically equates banal nationalism to a still flag hanging on a building that goes unnoticed, that tacitly reminds the citizenry of “their national place in a world of nations” (p. 8). This image contrasts with that of a flag being waved with fervent passion, which would be characteristic of the active, conscious imagining of the ‘imagined community’ of a newly formed nation.¹

Gellner (1983) asserts that “nationalism emerges only when the existence of the state ‘is already very much taken for granted’” (cited in Billig, 1995, p. 19). Thus, the perpetuation of a national identity is only possible via its continual reproduction in everyday life through symbols such as national flags, national songs, monetary emblems, and general everyday practices, such as sporting events. In other words, nationhood is reproduced through symbols/practices that are taken for granted, thus *banal*, but that provide a background for cultural reproduction, signaling original meanings (sometimes forgotten) that have a long cultural history. Hence, what is required is “a psychology of the routine without imagination, by which the ‘imagined community’ is reproduced banally and without imagination established in the world of nations” (Billig & Núñez, 1998, p. 42). What Billig and Núñez refer to as “psychology of the routine without imagination” is what Bourdieu (1990) calls *habitus*, or the

systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles which generate and organize practices and representations that can be objectively adapted to their outcomes without presupposing a conscious aiming at ends or an express mastery of the operations necessary in order to attain them. (p. 53)

Since language is inherently a social activity present in virtually every human practice, it is reasonable and obvious that certain linguistic practices become part of one’s *habitus*, and why not, part of a society’s/nation’s *habitus*.

Given the usage patterns of pronominal address forms in HS and the generalized ideology surrounding them (discussed in § 2.3), and additionally, the fact that historically the tendency in Latin America has been the replacement of *vos* with *tú* (Penny, 1991), the present study attempts to answer the following fundamental question: why has *voseo* not been taken over by *tú* and thus, is still so prevalent in HS? Working from Billig’s (1995) theory, it is argued here that the preponderance of *voseo* in this variety is explained by the fact that it functions as a banal symbol

1. Billig incorporates the notion of ‘imagined communities’ first proposed by Benedict Anderson (1983), who views nations as social constructs in which their members imagine themselves belonging to them.

that indexes and reproduces Honduran national identity.² Importantly, a connection between *voseo* and national identity has also been observed in other varieties. Carricaburo (1999), for example, found that *voseo*, as a symbol of Argentinian national identity, advanced the nation's independence movements from Spain and was key in the reproduction of that national identity post-independence. In order to best assess this hypothesis, the following research questions were proposed to guide the investigation:

- RQ1. What are the overall attitudes that Hondurans exhibit in relation to the use of *voseo* when addressing an interlocutor?
- RQ2. How is *voseo* perceived in relation to identity?
- RQ3. What is the perceived, current use of *vos* with respect to *tú* and *usted*?

4. Methodology

Data were collected via group, semi-directed interviews with the objective of eliciting information on the participants' own understandings of their identities in relation to their use of *vos* and on their attitudes toward current pronominal address form use in HS. The study of language attitudes allows predictions to be made regarding linguistic behavior based on opinions and perceptions regarding particular linguistic phenomena, varieties and speakers (cp. Ryan & Giles, 1982). Because Honduran speech is a common topic of conversation among Hondurans, it was presumed that genuine participant attitudes toward *voseo* would be easily obtained through group interviews.

The interviews were conducted in groups of 2 to 4 participants at a time, who were in close, intimate relationships such as couples, friends and relatives. The majority of the interviews were conducted at the participants' homes except for two: one conducted at a coffee shop and the other at the home of a friend of the interviewees. All interviews followed a semi-directed structure, in which the researcher prompted the participants with a question and allowed them to discuss

2. Address forms could be examined using Labov's (2001) conceptualizations of linguistic variables, in which he distinguishes three types, depending on the degree of sociolinguistic salience: indicators, markers and stereotypes. These concepts, however, do not account precisely for the data collected. For example, within the Honduran sociocultural context, it is not clear whether *vos* is an indicator, a marker or a stereotype. As an indicator, *vos* participates in social but not stylistic stratification, and is not stigmatized as it belongs to the national norm. As a marker, it functions as a symbol of national identity. And as a stereotype, it appears to be part of a change in progress (see § 5).

among themselves. Additional questions emerged from the discussions, which were used to explore further any relevant points made by the participants. The interviews were recorded for later transcription.

A total of 30 informants were included in the study (15 males and 15 females), all of whom were sampled through a combination of convenience and snowball sampling, equivalent to what Tagliamonte (2006) calls the social network approach. This involved directly recruiting relatives, friends and acquaintances of the researcher, who met the eligibility criteria, who then nominated other participants who could potentially participate in the study. These criteria included: (1) native speaker of HS, (2) member of the middle class, and (3) be born or raised in one of the three major cities (Tegucigalpa, San Pedro Sula or La Ceiba), or had lived in the urban setting for at least 5 years.

Participant information was gathered through a short sociodemographic survey completed before the interview. All participants needed to be native speakers of HS to obtain valid and reliable data not influenced by ideologies that might be present in other varieties. In addition, it was important that all participants belong to the middle class because they would provide a better-informed perspective. It is assumed that members of the middle class in Honduran society come in contact with members from not only their same socioeconomic class, but also the working and upper classes in all sorts of interactions at work, school, church, etc., depending on their social networks. Therefore, their ideology would be informed by assumptions held by all social classes. Finally, because *vos* is perceived as a more urban address form, whereas *usted* is perceived as more rural – participant 24-M.C explains, “[...] *cuando vengo de Ocotepeque, allá usted, usted, usted y usted. Decir vos es ya como una falta de respeto*[...]” – and since innovations are expected to be observed in urban varieties (cp. Labov, 2001), all participants needed to speak and hold similar ideological assumptions about the urban variety.

Once the interviews were completed, the participants were given an ID number ranging from 01 to 30 to maintain anonymity and were divided into three age groups: group A, those between 18 and 29 years old; group B, those between 30 and 49 years old; and group C, those between 50 and 69 years old. Following, the interview recordings were transcribed – resulting in a 30,685-word corpus – and were coded and analyzed, implementing a methodology typical of Narrative Analysis by focusing on the contents of the narratives shared in the interviews and dividing the narratives into common themes (Riessman, 1993). This resulted in three major themes, discussed in the following section.

5. Results and discussion of analysis

This section offers a qualitative analysis of the interview data, taking into consideration the following: (1) the ideological dichotomy surrounding address forms in HS between legitimate/standard *tú* and illegitimate/nonstandard *vos*, and (2) the theoretical framework and research questions presented in § 3. The following sections are organized by theme, each of which provides an answer to each of the research questions (that is, § 5.1 answers RQ1 and so on).

5.1 *Vos* as nonstandard norm

Attitudes toward *voseo* emerged through a series of questions that ranged from very general to more specific. The more specific questions were rarely asked because participants often provided answers to them as they answered the more general questions. The main question all participants were asked was ‘when you hear two people talking with each other using *voseo* what comes to mind?’ By asking this question, it was intended to access the unprompted attitudes of the participants. All unanimously said that nothing comes to mind other than the fact that the interlocutors have a trusting/intimate/close relationship, for using *voseo* is ‘normal’ in Honduras since “[...] *todo mundo lo usa*” (Participant 01-F.C). According to the informants, addressing someone using *vos* is a generalized practice in Honduras and neither level of education, social stratum, age, nor any other social attribute is relevant when it comes to (not) using *voseo*. Speaking about level of education, participant 12-F.C stated,

- (1) *a cualquier nivel lo usan, a cualquier nivel eh, académico, verdad, lo usan. Personas que tienen grandes títulos universitarios y vosean y vosean.*

Furthermore, in the interview with participants 13-M.B, 14-F.B and 15-F.A, participant 13-M.B attributed *vos* to the middle and low classes, and *usted* to the upper class. The participant claimed that

- (2) *[El uso de usted] depende también del nivel de esas personas, el nivel social y en caso de vos, casi también, vienen de, de, de personas de un nivel medio, bajo.*

This demonstrates that for some, the use of the formal form of address, *usted*, is the way in which members of the upper class – presumably the most educated class since it has access to more educational opportunities – speak in everyday conversations and do not necessarily use *tú*. However, the other two participants quickly refuted participant 13-M.B’s claims as they both argued that members of the upper

class also use *vos* in everyday interactions, with which participant 13-M.B agreed after discussing with the rest of the group.

The generalized use of *vos* was confirmed when participants were asked if there is a specific type of person who uses it and which form of address is used the most in Honduras. Again, it was unanimous that everybody uses *vos* and that *vos* is definitely the address form used the most in Honduras, especially in the urban setting, closely followed by *usted*. *Tú* is perceived as very rarely used in daily social interactions. In fact, participants did not mention the use of *tú* spontaneously when referring to the way Hondurans speak; *tú* was spoken of in the interviews when participants were specifically asked to discuss it (see § 5.2 for more detail). These findings disprove the idea that *voseo* could be seen as uneducated, since even the most educated members of society use it, and support a mainly bipartite system, *vos-usted*, in the spoken variety. In this respect, HS parallels with Nicaraguan Spanish and the spoken variety of Salvadorian Spanish. As was explained in § 2.2, these address systems are mainly bipartite, *vos-usted* (e.g. Christiansen, 2014; Quintanilla Aguilar, 2009). Furthermore, Quintanilla Aguilar (2009) reports similar attitudes toward *voseo* among Salvadorians, who view it as a feature shared by all social classes and who do not perceive it as an ‘incorrect’ form used by the uneducated.

However, since *vos* does not belong to standard/legitimate Spanish, it was expected for it to carry some negative connotations for some participants. Because Honduran grammar textbooks uphold the prescriptive tradition enforced by the Royal Academy of Spanish in Spain, where *vos* disappeared since the eighteenth century (Penny, 1991), *voseo* has been absent from the grammar curriculum of the Honduran education system; in a sense it has been erased (Irvine & Gal, 2000) and supplanted by *tú*, the legitimate/standard form. Speaking about what has influenced his child’s use of *tú* and *vos*, participant 08-M.B commented that

- (3) *También habría que ver los libros de texto porque en libros de texto es el tú y entonces por eso los niños de, de primeros años, de escuela, usan el tú también [...].*

As expected, some informants did express some negative attitudes toward *voseo*. Consistent with Labovian sociolinguistics, because individuals of older generations tend to speak a more conservative variety, it was not surprising that these negative sentiments emerged within the oldest age group. The use of *vos* was perceived as incorrect and distasteful. Unexpectedly, however, these perceptions were not a result of prescriptive notions, but rather, of the innovative uses of *vos* in contexts where traditionally *usted* should be used (see § 5.3 for more detail). Some participants view the use of *vos* as a dangerous practice because it can easily lead to disrespect due to the closeness and informality it indexes. This is consistent with the ‘*vos de*

enojo’ reported by Castro (2000), associated with general impoliteness (e.g. insults). On this, participant 06-F.C shared that the use of *vos*

- (4) [...] *no es lo correcto [...] Eh, es más, antes, por ejemplo, yo me acuerdo mis, los abuelos y todos les inculcaban el respeto. Entonces, qué es lo que da, qué es lo que, eh, nos produce a llevarnos el vos, el irrespeto, o sea, la poca, la poca seriedad [...].*

This was a shared sentiment among half of the participants within the oldest age group. Therefore, any negative connotations regarding the use of *vos* only emerge when it is used in inappropriate pragmatic contexts when *usted* should be used. Thus, for the informants, it is not a matter of using *tú* versus *vos*, but rather using *usted* versus *vos*.

Nevertheless, the dichotomy that is created between prescription (the prescriptive use of *tú*) and practice (the habitual use of *vos*) is very much present in Honduran ideological assumptions regarding address forms. The fact that participant 14-F.B explicitly stated “[...] *es que el vos no es malo [...]*” indicates that there is a prescriptive, ‘good’ form (i.e. *tú*) which speakers should use, but which in reality does not apply to the way Hondurans speak because HS already has another perfectly ‘good’ form (i.e. *vos*). According to Bourdieu (1991), the education system plays a key role in standard language formation, as the ‘teacher of speaking’ is also the ‘teacher of thinking.’ As a result, written language becomes normalized into the standard legitimate form, against which all other forms of language are measured. Because the use of *tú* is inculcated by the education system, it belongs to the standard/legitimate Spanish language. Therefore, any deviation from it, such as the use of *vos*, is seen as nonstandard – as illegitimate. However, this is true for the written/academic norm and for the ‘ideal’ Spanish that every Spanish-speaker should speak. In spoken language, *vos* does belong to the norm as it is viewed as the way Hondurans speak connected to their sociocultural heritage. On this, participant 07-M.A comments,

- (5) [...] *creo que es una forma tanto de educación, como de cultura ... En educación el español es puro por naturaleza y es hablar el español, el idioma, como nuestros libros nos lo enseñan, un español académico. Porque ya el español que uno practica, eh, ya va a depender del país en donde está. Más que todo, el español académico es el general para todos. Y ese es el difícil de hablar porque cada país tiene sus, sus culturas, sus modos. Pero en el área cultural, eso va a ser algo nuestro, [especialmente] en el español rural. Porque es algo de cultura, es algo de, de, por decir así (.) no se va a poder eliminar porque es algo que uno lo va a agarrar como cultura (.) con eso nos vamos a identificar [...].*

In this interview, the group agreed that *vos* belongs to Honduran cultural Spanish and *tú* to academic Spanish. Therefore, as part of the Honduran linguistic *habitus*, *vos* works against the prescriptive forces that perpetuate the notion of an ‘ideal’ Spanish, by indexing Honduran national identity, which is tacitly reproduced through the daily use of *vos*.

5.2 *Vos* as index of Honduran national identity

As was explained in § 3, nationalism in established nations is observed through symbols and practices present in the daily lives of the citizenry. These symbols and practices tacitly allow the members of the nation to imagine their community as that, a nation, through a constant yet unconscious reminding of their nationhood, and are thus, banal (Billig, 1995). To determine if *voseo* was consciously associated with Honduran identity, the participants were asked the following question: ‘what would you say characterizes the way Hondurans speak?’ Given how open ended the question is, it was presumed that the answers that would emerge would most likely constitute the linguistic elements that actively signal a Honduran identity in the community’s consciousness. It was expected that *vos* would be identified as a characteristic of HS only after being explicitly mentioned later by the researcher.

As anticipated, *vos* did not emerge as a salient marker of Honduran identity. Participants mostly offered discourse markers, such as *pues sí*, *vaya pues* and *verdad* (and its reduced form, *vaá*); lexical items, such as *pisto* (money), *¡pucha!* (shoot!), *cipote* (little boy) and *chigüín* (little boy); and the overuse of expletives, as characteristics of HS. Out of the 30 interviewees, only three mentioned *vos* as a particular, linguistic element of HS; however, this type of *vos* is specific to Honduras, as it is evident in the following quotes from participants 05-M.C and 08-M.B, respectively.

- (6) [...] *el vos nuestro es, los mayores [diciendo], ‘Ey vos, chigüín; ey vos, cipote’* (.)
Ese es el vos nuestro.
- (7) *El uso del vos se utiliza aquí y, y se apocopa en vo, ‘Ey vo’.*

As (6) and (7) show, Honduran *vos* involves a particular intonation, is usually associated with other Honduran linguistic elements (such as those mentioned above), and frequently appears in its reduced form, *vo*.

The fact that *vos* is not automatically offered as a characteristic feature of HS, but is seen as the normal way in which all Hondurans address others in daily interactions, demonstrates that *vos* banally indexes Honduran national identity. No Honduran wakes up every morning and declares, ‘Today I am Honduran and I will use *vos*,’ and yet all Hondurans use it as a regular social practice, as part of their linguistic *habitus*. Very much like Billig’s (1995) still flag on a building reproduces

national belonging in the world of nations, so does *vos* reproduce the Honduran nation. *Vos* transcends gender, social class, age group, and creed, interconnecting all Hondurans in an imagined community, while reproducing Honduran nationhood.

Moreover, claiming an identity not only requires a categorization of the self (of the community), but also a categorization of the other (of the foreign community) (Tajfel, 1978). It has been discussed that *tú* is considered part of the legitimate, standard Spanish that every Spanish-speaker should speak, present in HS in the written/academic/religious norm. In the spoken norm, *tú* is perceived as part of a foreign, non-Honduran variety of Spanish. When asked ‘what comes to mind if you hear two Hondurans using *tú* with each other?’, the participants displayed a strong reaction to the image. In some cases, it caused laughter and in others discomfort. All participants unanimously agreed that they would not think that the speakers are Honduran; they would think they are foreigners. As participant 27-F.C explained,

- (8) *[Pensaría] Que no son de Honduras (risas). Sí, porque realmente el voseo, el vos, es lo que nosotros escuchamos (.) Es lo propio de Honduras. El tú ya es para, siento yo que no son propiamente hondureños (.) Son extranjeros o alguien que vino del extranjero e hizo su vida aquí en Honduras y mantuvo el tú.*

In this sense, it would be inconceivable for ‘true’ Hondurans living in Honduras to speak using *tú*, since it is a characteristic of foreigners. In this respect, what differentiates the Honduran nation from a foreign nation is the use of *vos* with its Honduran particularities. Therefore, to claim a true Honduran national identity, one must use *voseo*. Moreover, any use of *tú* by Hondurans is perceived as a performance of foreignness, as participant 18-M.B clearly states,

- (9) *No, lo siento raro (.) Yo siento de que es alguien o que es de afuera, de otro país o que es un copión hondureño (risas) que está imitando una novela tal vez de otro lado.*

This contrasts with the findings of Murillo Medrano’s (2002) research in which he examined the components of a Costa Rican identity as perceived by Costa Ricans themselves. He uncovered sentiments of superiority and exceptionality that characterize the Costa Rican imagined community with respect to the rest of Central America, as a result of its location within the *Capitanía General de Guatemala*, absence of miscegenation and the consequent preponderance of a white race, and the desire to be viewed internationally as Europeans (i.e. foreign to the Central American identity). According to Fernández (2003) and Murillo Medrano (2002), this (foreign) identity has enabled *tú* to be used increasingly in Costa Rican Spanish *contra* the use of *vos*. Recall here that the recent incursion of *tú* has been documented in other studies, such as Cabal (2012) and Thomas (2008).

Even though *tú* is prescriptively the address form that belongs to the standard, it has not been able to take over *vos* in the spoken norm. This suggests that the indexicality that ties *vos* to Honduran national identity is a stronger force acting against the institutional legitimizing power of the education system and any other influence inculcating the use of *tú*, such as the media or religion. As a result, *voseo* has become cemented in HS disallowing the infiltration of *tú*. Participant 08-M.B commented that *tú* “*todavía no cuaja, creo yo, al nivel general (.) Todavía no penetra a nivel como para cambiar el uso.*” This is evident in the fact that infants, when they start to speak – since all children’s television programs are foreign and schools teach the use of *tú* – they mainly use *tú* to address others. As they grow, they stop using *tú* and start acquiring *vos* due to societal influence. All participants who have young children (4/30) commented on this trend. In fact, all participants, regardless of age group or gender, noted an increase in the use of *vos*, especially observable in the youngest generations.

5.3 Innovative use of *vos*

In recent years, a change appears to be underway in the sociopragmatic uses of *usted* and *vos* in which the latter has started to take over some of the territory belonging to the former. Following Brown and Gillman (1972), *usted* has been used traditionally to address an interlocutor with more social power (e.g. an authority) or someone who is socially distant (e.g. a stranger). According to participants in all age groups, the younger generations are no longer constrained by this paradigm and use *vos* innovatively in contexts where *usted* should be used. Commenting on Honduran speech patterns, participant 19-F.A shared,

- (10) *Mi sobrina apenas tiene cuatro años y a mi mamá y a mi papá que son los abuelos de ella, “ey vos, haceme caso.” O sea, tiene esa como, eh, absorbe todo, para empezar porque yo a ella la trato de vos y ella me trata de vos. A mí porque yo digo, es una niña solo le llevo como veinte años pue, pero a mis papás yo lo miro algo raro y yo creo que no soy la única. Creo yo que hay, que en este medio se está expandiendo. Quiere decir que esas generaciones el usted casi no lo va a usar. Solo va a quedar el vos, creo yo.*

It is important to mention that traditionally in Honduran society adults address children using *usted*, perhaps to teach children the acceptable sociopragmatic uses of *vos* and *usted* or metaphorically to show respect to children, as explained by participants 04-F.B and 03-M.A in (11) and (12), respectively, when referring to their interactions with their child.

- (11) *Porque nosotros al inicio, “díglele usted, trátelo de usted.” Nosotros siguiendo la línea, lo tradicional.*
- (12) *Y de usted fue variando a ... vos. Y ahora quedó en vos.*

However, as participant 19-F.A notes, she, an adult, does not use *usted* with her niece, but uses *vos* instead, perhaps because she does not perceive herself being much older than her niece. Similarly, the four participants who have young children also mentioned addressing their children using *vos*, not because they do not perceive themselves as being much older, but to index trust and intimacy. Participant 04-F.B reflects,

- (13) *Entonces, tal vez que, achapaditos a la antigua, verdad, con ese, con ese concepto que ya queriendo romperlo con los hijos, verdad, de que, de que hay que ser más amigos, más ... y tal vez tenemos ese, tal, podríamos decir que ese es el punto en el, del vos, verdad, en el que te da más confianza, el, aplicándolo a nuestros hijos, verdad, o amigos.*

Children addressing adults using *vos* is not only observed in the family context, but also in the public context. On this, participant 27-F.C states,

- (14) *pero ha habido un momento y ya lo he observado que el voseo está extendido y definitivamente lo miro en los niños hacia uno, verdad, ya tratan, ya lo tratan de vos un niño a, a, yo me considero muy adulta, tal vez para los niños o usted y ya lo tratan de vos.*

This is not only found in children's speech, but also among young adults. Participant 15-F.A, member of the youngest age group, reflects that when addressing others with whom she has little contact or even strangers,

- (15) *yo hablo de vos bastante y a veces no me gusta que me hablen de usted porque digo, así como que no hay aquella confianza.*

Similar usage patterns have been reported for Argentinian Spanish since the early and mid-1900s. Fontanella de Weinberg (1970) and Weber (1941) noted the increase in use of *vos* among young strangers instead of using *usted* – a change that was still in progress back in the 1970s, according to Fontanella de Weinberg. As detailed in § 2.1, a few decades later *voseo* has become the standard address form in this variety to the extent that it now co-occurs in the same interaction with nominal forms traditionally considered formal (e.g. *señora*, *caballero* + *voseo*) (Rigatuso, 2000).

These new usage patterns in HS reflect a new sociopragmatic etiquette; a shift in the sociopragmatic functions of *usted*, from denoting respect or deference to denoting a symbolic relational barrier. On this, participant 24-M.C states, “*Yo siento ...*

como una barrera que uno pone para que no se vengan contra uno.” Therefore, the use of *usted* is perceived as overtly placing a barrier between the addresser and the addressee, disallowing any possibility for a close relationship to develop, hence indexing distrust. Possibly, this is what has motivated members of the middle and young age groups to no longer use *usted* with children, especially those related to them, but to use *vos* instead. This suggests that in contemporary Honduran society trusting relationships are highly valued, especially in contexts where they should be, such as among family members or friends. Since the use of *vos* indexes an open, trusting relationship, there is no ground for *usted* to be used. This is the innovative use that causes some negative sentiments among the older generations discussed in § 5.1.

5.4 Concluding remarks

This article presented a type of qualitative, sociolinguistic study that implemented a methodology that has not been typically utilized when exploring address form use in Spanish. The use of group, semi-directed interviews proved to be an effective method for collecting sound attitudinal data, which once analyzed, provided evidence supporting the general claim argued here: *voseo* is still preponderant in HS because it functions as a tacit marker of Honduran national identity. Based on Billig’s (1995) theory of banal nationalism, it was demonstrated that *voseo*, as part of the (linguistic) *habitus* of Honduran citizenry – much like watching a soccer game between two Honduran teams or a still Honduran flag on a building – reproduces the imagined community of the Honduran nation.

It is clear from the narratives shared by the informants that the overall attitudes exhibited toward *voseo* are neutral. No negative connotations are attached to *voseo*, as its use is independent of socioeconomic class, gender, and generation; therefore, there is no specific user of *vos*, but rather it is used by all Hondurans. *Voseo* is only perceived as incorrect or inappropriate by older members of society when it is used in contexts traditionally reserved to *usted* (e.g. when addressing elders).

Importantly, *voseo* is not perceived as a salient marker of Honduran identity, but as a banal linguistic practice in which every Honduran engages. Therefore, because using *vos*, the nonstandard form, is not consciously decided *vis-à-vis* the standard form, *tú*, it tacitly reminds the citizenry of their belonging to the Honduran nation within the world of nations, many of which use *tú*. *Tú* is, thus, perceived as a linguistic feature of foreign nations; ergo, its use by any Honduran is viewed as unnatural, strange, and even spurious, as if pretending to be a foreigner.

Even though *voseo* signals trust, familiarity and intimacy, it seems that younger generations now use *vos* instead of *usted* to address strangers, acquaintances, and

even elders in both familial and public contexts. The overall perception is that *vos* is the pronominal form used the most in Honduras and that its use is increasing, especially in the urban setting. Therefore, the increase in use of *vos* and the new sociopragmatic etiquette regarding *vos* and *usted* further suggest that *vos* carries no negative connotations and is part of the Honduran linguistic spoken norm and *habitus*, which in turn reinforces the indexical connection between *vos* and Honduran national identity as *vos* becomes even more cemented in the Honduran way of life.

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PART 2

Interacting grammars

Acquisition of articulatory control or language-specific coarticulatory patterns?

Evidence from the production of laterals in second-language Spanish

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The present study examines the acquisition of coarticulatory patterns in Spanish as a second language (L2). Through an acoustic analysis of the production of /l/ preceded by a front vowel and by a back vowel by a large cross-sectional sample of English-speaking learners of Spanish ($n = 85$) and a comparison of L2 Spanish patterns to those in L1 Spanish ($n = 20$ speakers) and in L1 English, evidence is provided that, similar to the acquisition of other phonetic detail, acquisition of coarticulation proceeds from more L1-like patterns in early stages of learning toward more targetlike coarticulatory patterns in later stages. Additionally, acquisition of coarticulation does not seem to be tied to overall segmental acquisition.

Keywords: L2 phonology/phonetics, second language acquisition, coarticulation

Introduction

Research on the second language (L2) acquisition of phonetics and phonology has increased greatly in recent years, with studies exploring questions of the acquisition of new categories, of new phonetic detail, and of phonological processes (e.g., see Díaz-Campos, 2014; Simonet, 2013b, for recent overviews of work on L2 Spanish phonetics and phonology). Less is known about coarticulation during L2 production and about the acquisition of L2 coarticulatory patterns. Given that coarticulatory patterns differ between languages (see next section), the present study explores questions of whether, when, and the extent to which L2 learners acquire the coarticulatory patterns of the target language. Specifically, by examining the production of Spanish /l/ in the context of both front and back vowels by a large cross-sectional sample of L2 Spanish learners and comparing these productions and coarticulatory patterns to /l/ in native Spanish as well as in the learners' first

language (L1), the present study seeks to explore the path of acquisition of coarticulation in Spanish as a L2.

1. Background

1.1 Coarticulation

Human spoken language most often involves the production of a stream of speech (as opposed to that of particular sound segments in isolation), which naturally results in the coarticulation of adjacent sounds. Coarticulation has been defined as the overlapping of adjacent gestures during speech (Ladefoged, 2006) or as the contextual effects resulting from the overlapping articulation of neighboring segments (Hardcastle & Hewlett, 2006). It is a phenomena that has been widely researched (e.g., see volumes by Hardcastle & Hewlett, 1999; and Recasens, 2014; and research therein) and described under several different models (e.g., see discussions of theories, models, or views of coarticulation by Farnetani & Recasens, 1999; Simonet, 2015). We now know that, although coarticulation is a universal characteristic of human speech production, it is not realized uniformly across all languages (Hardcastle, 1982). Thus, when acquiring a L2, learners must also acquire the patterns of coarticulation specific to the new language. The present study explores this acquisition by examining production of /l/ in L2 Spanish.

1.2 Coarticulation and the lateral

The lateral segment has been the focus of several studies on coarticulatory processes, especially with regard to the coarticulatory differences between “light” and “dark” lateral variants. A light /l/, such as that in the English word *lamps* [læmps] or the Spanish word *luz* [lus], is typically articulated with the tip of the tongue touching the alveolar ridge. The production of a dark /l/ (as in the English word *feel* [fi:l]), involves the primary articulation of the tongue tip at the alveolar ridge as well a secondary articulation of the dorsum of the tongue arching upward at the velum or upper pharynx. This secondary articulation results in what is referred to as velarization or darkness (Ladefoged, 2006; Whitley, 2002). In their 1976 investigation of the allophonic variation of /l/ in British English Received Pronunciation, Bladon and Al-Bamerni proposed the term *coarticulation resistance* to describe the differing patterns of and degrees of contextual influence on /l/ depending on the lateral variant produced. By examining first and second formant frequencies (F1 and F2, respectively) – which index the relative height and frontness-backness of the tongue during articulation – of /l/ productions in various contexts, Bladon and

Al-Bamerni discovered that the degree of influence of adjacent vowels and consonants on /l/ was greatest for light laterals and was lower for dark productions. In other words, [ɫ] was found to be more coarticulatory resistant (i.e., less influenced by surrounding context) than [l].

Subsequent studies have corroborated this finding, comparing /l/ production by context in a wide variety of languages (e.g., Recasens & Espinosa, 2005, for two dialects of Catalan; Recasens & Farnetani, 1990, for American English, Catalan, and Italian; Recasens, Fontdevila, & Pallarès, 1996, for Catalan and German; Simonet, 2015, for Catalan and Spanish; see also Recasens, 2012, for a comparison of /l/ production in 23 languages and dialects). These studies have offered further explanation regarding coarticulatory resistance, proposing that it is the greater constraint on the tongue body in the production of [ɫ] (i.e., during the secondary dorsal retraction) that leads to its greater resistance from coarticulatory influence as compared to [l].

Nevertheless, despite this general finding of greater coarticulatory resistance in dark /l/ and less in light /l/, the degree of resistance is not uniform across all languages. For instance, the light /l/ of German has been shown to be less resistant to coarticulation than the dark /l/ of Eastern Catalan but more resistant than the /l/s of many other languages that also possess light /l/, such as French or Spanish (Recasens et al., 1996; Recasens, Pallarès, Fontdevila, 1998). Thus, despite universal tendencies, when learning a L2, one must acquire the L2-specific coarticulatory patterns that govern production in the new language.

The present study examines the acquisition of L2 coarticulatory patterns in Spanish by investigating the production of /l/ by English-speaking learners of Spanish. American English is described as having both light and dark variants of /l/ (as evident in the examples given at the beginning of this section): The light variant, [l], occurs in syllable-onset or prevocalic positions; the dark variant, [ɫ], occurs in syllable-final positions (Bronstein, 1960; Olive, Greenwood, & Coleman, 1993).¹ Most varieties of Spanish, on the other hand, contain only light laterals (Hualde, 2005), and Spanish laterals overall are lighter or more fronted than English laterals (Recasens, 2012). There are several allophones of /l/ in native Spanish that differ on the basis of the consonant that follows the lateral, but all are considered to be light. Thus, given the differences in coarticulatory resistance between light and dark /l/s, a syllable-final /l/ in English would be expected to show very little variation in

1. It should be recognized that, although the light-dark lateral contrast is widespread and typical of American English, there is regional and social variation in /l/ realization. For instance, dark /l/s and, especially, coda lateral vocalization is often considered a distinctive feature of African American English (e.g., Thomas, 2007) and of the speech of European American Southerners (e.g., Hazen & Dodsworth, 2012).

production depending on the surrounding context (given that it would be dark and, thus, more coarticulatory resistant), whereas a syllable-final /l/ in Spanish would be expected to vary more (i.e., be less resistant to coarticulation). For targetlike production of this phone in connected speech, then, English-speaking learners of Spanish must acquire not just the phonetic properties of Spanish laterals (i.e., overall more fronted productions; Recasens, 2012), but also the Spanish-specific patterns of coarticulation of syllable-final /l/. The present study examines whether or not learners do, in fact, acquire L2 coarticulation patterns and, if so, how such acquisition proceeds.

1.3 Coarticulation in second languages

Few studies exist that explore coarticulation in L2s. Those that do, however, seem to fall within one of two camps. The first camp are those that suggest that learners acquire coarticulation patterns in the same manner in which they acquire other language-specific phonetic details. For example, in a series of studies, Baumotte and colleagues (Baumotte & Dogil, 2008; Baumotte, Lenz, & Dogil, 2007) examined the production of intervocalic /l/ in English by L1 German speakers; German, like Spanish, contains only light /l/s and, as mentioned in the previous subsection, has been shown to be more susceptible to coarticulation than languages with dark /l/s (i.e., Eastern Catalan) but more resistant to coarticulation than other languages with light /l/s (i.e., French and Spanish; Recasens et al., 1996; Recasens et al., 1998). Results indicated that less proficient learners exhibited less coarticulatory resistance – that is, their production was more Germanlike – than more proficient learners, who exhibited more targetlike English high levels of coarticulatory resistance. Oh (2008) found similar results in her investigation of French and English native speakers and learners. Language-specific coarticulatory differences were found for /u/ production in native English and French with French /u/ showing less coarticulation (i.e., more resistance) in coronal contexts than English /u/, which the author hypothesized was due to the presence of the /u/-/y/ contrast in French and its absence in English. English learners of French exhibited less coarticulation in coronal contexts when producing French /u/ than when producing English /u/, and French learners of English exhibited higher degrees of coarticulation when producing English /u/ than when producing French /u/, suggesting acquisition by these speakers of the language-specific coarticulatory patterns of their respective L2s. Similar to Baumotte and colleagues' findings, Oh's more experienced learners exhibited more targetlike degrees of coarticulation than did less experienced learners. But, importantly, some learners achieved targetlike production of the vowels and/or consonants under investigation without demonstrating targetlike coarticulatory

patterns, suggesting that acquisition of coarticulation is not necessarily tied to or a natural consequence of segmental acquisition.

However, evidence suggesting a different path of acquisition has also been suggested. Simonet (2013a) examined the production of /l/ by 20 Catalan-Spanish bilinguals (10 Catalan-dominant, 10 Spanish-dominant). Simonet found that speakers showed greater articulatory control (i.e., coarticulatory resistance) in their respective L1s and more coarticulatory variation in their L2s, regardless of their dominant language. That is, the Catalan-dominant speakers' Spanish /l/s were more affected by contextual vowels than were their Catalan /l/s, whereas the Spanish-dominant speakers' Catalan /l/s showed more coarticulatory variation than their Spanish /l/s did. Thus, Simonet argued that, as opposed to acquiring language-specific coarticulatory patterns, L2 learners must instead acquire articulatory control (i.e., coarticulatory resistance) in their L2 to be able to navigate and produce coarticulatory patterns in a targetlike way.

The present study explores these two possible paths of acquisition of L2 coarticulatory patterns by investigating the production of /l/ by English-speaking learners of Spanish and comparing L2 Spanish coarticulation to patterns in L1 Spanish and in L1 English.

2. Research questions and hypotheses

To investigate the overarching question of how coarticulatory patterns are acquired in a L2 using the production of Spanish /l/ by English-speaking learners as the test case, this study explores the following two research questions:

1. How is /l/ produced (in terms of frontness-backness) in the context of a front vowel as compared to a back vowel in L1 Spanish, L1 English, and L2 Spanish of English speakers?
2. How do coarticulation patterns in L2 Spanish change as learner level increases?

Given previous accounts of the coarticulatory resistance of /l/ in English and Spanish, for our baseline native English and Spanish, greater coarticulatory resistance is expected in L1 English than in L1 Spanish; that is, less difference is expected between /l/ produced in different contexts in L1 English than in L1 Spanish. For L2 Spanish, if learners acquire coarticulation in the same manner as they acquire other language-specific phonetic properties (i.e., as suggested by Baumotte and colleagues as well as Oh, 2008), then a pattern of more resistance/control (i.e., less variation by context) at early levels following L1 English patterns would be expected, with less resistance (i.e., more variation or difference by context at higher levels) to be observed as learners progress toward targetlike Spanish patterns. If, in contrast, it

is articulatory control that must be acquired (i.e., as proposed by Simonet, 2013a), then less resistance/control (i.e., more variation) would be expected from early levels with more resistance exhibited at higher levels as learners gain general control over their L2 articulation.

3. Method

3.1 Participants

The participants in the current study comprised two groups: native English-speaking learners of Spanish ($n = 85$) and native Spanish speakers ($n = 20$). The Spanish learners were enrolled in Spanish courses at a large Midwestern university at five distinct institutional levels (see Table 1). The native Spanish speakers were from a variety of countries of origin (Mexico, $n = 3$; Peru, $n = 2$, Puerto Rico, $n = 4$; Spain $n = 5$; Costa Rica, $n = 1$; Colombia, $n = 2$; Argentina, $n = 2$; Bolivia, $n = 1$), were graduate students or instructors of Spanish within the same institutional context as the learners, and were bilingual in English. Table 1 summarizes the background characteristics of the learners at each institutional level and of the native Spanish speakers.

Table 1. Background information on participants

Level	Sex (F = female, M = male)	<i>M</i> age (years)	<i>M</i> time abroad (months)	<i>M</i> years of Spanish study	<i>M</i> grammar score (out of 12)*
First year ($n = 18$)	11 F, 7 M	20.72 (range 18–34)	0.67 (range 0–11)	3.17 (range 1–6)	2.94 (<i>SD</i> = 1.03)
Second year ($n = 15$)	11 F, 4 M	19.13 (range 18–21)	0.07 (range 0–1)	6.80 (range 4–13)	5.13 (<i>SD</i> = 1.96)
Third year ($n = 15$)	8 F, 7 M	19.87 (range 18–22)	0.13 (range 0–2)	8.87 (range 6–16)	6.80 (<i>SD</i> = 2.80)
Fourth year ($n = 16$)	13 F, 3 M	20.38 (range 20–22)	1.67 (range 0–14)	9.19 (range 7–14)	7.50 (<i>SD</i> = 2.40)
Graduate ($n = 21$)	10 F, 11 M	28.76 (range 23–34)	13.67 (range 0–29)	11.05 ^a (range 4–18)	11.19 (<i>SD</i> = 1.10)
Native ($n = 20$)	10 F, 10 M	32.35 (range 23–49)	6.5 years in English-speaking country (range 4 months – 21 years)	NA	11.65 (<i>SD</i> = 0.73)

* Score measured using 12-item multiple-choice grammar test adapted from the 25-item test used in Geeslin and Gudmestad (2008), among other studies.

3.2 Data elicitation

The data were elicited via a semi-self-automated activity delivered through PowerPoint. For the Spanish data, the activity elicited speech from three different styles or levels of formality through three component tasks: a picture description task, a sentence reading task, and a word-list reading task.² The picture description task (modeled after similar activities in Ronquest, 2012; Schmidt & Willis, 2011) guided participants through a series of activities involving a friend who was hosting a party and needed their assistance. First, participants were trained on the target words and their corresponding pictures. After the training, learners completed a series of chores for their friend that included telling her which of her guests is bringing what to the party or describing the items guests are bringing (e.g., in terms of color, style, or size) based on pictures provided. These activities were designed to elicit the target words in a variety of positions in nonread speech. After completing the picture description portion of the task, participants also completed sentence-reading and word list-reading activities involving the same target words.

As part of a larger study on the acquisition of the lateral segment in L2 Spanish, a total of 118 Spanish /l/ tokens were elicited in words selected to systematically manipulate and control for factors such as stress, preceding vowel, following segment, and cognate status. However, given the focus of the present study (coarticulation) and the desire to control the surrounding context, the present study examines only word-final, utterance-final coda tokens, and explores the difference in F2 between /l/s preceded by a front vowel (i.e., /e/) or /l/s preceded by a back vowel (i.e., /a/ or /o/). Thus, 42 potential tokens per speaker were analyzed, 15 preceded by a front vowel and 27 preceded by a back vowel (see Appendix A for list of target words).

English /l/ tokens were also elicited in similar contexts (through a word-list reading task).³ For the current study, eight tokens per participant were analyzed: four tokens preceded by front vowel /ɪ/ and four tokens preceded by back vowel /ʌ/.⁴

2. The picture description task was included to encourage production of /l/ within particular linguistic contexts but in more naturalistic and semi-spontaneous (nonread) speech. Early pilots revealed that the task was difficult for lower level learners. To ensure that sufficient numbers of viable tokens could be elicited from learners at all levels, sentence reading and word-list reading tasks were added.

3. Again, the data collected were part of larger project that focused on the acquisition of the lateral segment in L2 Spanish. English data were collected as a baseline for comparative purposes but were not collected for all of the same contexts or in the same tasks as the Spanish data. This is a limitation of the present study.

4. The present analysis focuses on the influence of English /ɪ/ and /ʌ/ in an attempt to avoid diphthongization, which is more common with /i/ and /u/.

3.3 Acoustic analyses

The second formant (F2) is generally accepted as the main acoustic correlate of or proxy for lateral darkness, with a dark /l/ exhibiting lower F2 values (indicating a backer production) and a lighter (or more fronted) /l/ exhibiting higher F2 values (Recasens & Espinosa, 2005; Simonet, 2010). Lateral segment boundaries were identified following cues employed in previous research (e.g., Simonet, 2010; Sproat & Fujimura, 1993), including a shift in F2 frequency and a decrease in the intensity of F2. Second formant measurements were taken from the midpoint of the lateral segments using an automatic linear predictive coding (LPC) extraction algorithm via a script in Praat. The settings included a window length of 0.025 s (the Praat standard) for all tokens and five formants estimated under 5500 Hz for females and under 5000 Hz for males. To account for physiological differences that could affect sound production and resonance structure, all F2 values were normalized using participants’ own vowel extremes to calculate a vowel centroid ratio (VCR) that was derived from Watt and Fabricius’s (2002) vowel S-centroid normalization procedure. The VCR utilizes measurements of the speaker’s front vowel and back vowel extremes to determine a centroid value along only the F2 dimension

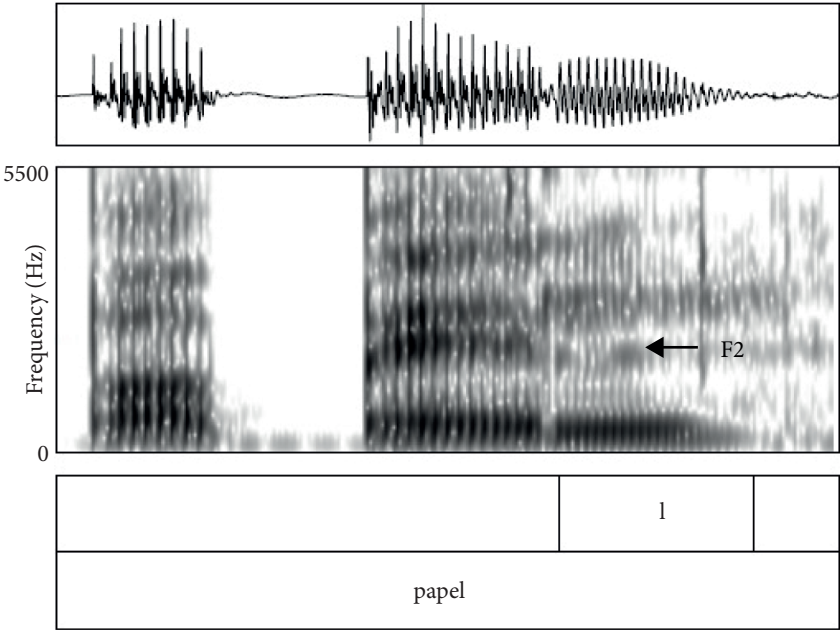


Figure 1. Production of Spanish word *papel* “paper” by native Spanish speaker participant (P2). Coda /-l/ preceded by /e/ has F2 of 1695 Hz; normalized F2 of .21 normalized Hz

and incorporates a half-spread measure (i.e., a measure of the distance between the front and back extremes) to account for differences in vocal tract spaces that could be lost by using the centroid measure alone (a more detailed description of the normalization process is available in Solon, 2016). The normalized F2 values are reported along a continuum from +1 to -1 with the speakers' centroid always at 0. A value closer to +1 indicates a higher F2 and, thus, a more fronted tongue position; a value closer to -1 indicates a lower F2 and, thus, a darker production or a realization produced in a more backed position. The spectrograms in Figures 1 and 2 illustrate potential differences in F2 values by speaker/linguistic experience and vowel context.

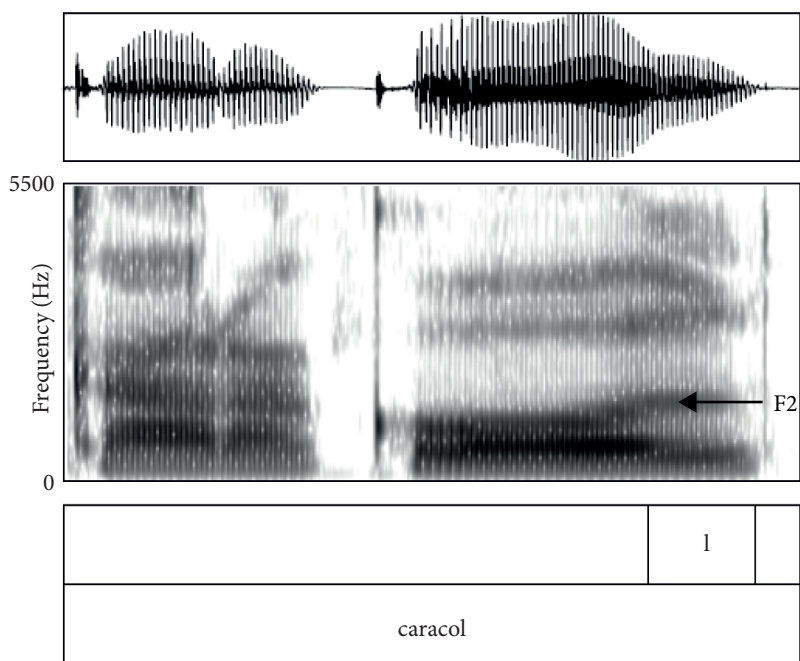


Figure 2. Production of Spanish word *caracol* “snail” by second-year learner of Spanish (P52). Coda /-l/ preceded by /o/ has F2 of 1409 Hz; normalized F2 of -.29 normalized Hz

3.4 Statistical analyses

The statistical analysis of coarticulation in the present study examines the production of /l/ according to the dependent variable normalized F2 and the influence of the independent factor preceding vowel. Other independent variables – such as level, task, and cognate status of the word – were also considered when appropriate

and will be commented on in the Results section. These analyses were carried out in SAS (SAS Institute Inc., 2013, Version 9.4) using two linear mixed models with individual included as a random factor. One model included all Spanish data (i.e., learner and native speaker) and the other included the learners' L2 Spanish and L1 English data. These two models permit the testing of (a) the significance of the differences in Spanish coarticulatory patterns (as demonstrated by the differences in the relationship between F2 and a preceding front versus back vowel) between each participant group (i.e., each learner level as well as the native Spanish speakers), and (b) the significance of differences observed between the learner participants' L2 Spanish coarticulatory patterns and their native English patterns, respectively.

4. Results

There was a theoretical ceiling of 4,410 Spanish tokens (42 Spanish tokens \times 105 participants) and 680 English tokens (8 English tokens \times 85 participants). Nevertheless, there were several production phenomena, such as creak, fricativization, and potential vocalization, that resulted in the exclusion of tokens from the formant analysis.⁵ Table 2 presents the number of Spanish and English tokens included in the analysis by language and group/level.

Table 2. Number of Spanish and English tokens by group/level

Level/group	<i>n</i> Spanish	<i>n</i> English
First-year learners (<i>n</i> = 18)	279	28
Second-year learners (<i>n</i> = 15)	281	28
Third-year learners (<i>n</i> = 15)	232	29
Fourth-year learners (<i>n</i> = 16)	306	25
Graduate student learners (<i>n</i> = 21)	544	43
Native Spanish speakers (<i>n</i> = 20)	574	NA
Total	2,216	153

5. As shown in Table 2, a large portion of the tokens had to be excluded from the present analysis because of the production phenomena mentioned. It is important to note that these tokens still provide important information regarding the acquisition of this segment (e.g., Solon, in press), but cannot reliably be included in an analysis of formant structure. The Spanish corpus is reduced in number but is still quite large. Unfortunately, these exclusions resulted in a small corpus of L1 English. Nevertheless, the English data are included here as a referential baseline to corroborate the claims of coarticulatory resistance in the literature. For this function, the small corpus is sufficient.

First, to explore overall patterns of coarticulation by language and group, average normalized F2 values for /l/s preceded by a front vowel and /l/s preceded by a back vowel were calculated for L1 Spanish, L1 English, and the L2 Spanish of the native English-speaking learners. Figure 3 presents the average values by group/language and context.

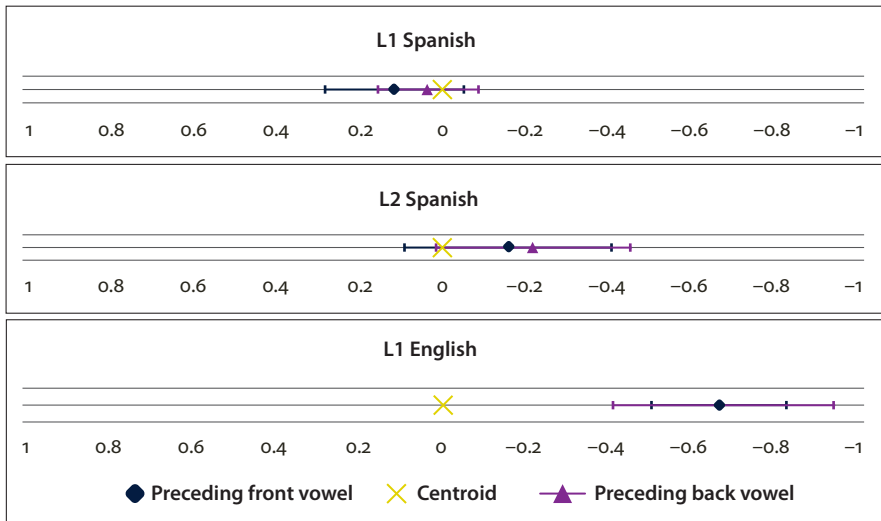


Figure 3. Average normalized F2 values for /l/s preceded by front and back vowels in L1 Spanish, L1 English, and L2 Spanish

As can be seen in Figure 3, the overall averages of normalized F2 of /l/ produced in front vowel and back vowel contexts in L1 Spanish and L1 English corroborate the general differences in coarticulatory resistance attested in previous literature: In addition to Spanish /l/s being lighter (i.e., more fronted) overall than English /l/s, word-final /l/ in native Spanish shows less coarticulatory resistance or more variation based on vowel context, as expected, as is shown in the difference between the more fronted production of /l/ in the context of a front vowel (the diamond marker) than a back vowel (the triangle marker). The word-final dark /l/ in English is more resistant to coarticulation (as expected), evident in the fact that English /l/s produced in both front- and back-vowel contexts are nearly identical in terms of frontness-backness. The L2 Spanish laterals produced by English-speaking learners fall somewhere in the middle of the L1 English and L1 Spanish norms, both in terms of overall darkness and in terms of coarticulation/coarticulatory resistance.

To further explore the L2 productions and the acquisition of coarticulatory patterns, the normalized F2 values for /l/s in each vowel context were further divided by learner level. Figure 4 presents average normalized F2 values by vowel context

and learner level with the L1 Spanish averages of the Spanish native speakers at the top of the figure and the L1 English averages of all learner groups combined at the bottom.

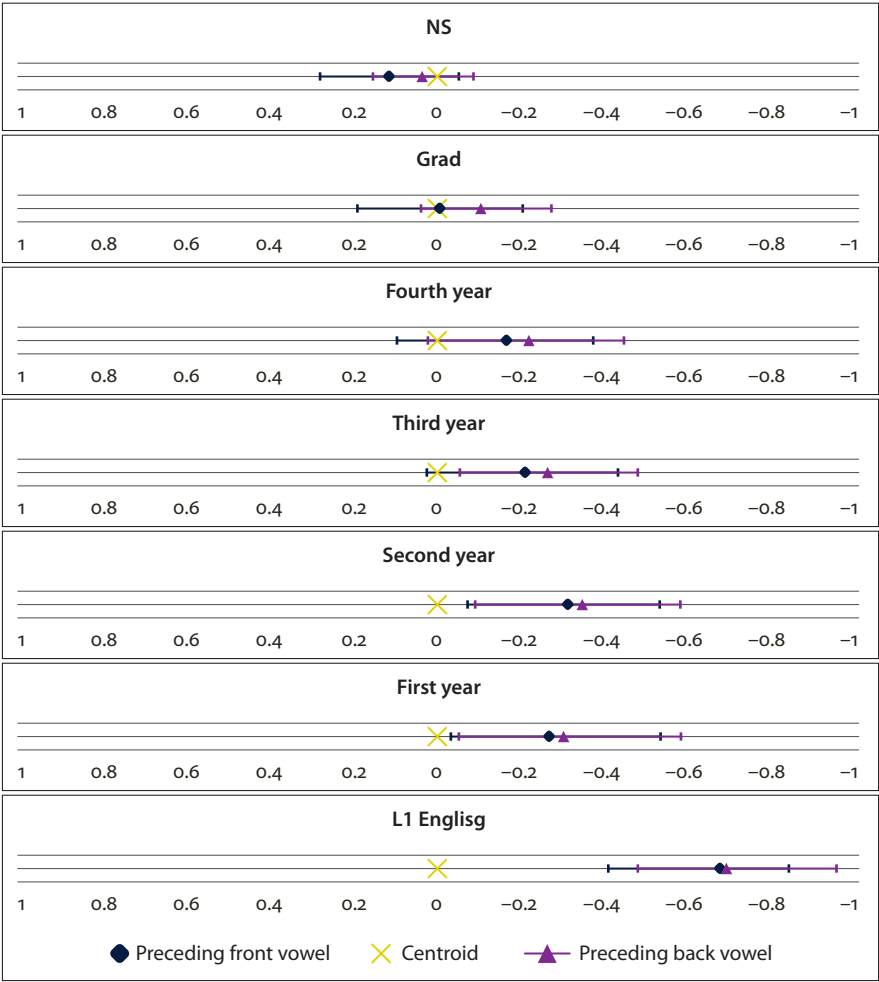


Figure 4. Average normalized F2 values for /l/s preceded by front and back vowels by level/group; NS = native Spanish speaker group

As can be seen in Figure 4, the difference in the normalized F2 values of /l/ in the context of a preceding front vowel as compared to a preceding back vowel grows as learner level increases. At the first-year level, the difference in the frontness-backness of L2 Spanish /l/ in the two contexts is very small and looks quite similar to (but slightly larger than) the small difference in L1 English /l/s. That difference grows at

the second- and third-year levels and is greatest at the most advanced (i.e., graduate student) level, even exceeding (visually and numerically) that of the native Spanish speakers.

Statistically, these differences were examined via the two linear mixed models described in the previous section. First, looking only at the Spanish productions by both learners and native speakers, a linear mixed model was run that tested the differences in the dependent variable (normalized F2) by vowel context (preceding front vowel and preceding back vowel) by level/group (first-year, second-year, third-year, fourth-year, graduate student, native speaker).⁶ The interaction between vowel context and level was significant in the overall model, $F(5, 2099) = 0.43$, $p = .028$, indicating that the difference in frontness/backness of /l/ by vowel context differed by level/group. To explore exactly where these differences lie, the differences of least squares means (the SAS equivalent of estimated marginal means) were explored and are summarized in Table 3. The β value indicates the difference in normalized F2 values between laterals preceded by a back vowel as compared to those preceded by a front vowel; a negative value indicates that /l/s in back vowel contexts were darker.

Table 3. Summary of the differences of least squares means comparing normalized F2 values for Spanish laterals preceded by front vowels and by back vowels by level/group

Level/group	β	SE	p
First-year learners	-.05	.02	.002
Second-year learners	-.06	.02	< .001
Third-year learners	-.10	.02	< .001
Fourth-year learners	-.07	.02	< .001
Graduate-level learners	-.12	.01	< .001
Native Spanish speakers	-.08	.01	< .001

As Table 3 shows, the difference between Spanish /l/s produced in the context of a back vowel and those produced in the context of a front vowel is significant at all learner levels as well as for native Spanish speakers. Nevertheless, the degree of this difference (as represented by the β values) differs by level. The difference is smallest at the first-year level and largest at the graduate level, with these most

6. This model also tested the effects of the independent factors task and cognate status, as well as the interactions between both of these factors and the factor preceding vowel. Task was significant in the overall model, $F(2, 2099) = 5.84$, $p = .003$, with overall darker productions being produced in the word-list reading task than in the other two tasks. However, there were no main effects of cognate status, $F(1, 2099) = 1.48$, $p = .224$, nor were the Task \times Preceding Vowel or Cognate Status \times Preceding Vowel interactions significant. Thus, neither task nor the cognate status of the word were found to influence coarticulatory patterns. These factors will not be discussed again.

advanced learners showing even less resistance (i.e., greater difference by context) than the native speakers.

To explore whether the English-speaking learners’ of Spanish coarticulatory patterns were different in their L2 Spanish than in their L1 English, a second linear mixed model was run that included all /l/s produced by these speakers in both languages and tested the effect of learner level (first year, second year, third year, fourth year, and graduate), language (Spanish vs. English), and vowel context (preceding front vowel, preceding back vowel) on the dependent variable (normalized F2). The interaction between these three independent variables was significant, $F(8, 1695) = 4.85, p < .001$, indicating that the difference in frontness/backness of /l/ by vowel context and language differed by level/group. An examination of the differences of least squares means aids in locating this difference. Table 4 summarizes the differences of least squares means, comparing /l/s preceded by a back vowel to /l/s preceded by a front vowel by level and language. Each row compares normalized F2 values for /l/s preceded by a back vowel to /l/s preceded by a front vowel by level; results for the learners’ L1 English and L2 Spanish are presented separately. A negative β value indicates that the mean normalized F2 value for laterals preceded by a back vowel was lower than that of laterals preceded by a front vowel and the β value itself indicates the difference.

Table 4. Summary of the differences of least squares means comparing normalized F2 values for /l/s preceded by a back as compared to by a front vowel by learners of Spanish at five levels

Level	Language	β	SE	p
First year	Spanish	-.05	.02	.008
	English	-.03	.08	.748
Second year	Spanish	-.06	.02	.001
	English	.04	.06	.471
Third year	Spanish	-.10	.02	< .001
	English	-.01	.06	.928
Fourth year	Spanish	-.07	.02	< .001
	English	-.04	.06	.540
Grad	Spanish	-.12	.01	< .001
	English	-.09	.05	.054

As can be seen in Table 4, at each learner level, the difference between /l/s produced in the context of a back vowel and those produced in the context of a front vowel is significant in Spanish but not in English. Additionally, as already seen in Table 2, the degree of difference between Spanish /l/s produced in the two contexts in general grows as level increases, with the largest difference occurring at the graduate

level and the smallest difference observed at the first-year level. It is also interesting to note that the graduate student learners produce the largest difference between /l/s produced in the two contexts in English, with /l/s preceded by back vowels having F2 values that are .09 normalized Hz lower or darker than /l/s preceded by front vowels; this difference in English /l/ production at the graduate student level approaches significance ($p = .054$). Although not a focus of the present study, it is possible that this pattern reflects an influence of the L2 on L1 patterns in this most advanced learner group.

5. Discussion

The present study investigated the acquisition of L2 coarticulatory patterns by examining the realization of the Spanish lateral segment in the context of a front versus a back vowel as produced by English-speaking learners of Spanish at various institutional levels and comparing these realizations to those of L1 English and L1 Spanish /l/s. According to previous studies and accounts of coarticulatory resistance (e.g., Bladon & Al-Bamerni, 1976; Recasens & Espinosa, 2005; Recasens & Farnetani, 1990; Recasens, Fontdevila, & Pallarès, 1996; Simonet, 2015), given the darkness of English coda /l/, which results in greater constraint on the tongue body, English /l/s were expected to show greater resistance to coarticulatory effects of neighboring vowels. Spanish coda /l/s, on the other hand, are light and, thus, were expected to be less resistant to coarticulation. An examination of L1 Spanish /l/s of 20 native Spanish speakers and L1 English /l/s produced by the present study's learners corroborated these findings (Figure 3). L1 English /l/s showed very little difference in relative frontness-backness when produced following a front versus a back vowel, whereas L1 Spanish vowels exhibited noticeable differences in the two contexts. Learners' L2 Spanish productions (all levels averaged together) fell in between the two L1 extremes.

To observe more closely the acquisition of L2 coarticulatory patterns, then, the learners' normalized F2 averages were examined by level (Figure 4). Overall, learners were observed to exhibit L1-like patterns during early stages of acquisition and gradually move toward L2-like patterns, with the most advanced learners demonstrating greater-than-targetlike coarticulatory variation according to vowel. Specifically, learners at the first-year level showed the least difference in Spanish /l/ frontness-backness according to preceding vowel; this difference gradually increased at the second- and third-year levels (with a slight drop at the fourth-year level). Graduate student learners exhibited more difference in Spanish /l/ frontness-backness by vowel context (a .12 normalized Hz difference) than did the native Spanish speakers (a .08 normalized Hz difference). Thus, overall, learners

appear to acquire coarticulatory patterns in a manner similar to the acquisition of other phonetic detail (Oh, 2008), exhibiting more L1-like patterns at early stages and eventually moving toward targetlike patterns (as opposed to needing to acquire coarticulatory control in the L2).

It is interesting to note that, although the first-year learners exhibited coarticulatory patterns that are visually like the overall L1 English patterns, even at this first-year level, the difference between a Spanish /l/ produced following a front vowel and that produced following a back vowel was significant, whereas the difference by vowel context in L1 English was not. Thus, even at this first-year level, learners show differences between the coarticulatory patterns that govern their L1 production and those that govern their L2, suggesting that acquisition of coarticulatory patterns begins early.

The most advanced learners – those at the graduate level – produced even more variation based on vowel context than did the native Spanish speakers. Such overshooting of the targetlike norm is something that has been observed for other aspects of L2 acquisition (e.g., in the application of variable rules in L2 morpho-syntactic variation: Geeslin & Gudmestad, 2011; Kanwit & Solon, 2013), and may represent these learners' attempt to (subconsciously) show greater differentiation between their L1 and L2 patterns. Nevertheless, as mentioned in the Results section, learners at this level also show the greatest amount of coarticulatory variation in their L1 English productions – suggesting that, perhaps, the L2 has, in fact, influenced L1 production as well.

Overall, the present results provide support for an account of the acquisition of coarticulatory patterns proceeding in a manner similar to the acquisition of other types of phonetic detail (e.g., Baumotte & Dogil, 2008; Baumotte, Lenz, & Dogil, 2007; Oh, 2008). Nevertheless, the question remains: For Spanish /l/, are L2 coarticulatory patterns simply acquired alongside the overall acquisition of the segment? For instance, as native English speakers acquire the overall more fronted position of the Spanish /l/, do they automatically acquire the greater variation permitted according to context? Such an explanation may make sense, given that a lighter /l/ production implies less tongue body constraint, naturally permitting more contextual variation. Additionally, as is evidenced in Figure 4, as learner level increases, L2 Spanish /l/ production gets lighter (i.e., more fronted) overall. Although an in-depth examination of individual production patterns is outside the purview of the present study, a cursory comparison of overall Spanish /l/ production (i.e., in terms of frontness-backness, as measured by F2) as compared to Spanish coarticulatory patterns (i.e., the difference between /l/ frontness-backness according to vowel context) by individual learner (see full table of normalized F2 means by participant in Appendix B) suggests that Spanishlike coarticulatory variation is not automatically acquired as a result of acquiring a more fronted overall Spanish /l/ realization, given

that some learners with very light or fronted /l/ (i.e., more Spanishlike) productions overall exhibited very low levels of coarticulatory variation (i.e., more Englishlike), whereas other learners with darker /l/ productions overall (i.e., more Englishlike) exhibited greater coarticulatory variation. For example, second-year Participant 99 produced /l/s with a mean overall F2 value of $-.06$ normalized Hz, which is lighter (i.e., more targetlike) than the overall average produced by learners at the graduate level (graduate level average = $-.07$ normalized Hz), but showed very little coarticulatory variation (a difference of $.01$ normalized Hz between /l/s produced in front vowel versus back vowel contexts), instead exhibiting L1 Englishlike contextual resistance. In contrast, third-year Participant 79 showed more targetlike coarticulatory patterns (i.e., difference in average F2 in context of front vowel vs. back vowel = $.11$ normalized Hz; overshooting NS average difference of $.08$ normalized Hz), despite producing very dark /l/s overall (mean normalized F2 = $-.41$). These individual results further corroborate Oh's (2008) account of coarticulatory acquisition in that, despite proceeding in a similar manner to that of the acquisition of other phonetic detail, acquisition of coarticulation does not appear to be necessarily tied to overall segmental acquisition.

6. Conclusion

The present study investigated the acquisition of L2 coarticulatory patterns by examining the production of Spanish /l/ by native English-speaking learners of Spanish at various levels of Spanish study. The results suggest that, similar to previous accounts for other languages (e.g., Baumotte & Dogil, 2008; Baumotte, Lenz, & Dogil, 2007; Oh, 2008), L2 coarticulation is acquired in the same fashion as the acquisition of other phonetic detail. Specifically, in the present study, L2 Spanish lateral coarticulatory patterns – measured via an examination of /l/ in the context of a front and a back vowel – resemble L1 English patterns of greater coarticulatory resistance (i.e., less variation based on vowel context) during early stages of acquisition but gradually show movement toward L2-like patterns of less resistance (i.e., more context-based variation). Additionally, a preliminary look at individual results suggests that more targetlike production of the lateral segmental does not automatically result in more targetlike coarticulation, providing further evidence that acquisition of coarticulatory patterns is not a natural consequence of segmental acquisition. Future investigations could more closely examine individual results to search for more clues as to when and how such modifications to the L2 system are made and how they relate to overall segmental acquisition.

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Appendix A

List of target words (each produced three times – once in each task)

<i>pastel</i>	<i>cárcel</i>
<i>sol</i>	<i>beisbol</i>
<i>parasol</i>	<i>hospital</i>
<i>papel</i>	<i>trébol</i>
<i>señal</i>	<i>puñal</i>
<i>animal</i>	<i>hotel</i>
<i>caracol</i>	<i>ángel</i>

Appendix B

Table of overall normalized F2 means, normalized F2 means by vowel context, and the difference in mean normalized F2 in front vowel and back vowel contexts for each individual participant.

Level	Participant	Overall M normalized F2 (SD)	M normalized F2 of /l/ with preceding front vowel (SD)	M normalized F2 of /k/ with preceding back vowel (SD)	Difference in M normalized F2 of /l/ in front vs. back vowel contexts
First year	66	-.38 (.13)	-.32 (.10), n = 6	-.45 (.12), n = 5	.13
	67	-.24 (.10)	-.30 (.12), n = 5	-.22 (.08), n = 11	-.08
	68	-.49 (.11)	-.46 (.11), n = 7	-.50 (.11), n = 9	.04
	70	-.44 (.25)	-.45 (.04), n = 11	-.43 (.32), n = 17	-.02
	71	-.13 (.12)	-.09 (.09), n = 12	-.17 (.13), n = 15	.08
	75	-.57 (.09)	-.52 (.01), n = 2	-.67 (NA), n = 1	.15
	77	-.34 (.21)	-.41 (.10), n = 8	-.26 (.27), n = 7	-.15

Level	Participant	Overall <i>M</i> normalized F2 (<i>SD</i>)	<i>M</i> normalized F2 of /l/ with preceding front vowel (<i>SD</i>)	<i>M</i> normalized F2 of /k/ with preceding back vowel (<i>SD</i>)	Difference in <i>M</i> normalized F2 of /l/ in front vs. back vowel contexts
	78	-.29 (.29)	-.32 (.05), <i>n</i> = 6	-.27 (.37), <i>n</i> = 11	-.04
	110	-.17 (.14)	-.08 (.10), <i>n</i> = 9	-.23 (.12), <i>n</i> = 14	.15
	111	-.75 (.12)	-.71 (.10), <i>n</i> = 6	-.88 (.06), <i>n</i> = 2	.17
	112	-.43 (.11)	-.37 (.09), <i>n</i> = 6	-.47 (.11), <i>n</i> = 9	.10
	113	-.41 (.08)	-.37 (.10), <i>n</i> = 3	-.45 (.04), <i>n</i> = 3	.08
	114	-.50 (.13)	-.48 (.14), <i>n</i> = 4	-.51 (.14), <i>n</i> = 5	.04
	117	-.06 (.16)	.03 (.06), <i>n</i> = 8	-.13 (.19), <i>n</i> = 9	.16
	118	-.21 (.14)	-.11 (.10), <i>n</i> = 5	-.26 (.12), <i>n</i> = 11	.15
	120	-.09 (.09)	-.01 (.04), <i>n</i> = 7	-.12 (.08), <i>n</i> = 17	.11
	121	-.46 (.28)	-.56 (.01), <i>n</i> = 2	-.44 (.30), <i>n</i> = 10	-.11
	122	.04 (.10)	.11 (.10), <i>n</i> = 7	-.01 (.06), <i>n</i> = 9	.11
Second year	52	-.41 (.12)	-.42 (.12), <i>n</i> = 12	-.40 (.12), <i>n</i> = 13	-.02
	54	-.49 (.07)	-.46 (.07), <i>n</i> = 7	-.52 (.07), <i>n</i> = 9	.07
	55	-.44 (.13)	-.44 (.12), <i>n</i> = 6	-.44 (.14), <i>n</i> = 8	.00
	60	-.40 (.17)	-.37 (.19), <i>n</i> = 8	-.41 (.17), <i>n</i> = 13	.04
	65	-.29 (.15)	-.17 (.06), <i>n</i> = 9	-.35 (.14), <i>n</i> = 19	.18
	72	-.43 (.26)	-.40 (.12), <i>n</i> = 6	-.45 (.32), <i>n</i> = 11	.05
	76	-.53 (.26)	-.45 (.31), <i>n</i> = 12	-.59 (.21), <i>n</i> = 17	.14
	95	-.44 (.08)	-.42 (.06), <i>n</i> = 7	-.45 (.10), <i>n</i> = 9	.03
	97	-.29 (.07)	-.25 (.05), <i>n</i> = 5	-.32 (.07), <i>n</i> = 6	.07
	98	-.25 (.22)	-.26 (.27), <i>n</i> = 10	-.25 (.19), <i>n</i> = 16	-.01
	99	-.06 (.17)	-.07 (.04), <i>n</i> = 4	-.06 (.20), <i>n</i> = 2	-.01
	101	-.03 (.12)	.01 (.06), <i>n</i> = 9	-.06 (.20), <i>n</i> = 12	.07
	107	-.40 (.08)	-.35 (.08), <i>n</i> = 2	-.44 (.06), <i>n</i> = 2	.09
Third year	108	-.44 (.14)	-.38 (.03), <i>n</i> = 5	-.50 (.18), <i>n</i> = 5	.12
	109	-.20 (.11)	-.14 (.08), <i>n</i> = 7	-.24 (.11), <i>n</i> = 15	.10
	37	-.43 (.08)	-.39 (.07), <i>n</i> = 5	-.49 (.06), <i>n</i> = 3	.09
	39	-.05 (.12)	.04 (.07), <i>n</i> = 4	-.08 (.12), <i>n</i> = 10	.12
	41	-.04 (.07)	-.01 (.06), <i>n</i> = 6	-.05 (.08), <i>n</i> = 13	.05
	43	-.08 (.14)	.04 (.11), <i>n</i> = 2	-.14 (.11), <i>n</i> = 22	.18
	45	-.42 (.09)	-.34 (.03), <i>n</i> = 5	-.50 (.06), <i>n</i> = 5	.15
	48	-.47 (.09)	-.47 (.05), <i>n</i> = 9	-.47 (.12), <i>n</i> = 10	-.01
	53	-.08 (.17)	.04 (.11), <i>n</i> = 2	-.12 (.18), <i>n</i> = 6	.16
	56	.00 (.08)	.03 (.08), <i>n</i> = 12	-.03 (.08), <i>n</i> = 15	.05
	58	-.49 (.12)	-.50 (.02), <i>n</i> = 4	-.49 (.14), <i>n</i> = 11	-.02
	59	-.34 (.16)	-.28 (.09), <i>n</i> = 5	-.36 (.18), <i>n</i> = 15	.08
	63	-.50 (.02)	NA, <i>n</i> = 0	-.50 (.02), <i>n</i> = 4	NA
	74	-.30 (.10)	-.23 (.06), <i>n</i> = 6	-.33 (.11), <i>n</i> = 11	.10
	79	-.41 (.11)	-.35 (.06), <i>n</i> = 7	-.46 (.11), <i>n</i> = 9	.11
	84	-.35 (.22)	-.25 (.25), <i>n</i> = 6	-.48 (.07), <i>n</i> = 5	.23
	96	-.39 (.11)	-.35 (.12), <i>n</i> = 6	-.44 (.09), <i>n</i> = 5	.09

Level	Participant	Overall <i>M</i> normalized F2 (SD)	<i>M</i> normalized F2 of /l/ with preceding front vowel (SD)	<i>M</i> normalized F2 of /k/ with preceding back vowel (SD)	Difference in <i>M</i> normalized F2 of /l/ in front vs. back vowel contexts
Fourth year	22	-.03 (.06)	.03 (.08), <i>n</i> = 8	-.06 (.03), <i>n</i> = 12	.09
	24	-.29 (.14)	-.29 (.11), <i>n</i> = 8	-.28 (.16), <i>n</i> = 12	-.01
	26	-.36 (.15)	-.40 (.04), <i>n</i> = 3	-.35 (.18), <i>n</i> = 9	-.05
	27	-.27 (.13)	-.25 (.13), <i>n</i> = 12	-.28 (.14), <i>n</i> = 24	.03
	28	-.26 (.08)	-.18 (NA), <i>n</i> = 1	-.27 (.08), <i>n</i> = 6	.09
	31	-.39 (.12)	-.35 (.04), <i>n</i> = 2	-.40 (.13), <i>n</i> = 8	.05
	33	-.23 (.14)	-.14 (.07), <i>n</i> = 6	-.33 (.13), <i>n</i> = 8	.20
	34	.11 (.11)	.16 (.11), <i>n</i> = 7	.05 (.10), <i>n</i> = 7	.10
	36	-.21 (.20)	-.26 (.15), <i>n</i> = 10	-.18 (.23), <i>n</i> = 15	-.08
	38	-.36 (.18)	-.40 (.05), <i>n</i> = 3	-.35 (.21), <i>n</i> = 8	-.05
	42	-.04 (.34)	.13 (.23), <i>n</i> = 7	-.12 (.36), <i>n</i> = 15	.25
	51	.07 (.15)	.11 (.12), <i>n</i> = 15	.05 (.16), <i>n</i> = 26	.06
	82	-.43 (.14)	-.36 (.13), <i>n</i> = 8	-.50 (.11), <i>n</i> = 8	.15
	85	-.47 (.14)	-.40 (.14), <i>n</i> = 4	-.52 (.12), <i>n</i> = 5	.13
	90	-.16 (.12)	-.03 (.04), <i>n</i> = 5	-.21 (.10), <i>n</i> = 13	.18
	91	-.24 (.12)	-.20 (.07), <i>n</i> = 13	-.26 (.14), <i>n</i> = 20	.06
Graduate level	1	-.02 (.10)	.06 (.07), <i>n</i> = 9	-.07 (.08), <i>n</i> = 17	.13
	3	-.27 (.16)	-.22 (.14), <i>n</i> = 15	-.30 (.16), <i>n</i> = 25	.08
	4	-.22 (.10)	-.14 (.04), <i>n</i> = 13	-.26 (.09), <i>n</i> = 20	.12
	5	-.24 (.07)	-.18 (.09), <i>n</i> = 2	-.27 (.04), <i>n</i> = 4	.08
	6	-.12 (.16)	-.01 (.14), <i>n</i> = 9	-.18 (.14), <i>n</i> = 16	.17
	7	-.11 (.12)	-.02 (.05), <i>n</i> = 4	-.23 (.06), <i>n</i> = 3	.20
	8	-.03 (.08)	.01 (.06), <i>n</i> = 11	-.06 (.08), <i>n</i> = 22	.07
	9	.27 (.24)	.59 (.13), <i>n</i> = 10	.15 (.13), <i>n</i> = 25	.44
	10	-.14 (.17)	-.05 (.17), <i>n</i> = 10	-.22 (.12), <i>n</i> = 12	.18
	11	-.10 (.11)	-.03 (.06), <i>n</i> = 13	-.14 (.11), <i>n</i> = 23	.11
	15	.05 (.07)	.10 (.04), <i>n</i> = 10	.02 (.08), <i>n</i> = 24	.07
	16	-.06 (.08)	.02 (.03), <i>n</i> = 6	-.09 (.07), <i>n</i> = 15	.11
	17	-.14 (.10)	-.06 (.06), <i>n</i> = 9	-.18 (.10), <i>n</i> = 21	.12
	18	-.25 (.19)	-.12 (.14), <i>n</i> = 4	-.31 (.18), <i>n</i> = 9	.19
	19	-.13 (.21)	-.14 (.08), <i>n</i> = 10	-.13 (.27), <i>n</i> = 15	-.01
	20	-.23 (.14)	-.18 (.20), <i>n</i> = 6	-.27 (.06), <i>n</i> = 9	.09
	21	-.18 (.19)	-.19 (.19), <i>n</i> = 8	-.18 (.20), <i>n</i> = 16	-.01
	23	.03 (.07)	.10 (NA), <i>n</i> = 1	.03 (.07), <i>n</i> = 12	.07
	30	.04 (.08)	.05 (.04), <i>n</i> = 12	.03 (.09), <i>n</i> = 24	.02
	81	-.04 (.09)	.03 (.06), <i>n</i> = 13	-.08 (.07), <i>n</i> = 19	.11
	86	.04 (.08)	.12 (.07), <i>n</i> = 15	.00 (.04), <i>n</i> = 25	.12

Level	Participant	Overall <i>M</i> normalized F2 (SD)	<i>M</i> normalized F2 of /l/ with preceding front vowel (SD)	<i>M</i> normalized F2 of /k/ with preceding back vowel (SD)	Difference in <i>M</i> normalized F2 of /l/ in front vs. back vowel contexts
Native speaker	2	.13 (.17)	.29 (.18), <i>n</i> = 15	.05 (.08), <i>n</i> = 27	.23
	12	.08 (.06)	.04 (.06), <i>n</i> = 4	.11 (.04), <i>n</i> = 6	-.07
	13	-.02 (.05)	-.04 (.07), <i>n</i> = 15	-.01 (.03), <i>n</i> = 26	-.03
	14	-.08 (.16)	.06 (.12), <i>n</i> = 13	-.16 (.11), <i>n</i> = 22	.23
	25	.07 (.14)	.23 (.19), <i>n</i> = 5	.02 (.06), <i>n</i> = 12	.21
	35	.01 (.01)	-.08 (.29), <i>n</i> = 5	.05 (.26), <i>n</i> = 12	-.12
	46	.04 (.05)	.08 (.04), <i>n</i> = 11	.02 (.03), <i>n</i> = 24	.07
	57	.10 (.12)	.27 (.13), <i>n</i> = 7	.04 (.05), <i>n</i> = 21	.23
	62	-.01 (.10)	.05 (.12), <i>n</i> = 11	-.04 (.08), <i>n</i> = 21	.09
	64	.17 (.12)	.22 (.17), <i>n</i> = 15	.14 (.07), <i>n</i> = 23	.08
	83	.13 (.09)	.20 (.04), <i>n</i> = 11	.10 (.08), <i>n</i> = 24	.11
	87	.12 (.19)	.20 (.19), <i>n</i> = 5	.08 (.18), <i>n</i> = 9	.12
	88	-.02 (.20)	.18 (.21), <i>n</i> = 5	-.09 (.14), <i>n</i> = 14	.27
	92	.08 (.05)	.11 (.02), <i>n</i> = 2	.07 (.05), <i>n</i> = 10	.04
	93	.06 (.08)	.12 (.08), <i>n</i> = 8	.02 (.05), <i>n</i> = 16	.10
	102	.04 (.13)	.01 (.15), <i>n</i> = 13	.05 (.11), <i>n</i> = 27	-.05
	103	.05 (.13)	.06 (.18), <i>n</i> = 12	.04 (.10), <i>n</i> = 26	.02
	104	.00 (.08)	.09 (.05), <i>n</i> = 9	-.03 (.06), <i>n</i> = 21	.12
	115	.10 (.13)	.08 (.15), <i>n</i> = 11	.12 (.11), <i>n</i> = 17	-.04
	116	.16 (.05)	.15 (.05), <i>n</i> = 11	.17 (.05), <i>n</i> = 25	-.02

Voice onset time and the child foreign language learner of Spanish

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Stop consonants are one of the most investigated sound classes in second language speech production studies. Robust age of acquisition effects are documented in the literature base; however, the advantage of early learners has been primarily documented in second language, not foreign language, contexts. In order to further tease apart the variables of age and context, this paper compares the VOT values of /p, t, k/ of a cross-sectional sample of child, foreign language learners of Spanish with those of Spanish-English bilinguals. Learner productions did not differ from those of native speaking peers, yet there was a significant interaction of first language and grade level, suggesting that age of acquisition alone is insufficient to explain outcomes. Quantity of input, in both the first and second/foreign language, is explored as a possible explanation.

Keywords: voice onset time, second language phonology, early second language learning, language immersion education

1. Introduction

The global foreign accent of non-native speakers is significantly correlated with the voice onset time (VOT) of stop consonants (Flege, 1992). This, combined with cross-language differences in how stop consonants are realized, both the phonological categorization and phonetic implementation, make VOT one of the most studied phenomenon in second language (L2) phonology. However, research primarily falls into two camps, L2 studies with children and/or adults (e.g., Flege, 1991; Flege & Eefting, 1987a, 1987b; Fokes, Bond & Steinberg, 1985; Mack, 1989; Stölten, Abrahamson & Hyltenstam, 2015; Williams, 1997) and foreign language (FL) studies with adults (e.g., Caramazza, Yeni-Komshian, Zurif & Carbone, 1973;

Mack, Bott & Boronat, 1995; Flege & Eefting, 1987a; Thornburgh & Ryalls, 1998).¹ It has generally been concluded that early learners have an advantage and are able to produce stop consonants with nativelike VOTs, but these studies have been predominantly conducted in the second language context. Because the VOTs of child learners in FL contexts are relatively unexplored, it is unclear whether the reported advantage of early learners is due to age, learning context, or a combined effect. The present study explores whether the advantage attained by early L2 learners extends to the child learner in a FL context and in this way can help to disambiguate the effects of age and context. The specific research questions that guided this work were:

- Do early native English-speaking, FL learners of Spanish produce Spanish voiceless stops with nativelike VOTs?
- Does VOT change as students develop greater proficiency in the FL? If so, how?

In the literature review that follows, Spanish and English VOT are overviewed, and then some of the factors that influence L2/FL acquisition of VOT are discussed. Section 3 details the research design used for data collection and analysis, which is followed by presentation of results in Section 4 and a discussion of them, in Section 5. Finally, conclusions and directions for future research are offered in Section 6.

2. Literature review

2.1 VOT

Across languages, three universal phonetic categories serve to distinguish phonologically voiced and voiceless stops: lead or pre-voicing, short lag voicing, and long-lag voicing (Keating, 1984; Lisker & Abramson, 1964). The timing of glottal aperture and subglottal gestures during articulation, or voice onset time, has been consistently identified as the primary cue for distinguishing voiced and voiceless stop consonants. Acoustically, VOT is the timing difference between the release of the stop closure and the onset of voicing. Place of articulation (Lisker & Abramson, 1964; Zlatin, 1974; Volaitis & Miller, 1992), speaking rate (Kessinger & Blumstein,

1. Although many use L2 in an all-encompassing way, in this article its use is limited to contexts in which the language being acquired is the majority language of the community. FL is reserved for situations in which the language in question is a minority language and generally not spoken outside of the classroom. This distinction will be maintained throughout the article; L2/FL is used when the context of learning is not relevant, referencing any language other than the first.

1997; Volaitis & Miller, 1992), and accent/stress (Choi, 2003; Lisker & Abramson, 1967; Simonet, Casillas & Díaz, 2014) have all been found to impact VOT duration.

Although Spanish and English have the same phonological voicing contrast (voiced-voiceless), they differ in the phonetic realization of that contrast. English voiceless stop consonants, /p, t, k/, are typically realized with long-lag voicing and aspiration (word initially), [p^h, t^h, k^h]; voiced stop consonants, /b, d, g/, are realized with short lag voicing. Voicing for both voiced and voiceless stops in English begins after the release of the stop burst. In contrast, voiced stop consonants in Spanish, are produced with lead or pre-voicing, [b, d, g], and voiceless stop consonants, with short lag voicing, [p, t, k]. There is thus overlap in the phonetic implementation of Spanish /p, t, k/ and English /b, d, g/ (as shown in Figure 1). Assuming a common phonological space for L1 and L2/FL phones, in accordance with the Speech Learning Model (SLM) (Flege, 1995), Spanish voiceless stop consonants thus pose two challenges for native English speakers acquiring Spanish as an L2 or FL: elimination of long-lag voicing and recategorization of short lag voicing as voiceless (as opposed to voiced as in English).

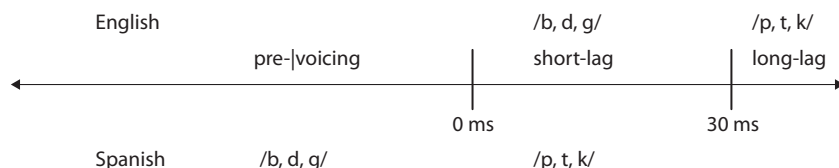


Figure 1. Distribution of Spanish and English stop consonants

2.2 L2/FL acquisition of VOT

Numerous studies have examined the productions of bilinguals as well as L2 and FL learners acquiring a language with a different voicing contrast than their first language (L1); researchers have considered bidirectional language effects (i.e., the influence of the L1 on the L2 and the influence of the L2 on the L1) as well as learner variables such as age, L2/FL use, proficiency level, context of learning. The role of each of these learner variables is considered here, as it relates to L2/FL VOT values.

2.2.1 Age and L2/FL acquisition of VOT

Unlike the Critical Period Hypothesis (Lenneberg, 1967), the SLM posits that learners retain access to the processes and mechanisms that guide L1 speech acquisition throughout the lifespan. Nonetheless, the ability to form native L2/FL phonetic categories decreases throughout childhood (and beyond) as a result of continuing development, or strengthening, of L1 phonetic categories. Flege (1999) summarized

multiple experiments that had shown early learners, with age of acquisition prior to the age of eight, consistently receive native pronunciation ratings. In addition, acoustic analyses of the voiceless stop productions of early L2 learners of English from a variety of L1s, including Spanish, French, and Arabic, have documented nativelike productions (i.e., /p, t, k/ productions with long-lag voicing) (Flege, 1991; Fokes, et al., 1985; Mack, 1989; Williams, 1977). Work with adult learners, across different language pairings, in contrast, has shown that consonants are either produced with L1-like VOT values or with “compromise” VOTs (e.g., Flege, 1987b, 1991; Flege & Eefting, 1987a, 1987b; Flege & Hillenbrand, 1984; Major, 1992; Thornborough & Ryalls, 1998; Williams, 1977). In these studies, L2 speakers of English, who learned English in adolescence or adulthood, produced voiceless stop consonants with longer VOTs than their L1 (French or Spanish) but shorter VOTs than English monolinguals (see for example Flege & Eefting, 1987a). Flege (1991) suggested that the intermediate or compromise VOT values of Spanish speakers of English might be the result of “equivalence classification” (Flege, 1987b), which inhibits establishment of accurate perceptual categories for similar sounds.

The advantage of early learning is further supported by research on incidental learning during childhood. Au, Knightly, Jun, and Oh (2002), Knightly, Jun, Oh, and Au (2003), and Au, Oh, Knightly, Jun, and Romo (2008) have documented a positive effect of hearing a non-native language prior to the onset of schooling on production of the non-native language later in life. More specifically, VOTs of /p, t, k/ produced by L2/FL learners of Spanish who had overheard Spanish as a child, were similar to those of L1 Spanish speakers and shorter than those of late L2/FL learners of Spanish who had not grown up hearing Spanish.

Age of acquisition effects are not categorical. Multiple studies have suggested that early learners may fail to fully differentiate their two phonetic systems, producing /p, t, k/ with compromise VOTs (Caramazza, et al., 1973; Mack, et al., 1995; Flege & Eefting, 1987a; Thornburgh & Ryalls, 1998). In addition, the existence of “exceptional” learners (Moyer, 2014), adult learners with nativelike VOT articulations, is documented in the literature (e.g., Birdsong, 2007; Stölten, et al., 2015). Moyer (2014) proposes that the explanation for “exceptional learning”, or lack thereof on the part of early L2/FL learners, “resides at the intersection” of “numerous cognitive, social, and psychological factors” (p. 419), among which are learning context, patterns of language use, and proficiency level.

2.2.2 *Context of learning and L2/FL acquisition of VOT*

To my knowledge, no study directly investigates context of learning, by comparing the VOT values of L2 learners with those of FL learners; thus, conclusions about the impact of context of learning must be made via retrospective comparisons of outcomes and are further complicated by multiple learning contexts for many learners.

Examination of reports of non-native stop consonant articulations by early L2/FL learners reveals that participants in three of the four studies were in FL contexts, in which the subjects' L1 was the dominant societal language (Caramazza et al., 1973; Mack, et al., 1995; Flege & Eefting, 1987a). Conversely, reports of nativelike articulations come out of L2 learning environments (e.g., Flege, 1991; Fokes, et al., 1985; Mack, 1989; Williams, 1977).

And although non-native articulations are reported for adult learners in both L2 (e.g., Flege & Eefting, 1987a; Stölten, et al., 2015; Thornburgh & Ryalls, 1998) and FL contexts (e.g., Caramazza, et al., 1973; Mack, et al., 1995; Díaz-Campos, 2004, 2006; Zampini, 1998), no studies have directly compared the outcomes of the two groups. Context of learning is, however, considered within the study abroad literature base, which focuses on university FL learners. Findings on the impact of immersion in an L2 context are not conclusive for adult FL Spanish learners. For example, Díaz-Campos and Lazar (2003) found that classroom learners improved articulation of /p, t, k/ more than students in a study abroad program, whereas Díaz-Campos (2006) reported more accurate production of Spanish voiceless stops by study abroad students, particularly in conversational speech. As Díaz-Campos (2004) and Crane and Alvord (2012) point out though, L2/FL use may be a mediating variable (see next section for discussion).

Some researchers question the possibility of establishing native phonetic categories in FL settings, problematizing the quality of the phonetic input received (e.g., Flege & Eefting, 1987a; Flege, 1991; Menke, 2015). Flege (1991) underscored the importance of native speaker models in L2/FL acquisition, commenting that the early FL learners in Caramazza, et al. (1973) may not have “receive[d] sufficient native speaker input to enable them to produce English [p, t, k] authentically” (p. 397). Furthermore, Menke (2015) pointed out that in classroom FL contexts learners are exposed to the phonetic approximations of peers and also the productions of their teacher, which may be hyperarticulated in order to increase the comprehensibility of the speech signal. In this way, the input received in classroom FL settings may be impoverished in both quantity and quality.

2.2.3 *Language use patterns and L2/FL acquisition of VOT*

Flege (1987a) pointed out that many factors that influence speech learning are conflated with age of acquisition, including amount and circumstances of L1 and L2/FL use. Amounts of L1 and L2/FL use are inversely related in that an increase in L2/FL use results in a decrease in L1 use, which may lead to L1 loss or attenuation (e.g., Grosjean, 1982; Romaine, 1995). Dunkel (1948) hypothesized that the influence of the L1 on the L2 is less when L1 use is less, resulting in a reduction in foreign accent. This has been found to be true for L2 vowels (Flege & MacKay, 2004; Flege, Schirru & MacKay, 2003) as well as overall foreign accent (Flege, Frieda & Nozawa,

1997). Similar results have been obtained in Spanish FL contexts, in which greater use of Spanish use outside of class favored more faithful productions of a variety of Spanish phones (Díaz-Campos, 2004). More specifically, increased use of Spanish resulted in fewer aspirated tokens of /p, t, k/ by adult L2/FL learners of Spanish after a sojourn abroad (Crane & Alvord, 2012; Díaz-Campos, 2004).

2.2.4 *Proficiency level and L2/FL acquisition of VOT*

The learner variable of proficiency is more frequently cited as an explanatory variable in the FL phonological research base than the L2 base. Nonetheless, in both contexts proficiency is often operationalized via other measures such as length of residence, years of study, or course level. With respect to L2/FL Spanish VOT, few studies have directly examined how articulations develop or change with increased proficiency. While reports of compromise VOT values by intermediate L2/FL Spanish learners abound (Crane & Alvord, 2012; Díaz-Campos & Lazar, 2003; González-Bueno, 1997; Zampini, 1998), only Lord (2008) examines more advanced FL learners. She found that graduate students and professors of Spanish produce Spanish /p, t, k/ with VOT values similar to those of native speakers, suggesting that proficiency is an important variable to consider.

Taken together, these studies suggest that early L2 learners are able to produce stop consonants with native or near native VOTs. The effect of age of acquisition on VOT has been only minimally considered, however, in the FL context. Findings with both adult and child FL learners point to accented articulations, but no studies to date have examined child FL learners of Spanish. Examining the articulations of this particular group of learners will contribute to our understanding of age of acquisition effects in relation to context of learning.

3. Research design

3.1 Participants

A total of 90 children participated in this study, 67 native English-speaking (NES) FL learners of Spanish and 33 native Spanish-speaking (NSS) peers. All participants were enrolled in language immersion programs in Texas. Language immersion programs teach academic content through a second or foreign language; the L2/FL is the medium of content area instruction. 23 of the NES participants and all 33 NSS peers were enrolled in a two-way (bilingual) immersion program, in which majority language speakers and minority language speakers are brought together in an academically challenging learning environment. As educational enrichment for all, it aims to develop biliteracy, content area knowledge, and cultural awareness in both

groups of students. The remaining 34 NES participants were enrolled in a one-way (foreign language) immersion program; unlike two-way programs, all students in one-way immersion are speakers of the majority language. Greater detail about each of the schools, including language distribution and student demographics, can be found in Table 1 in the Appendix.

In order to explore differences in VOT as a result of proficiency in the language, a cross-sectional sample was selected, ranging from Grade 1 to Grade 7.² NES participants in Grade 1 have only 1–2 years of experience in the language, while those in Grade 7 have had 7–8 years. All participants in this study entered the respective immersion program in either kindergarten (two-way) or first grade (one-way). A summary of participants according to language group and grade level is available in Table 1.

All participants in the NSS comparison group were either Spanish monolingual or Spanish-dominant upon entry into the school system. On a background questionnaire, parents identified the child's L1 as Spanish and that both parents spoke Spanish, with at least one being a native speaker.³ Parents reported using Spanish minimally 60–80% of the time with the student and that students used Spanish minimally 40–60% of the time with parents.

Table 1. Number of participants by language group and grade

	One-way NES	Two-way NES	Two-way NSS	Mean age
Grade 1	10	8	10	6.8
Grade 3	9	8	9	8.5
Grade 5	8	4	8	10.8
Grade 7	7	3	6	12.8
Total	34	23	33	–

2. As with other FL phonological studies, proficiency in this study is indicated by grade level, with those in higher grade levels having greater proficiency as a result of increased length of study. Fortune and Tedick (2015) recently reported that the Spanish proficiency of early, total, one-way immersion students consistently increased from Kindergarten to Grade 5; Grade 8 students, however, were at the same proficiency level as Grade 5 students. Consequently, Grade 5 and Grade 7 participants in this study may be at the same level of proficiency, within the intermediate range (ACTFL, 2012).

3. The background questionnaire, developed by the researcher, was based upon background questionnaires in sociolinguistic research and the questionnaire used by Potowski (2002).

3.2 Data collection and analysis

Participants met with a NES researcher in pairs in a quiet classroom during the school day for about 30 minutes. After a short conversation, participants completed a picture sorting task, a story walk, and an attitude and ability questionnaire. Only details from the picture sorting task are reported here. In this task, the researcher posed questions to students related to animals, such as ‘¿Qué animales viven en la granja?’ ‘What animals live on the farm?’ or ‘¿Qué animales comen a otros animales?’ ‘What animals eat other animals?’ Students took turns responding orally, choosing their answers from 30 pictures available to them. This task elicited spontaneous, semi-connected speech via an activity that was familiar to students in their educational context.

Table 2. Tokens used in analysis

/p/	/t/	/k/
<i>los pájaros</i>	<i>los tigres</i>	<i>los caballos</i>
‘birds’	‘tigers’	‘horses’
<i>los patos</i>	<i>los tiburones</i>	<i>los canguros</i>
‘ducks’	‘sharks’	‘kangaroos’
<i>los peces</i>	<i>las tortugas</i>	<i>los camellos</i>
‘fish’	‘turtles’	‘camels’
<i>los perros</i>		<i>los conejos</i>
‘dogs’		‘rabbits’
<i>los pingüinos</i>		<i>las culebras</i>
‘penguins’		‘snakes’
		<i>los cocodrilos</i>
		‘crocodiles’

All voiceless stop /p, t, k/ tokens were taken from the 30 animals depicted in the pictures and occurred in word-initial position. A list of tokens is provided in Table 2. Up to 10 tokens of each phoneme were selected and analyzed for each participant. Not all participants responded to questions in anticipated ways; consequently, not everyone produced 10 tokens of each phoneme, especially /t/, which had a lower rate of occurrence in the images (mean number of tokens per speaker: /p/ = 9.3, /t/ = 3.78, /k/ = 8.63).

Acoustical measurements were made in Praat, using both the waveform and spectrogram. VOT was measured in ms from the release of the burst to the onset of periodicity in voicing as shown in Figure 2. In order to address a shortcoming of previous research, which has failed to control for speech rate effects (cf. Stölten

et al., 2015), a second measure, VOT-to-vowel ratio, was used.⁴ This ratio remains relatively consistent across speaking rates (Kessinger & Blumstein, 1998) and was thus used to account for differences in VOT that may result from different speaking rates. Duration of the following vowel was measured from the onset of periodicity to the onset of the following segment (offset of voicing in voiceless consonants, change in formants for voiced consonants, closure in rhotics).

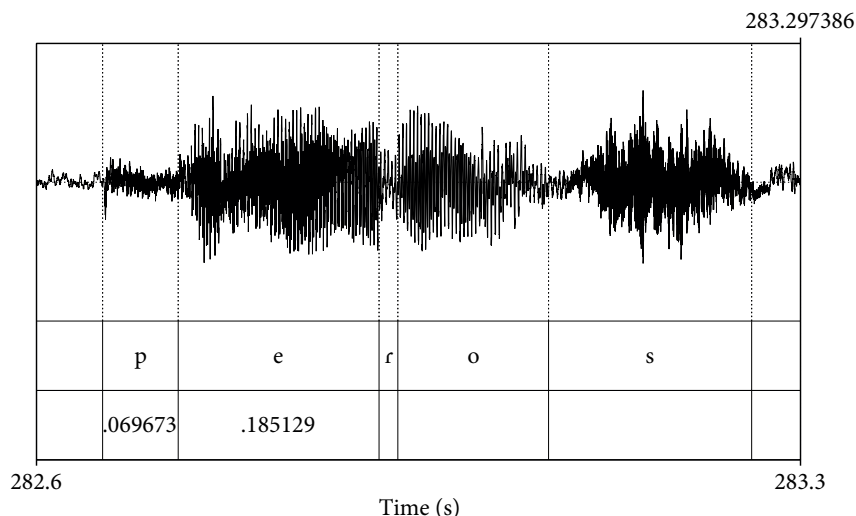


Figure 2. Waveform image of ‘perros’ by NES Grade 3 participant with VOT and vowel duration identified (A3–3, p4–3)

Two mixed-effects models were constructed using R statistical software and the lme4 package (Bates, Maechler, Bolker & Walker, 2015), one for absolute VOT and another for relative VOT. The model included stress, phoneme, language group, grade, language group x grade, language group x phoneme, grade x phoneme, and language group x grade x phoneme as fixed effects and a random intercept for each participant and item as well as a random slope for phoneme within speaker. Given that stress has been shown to impact VOT (Choi, 2003; Lisker & Abramson, 1967; Simonet, Casillas, & Díaz, 2014) and was not controlled for in token selection, it is included as a covariate in the model in order to account for any influence.

4. At slower speaking rates, English /p, t, k/ have longer VOTs (Kessinger & Blumstein, 1997; Schmidt & Flege, 1996; Volaitis & Miller, 1992), and Spanish /b, d, g/ has greater pre-voicing (Kessinger & Blumstein, 1997; Schmidt & Flege, 1996). Short-lag stops, such as English /b, d, g/ and Spanish /p, t, k/ evidence fewer differences in VOT as a result of speaking rate changes. While the impact of speech rate is not uniform across phonetic categories, it may potentially impact L2/FL productions.

Significance was set at .05 for all statistical tests. Effect size calculations for language group were calculated following the procedure set forth in Xu (2003) for linear mixed effects models:

$$1 - \frac{\text{variance} * \text{residuals}}{\text{variation} * \text{ratio}}$$

Strength of effect size was then considered in accordance with the recommendations laid out in Plonsky and Oswald (2014): .4 small, .7 medium, and 1.0 large.

4. Results

A total of 2274 tokens were selected for analysis. Of these, 85 were discarded due to overlapping sounds, changes in voice quality (whispering, creaky voice), devoicing, or weak signal strength. An additional 97 tokens were discarded due to extreme vowel length, which skewed relative VOT values. A total of 2092 tokens were included in the statistical model.

In order to test whether any differences were found between the two NES learner groups, two separate linear mixed models (random intercept by speaker and item and random slope for phoneme within speaker) were fit with program as a fixed effect, one for absolute VOT and one for relative VOT. Both models had large p -values ($\chi^2 = .8637, p = .6493$ and $\chi^2 = 1.4819, p = .4767$), indicating that the two NES groups are not statistically different and can be combined in the statistical model.

4.1 Absolute VOT

Mean VOTs for each phoneme are identified in Table 3 according to language group. With the exception of NES participants' production of /k/, all mean values fall within the short-lag range (0–30 ms) identified by Lisker and Abramson (1964). For both groups, mean VOTs are shortest for /p/ and longest for /k/ in line with other findings on VOT and point of articulation (Lisker & Abramson, 1964). NES participants articulate each of the voiceless stop consonants with slightly longer VOTs than NSS peers; the difference is approximately 3 ms for /t/ and /k/ and 1 ms for /p/. Productions of NES learners also present greater variability as evidenced by larger standard deviations across all three phonemes.

Within a language group, differences across grade level are minimal, no more than 11 ms, as can be seen in Figure 3; mean values and standard deviations are also presented numerically in Table 4. Although the path is not linear, absolute VOTs of NSS decrease from Grade 1 to Grade 7 across all three phonemes. The same does

not hold true for NES learners. For NES learners, the difference between Grade 1 and Grade 7 participants varies across the three phonemes; the mean VOT of Grade 7 participants is shorter for /k/ (−4.6 ms difference), longer for /t/ (1.9 ms difference), and nearly equal for /p/ (difference of −.4 ms difference).

Table 3. Mean (absolute) VOT according to phoneme and language group

	/p/ mean (std. dev.) n	/t/ mean (std. dev.) n	/k/ mean (std. dev.) n
NES	16.8 ms (19.5) <i>n</i> = 533	26.1 ms (16.3) <i>n</i> = 205	31.2 ms (24.4) <i>n</i> = 613
NSS	15.7 (14) <i>n</i> = 273	23.4 (13.3) <i>n</i> = 107	28.4 ms (18.3) <i>n</i> = 361
Total n	806	312	974

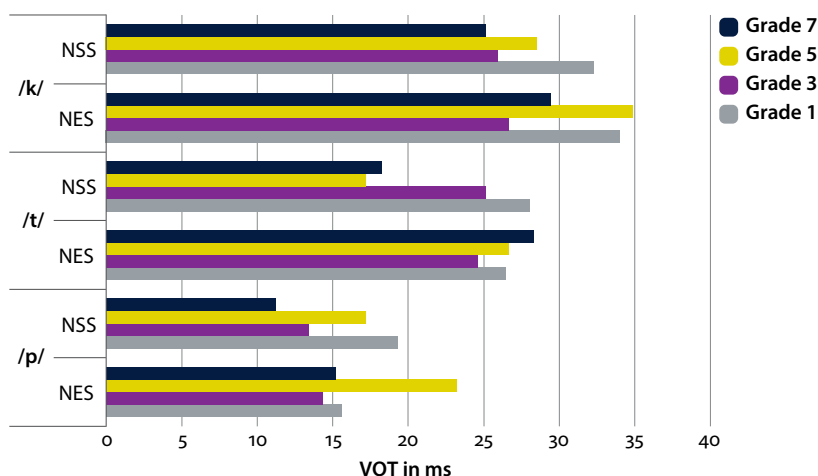


Figure 3. Mean (absolute) VOT across grade levels by language group and phoneme

Table 4. Mean (absolute) VOT and standard deviation across grade levels by language group and phoneme

	NES				NSS			
	Grade 1	Grade 3	Grade 5	Grade 7	Grade 1	Grade 3	Grade 5	Grade 7
/p/	15.6 ms (22.1)	14.3 ms (11.9)	23.2 ms (26)	15.2 ms (11)	19.3 ms (18.6)	13.4 ms (11.9)	17.2 ms (11.6)	11.2 ms (7.4)
/t/	26.4 ms (16.1)	24.6 ms (15.2)	26.6 ms (19.3)	28.3 ms (14.4)	28 ms (16.6)	25.1 ms (12.7)	17.2 ms (6.1)	18.2 ms (7.8)
/k/	34 ms (29.4)	26.6 ms (15.6)	34.8 ms (29.1)	29.4 ms (17.8)	32.3 ms (18.9)	25.9 ms (13.4)	28.5 ms (14.3)	25.1 ms (25.5)

When language groups are compared at each grade level for a given phoneme (see Table 2 in the Appendix), it is striking that differences at the upper grade levels, Grades 5 and 7, are greater than those at the lower grades, compare the approximately 10 ms difference in /t/ VOTs at Grades 5 and 7 to the less than 2 ms difference in Grades 1 and 3. While this could be attributed to greater variability due to fewer participants in Grades 5 and 7, standard deviations are similar across grade levels, with the exception of /k/ in Grade 7 by NSS participants.

4.2 Relative VOT

Due to the impact of speech rate on VOT (Kessinger & Blumstein, 1997; Volaitis & Miller, 1992) and reported differences in rate of speech between L2/FL and native speakers (Lennon, 1990; Munro & Derwing, 1995, 1998; Trofimovich & Baker, 2006), relative VOT is used for the base of statistical modeling; the ANOVA table for the absolute VOT model can be found in Table 3 in the Appendix. Relative VOTs express VOT as a percentage of the following vowel. By including relative VOT, limitations of previous research are addressed (see Stölten, et al., 2015), and the possibility of differences in VOT being attributable to speaking rate is minimized. Relative VOT values are presented visually in Figure 4.

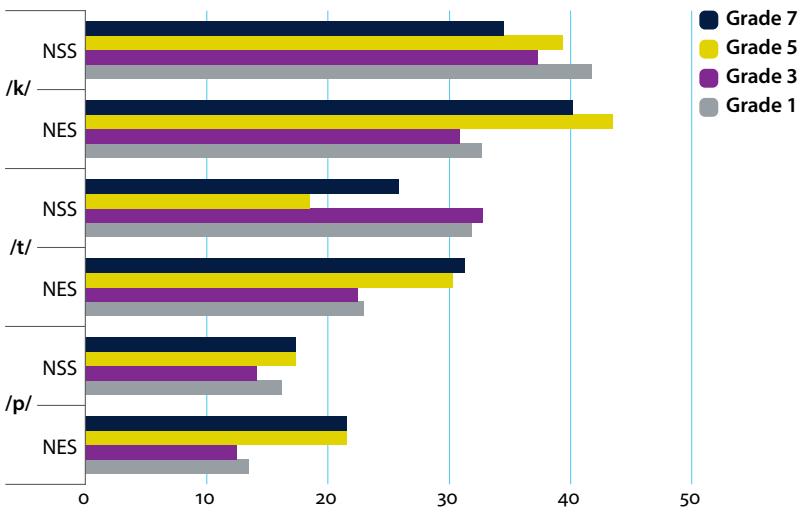


Figure 4. Mean (relative) VOT across grade levels by language group and phoneme

In the lower grades, Grades 1 and 3, the relative VOT of NES participants is less than that of NSS participants, signaling that the consonant makes up a smaller portion of the consonant-vowel sequence for this group of learners. An opposite

trend is observed in Grades 5 and 7; relative VOT of NES participants is greater than that of NSS peers, indicating that the consonant comprises a larger portion of the consonant-vowel sequence in NES productions. While the relative VOT of NSS participants tends to stay the same (/p/) or decrease (/t, k/) as grade level increases, the relative VOT of NES participants increases between Grade 1 and Grade 7, although not in a linear trajectory.

Results of statistical modeling, summarized in Table 5, reveal few significant interactions or main effects. The interaction of language group and grade is statistically significant ($p = .048$), suggesting that the effect of grade is not independent of the effect of language group, but rather that the two variables must be considered together. Examination of the descriptive statistics for relative VOT, reported above, reveals different trends across grade levels for the two language groups; the relative VOT of NSS participants is less in the upper grades than in the lower grades, and the relative VOT of NES participants in Grades 5 and 7 is greater than in Grades 1 and 3. No post-hoc pairwise comparisons reach or approach statistical significance.

Neither of the learner-related main effects prove significant, but one of the linguistic main effects, phoneme, does. In line with what was observed with absolute VOT values, relative VOTs increase as the place of articulation becomes more posterior for both participant groups. Because stress was not controlled for in the tokens selected, it is included as a covariate in the model in order to account for any its influence and is marginally significant. Relative VOT of productions in unstressed syllables was longer than that of phonemes in stressed syllables, compare 34% and 15.72%.

Table 5. ANOVA table for mixed-effects model on relative VOTs

Variable	χ^2	df	<i>p</i> -value
Stress	3.553	1	.059
LangGroup	.216	1	.642
Grade	4.825	3	.185
Phoneme	23.347	2	<.001
LangGroup:Grade	7.925	3	.048
LangGroup:Phoneme	2.155	2	.341
Grade:Phoneme	4.536	6	.605
LangGroup:Grade:Phoneme	4.27	6	.64

Results of statistical modeling indicate that the VOT values of NES and NSS students in language immersion programs are not different. This finding is further supported by results of effect size calculations for linear mixed effects models (Xu, 2003), which measures the proportion of variation in Ratio that is explained by its relationship with Language Group after accounting for the random effects of

speaker and item. The result of this calculation is .281, less than the .4 threshold established by Plonsky and Oswald (2014) for a small effect.

5. Discussion

In many ways, productions of Spanish voiceless stop consonants of both NES immersion students and NSS students in two-way immersion programs align with previously reported findings with respect to VOT. Both participant groups produce Spanish voiceless stops in the short-lag region, and they produce anterior consonants with shorter VOTs than posterior consonants (Lisker & Abramson, 1964).

The purpose of the current study was to explore whether child FL learners of Spanish produce voiceless stop consonants with VOTs different from those of native speakers. Unlike work with adult, intermediate L2/FL learners of Spanish, the NES children in this study generally produce Spanish /p, t, k/ with VOTs in the short-lag range. When averaged together, the mean VOTs of NES learners are slightly greater than those of NSS peers and show greater variability (as measured by standard deviation). Differences across language groups do not, however, reach significance. Only one language group interaction reaches significance, and language group is not a significant main effect in either statistical model (absolute or relative VOT). Moreover, results of effect size calculations are less than the threshold for a small effect. Thus there is no evidence of difference between the child FL learners of Spanish and NSS peers.

The results of this study align with findings for child L2 learners, who are generally reported to produce voiceless stop consonants with nativelike VOTs (Flege, 1991, 1999; Fokes, et al., 1985; Mack, 1989; Williams, 1977), but they differ from those with other FL learner populations, both child (Caramazza et al., 1973; Mack et al., 1995; Flege & Eefting, 1987) and adult (Díaz-Campos & Lazar, 2003; González-Bueno, 1997; Zampini, 1998). Although the current study was conducted in a FL context, in that the language being acquired is not the majority language of the community, age at testing and differences in exposure to the target language may explain the results.

One participant group in Flege & Eefting (1987a) and all participants in Caramazza, et al. (1973) were tested during high school/university studies (17–25 years old) whereas participants in this study were tested earlier. Although participants in Flege and Eefting (1987a) and Caramazza et al. (1973) had studied the language for a greater period of time, their older age may have played a role (see discussion of changes across grades, research question 2, below).

Previous studies provide few details about the intensity or nature of exposure to the FL. Flege and Eefting (1987a) noted that early learners attended a private,

English-speaking school, and Caramazza, et al. (1973) commented that bilingual participants had begun to acquire English prior to the age of 7 and that they were a mix of simultaneous and sequential bilinguals. Both studies noted that participants were proficient, as determined by lack of a noticeable Spanish accent (Flege & Eefting, 1987a) or self-ratings and reading speed (Caramazza et al., 1973), but they did not provide detail about how much instruction in English (the FL) participants had. Participants in the current study differ from most traditional FL learners in the amount of exposure. During the early elementary years, participants receive all content area instruction in the FL, equaling approximately five hours each day; this is significantly more than most FL models. The greater quantity of input may explain the different findings.

The second research question addressed differences across grade levels, as a measure of greater experience in the FL and biological age. Findings from the current study are inconclusive with respect to increased length of study. Although the effect of grade is not significant, there is an interaction between the two learner-based variables of grade and language group, indicating that the two cannot be considered independently. Examination of trends in the descriptive data sets across grades within each language group reveals two different patterns. Older NSS students produce consonants with shorter absolute VOTs than younger NSS students, which is expected given the increased motor control of older children and adults (Kent & Forner, 1980). A different pattern is observed for the NES learners, for whom VOT increases across grade levels for /t/ and decreases for /p/ and /k/. Also as observed in Table 2 of the Appendix, the difference in absolute VOT values of NES and NSS participants are descriptively greater in the upper two grades, Grades 5 and 7, than the lower two grades, Grades 1 and 3. Biological age, a decrease in FL exposure, and emerging identities are possible explanations for the significant interaction between grade and language group in this study.

The Speech Learning Model (Flege, 1995) notes that the phonetic systems of bilinguals are not static but dynamic; they adapt over the course of the life span in response to interaction between L1 and L2 sounds. Unlike adult FL learners, who have a developed L1 prior to the onset of FL learning, early FL learners are still in the process of developing their L1 (see Baker & Trofimovich, 2005). NES children do not produce English stop consonants with adult-like VOTs until the age of 10 (approximately Grade 4 or 5) (Bailey & Haggard, 1980; Flege & Eefting, 1986; Kewley-Port & Preston, 1984; Zlatin & Koenigsknecht, 1976); younger children's voiceless stop consonants have shorter VOTs. For example, NES children in Flege and Eefting (1986) established the /d/-/t/ threshold boundary as 29 ms, a value much shorter than the 43 ms identified for adults. Increasing English VOTs during the elementary years may lead to longer VOTs in Spanish as well. Moreover, the relative strength of the L1 may be greater in the adolescent years than the primary

years as a result of a more developed system, which could explain the slightly greater difference in VOTs of NES and NSS participants in the upper grades as compared to the lower grades in the present study, as well as the non-native VOTs of high school and university participants in Caramazza, et al. (1973) and Flege and Eefting (1987a).

Concomitant with the increase in L1 VOTs for the early FL learners in this study is a decrease in instructional time in Spanish. The amount of Spanish instructional time decreases significantly in the upper elementary grades so that by Grade 6 an equal amount of instructional time is devoted to each language. In addition, scholars have observed that during the late elementary years and beyond immersion learners' use of English dominates as they reserve Spanish language use for academic functions (Broner, 2000; Fortune, 2001; Potowski, 2002, 2004). This concurrent decrease in Spanish and increase in English may serve to further strengthen L1 representation in the learners' linguistic systems, which could explain the significant interaction. These findings, together with those from both L2 (Flege, et al., 1997; Flege & MacKay, 2004) and FL contexts (Crane & Alvord, 2012; Díaz-Campos, 2004), support the single system hypothesis, which predicts a stronger L2 accent with greater L1 use (Flege, 1995).

The late elementary years are also the time when immersion learners begin to exert the emerging adolescent identity through increased use of the L1 (Tarone & Swain, 1995). Tarone and Swain (1995) have argued that learners do this because the immersion language does not allow them to connect with peers or express themselves as a pre-teen. The impact of motivation and linguistic attitudes is well attested in L2/FL phonological research (e.g., Dalton-Puffer, Kaltenboeck & Smit, 1997; Elliot, 1995a, 1995b; Hedgcock & Lefkowitz, 2000; Lybeck, 2002; Zuengler, 1998), and the less firmly-established linguistic identities of children have been used by some to explain child-adult differences in language acquisition (e.g., Brown, 1987; Long, 1990). Grades 5 and 7 NES participants in this study may thus be exploring their linguistic identity and beginning to modify their pronunciation to reflect it. While further research is needed to explore the linguistic identities and attitudes of the participants and their connection to language use, the impact of each of these variables on the pronunciation of child FL learners also remains to be teased apart.

6. Conclusions

The present study expands upon previous work to show that early FL language learners do not produce stop consonants with different VOTs from native speaking peers. It additionally controls for speech rate by examining relative VOT in the

statistical model. Previous work has shown that although early L2/FL learning does not guarantee nativelike articulations, it appears to facilitate it. The early FL learners in this study produce Spanish voiceless stops with absolute and relative VOTs that do not differ from those of NSS peers. This finding contrasts with other work with early FL learners, but the greater exposure to Spanish and the participants' younger age at the time of testing may explain these differences. Although Grade 5 and 7 NES had more experience with the language, their absolute and relative VOTs differed more from same age NSS peers than those of younger learners, leading to a significant interaction of language group and grade for relative VOT. A decrease in intensity of Spanish exposure, a more developed L1, and emerging linguistic identities were offered as potential explanations. Future research could expand upon this initial study to include voiced stop consonants, /b, d, g/, and also directly investigate the impact of L1-L2/FL use and identity on the articulations of child FL learners.

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Appendix

Table 1. Student demographics and language distribution in research sites

	One-way program	Two-way program
	District demographics	
No. of students	4447	86,000
No. of schools	5	97
Race		
White	64%	26%
Hispanic	31%	62%
Other	7%	12%
Free/reduced lunch	25%	46%

(continued)

Table 1. (continued)

	One-way program		Two-way program	
	Distribution of languages in curriculum			
	Spanish	English	Spanish	English
Kindergarten	NA	100%	90%	10%
Grade 1	100%	0%	90%	10%
Grade 2		30 min/day 2nd semester only	80%	20%
Grade 3		30–45 min/day	80%	20%
Grade 4		1 hr/day	70%	30%
Grade 5		1 hr/day	60%	40%
Grade 6	Social Studies Science	Math Engl. Lang. Arts	50%	50%
Grade 7	Science Span. Lang. Arts	Math Engl. Lang. Arts Social Studies	Science History Span. Lang. Arts	Math >English/ Reading

Table 2. NES-NSS differences in absolute VOT (ms) across grade levels and phonemes

	/p/	/t/	/k/
Grade 1	–3.7	–1.6	1.7
Grade 3	.9	–.5	.7
Grade 5	6	9.4	6.3
Grade 7	4	10.1	4.3

Table 3. ANOVA table for absolute VOT

Variable	χ^2	df	<i>p</i> -value
Stress	.000	1	.992
Language group	.624	1	.43
Grade	4.685	3	.196
Phoneme	21.892	2	<.001
Language group:Grade	5.347	3	.148
Language group:Phoneme	.69	2	.708
Grade:Phoneme	13.9	6	.031
Language group:Grade:Phoneme	4.025	6	.673

“Extraña uno lo que es la tortillas”

A preliminary study of number agreement in Spanish in contact with Purépecha

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Regarding studies of Spanish in contact with Latin American indigenous languages, there has been little research on contact between Spanish and Purépecha, a language isolate from western Mexico. The present paper addresses this lacuna by examining number marking and number agreement in the Spanish production of five L1 adult Purépecha speakers, and it contributes to both the fields of second language studies and contact linguistics studies, by detecting specific structural and semantic conditions under which Purépecha morphosyntactic patterns are incorporated into Spanish: Results show non-standard number marking and lack of number agreement across the noun phrase, between the subject and the verb, and between the noun and its predicative adjective, possibly due to a shift dynamic (Thomason, 2001).

Keywords: Purépecha, Spanish, number agreement, interference, contact linguistics

Introduction

The present investigation examines number marking and number agreement across the noun phrase (NP), between the subject and the verb (S/VA), and between the noun (N) and its predicative adjective in Spanish in contact with Purépecha, a language isolate from Michoacán, Mexico. In doing so, it makes a connection between research on second language acquisition (SLA) and that on contact linguistics, specifically on contact varieties of Spanish in the Americas, by identifying the structural and semantic conditions under which these specific transfers can occur.

While there are studies on Purépecha morphosyntax, very few scholars account for all the literature written on it. Chamoreau's work on Purépecha (2004, 2007, 2008, 2011, 2012, 2013) fills a lacuna regarding knowledge on said language, and

it tackles all aspects of Purépecha, i.e., phonology, syntax, morphology, and the lexicon. Other scholars have also studied Purépecha morphosyntax: Vázquez-Rojas (2012) gives an account of the language's syntax and semantics of noun phrases and its mass-count distinction, Zyman (2011) describes Purépecha unaccusative structures, and Mendoza (2007) and Friedrich (1971) have studied Purépecha suffixes. Finally, Purépecha in contact with Spanish has been studied from a lexical point of view by Demišová (1999) and Chávez Rivadeneyra (2006), and by comparing nominal predication in both languages (Villavicencio, 2006). The present study, which draws from the aforementioned researchers' expertise on Purépecha, investigates whether the Purépecha morphosyntactic trait of number marking may have influenced the Spanish production of five adult Purépecha L1 speakers who learned Spanish as children (cL2), which is an understudied topic. The issue of contact between Spanish and Purépecha is not only relevant given the different social values that each language has in the community, but also given the typological differences of the two languages.

In order to proceed with an analysis of number marking and number agreement variation in Spanish in contact with Purépecha, it is vital to provide a brief socio-historical overview and typological description of Purépecha.

The Purépecha language, also known as P'orhépecha or Tarascan, is classified as a language isolate, spoken by approximately 117,000 people in the state of Michoacán, Mexico, and ranks fifteenth place among indigenous languages according to its number of speakers (Instituto Nacional de Estadística y Geografía [INEGI], 2010). In 2003, Purépecha acquired the status of national language (see Map 1).



Map 1. The state of Michoacán (in black) within Mexico

In Mexico, and specifically in Michoacán, Spanish is the language of prestige, linked to education, religion, oral and written media, public and private administration, commerce, and work, whereas Purépecha is mainly an oral language, used at home, for everyday activities around town, and with family and friends. However, a few publications have recently appeared in Purépecha (Chamoreau, 2010).

Typologically, Purépecha is a case-marking, nominative-accusative language, in which the nominal subject has no overt marking. It is a morphologically agglutinative and synthetic language, almost exclusively suffixing (Chamoreau, 2010). It has SVO word order that is pragmatically unmarked (Capistrán, 2002; Chamoreau, 2003 [2000]). It is a dependent marking language (Dryer & Haspelmath, 2013), i.e., morphological markings of grammatical relations in Purépecha appear either on the dependent member of the constituent, or on both the head and the dependent (Chamoreau, 2003 [2000]; Vázquez-Rojas, 2012).

1. Background

1.1 Early second language acquisition

De Houwer (2005) defines *bilingual language acquisition* as regular exposure to two or more languages from birth until before the age of two. The term *child bilingual* has been used often as a synonym of *child L2 learner*, when in fact they do not denote the same population: bilingual children learn two or more languages simultaneously while child L2 (cL2) learners learn one language before they begin learning another, and they usually speak the L1 at home and the L2 at school (Paradis, 2007). Schwartz (2004) and Meisel (2011) define the L2 child as one whose initial exposure to the L2 is between the ages of four and seven. Noticeable differences emerge in the development of morphosyntax in L2 learners compared to L1 speakers between age of onset of acquisition (AOA) 3;6 and 4: Schwartz (2004) postulates that the optimal periods for syntactic development fade out earlier than the ones for inflectional morphology.

In this respect, Meisel (2011) provides a state-of-the-art review of research regarding cL2. Sopata (as cited in Meisel, 2011) analyzed the acquisition of German by three Polish boys who had moved to Germany (AOA 3;8–4;7), and found that they all made errors that qualified them as cL2 learners: None of them used the predominant OV German word order, mostly placing finite verbs in a target-deviant *V3 position, while at the same time moving non-finite verbs to the V2 position, which Meisel (2011) calls “an unambiguous feature of L2 acquisition” (p. 215). Meisel (2007) investigated the acquisition of French by German children in an immersion setting (AOA 3), and revealed that 60% ($N = 6$) of informants resembled

adult L2 (aL2) learners when using finite and non-finite verb forms. Additionally, informants analyzed subject clitics as maximal projections rather than as clitics, a pattern similar to aL2 learners of French studied by Granfeldt, and Granfeldt and Schlyter (as cited in Meisel, 2011).

The five informants in the present investigation learned Spanish in school between the ages of four and six. This makes them Spanish cL2 learners, sharing traits of both L1 speakers and of aL2 learners. The low frequency with which deviations from normative Spanish are found in the data shows relatively high bilingualism among them. Mufwene (2010) notes that each and all language acquisition processes, and not only L2 processes, are incomplete and imperfect; that the idiolects of the model population vary interminably; and that language learning only ends when the speaker dies.

1.2 Contact varieties

Language evolves through individual speakers and individual speech acts. Mufwene (2001) poses the question of when and how do individual selections (changes in idiolects) amount to group selections (changes in a language variety), and states that linguistic changes mainly spread horizontally through the individual speakers' interaction with members of their own speech community. Also, if a speaker knows more than one language, this makes one linguistic system part of the ecology of the other, so that the features of one speaker may affect the features of another speaker, "setting conditions for long-term change in the overall structure of a language *qua* species" (Mufwene, 2001, p. 152).¹

Divergences in language varieties can stem from differing ecologies: In communities where second language speakers are the majority (as is the case with some Purépecha regions, like Cherán Atzicuirín, where all informants for the present study grew up), the languages they spoke before learning a European language (i.e., Spanish) favored variants that could sometimes be at variance with selections made in other communities (Mufwene, 2001, p. 157).

Literature on SLA has mostly focused on individual language acquisition without taking into account communal norms, whereas research on creoles and language evolution has mostly focused on the latter topic (Mufwene, 2010), and while

1. Mufwene (2001, p. 153) takes the definition of *ecology* from its use in macroecology, a branch of biology in which *ecology* is understood as a cover term for diverse internal and external factors that affect a species and its evolution. Brown notes that such factors include "population size, habitat requirements, and genetic variation," as well as "differences in initial conditions, stochastic events, time lags, processes operating on different time scales, and spatial subdivisions" (as cited in Mufwene, 2001).

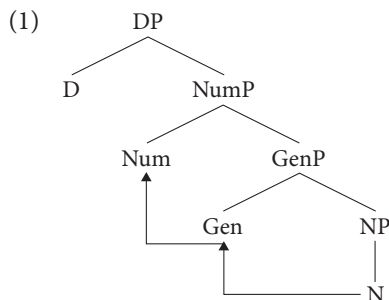
language evolution takes place through individual speakers, Mufwene (2010) notes that both “the invisible hand [...] bringing about new norms” and the language ecology that affects that invisible hand cannot be ignored (p. 371).² He cautions against believing that individual speakers’ properties always translate into communal norms, because this is not always necessarily the case. Furthermore, Perdue (1995) shows in his study of foreign workers’ interlanguages that substrate influence plays a role in naturalistic SLA, but this influence does not happen consistently from one learner to another, and is not an ineluctable phenomenon in all aspects of SLA.

One of the major dangers of comparing research on SLA to that on the emergence of creoles lies in generalizing results about individual learners in SLA to population-level hypotheses about creoles (Mufwene, 2010). I believe this danger is surely not limited to creoles but can also be said about contact languages. Although research on SLA shows that substrate influence plays a role in naturalistic SLA, not all learners transfer the same features to the target language (TL); likewise, Mufwene (2010) states that transfer at the individual level does not entail substrate influence at the communal level.

1.3 The syntax and semantics of number, number features in Purépecha, and the mass/count distinction

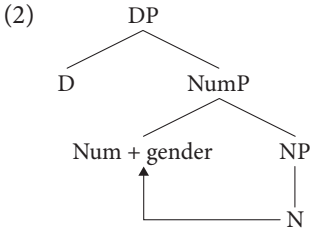
1.3.1 *The syntax and semantics of number, and number features in Purépecha*

In the linguistics literature, there are two different proposals about how number is represented syntactically within a generativist framework. Picallo (1991) posits that each feature (i.e., gender and number) heads its own projection in the syntactic tree, as in (1).



Ritter (1993), on the other hand, argues for number heading its own projection, but not gender, which would be part of the number phrase, as in (2).

2. Mufwene (2010, p. 380) defines *norms* as “population-level characteristics.”



Corbett (2000) defines the term *agreement* as “the covariance or matching of feature specifications between two separate elements, such as subject noun phrase and verb” (p. 178). He calls the element that determines the agreement *controller*, and the element determined by such controller, *target*. The controller of agreement is the noun phrase, and the possible targets are varied cross-linguistically: verbs, adjectives, demonstratives, articles, possessives, participles, adpositions, adverbs, complementizers, and pronouns (Corbett, 2000).

Corbett (1979) proposes an agreement hierarchy (3) in order to capture empirical generalizations about syntactic and semantic agreement with respect to number and gender marking.

- (3) attributive < predicate < relative pronoun < personal pronoun

In this hierarchy, syntactic agreement will decrease monotonically from left to right, so that the more an element is to the right of the hierarchy, the more likely it is to have semantic agreement instead of syntactic agreement. Corbett (1979) defines *semantic agreement* as agreement that is not strict syntactic agreement, and *syntactic agreement* as one that shows strict agreement.

Purépecha can sometimes show number marking and number agreement: the nominal suffix *-icha*, which attaches to nouns or noun phrases and indicates plurality of the head noun, can be suffixed to the final element of the NP, as in (4a), or to the head noun and the end of the NP, as in (4b) (Vázquez-Rojas, 2012).³ If the suffix occurs only on the head noun and not at the end of the NP, the sentence is not fully acceptable, as in (4c) (Vázquez-Rojas, 2012). All Purépecha examples in this subsection are taken from Vázquez-Rojas (2012, p. 125).

- (4) Context: We have black hens and white hens. The black hens have been fed.
 a. Tsíkata turhípiti-icha t’irhe-h-ti=ia
 hen black-PL eat-PFV-3IND=ADV
 ‘The black hens have already eaten’

3. Spanish marks number categorically throughout the NP, showing double marking. Thus, Example (4b) could be a case of Spanish influence in Purépecha. Vázquez-Rojas (2012) does not mention this possibility, but future studies could investigate the issue.

- b. Tsíkat-icha turhípiti-cha t'irhe-h-ti=ia
 hen-PL black-PL eat-PFV-3IND=ADV
 'The black hens have already eaten'
- c. ??Tsíkat-icha turhípiti t'irhe-h-ti=ia
 hen-PL black eat-PFV-3IND=ADV
 Intended: 'The black hens have already eaten'

However, Chamoreau (personal communication, June 2014) holds that, for examples such as (4c), while general tendency is for the plural marker to be suffixed at the end of a NP, some variation might be found, with a current ongoing shift towards head-marking – instead of final position marking – for cases, plural markers, and enclitics. Thus, she finds (4c) to be possible, but not very frequent or accepted by many speakers.

This shift towards head-marking seems to be in line with universal trends of *headward migration* (Nichols, 1986), which states that if any type of affixal morphology moves, it will go from the dependent to the head and not viceversa. This follows from the principle that dependents (or parts of them) become head affixes (Nichols, 1986). Nichols also states that head-marking patterns appear to be favored and universally preferred. Purépecha is catalogued as a dependent-marking language, and Spanish as a variable language that can be head-marked, dependent-marked, marked on both the head and the dependent (i.e., double marking), or neither on the head or the dependent (Dryer & Haspelmath, 2013). It is beyond the scope of the present study to investigate the shift towards head-marking in Purépecha, but future studies should address this topic.

Verbs in Examples (4a–c) above are not marked for third person plural, although they can be (see Examples 5–6). Moreover, *-icha* obligatorily attaches to count nouns (5), but is optional with count-mass nouns (6).

- (5) *Tsíkat (-icha) t'irhe-h-ti=ksĩ=ia
 hen-PL eat-PFV-3IND=3PL=ADV
 'The hens have already eaten'
- (6) Ichúht(-icha) karhí-h-ti=ksĩ
 tortilla-PL dry-PFV-3IND=3PL
 'The tortillas dried out'

With respect to verbal inflection, Purépecha distinguishes between first and second person (marked by the suffix *-ka*) and third person (marked by the suffix *-ti*) in the indicative mood. These suffixes do not possess number distinction, which is fulfilled by pronouns and clitics, and is not obligatorily marked on verbs: Person and number have separate markers in Purépecha. Additionally, *-ka/-ti* endings

are neutralized in subordinate constructions, where the suffix for all grammatical persons is *-ka* (Villavicencio, 2006).

In contrast, standard Spanish marks number categorically throughout the NP: The head and its determiner and/or adjective are marked, as well as the object pronoun and its referent. Spanish distinguishes between person, and number is obligatorily marked on verbs. These number marking mechanisms must be acquired by L2 learners of Spanish.

1.3.2 *The mass/count distinction in Purépecha*

Purépecha, according to Vázquez-Rojas (2012, Chapter 2), distinguishes three classes of nouns: mass nouns, such as *itsi* ‘water’, which denote a set of individuals that does not contain atomic entities (they can be accumulated as well as divided); count nouns, such as *anátapu* ‘tree’, which constitute a set of atomic individuals; and count-mass nouns, a class that includes atomic units in its denotation (just like count nouns), but which is like mass nouns in being cumulative, like *narásha* ‘orange’, *kupánta* ‘avocado’ and *shaníni* ‘corn cob’.

In Purépecha, the plural marker *-icha* always appears with count nouns, optionally appears with count-mass nouns, and never with mass nouns, while numerals can only co-occur with count nouns and count-mass nouns, but never with mass nouns (Vázquez-Rojas, 2012).

1.4 Overview of number marking in contact varieties and SLA studies

1.4.1 *Number agreement within the NP*

Within SLA literature, White, Valenzuela, Kozłowska-Macgregor, and Leung (2004) show that in the acquisition of Spanish for French and English L1 speakers, number agreement in NPs is relatively unproblematic. Examples with incorrect number agreement show either no overt plural marking, or plural marking only appearing in first position, this usually being the determiner (D).

In regard to contact varieties, lack of number agreement within the NP is attested in Uruguayan Portuguese (UP), where the plural marker */-s/* appears only on the first element of the NP, as in *as casa*Ø ‘the houses’ (Carvalho, 2006). This same situation takes place in Afro-Choteño Spanish, where the plural marker */-s/* occurs only once, almost always in first position: *los doctor* ‘the doctors’ (Lipski, 2010). In Afro-Bolivian Spanish all nouns and adjectives remain invariant for number, and only when the plural definite article *lu* appears is there any overt plural marking: Ø *perro ta flojo* [los perros están flojos] ‘dogs are worthless’; *lu persona mayó* [las personas mayores] ‘the older people’ (Lipski, 2010), where, again, plural is only marked on the first element of the NP.

Spanish in contact with Quechua differs in its number marking mechanisms from the examples above, because the last element of the NP can sometimes be the only one number-marked: *se juntan bastante hombres* [se juntan bastantes hombres] ‘many men get together’ (Escobar, 2000). Escobar explains that this example and similar ones are due to the fact that these expressions already have the concept of plurality within their meaning, because of their quantitative modifiers (i.e., *bastante*).

In sum, non-standard number marking in UP, Afro-Choteño Spanish and Afro-Bolivian Spanish (but not Spanish in contact with Quechua) show a tendency to mark plural only once, almost always in first position. This is in line with Poplack’s (1980) proposal that “the absence of a marker on the segment preceding the token in question favors deletion on that token, whereas presence of an immediately preceding marker favors retention of marker on that token” (p. 377).

1.4.2 *Subject-verb agreement*

Traditionally, agreement has been treated as an essentially syntactic phenomenon (Corbett, 1997), but some researchers have challenged this view: There is a growing body on evidence that semantic factors may indeed play a role in agreement. A series of studies by Vigliocco and colleagues (Vigliocco, Butterworth, & Semenza, 1995; Vigliocco, Butterworth, & Garrett, 1996; Vigliocco, Hartsuiker, Jarema, & Kolk, 1996) examined distributive noun phrases such as *the label on the bottles*, where the semantics of the phrase implies the existence of multiple labels. These experiments were conducted in Italian, Spanish, Dutch and French, and all showed that after distributive phrases, more plural verbs were produced than after non-distributive phrases. Likewise, Bock, Nicol, & Cutting (1999) found effects of another semantic factor, collectivity, on subject – verb agreement. In their study, collective head nouns such as *committee*, followed by a plural noun in the post-modifying phrase, elicited 60% plural verbs, whereas for ordinary singular head nouns, also containing a plural noun in the post-modifying phrase, this rate was 10%.

In SLA studies, third person singular verb conjugation appears to be the default form in the production of L2 Italian speech of English L1 speakers (Rodgers, 2011), and of L2 Spanish speech of English L1 speakers (Bruhn de Garavito, 2003; McCarthy, 2005).

In regard to contact varieties, Escobar (2000) shows that in Spanish in contact with Quechua, most lack of agreement happens with the adjective in attributive predications, and she explains this phenomenon as having to do with distance: She notes that in acquisition studies, the more distance between the head and its modifier, the more probability that agreement does not happen until later in the acquisition process.

2. The present study

2.1 Theoretical framework

This paper follows Thomason's (2001) proposals on language contact and change. The first social predictor Thomason mentions is intensity of contact, where more intensity of contact means a greater degree and breadth of interference. She also posits that the subordinate group will adopt features from the socioeconomic dominant group. In the specific case of the present study, Spanish is and has historically been the language of the socioeconomic dominant group, as Spaniards conquered the Purépecha region, and the Mexican territory at large, in the sixteenth century, with Mexico being a Spanish colony for more than 300 years (16th–19th centuries). Purépecha speakers historically had to learn Spanish, and sometimes still have to do so today, as an L2, and the imperfect or incomplete learning of the L2 is a route to interference: According to Thomason (p. 74), this would involve a shifting process from one speaker group to another group's language, where the shifting population can carry over some features of their native language into their version of the target language (TL).

Thomason (2001) states, "the crucial prediction about shift-induced interference is that, unlike borrowing, it does not start with the lexicon" but with phonology and syntax (p. 75). She posits that the three main linguistic factors affecting contact-induced change are: (a) universal markedness, where marked features in the TL are less likely to appear in the learners' version of the TL, or TL₂; (b) the degree to which features are integrated into the linguistic system, since deeply embedded features in elaborate interlocking structures in the source language (SL) are less likely to be transferred to the TL; and (c) typological distance between the SL and the TL – highly embedded and/or marked features can be easily exchanged between typologically similar systems. The probability that shift-induced interference will become fixed in the TL, Thomason argues, depends on the relative sizes of the two speaker groups: if the shifting group is larger than the target language group, then there is a greater chance that the shifters' interference features will become fixed in the TL.

2.2 Hypotheses

The TL in the present study, Spanish, is typologically different from the SL, Purépecha, and thus it is more difficult to find TL-SL correspondences. Number marking mechanisms in both languages are different, and consequently, it is expected that in the shift process speakers carry the SL structural features into the

TL. In the present study, instances of non-standard Spanish utterances by informants are considered opportunities to explore possible interference from their L1, Purépecha. The morphosyntactic traits analyzed in the present paper are number marking and number agreement.

I predict that there might be lack of number agreement within the NP, between the subject and the verb, and between the noun and the predicative adjective in the informants' Spanish production due to their L1 influence. Within the NP, plurals in non-standard utterances, if marked, will be done so at the end of said NP. Some variation might be found due to the current shift towards head-marking. With respect to verbal inflection, Purépecha distinguishes between person, yet number is not obligatorily marked on verbs, so it is expected that Spanish verbs will not be necessarily marked for plural. Deviations from the norm in regards to nominal predication have been attested in contact varieties (Escobar, 2000; Villavicencio, 2006) and therefore, I predict that there might be lack of number agreement between the noun and its predicative adjective.

The probability that shift-induced interference will become fixed in the TL depends on the relative sizes of the two speaker groups and is beyond the scope of the present paper: Further studies can be carried out to investigate this topic.

2.3 The informants

Informants in the current study were selected because of the homogeneity of their backgrounds; they come from the same community of practice.⁴ All five informants, four males and one female, were between 30 and 40 years old at the time of the interview, and they were born and raised in the Sierra region, in Cherán Atzicuirín (also known as Cheranástico), Michoacán. They live in the suburbs of Chicago, IL, where many Michoacanos have emigrated (López Castro, 2003). Purépecha is their native language, and they all learned Spanish as a second language in school at a young age, which would have made them child second language (cL2) learners at the time: Their Spanish variety nowadays can be understood to be a contact variety or native system (Mufwene, 2010).

Regarding their knowledge of English, one participant claims not to know how to speak any English, three say they know "a little bit," and the remaining one says he speaks it "at around 60% [of fluency]." All informants speak Purépecha and Spanish at home, had been living in the United States for 6 to 22 years at the time of the

4. The notion *community of practice*, developed by Lave and Wenger (1991), refers to a collection of people who engage on an ongoing basis in some common endeavor. This term was brought into sociolinguistics by Eckert and McConnell-Ginet (1992).

interview (all moved to the United States as adults, having only lived in Michoacán before that), and have a close-knit social network that consists of other immigrants from Michoacán, who speak Purépecha as well; together, they do activities such as performing Pirekua concerts,⁵ church activities (conducted in Purépecha), and social gatherings: This would translate into a dense social network that would provide a feature pool of structures that they use both in Purépecha and in Spanish, facilitating L1 interference, and commonly making use of structures that can work in both languages.

While Spanish speakers vastly outnumber Purépecha speakers in Michoacán, Mexico, the specific situation of Spanish in contact with Purépecha in Chicago may be different in the sense that the Purépecha being a very close-knit community, their L1 interference features may become fixed in Spanish. In the following paragraphs I will explain why the target language in the participants' specific case is Spanish and not English, which one might expect as they are living in the United States.

In 2005, the Mexican Institute of Statistics and Geography (INEGI) registered 15,853 fewer Purépecha speakers than in 2000. According to this government organization, Michoacán is the Mexican state with the second highest rate of immigration to the United States, with 83,642 people moving there in 2010, being outranked only by the state of Guanajuato (INEGI, 2010).

Given the large population of Michoacanos who live in Chicago, Farr (2006) mentions the "cohesiveness of Chicago and Michoacán" (p. 59), where Michoacanos living in Chicago will contribute economically to construction, parties, etc. in Michoacán, and will maintain multiple links on both sides of the border, going back and forth themselves, either to visit or to live for varying periods of their lives.

In Mexican neighborhoods in Chicago, according to Farr (2006), people still dress as if they were in western Mexico, children still use Mexican-style school uniforms, Mexican music is heard throughout, street vendors sell Mexican food, and Catholic religion and customs are ever-present. There are more than one million Mexicans in the Chicago area nowadays, and their social networks are based on interconnections among families, where in-group marriage is a frequent practice, interaction within the network is usual, and people turn to each other for information and help on specific problems and situations, providing a safety net for individuals in the community (Farr, 2006).

Farr (2006) describes the community's work situation as one where Mexicans of both sexes prefer to work in factories and construction, being their own bosses.

5. Pirekuas are the traditional songs of Purépecha communities in Michoacán, interpreted by both men and women, showing a slow tempo. These songs include varied topics in its lyrics, such as historical events, social and political ideas, and love.

In regards to language, she states that Mexicans in Chicago speak both English and Spanish, believing that there is a “correct” way to talk in both languages, and mentions that there is no systematic work yet on how Chicago Spanish and/or English differ from the standard counterparts.

Data from five participants do not allow for generalizations regarding the Spanish of Purépecha adult speakers; however, this is a first treatment of the topic. To carry it out, I will comment on non-standard structures of Spanish that were produced by participants, and compare them to their Purépecha counterparts, in order to observe whether Spanish structures show any L1 interference from Purépecha.

2.4 Data collection methodology

Data were collected during the summer of 2014 by means of three sociolinguistic interviews in Chicago, IL. The data consist of a total of 166 entries, extracted from three interviews which total seventy minutes of audio combined: The first one was conducted with three of the informants and the interviewer (myself), and the second and third interviews were conducted individually with each of the remaining informants and the interviewer. The interviews were conducted by asking the informants about their favorite Mexican food, and after that, letting them talk about any topic of their liking and asking follow-up questions, in line with the principle of Tangential Shift (Labov, 1984), as an attempt to reduce the Observer’s Paradox (Labov, 1972) as much as possible.

3. Results and discussion

Within the present study, informants tended to mark plural conventionally throughout the NP and between the noun and its predicative adjective, as well as to show subject-verb agreement (S/VA) in their Spanish production. However, all syntactic contexts show at least one instance of non-standard number marking. In line with results from Perdue (1995), substrate influence seems to play a role in the informants’ speech, but this influence does not happen consistently from one learner to another: none of the five informants produced non-standard number marking in all three categories, but did so in at least one of them (number agreement within NP, in S/VA, and between the N and its predicative adjective). Results will be explained in detail in the following subsections.

3.1 Number agreement within the NP

Data show that while informants tend to display number agreement throughout the NP ($N = 87$, 97%), there are some instances that show lack of number agreement ($N = 3$, 3%) and appear to mostly follow Purépecha plural marking patterns (see Table 1).

Table 1. Number of standard and non-standard utterances for number agreement within the NP

Participant	Non-standard utterances	Standard utterances	Total	% of non-standard utterances
F1	0	33	33	0.0%
M1	1	15	16	6.3%
M2	1	16	17	5.9%
M3	1	14	15	6.7%
M4	0	9	9	0.0%
Total	3	87	90	3.3%

Within non-standard utterances, 66% of these ($N = 2$) mark the plural at the end of the NP (Examples 7a–b), while the remaining 33% ($N = 1$) mark the plural on the determiner and noun but not on adjectives (Example 7c).

- (7) a. Aquí hay mucho, por la biblioteca-s.
 Here there.are.3PL much because ART.SG library-PL
 ‘Here there are many [books in Spanish], due to the libraries.’
 b. Extraña-a uno lo que es la tortilla-s.
 Miss-TV.PRS.3SG one ART REL be.PRS.3SG ART.SG tortilla-PL
 ‘One misses tortillas.’
 c. Yo di-ría que vengo de la-s raíz-es
 I say.COND.1SG REL come.PRS.1SG PREP ART-PL root-PL
 tarasca o michoacana.
 tarascan.SG or michoacano.SG
 ‘I would say that I come from Tarascan or Michoacano roots.’

By comparing the percentage of informants’ non-standard utterances (an average of 3.3% per speaker, $N = 3$) with the Spanish control group in White et al.’s (2004) study regarding number agreement, it can be gauged that the latter group had a rate of non-standard utterances of 0.159% for D-N sequences and of 0.311% for D-N-Adj sequences, both being considerably smaller than the former group’s percentage. Furthermore, White et al. show that in the acquisition of Spanish for French and English L1 speakers, number agreement in NPs is relatively unproblematic.

Non-standard number marking in the acquisition of Spanish as an L2 for French and English L1 speakers, as well as in contact varieties such as UP, Afro-Choteño Spanish and Afro-Bolivian Spanish, all show a tendency to mark plural only once, almost always in first position. However, the majority of examples of non-standard number agreement within the NP in the present study (7a–b) show a contrary tendency, so that the hypothesis that plural marking within the NP would be marked at the end of said NP holds with one exception, Example (7c).

From a syntactic perspective, all Examples (7a–c) show head-marking: In (7a–b), the head noun is also at the end of the phrase, so that number marking is identical to the Purépecha strategy of marking plural at the end of the phrase. Example (7c) also shows head-marking, but the head noun is not at the end of the phrase (the adjectives are). There is a current shift towards head-marking in Purépecha (Chamoreau, personal communication, June 2014) and it is a possibility that this Purépecha syntactic structure influenced the informants' Spanish.

From a semantic perspective, non-standard number marking appeared in one count noun (*bibliotecas* 'libraries'), where the plural suffix *-icha* is obligatory in Purépecha, and two count-mass nouns (*tortillas* 'tortillas' and *raíces* 'roots') where the plural suffix is optional in Purépecha, and where the meaning of the two nouns can refer to a generic concept.

As had been stated in a previous section, Escobar (2000) observes that Spanish in contact with Quechua shows examples in which the last element of the NP is the only one that is plural-marked, due to the fact that these expressions already have the concept of plurality within their meaning (e.g., *se juntan bastante hombres* [se juntan bastantes hombres] 'many men get together'). This semantic factor plays no role in (7a–b), as those NPs do not show any concept of plurality within their meaning.

3.2 Subject-verb agreement

Informants showed plural subject-verb agreement in 96% of tokens ($N = 71$). However, an average of 4.1% of instances per speaker only display plural marking for the subject (see Table 2).

Because verbs in Purépecha are not usually number marked, interference could be causing an identical verbal structure in Spanish verbal inflection in the production of the participants' speech. The hypothesis holds, as only the subject (and not the verb) was marked for plural in all non-standard utterances (100%, $N = 3$), as shown in Examples (8a–c).

Table 2. Number of standard and non-standard utterances for subject-verb agreement

Participant	Non-standard utterances	Standard utterances	Total	% of non-standard utterances
F1	1	25	26	3.8%
M1	2	12	14	14.3%
M2	0	11	11	0.0%
M3	0	19	19	0.0%
M4	0	4	4	0.0%
Total	3	71	74	4.1%

- (8) a. Prob-a-ndo aunque sea poquito ya se te
try-TV-PROG although be.SBJV.3SG a.little already REFL PRON
quit-a tanto **la-s** **gana-s.**
remove.TV.PRS.3SG so.much the-PL disposition-PL
'By tasting even a little bit, well, the craving goes away.'
- b. Y ahor-ita **est-á** **de moda** **unos enagua-s** que
And now-DIM be-TV.PRS.3SG of fashion some petticoat-PL REL
sal-e-n flor-es arriba.
come.out-TV-PRS.3PL flower-PL up
'And now, petticoats with a flower design on the top part are in fashion.'
- c. Context: Interviewer asks informant if he likes American or Mexican food better. Informant answers that he misses Mexican food. *Extraña uno allá*
'One misses [food from] there', he says, right before stating:
Extrañ-a uno lo que es la **tortilla-s.**
Miss-TV.PRS.3SG one ART REL be.PRS.3SG ART.SG tortilla-PL
'One misses tortillas.'

Examples (8a–b) suggest that agreement could be affected by semantic factors, and specifically, by semantic roles, which is in line with the studies done by Vigliocco and colleagues (Vigliocco, Butterworth, & Semenza, 1995; Vigliocco, Butterworth, & Garrett, 1996; Vigliocco, Hartsuiker, Jarema, & Kolk, 1996), as well as with Bock et al. (1999). In (8a), the animate dative experiencer (*te*) is placed in canonical subject position, before the verb, while the inanimate theme and grammatical subject (*las ganas*) is postposed to the verb in canonical object position. It seems that the informant is making the verb agree with the dative experiencer, and could be interpreting the grammatical subject, *las ganas*, as the object. Because *las ganas* is only plural in form, it seems to be showing semantic, not syntactic, agreement (Corbett, 1979). A similar occurrence takes place in (8b), where the inanimate subject of the intransitive verbal periphrasis *estar de moda* is postposed to the verb, in canonical object position, with the semantic role of theme. The informant could understand

phrase (8b) as an impersonal sentence because it lacks an agent or experiencer, and consequently, conjugate the verb in third person singular form. Again, *unos enaguas* is only plural in form, but singular in meaning, so it shows semantic agreement with the verb (Corbett, 1979). The fact that there is no gender agreement between the noun *enaguas* and its determiner *unos* is outside the scope of the present paper but should be addressed in future studies.

In Example (8c), the inanimate subject of the subordinate clause (*tortillas*) does not agree in number with the copula *ser* ‘to be’, which is conjugated in third person singular. In (8c), again an inanimate subject follows the verb: A pattern can be surmised, as all non-standard utterances in regards to subject-verb agreement show the subject postposed to the verb. Furthermore, all non-standard subjects are inanimate, non-agentive nouns. Tortillas are, apart from delicious, count-mass nouns, and can refer to a generic concept, not to a plural specific.

Additionally, SLA studies show that third person singular verb conjugation appears to be the default form in the production of L2 Italian speech of English L1 speakers (Rodgers, 2011), and of L2 Spanish speech of English L1 speakers (Bruhn de Garavito, 2003; McCarthy, 2005). It is possible that Examples (8a–d) follow this same L2 default pattern.

3.3 Agreement in predication

Within the data, there are fifteen attributive predication examples, and only one (6.6%) shows non-standard number marking. In Example (9), the copula *ser* is conjugated for third person plural but the attributive predication is singular, meaning that there is no agreement between the noun and the predicative adjective. This utterance was produced by informant M4, the only participant who showed standard number marking both within NPs and between the subject and the verb.

- (9) Pero **la-s** **carne-s** **son** **chiqu-ita**.
 But ART-PL meat-PL be.PRS.3PL small-DIM.SG
 ‘But the [pieces of] meat are small.’

This can be explained as a distance phenomenon (Escobar, 2000). In Spanish in contact with Quechua, Escobar notes that most lack of agreement happens with the adjective in attributive predications: In acquisition studies, the more distance between the head and its modifier, the more probability that agreement does not take place until later in the acquisition process. Also, *carnes* ‘meats’ is a count-mass noun, which in Purépecha is not obligatorily marked, and can refer to a generic concept.

Villavicencio (2006) mentions similar transferences from Purépecha to Spanish, and notes that while it is rare to see deviations from the norm in regards to nominal predication, there are some instances of it. She provides the example *las actividades es primaria y secuntaria[sic] y terciaria* ‘the activities is [intended: are] primary, secondary and tertiary’, but does not offer a possible explanation for this phenomenon.

4. Conclusions and future directions

The low frequency with which deviations from standard Spanish number marking are found in the data points to a relatively high bilingualism among the informants. However, non-standard examples could indicate shift-induced interference from the substratum language, Purépecha (Thomason, 2001). Moreover, substrate influence seems to play a role in the informants’ speech, but this influence does not happen consistently from one learner to another, similarly to what has been observed in naturalistic SLA (Perdue, 1995): None of the five informants in the present study produced non-standard number marking in all three categories that were being studied, but did so in at least one of them.

Informants spend much of their leisure time together, and this makes them a dense social network that would provide a feature pool of structures that they use both in Purépecha and in Spanish, facilitating substratum interference, and commonly making use of structures that can work in both languages.

Non-standard number marking and agreement within the data show that when there is lack of number agreement within the NP, the general tendency is for the plural marker to be suffixed on the end of the NP, as in Purépecha, or on the head, in line with the current shift towards Purépecha head-marking. Two out of the three nouns that showed non-standard number marking were count-mass nouns, i.e., their reading could be generic. Results in this area do not match what has been observed in other contact varieties, where the plural marker /-s/ tends to appear only on the first element of the NP.

With respect to verbal inflection, all non-standard utterances show inanimate, non-agentive subjects in non-canonical position, i.e., postposed to the verb. Besides, most non-standard number marking in the examples provided either include count-mass nouns, which accept a generic reading, and are not obligatorily marked for number in Purépecha, or syntactically plural nouns that have a singular meaning. This follows features found in other languages, such as Italian, Spanish, Dutch and French, where semantics precedes form (Corbett, 1979; Vigliocco et al., 1995, 1996; Bock et al., 1999).

The present investigation does not discuss the similarities between the variety under study and the variety spoken by speakers with a similar sociolinguistic

background in Michoacán. Future studies should address the need to study the larger speech community in Michoacán in order to observe if these patterns are found more widely, because generalizing results about individual speakers to population-level hypotheses is not advisable: As Mufwene (2010) states, transfer at the individual level does not entail substrate influence at the communal level.

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Mothers' use of F0 after the first year of life in American English and Peninsular Spanish

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Infant-directed speech has been shown to be different from adult-directed speech in that it is generally characterized by short, acoustically exaggerated (e.g. higher F0 peaks, wider F0 range) utterances (Fernald et al., 1989; Kitamura et al., 2001, *inter alia*). Thus, at some point parents begin to change these acoustic parameters once the child is no longer an infant. The present study uses longitudinal data to compare F0 use in two language varieties, American English (AE) and Peninsular Spanish (PS), in an effort to understand how two prosodic aspects (mean F0 and F0 range) change after a child's first birthday. Specifically, we asked how these parameters might change as a function of the child's linguistic development, here defined as the children's mean length of utterance (MLU). Results show that mothers show changes in their use of both of these parameters after the second birthday, with turning points between 28 and 31 months. MLU was not found to be a significant predictor for either language. Additionally, despite differences in how AE and PS exploit F0 for expressing focus, both AE- and PS-speaking mothers were shown to use more narrow F0 range for utterances not containing a focused element sometime after 30 months. Implications for language acquisition are discussed.

Keywords: mean F0, F0 range, child-directed speech, infant-directed speech, Peninsular Spanish, American English

1. Introduction

Infant-directed speech (IDS) is a unique speech style that has been described in terms of how it differs from adult-directed speech (ADS). IDS is generally characterized as syntactically and lexically simplified speech that exhibits short, simple utterances, frequent repetition, words no longer than 2 syllables and frequent diminutives or words of affection. It is also known to be acoustically exaggerated

relative to ADS, with increased average fundamental frequency (mean F0) and F0 range, prolonged pauses, final-syllable lengthening, and a slower rate of articulation overall (Fernald, Taeschner, Dunn, Papousek, & de Boysson-Bardies, 1989; Kitamura, Thanavishuth, Burham, & Luksaneeyanawin, 2001; Stern, Spieker, & MacKain, 1982; *inter alia*). Among the major roles attributed to IDS, it has been claimed that it functions to attract and maintain the infant's attention as well as regulate their affective behavior (Fernald & Simon, 1984; Papousek, Bornstein, Nuzzo, Papousek, & Symmes, 1990; Stern, Spieker, & MacKain, 1982). Elsewhere, IDS has been shown to communicate speaker affect and facilitate social interaction (Fernald, 1989, 1992; Werker & McLeod, 1989). Still others have claimed that IDS partially facilitates language acquisition (Fernald & Mazzie, 1991; Gleitman, Gleitman, Landau, & Wanner, 1988; Hirsh-Pasek, Kemler Nelson, Jusczyk, Wright Cassidy, Druss, & Kennedy, 1987; Kemler Nelson, Hirsh-Pasek, Jusczyk, & Wright Cassidy, 1989) and aids in the process of socialization, since it enables the infant to learn the basic protocols of conversation and social interaction (Snow, 1977, 1989). Lastly, IDS has been shown to help infants in distinguishing their mothers' communicative intent more clearly (Saint-Georges et al., 2013).

The present study addresses some of the gaps in previous scholarship on the transition from IDS to ADS via child-directed speech (CDS), that is, speech directed to children when they are no longer considered infants. In this study, we were interested in how aspects of a mother's use of prosody, namely F0, change after a child's first birthday. We conducted a longitudinal analysis of F0 measures in the speech of mothers to their daughters, making cross-linguistic comparisons between American English (henceforth AE) and Peninsular Spanish (henceforth PS).

A number of studies have examined how the production of pitch is developed over time in maternal speech to preverbal children. Stern et al. (1983) took measurements of F0 in mothers' speech directed to newborn babies (just after birth: 2 to 6 days) and also at 4, 12, and 24 months. They found that the highest mean F0 was produced by mothers when their infants were 4-months old. McRoberts and Best (1997) as well as Kitamura and Burnham (2003) showed similar results. The former took measurements at 3, 7, 10, 15, and 17 months (thus going beyond the first year of life) and found that adult caregivers' highest mean F0 was reached at 7 months. The results of the latter study, which did not go beyond the first year (F0 measurements were taken at months 3, 6, 9, and 12), showed that the highest mean F0 occurred at 6 and 12 months. The majority of the aforementioned studies have focused on changes in mean F0 throughout the first year of the infant's life. There is, however, a dearth of studies that capture a detailed image of mothers' use of F0 might continue to change after the first year.

In addition to the age of the child, other factors such as linguistic development and gender have also been shown to influence caretakers' use of prosody in IDS. Ko (2012) explored changes in adult speech rate over time. The children included in this study were between 5 and 59 months old. The author found that these changes were correlated with children's Mean Length of Utterance (MLU). That is, as the child produced longer utterances, their parents increased their speech rates. The gender of the child has also been found to have an effect on parents' prosodic modifications, though this seems to be culture-specific. Australian mothers, for example, when speaking to their children at birth, 3, 6, 9 and 12 months, tended to use higher mean F0 (as well as wider pitch range) with their daughters, while Thai mothers (at identical time points) used higher mean F0 with their sons (Kitamura et al., 2001; Kitamura & Burnham, 2003).

Finally, the specific language the child is being exposed to is also known to play a role in how F0 is used in linguistic input. Cross-linguistic differences were also shown by Fernald et al. (1989) such that AE-speaking parents, when speaking to children between 10 and 14 months, exhibited the most extreme pitch modifications and highest mean fundamental frequency when compared to parallel groups of speakers of British English, French, Italian, German, and Japanese. However, as Grieser and Kuhl (1988) observe when comparing mothers' speech to their 2-month old children in Mandarin (a tone language), English and German (intonation languages), there are many characteristics of IDS that seem to be universal.

The body of research investigating IDS or CDS in Spanish is quite limited. Blount and Padgug (1976) concluded that Latin American Spanish-speaking parents (children aged 8–13 months and 18–22 months) exhibit a less “exaggerated” intonation than AE-speaking parents (children aged 9–18 months), though these observations are not supported by acoustic analysis, and thus in principle could have included differences in F0 max, mean F0 or other measures that are known to be associated with IDS. Other studies (Armstrong, 2016; Thorson, Borràs-Comes, Crespo-Sendra, Vanrell, & Prieto, 2014) examine the intonational characteristics of Spanish in CDS (PS and Puerto Rican Spanish, respectively), comparing them to child speech, from a phonological perspective, within the Autosegmental Metrical framework (Beckman & Pierrehumbert, 1986; Jun, 2005; Pierrehumbert, 1980). Of these studies, only Armstrong (2016) divided the data up into stages to observe longitudinal differences in when three specific polar question contours were observed in Puerto Rican Spanish. She found that parents and caretakers used all three of these contours from the beginning of the corpus, which began at 17 months of age. However, these intonational studies focus mainly on form-meaning mapping (i.e. nuclear configurations and their semantic/pragmatic meanings) rather than focusing on how phonetic cues might change over time.

2. Present study

In spite of the studies summarized above, relatively little is known about the extent to which the same prosodic modifications that have been investigated in the literature occur in the speech of caretakers after the child's first birthday. In the present study, we compare caretaker speech in two intonation languages: American English and Peninsular Spanish. In order to control for any potential effects of gender on caretaker speech, we limited the study to mothers and their female children.

AE and PS have in common that they are both intonation languages (i.e. they use F0 to make distinctions at the post-lexical level), and yet they display differences with respect to prosody. In ADS, a number of studies have shown that English speakers use a wider pitch range than Spanish speakers (Backman 1987; Estebas-Vilaplana 2014). Additionally, English and Spanish present differences in the frequency with which they use prosodic strategies to mark certain types of grammatical information. It has been claimed that AE and PS belong to two different groups based on their speakers' use of prosody to highlight new information in discourse (Vallduví & Engdahl, 1996). English is considered to be a *plastic language*, due to the fact that its speakers may modify a prosodic contour in order to guarantee that a focused constituent receives the main prosodic prominence as manifested by the use of an expanded pitch range, higher peaks, longer duration and higher intensity (Cruttenden, 1986; Gussenhoven, 2004; Ladd, 1996). Among these diverse cues, Mahrt and Cole (2014) showed that F0 was the most relevant in the perception of focal prominence in American English, even though previous studies such as Kochanski et al. (2005) have provided evidence that does not support such a claim for other varieties of English. Spanish, on the other hand, has been described as a *non-plastic language* – that is, a language with a more fixed prosodic structure that makes use of syntactic strategies such as changes in word order to place focused constituents in a position of higher prosodic prominence. Even though the use of some prosodic strategies – namely alignment and duration – has been reported for Spanish (Vanrell, Stella, Fivela, & Prieto, 2013), it is safe to say that these two languages differ in the extent to which they rely on prosody for focus-marking (Domínguez, 2004; Zubizarreta, 1998). To our knowledge, the only study comparing the prosodic realization of focus in these two languages is García-Lecumberri (1995) in which the author compared British English and Northern-Peninsular Spanish. In this study, English speakers were found to use a wider pitch range than Spanish speakers to convey focus. Nonetheless, we are not aware of any studies that have compared the realization of focus in AE and PS, with the exception of Ortega-Llebaria and Colantoni (2014), a study on the L2 acquisition of the prosodic realization of focus in English by Spanish and Mandarin speakers. The results suggest that Spanish speakers learning English produce a much narrower pitch range

than native speakers as a result of transfer from their L1, where pitch scaling is not exploited for this purpose. Yu, Khan, and Sundara (2014) found an increased use of pitch accents for focus marking in AE IDS, while for Bengali IDS, they found an increase in complex boundary tones associated with focus marking. Thus IDS is known to contain more intonational focus-marking than ADS. Also of importance to our study is the fact that language-specific differences play out in IDS.

In addition to these differences between AE and PS, we also surmised that differences in mean F0 might be apparent, given the cross-linguistic differences found for mean F0 in Fernald et al. (1989), as well as possible prosodic differences that could have been at play when Blount and Padgug (1976) compared the speech of Latin American Spanish-speaking parents to that of AE-speaking parents.

2.1 Research questions and hypotheses

Given the findings we have just mentioned, we hypothesized that Spanish speakers would make use of a much narrower pitch range overall, as well as in utterances with intonational focus. While we did not focus on phonological differences in intonation in our study, we find it important to consider that the way in which prosody is exploited in a given language, namely the extent to which it is used for focus-marking, could affect variables such as mean F0 and F0 range; and thus, we consider this in exploring differences in the speech of AE-speaking mothers and PS-speaking mothers when talking to their female children. We present our research questions below:

1. This question was concerned with the nature of the prosodic characteristics of mothers' speech after their infant's first year of life. We predicted that changes in prosodic modification would be gradient rather than abrupt, and that mothers would vary their use of mean F0 and F0 range as the child aged. That is, we expected to find a progressively lower mean F0 and progressively narrower pitch range as the children got older. We also predicted that such changes might be predicted by MLU, as was found for the case of speech rate in Ko (2012).
2. We also considered the differences in mean F0 that have been specifically discussed or alluded to in the literature (Blount & Padgug, 1976; Fernald et al., 1989), predicting that AE-speaking mothers would produce higher mean F0 and a wider F0 range when compared to PS-speaking mothers.
3. Finally, since AE relies more on intonational marking of focus, we explored the possibility that AE-speaking mothers might differentiate utterances with focus versus those without focus to a greater extent when compared to PS-speaking mothers.

3. Methods

3.1 Corpus and subjects

The empirical basis for this study is a longitudinal corpus consisting of the transcribed speech of two mothers of AE and two mothers of PS-acquiring female children between 11 and 37 months old. The AE-speaking children were Naima (Providence, DOB March 14, 2001) and Lily (Providence, DOB: January 13, 2001). The PS-speaking children were Irene (Asturias, DOB: August 23, 1997) and María (Madrid, DOB: November, 1987). Previous studies show that with preverbal infants, mothers communicate differently depending on whether the baby is a boy or a girl. Consequently, we considered only female participants (Kitamura & Burnham 2003). The AE data come from the Providence corpus of Demuth, Culberson, & Alter (2006) and the PS data from the Llinàs-Grau (2000) and López-Ornat corpora (1994). All of these corpora are available on the CHILDES (MacWhinney 2000) website, a child language component of the TalkBank system designed for sharing and studying conversational interactions.

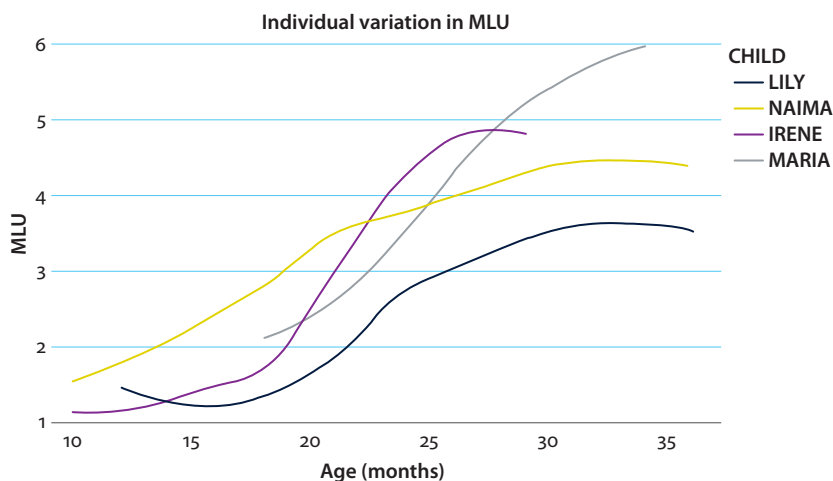
Table 1 contains a summary of the data analyzed in the present study. At the time of the recordings, Irene was a monolingual speaker of PS from Asturias, a Northern region of Spain.¹ She was recorded 1–2 times per month in 15-minute spontaneous interactions with her parents (both monolingual speakers of PS) from 11 to 30 months. María was a monolingual speaker of PS from Madrid. She was videotaped in 30-minute spontaneous interactions with her parents at approximately two-week intervals from 19–35 months. Lily and Naima, both monolingual speakers of AE, were recorded in 1-hour spontaneous interactions with their mothers every 2 weeks beginning at the onset of lexical production. Naima was recorded from 11 to 37 months while Lily was recorded from 13 to 37 (See *Appendix A* for specific information about the number of utterances per session, child, and language, as well as the modality of utterance, presence/absence of focus, and direction of the toneme). Younger or older siblings were not present during recording sessions. Thus any potential influence they might have had on the mothers' use of prosody in their CDS may be discounted. Table 1 summarizes the ages, sessions and language for each child in our study.

1. We point out that there are known intonational differences in terms of the Spanish spoken in Asturias when compared to other varieties of Spanish spoken in Spain (López-Bobo & Cuevas-Alonso, 2010). While dialectal variation in American English is less studied, we note that the English spoken in Providence could certainly differ from other American English varieties as well.

Table 1. Summary of the American English and Peninsular Spanish data: Ages analyzed and number of sessions

NAME	AGE (MONTHS)	#SESSIONS	LANGUAGE
Irene	11–30	8	PENINSULAR SPANISH
María	19–35	9	PENINSULAR SPANISH
Naima	11–37	10	AMERICAN ENGLISH
Lily	13–37	9	AMERICAN ENGLISH
TOTAL		38	

Children's linguistic development follows a sequential order; as they mature, the length of their utterances tends to increase. We calculated the MLU for each child using the 'mlu' command in CLAN (MacWhinney, 2000). Figure 1 shows the increase in MLU for each child (Lily, Naima, Irene, and María). It is important to note that not all lines in the graph start and finish at the same time points due to a lack of corresponding recordings for all subjects at each time point. More specifically, at 35 months there are data for Naima, María and Lily but not for Irene. Additionally, María's data start at 19 months and thus later than those of the other children.

**Figure 1.** Measures of mean length of utterance for each child over time

The graph in Figure 1 shows that despite a moderate degree of inter-child variation in MLU values over time, MLU increases with age for all children. This variation, as suggested by Prieto et al. (2011), might be due to the child's shifting level of talkativeness from one session to the next. During the first months until 22 months, Naima displays the highest MLU, reaching a value of 3. Irene, then, achieves a value of 4 at 24 months. After that point, María seems to exhibit the highest MLU values

through the end of the sessions considered for this study. Thus, despite the lack of corresponding recordings for all children at the same time point, we can conclude that, in general, MLU increases with age.

3.2 Coding and analysis

Audio files were extracted from the video recordings and annotated using *Praat* (Boersma & Weenink, 2015). For each participant, recordings were selected from every three months between 11 and 37 months. The first 50 infant-directed utterances in each recording that were consistent with our selection criteria were selected for analysis, for a total of 1,691 utterances: 952 utterances for American English and 739 utterances for PS (see Appendix A for a complete account of the number of utterances per session, child, and language, as well as sentence modality, presence/absence of focus, and F0 trajectory). Following Kitamura and Burnham (2003), who found that there are no differences based on what point in the recording the utterances are taken from, we made our selections without any special criteria in this regard. In our analysis, we included only those utterances that were free of external noise (background noise or intermingled voices) and of adequate quality for acoustic analysis, where F0 could clearly be identified on the pitch track. Measurements were not extracted when tracking errors were observed. For Fernald et al. (1989, p. 485), an “utterance was defined acoustically rather than linguistically, as a section of speech bounded by pauses greater than 300 msec.”; for this study, we used the ToBI criteria for a Break Index 4, indicating an intonational phrase boundary (IP), defined as a final boundary tone after the last phrasal tone (Beckman et al., 2005). The data were analyzed using the software for statistical analysis R Studio (R Core Team, 2014) and the package *lmerTest* (Bates, Maechler, Bolker, & Walker, 2014).

For each sampled utterance, annotations were done on tier 1 for orthographic transcription and on tier 2 for the maximum and minimum points in fundamental frequency (F0 min and F0 max). The annotations were made using *Praat*’s pitch track and the authors’ own auditory perception. When there were doubts about those annotations, the transcriber asked another author to check the consistency of labeling. See Figure 2 below for an example of annotations performed for this study. For each annotation, the following measurements were extracted:

a. Acoustic measurements

1. MEAN FUNDAMENTAL FREQUENCY: calculated in Hertz (Hz) and then transformed into semitones (st) to obtain normalized values.²

2. Nolan (2003) showed that a logarithmic scale, such as the one obtained with semitones, is the most appropriate scale.

- 2. F0-MAXIMUM: the highest F0-peak in the utterance; Hz were converted into st.
- 3. F0-MINIMUM: the lowest F0-value in the utterance; Hz were converted into st.
- 4. F0 RANGE: calculated by subtracting F0-minimum (in st) from F0-maximum (in st);
- b. Other measurements
 - 5. FOCUS PRESENCE: present vs. absent. This refers to the entire utterance thus “present” means that the utterance had a narrowly focused element (either with information or contrastive focus) at any point in the utterance; “absent”, on the other hand, means that there were no narrowly focused elements at any point in the utterance, which includes instances of broad focus. The previous discourse context was used to determine the presence of focus. Thus, contexts with narrow focus were those in which the mother was introducing new information or contrast (e.g. when an information gap was filled, when making a correction). There were four different transcribers and while no inter-transcriber reliability check was run to check the consistency of this labelling, whenever a transcriber was uncertain about how to label a given utterance, the uncertainty was discussed by all four labellers until they came to a consensus.

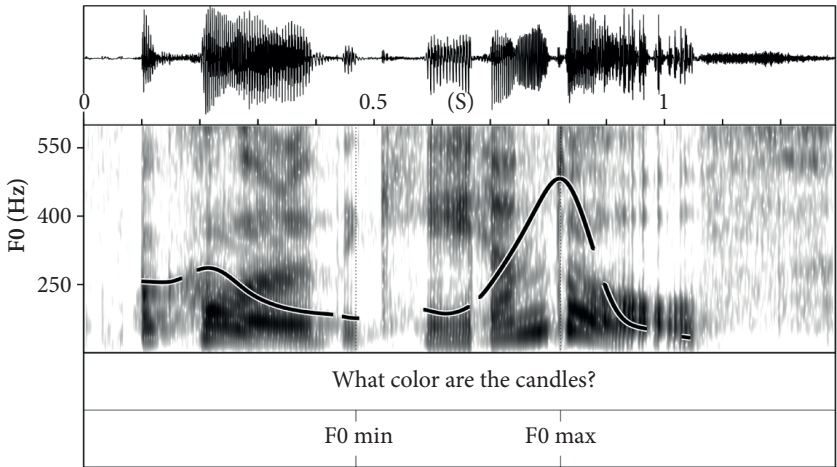


Figure 2. Waveform display, spectrogram, F0 contour, orthographic transcription, F0 max and F0 min of the utterance: *What color are the candles?* by Lily’s mother at 25 months

4. Results

4.1 Mean F0

In order to assess the role of our different variables in relationship to Mean F0, a mixed modal linear regression analysis was carried out using the lmerTest package in R (R Core Team, 2014). MOTHER was included as a random effect. We included LANGUAGE, AGE, MLU, FOCUS PRESENCE and their interactions as possible predictors. Models were compared using ANOVAs, and the best fit model included all of these factors. The best-fit model included only the factors AGE, MLU, LANGUAGE and FOCUS PRESENCE. No interactions were included in the best-fit model.

Table 2. Coefficients (Estimate, Standard Error, degrees of freedom, *t*-values and *p*-values) for predictors of normalized mean F0

	Estimate	SE	df	<i>t</i> -value	<i>p</i> -value
Intercept	15.45	0.47	11.50	32.97	<0.001
Age	−0.12	0.02	294.50	−4.60	<0.001
MLU	0.14	0.15	192.80	0.92	0.35
Language (Spanish)	−1.49	0.41	2.00	−3.61	0.07
Focus (Present)	0.04	0.26	1685.80	0.15	0.88

As can be seen in Table 2, age was the only significant predictor of mean F0. This result shows us that in our data, as age increased, mean F0 decreased. While there was no significant effect of language, there was a tendency such that mean F0 was lower for Spanish. Figure 3 shows boxplots for changes in mean F0 over time for

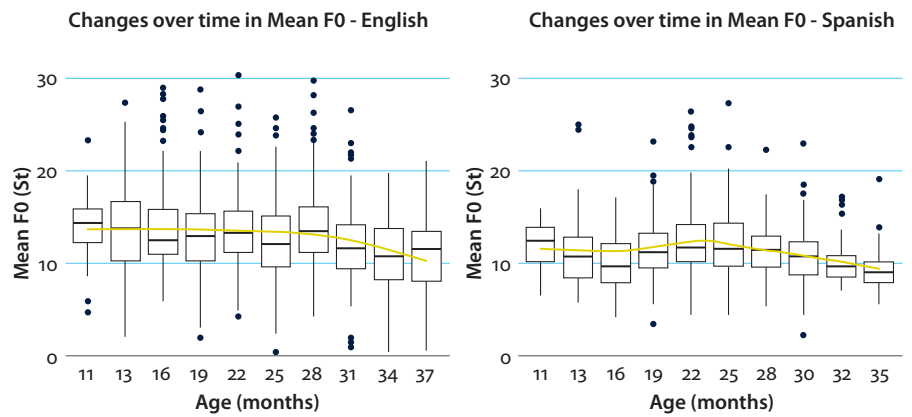


Figure 3. Boxplots showing changes in Mean F0 over time in English (left panel) and in Spanish (right panel) with regression lines

Spanish and English, with regression lines. The regression lines allow us to observe similar trends for each language – within the 22–25 months window, we start to see a decrease in mean F0 for both languages.

In order to better understand possible turning points in age, we created a Conditional Inference Tree using the *partykit* package in R (Hothorn & Zeileis, 2015). Conditional inference trees use recursive partitioning to evaluate whether an independent variable is a useful predictor of responses to the dependent variable. It should be noted that the inference tree is not as conservative as the model, since the variation for each mother was not factored out as a random factor, as was done in our mixed model linear regression. Since age was the only significant predictor in our model, we created the inference tree with mean F0 as the dependent variable, and age as a predictor. The conditional inference tree plot is presented in Figure 4.

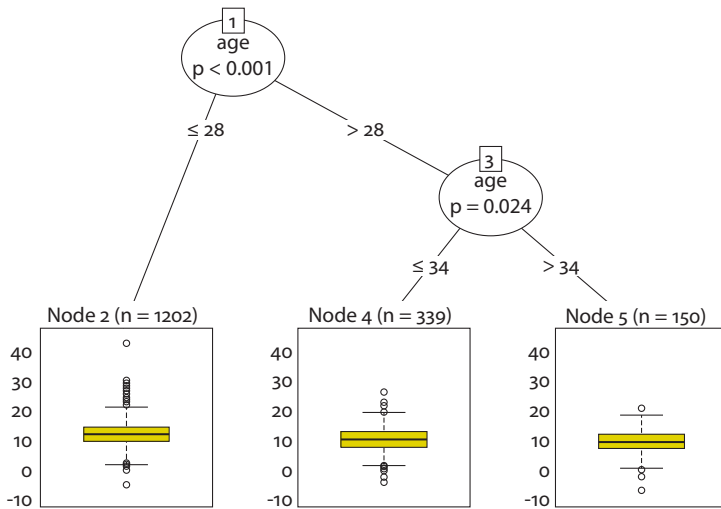


Figure 4. Conditional inference tree showing the relationship between predictors for mean F0 (normalized in semitones)

The results from the inference tree give us further insight into the observations made from Figure 3. We see a difference in mothers' mean F0 use such that significantly lower mean F0 is used with children when they are 28 months or younger compared to ages older than 28 months. The inference tree shows further age differences during this later stage, showing significantly higher mean F0 for utterances produced when children are 34 months of age or younger, versus when they are older than 34 months. Thus the conditional inference tree gives us more information about the falling regression lines we observed for each language in Figure 3.

Figures 5 and 6 below show examples of Spanish and English, respectively. The Spanish examples in Figure 5 show a *wh*-question produced before the child's first birthday, which shows a higher mean F0 (262 Hz or 12.55 st) than a similar utterance produced when the child is much older (222 Hz or 9.68 st). Similarly, the English examples (Figure 6) show how Naima's mother uses an overall higher F0 at the beginning of the corpus than at the end in two different declaratives. In the former utterance, the mean F0 is 264 Hz (12.67 st). In the latter utterance, the mean F0 is 201 Hz (7.94 st).

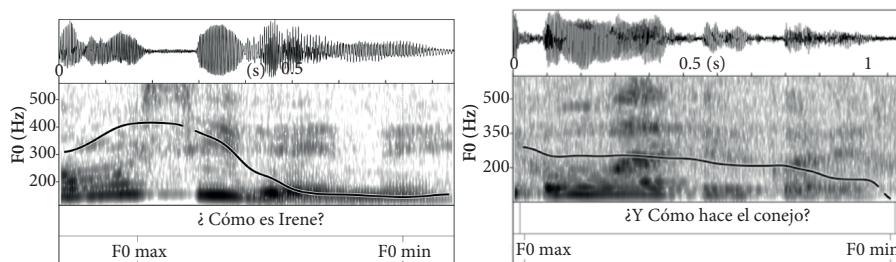


Figure 5. The *wh*-questions *¿Cómo es Irene?* ‘How is Irene?’ (left panel) and *¿Y cómo hace el conejo?* ‘What does the bunny do?’ (right panel) produced by Irene’s mother at 11 (left) and 30 months (right), respectively

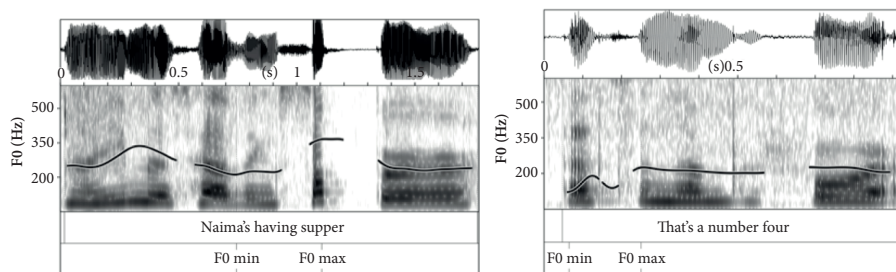


Figure 6. The utterances *Naima's having supper* (left panel) and *That's a number four* (right panel) as produced by Naima's mother at 11 months and 31 months respectively

4.2 F0 range

In order to assess the role of our different variables in relationship to F0 Range, a mixed model linear regression analysis was carried out using the *lmerTest* package in R (R Core Team, 2014). *MOTHER* was included as a random effect. We included *AGE*, *MLU*, *LANGUAGE*, and *FOCUS PRESENCE* as well as their interactions as fixed effects. Models were compared using ANOVAs. The best-fit model included *AGE*,

MLU, LANGUAGE, FOCUS PRESENCE, interaction between AGE and FOCUS PRESENCE, the interaction between AGE and LANGUAGE as well as the three-way interaction between AGE, LANGUAGE, and FOCUS PRESENCE. Of these, AGE, the interaction between AGE and FOCUS PRESENCE as well as the three-way interaction between AGE, LANGUAGE, and FOCUS PRESENCE were shown to be significant predictors of F0 range. Table 3 shows the results from the best fit model.

Table 3. Coefficients (Estimate, Standard Error, degrees of freedom, *t*-values and *p*-values) for predictors of normalized F0 range

	Estimate	SE	df	<i>t</i> -value	<i>p</i> -value
Intercept	15.98	2.65	2.20	6.02	<0.05
Age	0.04	0.04	1682.00	−3.49	<0.001
MLU	0.19	0.15	129.50	1.27	0.21
Language (Spanish)	−5.89	3.83	2.40	−1.53	0.24
Focus (Present)	1.87	1.17	1681.00	1.60	0.10
Age x Language (Spanish)	0.00	5.29	1682.00	1.79	0.07
Age x Focus (Present)	0.12	0.03	1681.00	2.46	<0.05
Age x Language(Spanish) x Focus (Present)	0.01	3.16	1681.00	−3.46	<0.001

Even though language was not found to be a significant predictor in the model, we can observe from the boxplots in Figure 7 that AE-speaking mothers did tend to use a wider and more varied F0 range. It is striking to note that mean F0 range begins to decrease at around the same time for both languages (28 months), as indicated by the regression lines.

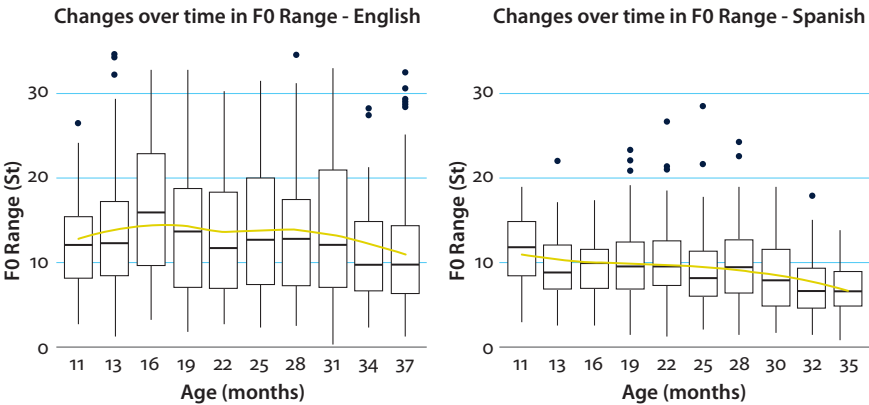


Figure 7. Boxplots showing changes in F0 Range over time in English (left panel) and in Spanish (right panel) with regression lines

Figures 8 and 9 show clear examples of how the pitch range used by both AE-speaking and PS-speaking mothers becomes narrower as their children grow. The Spanish examples below (Figure 8) show utterances produced by María's mother at the beginning of their corpus. These display tonal movements with a much wider pitch range (216 Hz or 12.38 st) than those produced at the end of the corpus (94.64 Hz or 7.79 st). Figure 9 shows variation in pitch range in two similar declarative utterances. One was produced by Naima's mother when her daughter was 19 months old, for which the pitch range is 237 Hz (14.98 st). The other, produced when Naima was 31-months, displays a pitch range of 94 Hz (6.89 st).

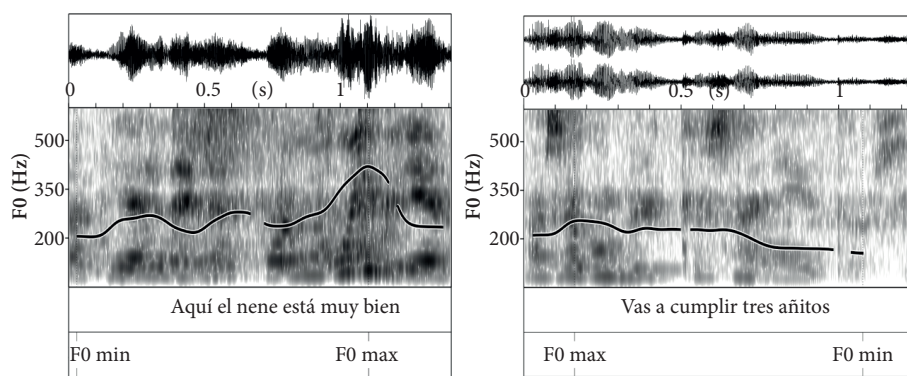


Figure 8. The utterances *Aquí el nene está muy bien* ‘Here the kid is all right’ (left panel) and *Vas a cumplir tres añitos* ‘You are turning three years old’ (right panel) as produced by María's mother at 19 months and 35 months, respectively.

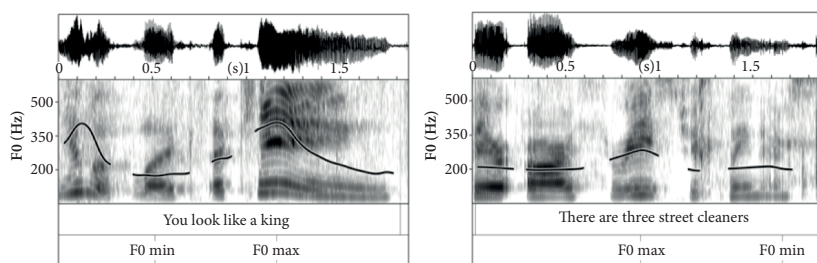


Figure 9. The utterances *You look like a king* (left panel) and *There are three street cleaners* (right panel) as produced by Naima's mother at 19 months and 31 months respectively

In order to better understand the interactions we found, as well as important changing points for age for F0 range, we created a conditional inference tree with F0 range as the dependent variable and age, language and focus as predictors. The conditional inference tree plot is found in Figure 10. Again, since inference trees

do not allow for random factors, the inference tree is perhaps less conservative. However, it does allow us to understand the relationship between predictors, as well as important changing points in age.

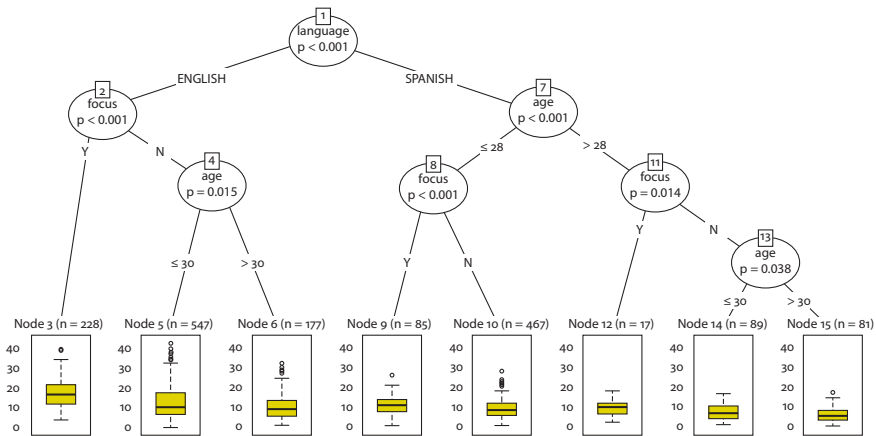


Figure 10. Conditional inference tree showing the relationship between predictors for F0 range (in semitones)

In contrast to the more conservative mixed model regression, the conditional inference tree shows that the most important factor for F0 range production is language: AE and PS-speaking mothers showed different behaviors with respect to F0 range. Next in importance for AE-speaking mothers, as shown on the left side of the tree, is focus presence. In general, utterances containing a focused element have wider F0 range. For utterances with no focused element present, however, we find a significant difference in terms of age. The conditional inference tree found an important threshold at 31 months, such that utterances are produced with lower F0 range after this age. On the right side of the tree we see that the most important factor for PS-speaking mothers, differently from AE-speaking mothers, is age, with utterances produced at 28 months and younger having significantly wider F0 range compared to those utterances produced after this age (similar to what was found for mean F0 when both AE and PS data was combined). Focus was significant both when the children were younger and older than 28 months for PS, with utterances produced with a focused element showing wider F0 range. PS-speaking mothers produced utterances *without* focus with significantly wider F0 range when the children were 30 months or younger as compared to unfocused utterances spoken to their children when they were older than 30 months, where they began to be produced with more narrow F0 range. Note that this same effect was found for AE-speaking mothers.

Given these results, we asked whether perhaps focus was marked less for Spanish when compared to English overall in our corpus. That is, did PS-speaking

mothers simply use focus less? In order to evaluate this, we ran a post-hoc analysis. We used a mixed model logistic regression in R using the *glmer* function with FOCUS PRESENCE as the dependent variable. We included LANGUAGE but also AGE as possible predictors, as well as the interaction of the two. Nested models were compared with ANOVAs, and the best fit model included LANGUAGE and AGE. As can be observed in Table 4, both of these predictors were significant.

Table 4. Coefficients (Estimate, Standard Error, *t*-values and *p*-values) for predictors of focus presence

	Estimate	SE	<i>t</i> -value	<i>p</i> -value
Intercept	−0.57	0.23	−2.47	<0.05
Language (Spanish)	0.70	0.16	−4.31	<0.001
Age	−0.02	0.01	−2.76	<0.001

This shows us that indeed, PS-speaking mothers produced significantly fewer utterances with focus presence as compared to AE-speaking mothers. However, as a whole, we can say that mothers produced less focus as their children grew older. This is interesting to consider along with the results of the conditional inference tree. Not only do mothers start to produce fewer utterances with focus, but they also begin to produce utterances with no focus with more narrow pitch range. In Figure 11 below, we can observe boxplots representing the F0 range values for each language based on the presence or absence of focus.

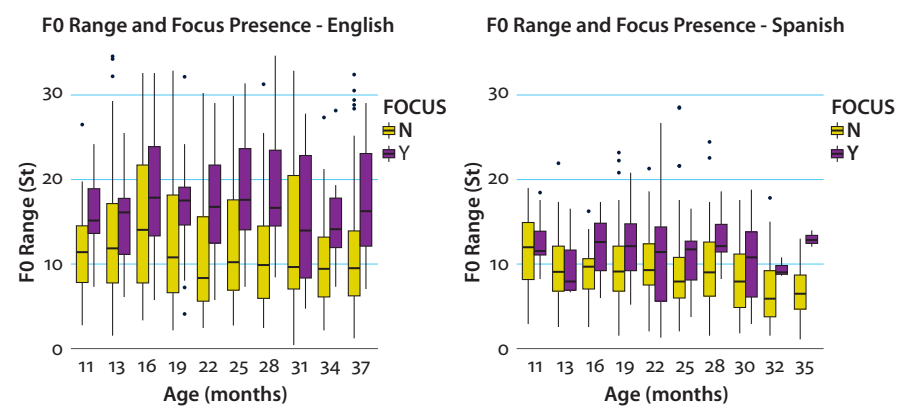


Figure 11. Changes in F0 range as a function of AGE based on the presence (Y-purple) or the absence (N-yellow) of FOCUS for each language

Figures 12 and 13 below display focus conditions of PS and AE respectively. Figure 12 shows a PS example in an utterance where the focused word is *papá* and

the pitch range is 106 Hz (7.16 st). In the AE example, shown in Figure 13, *there* is the focused word and the utterance displays a pitch range of 146 Hz (8.79 st). While these utterances were produced at a similar age, there is a clear difference in the pitch ranges exploited by the PS and the AE-speaking mothers. It is interesting to note as well that the wider pitch-range excursion in the PS example is produced in pre-focal position.

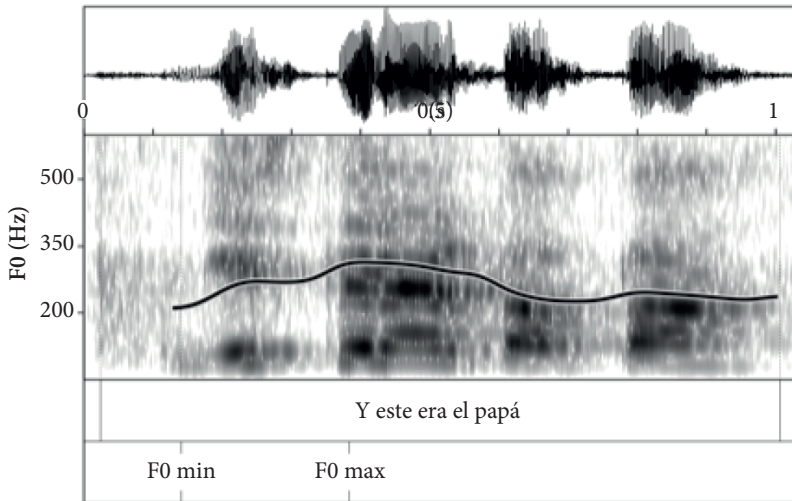


Figure 12. Utterance *Y este era el papá* 'And this one was the daddy' as produced by María's mother when her daughter was 30-months old. The focused word is *papá*

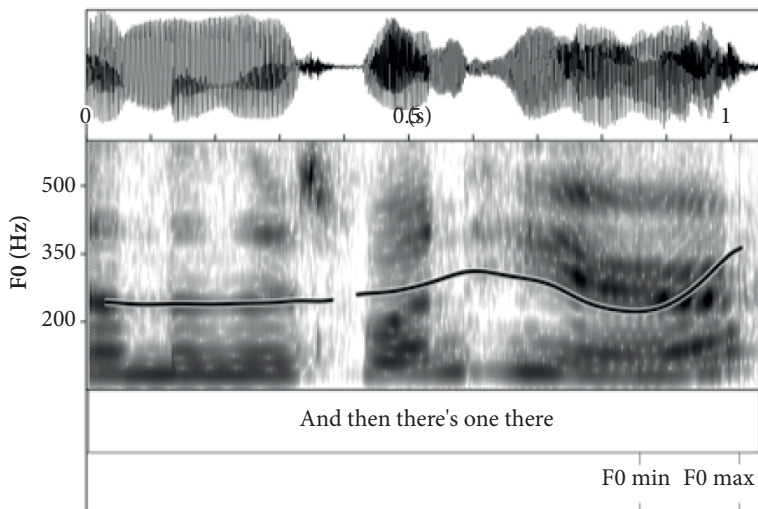


Figure 13. Utterance *And then there's one there* as produced by Naima's mother when her daughter was 31 months old. The focused word is *there*

5. Discussion and conclusions

In this study, we analyzed 1,691 utterances of IDS/CDS produced by 2 AE-speaking and 2 PS-speaking mothers. We initially asked whether changes in prosodic characteristics were occurring in the speech of mothers to their daughters after the first year of life. Our results confirm that for the AE-speaking and PS-speaking mothers considered here, we can observe changes in both mean F0 and F0 range well after the first year of life. Indeed, mean F0 got lower and F0 range got more narrow as children grew older. Overall, language was not a predictor in either of the mixed-model linear regressions we fit. However, Figures 3, 7 & 11 make clear a tendency for AE to have higher mean F0 and wider F0 range. Conditional inference tree results reveal that focus is more important for AE than it is for PS in terms of F0 range. For PS, age was most important, but a few months after the first birthday, focus starts to become important as well. Finally, unlike what has been shown for speech rate in CDS (Ko, 2012), MLU was not found to be a predictor for mean F0 or F0 range.

The significant predictors for our two measures differed depending on the measure. As we have said, with respect to mean F0, age, but not MLU was found to be a significant predictor. While there was a tendency for Spanish mothers to have lower mean F0, the difference was not significant in our model. A further inspection of our data revealed that for both languages, mean F0 begins to decline around 28 months and again around 34 months, suggesting that important changes in how mothers use F0 are happening when children are two years of age. We explore the possible significance of this below.

As children get older, F0 range was found to become more narrow for the whole data set. However, for this measure we found that two other factors were at play: focus presence and language. The interaction between age and focus presence indicated that whether or not focus was present in an utterance affected the F0 range used, and that this changed with age. Next we found a three-way interaction between age, focus presence and language. The conditional inference tree helped us to better understand these interactions. The conditional inference tree first found the difference in F0 range for AE-speaking versus PS-speaking mothers to be significant. The inference tree showed that the predictors had different hierarchies for each language. We found that for English, focus is the most important predictor for F0 range, and then age. Age was shown to be a significant predictor of F0 range for utterances that were not produced with focus, with those utterances produced at or before 31 months of age showing a wider pitch range than those produced when AE-speaking daughters were older than 31 months. This means that for the AE-speaking mothers, utterances with focus were generally produced with wide F0 range, but that non-focused utterances were also produced with wider F0 range

when children are younger. On the other hand, age was the most important predictor for the PS-speaking mothers, and then focus. In this case 28 months was found to be an important point, with wider F0 range being used when the child is 28 months or younger, and more narrow range used when a child is older. For the younger children (28 months and younger), utterances with focus are produced with wider F0 range. For the older children, we find the same effect as we find for the AE-speaking mothers. Utterances with focus are produced with wider F0 range than utterances without focus, but those utterances produced without focus are produced with wider F0 range when children are 30 months of age or younger. It is striking that this occurs at about the same age that it happens for the PS-speaking mothers. Thus we find that for both of our measures, some important changes seem to be taking place after the child's second birthday. The 28 month mark is an important point for mean F0, as well as for F0 range in the case of PS-speaking mothers. Mothers from each language are starting to produce utterances with no focus with a narrower F0 range around 30–31 months. Therefore, for both mean F0 and F0 range, important changes are observed after a child's second birthday.

Why might mothers change their use of mean F0 and F0 range at the points that they do? The only aspect of child speech that we examined here was MLU, and this was not found to be a significant predictor of mothers' use of mean F0 or F0 range for either language. Prieto, Estrella, Thorson and Vanrell (2011) found that intonational development (in the phonological sense) was not correlated with grammatical development in children, but rather with lexical development. They found that all children in their study showed a "jump" in the number of tunes they produced that always occurred after the 25-word milestone. However, both the jump and the 25-word milestone occurred before these children's second birthdays, and therefore it would be of interest to understand what kinds of intonational milestones occur after the 2nd birthday in children, specifically related to prosodic cues such as F0, duration and intensity. Another consideration is the effect of a child's developing vocal tract and how parents may respond to this in their F0 production. As the vocal tract develops, its acoustic properties change (Fant, 1960). Vorperian et al. (2004) note that formant frequencies decrease with age and lengthening of the vocal tract. Despite substantial lengthening in the vocal tract during the first two years of life, there is evidence that formant frequencies do not decrease until after two years of age. While it is not clear to what extent F0 is affected, it could be that children's F0 begins to drop after age two, and that mothers accommodate to this change. Snow (2006) has also found that at around 23 months, a child's pitch range begins to stabilize, thereby becoming more adult-like. Mothers may be sensitive to this emerging control of pitch. Such prosodic entrainment (convergence) occurs in adult-to-adult speech as well (Levitan, Gravano, Willson, Benus, Hirschberg, &

Nenkova, 2012). We believe these developmental changes could account for our findings for both measures investigated here.

With respect to the role of focus as a predictor for F0 range, it is perhaps not surprising that in the conditional inferences tree, focus presence was the most important predictor for AE-speaking mothers, but not PS-speaking mothers, since AE is known to rely more on intonational means for focus marking when compared to PS. For the PS-speaking mothers, age was the most important predictor, showing more narrow range after 28 months. What is perhaps most striking was a pattern found for both AE- and PS-speaking mothers – at around 30 months, when mothers from both languages started producing utterances that were not produced with focus with a narrower pitch range. Yu, Khan and Sundara (2014) found that for AE, almost all pitch accents that were shown to have increased use in IDS when compared to ADS are associated with focus, and for Bengali IDS there was an increase in the use of both their focus-marking tone and intonational topicalization marker. This suggests that IDS is characterized by a great deal of intonational focus marking. We believe that this is related to our results. While we did not observe specific pitch accents, it seems that the difference in pitch range between utterances with and without focus is less, prior to 30 months. Eventually however, mothers start making more of a distinction between focus presence and absence, which we take to be more adult like. We would like to propose that this is related to the attention-provoking aspect of F0 range use in CDS – mothers may use an increased range to encourage the attention of their daughters for utterances with and without focus. Such a use could be useful for word-learning. Later, mothers narrow their pitch range for utterances without focus, which is what we might expect for ADS. This represents a shift in the way F0 is used for linguistic meaning, and could have important consequences for the child's acquisition of focus. As Ito (To appear) points out, the comprehension of focus prosody takes time to develop in children. Eyetracking studies have shown that even children aged 10–11 are not completely adult-like in their responses to focus prosody (Ito, Bibyk, Wagner, & Speer, 2014). Additionally, our post-hoc analysis of focus presence in general also confirms the differences Yu et al. (2014) found in terms of intonational marking of focus, since this was found to be more common in IDS than ADS. Our results show that as children got older, the mothers in our study used less utterances with focused elements present. Our post-hoc analysis showed that PS-speaking mothers tended to use utterances with presence of an element in focus significantly less than AE-speaking mothers. Therefore, while putting elements in focus in speech could be a strategy in IDS and CDS, the degree to which this is done might vary cross-linguistically/cross-culturally. However, there was no interaction between age and language in our data, showing that both AE- and PS-speaking mothers both use less focus in the speech to their daughters over time.

AE and PS are language varieties³ that exploit F0 in different ways, but the role of F0 in their grammars is certainly not identical. Nevertheless, we find striking similarities in terms of the changes mothers are making for mean F0 and F0 range as their children get older, with 28 months being important for mean F0 and F0 range (for PS-speaking mothers, regarding the latter) and 30–31 months for making more clear prosodic distinctions between utterances with focus that is present versus absent. While it is still unclear why these specific ages are important, we have offered some possibilities to explore in future research. The role of a child's changing use of F0 could be very enlightening. It is of course important to point out that this study used a very small sample, but this also highlights the need for comparable corpus data, especially for languages other than English. This study did not include factors such as duration, lexicon size or pitch accent type which could be of great value in better understanding why specific changes in IDS/CDS occur. Additionally, since many child corpora do not contain sufficient amounts of ADS to allow for baseline comparisons, we were not able to do so in this study. In the future it could be useful to include a certain amount of ADS recordings in child corpus studies, for purposes of comparison. Regardless, our work highlights the dynamic nature of CDS after a child's first birthday, and for this data set shows remarkable similarities between two languages that rely on intonation in similar ways (they are both intonation languages) but to different extents (differences in the use of intonation for focus). F0 cues many types of information in languages (e.g. word stress, intonational categories, social information) and studying its specific uses will be of great use in better understanding children's prosodic development. With this study we hope to have provided some useful considerations for studying the type of input a young child is exposed to from a cross-linguistic perspective.

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3. We acknowledge that these are specific varieties of AE and PS, Eastern-New England American English and Asturian Spanish, respectively, and that the patterns found for these varieties might not hold for other varieties of AE and PS.

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Appendix A

Table 5. Number of utterances per language, child, session, and sentence modality, including information about the presence/absence of focus in each of them

Session #		1	2	3	4	5	6	7	8	9	10	11
NAIMA (AE)	Age (months)	11	13	16	19	22	25	28		31	34	37
Declaratives	Focus	6	8	16	12	12	5	7		13	8	5
	No Focus	23	13	18	17	22	26	15		11	18	21
Question	Focus	3	3	1	2	3	3	23		9	2	0
	No Focus	13	24	15	19	10	14	5		16	20	22
Commands	Focus	2	1	0	0	0	0	0		0	0	0
	No Focus	3	1	0	0	3	2	0		1	2	2
Total		50	50	50	50	50	50	50		50	50	50
LILY (AE)	Age (months)	11	13	16	19	22	25	28		31	34	37
Declaratives	Focus	0	4	13	8	10	21	5		3	1	2
	No Focus	0	27	26	22	18	13	19		23	20	30
Questions	Focus	0	2	3	2	8	7	10		6	4	2
	No Focus	0	15	8	18	13	8	15		15	23	15
Commands	Focus	0	1	0	0	0	0	0		1	0	0
	No Focus	0	1	0	0	1	1	1		2	2	1
Total		0	50	50	50	50	50	50		50	50	50
IRENE (PS)	Age (months)	11	13	16	19	22	25	28		30	34	37
Declaratives	Focus	8	6	8	9	4	9	3		2	0	0
	No Focus	13	6	6	6	13	10	17		12	0	0
Questions	Focus	0	0	1	0	2	1	2		2	0	0
	No Focus	23	21	27	24	20	26	24		28	0	0
Commands	Focus	0	2	3	5	2	1	1		0	0	0
	No Focus	6	15	5	6	9	3	3		6	0	0
Total		50	50	50	50	50	50	50		50	0	0
MARIA (PS)	Age (months)	11	13	16	19	22	25	28	30	32	35	37
Declaratives	Focus	0	0	0	4	8	3	2	7	3	3	0
	No Focus	0	0	0	21	8	10	16	18	15	14	0
Questions	Focus	0	0	0	0	0	0	0	0	0	0	0
	No Focus	0	0	0	18	23	18	18	18	17	28	0
Commands	Focus	0	0	0	0	0	0	1	0	0	0	0
	No Focus	0	0	0	7	11	19	13	7	2	5	0
Total		0	0	0	50	50	50	50	50	37	50	0

Table 6. Number of utterances per language, child, session, and sentence modality, including information about F0 trajectory in each of them

Session #		1	2	3	4	5	6	7	8	9	10	11
NAIMA (AE)	Age (months)	11	13	16	19	22	25	28		31	34	37
Declaratives	Raising	3	2	8	5	4	4	2		4	4	1
	Falling	26	19	26	24	30	27	20		20	22	25
Questions	Raising	9	17	13	16	8	12	20		15	18	21
	Falling	7	10	3	5	5	5	8		10	4	1
Commands	Raising	1	0	0	0	2	0	0		0	0	1
	Falling	4	2	0	0	1	2	0		1	2	1
Total		50	50	50	50	50	50	50		50	50	50
LILY (AE)	Age (months)	11	13	16	19	22	25	28		31	34	37
Declaratives	Raising	0	12	8	6	4	12	9		8	2	7
	Falling	0	14	26	15	19	18	11		9	9	18
	Neutral	0	5	5	9	5	4	4		9	10	7
Questions	Raising	0	9	3	19	16	15	24		12	20	12
	Falling	0	7	7	1	1	0	0		1	2	2
	Neutral	0	1	1	0	4	0	1		8	5	3
Commands	Raising	0	1	0	0	1	0	0		1	0	0
	Falling	0	1	0	0	0	1	1		0	0	0
	Neutral	0	0	0	0	0	0	0		2	2	1
Total		0	50	50	50	50	50	50		50	50	50
IRENE (PS)	Age (months)	11	13	16	19	22	25	28		30	34	37
Declaratives	Raising	5	0	0	2	1	0	1		1	0	0
	Falling	8	9	9	10	14	18	11		12	0	0
	Neutral	8	3	5	3	2	1	8		1	0	0
Questions	Raising	4	9	12	11	5	4	10		8	0	0
	Falling	17	9	16	13	14	19	12		21	0	0
	Neutral	2	3	0	0	3	4	4		1	0	0
Commands	Raising	0	0	1	1	1	0	0		1	0	0
	Falling	4	10	5	10	8	4	4		2	0	0
	Neutral	2	7	2	0	2	0	0		3	0	0
Total		50	50	50	50	50	50	50		50	0	0

Table 6. (continued)

Session #		1	2	3	4	5	6	7	8	9	10	11
MARIA (PS)	Age (months)	11	13	16	19	22	25	28	30	32	35	37
Declaratives	Raising	0	0	0	2	0	1	0	1	0	0	0
	Falling	0	0	0	21	15	11	13	22	17	16	0
	Neutral	0	0	0	2	1	1	3	2	1	1	0
Questions	Raising	0	0	0	13	15	10	10	8	7	13	0
	Falling	0	0	0	5	7	7	8	8	10	12	0
	Neutral	0	0	0	0	1	1	0	2	0	3	0
Commands	Raising	0	0	0	0	0	2	1	2	0	0	0
	Falling	0	0	0	6	9	13	13	5	2	5	0
	Neutral	0	0	0	1	2	4	2	0	0	0	0
Total		0	0	0	50	50	50	50	50	37	50	0

Extra-syntactic factors in the *that*-trace effect

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Using predictions from the Interface Hypothesis and the grammar of Spanish-English bilinguals, we test whether non-syntactic factors play a role in the *that*-trace effect. Though generally analyzed syntactically, some work on *that*-trace supports a syntax-prosody account (Kandybowicz, 2006). The Interface Hypothesis predicts that bilinguals will have difficulty with interface phenomena but not narrow syntax, such that testing bilinguals' knowledge of *that*-trace provides a unique testing ground for comparing the two approaches. We demonstrate that bilinguals have the syntactic underpinnings necessary for both syntactic and syntax-prosody accounts of *that*-trace; however, they differ from the monolinguals with regard to *that*-trace, extending the phenomenon's restriction on extraction to a new context, supporting a syntax-prosody account of *that*-trace.

Keywords: bilingualism, Interface Hypothesis, EPP, wh-questions, expletives, syntax-prosody interface

1. Introduction

A large body of work stretching back to Perlmutter (1971) has tried to account for a puzzling restriction on extraction of a wh-phrase from an embedded clause.¹

- (1) a. Who_i do you think [t_i bought the book]?
b. *Who_i do you think [that t_i bought the book]?

1. In fact, this restriction applies to \bar{A} -movement more generally (Bresnan, 1977, pp. 178–182), but we will be focusing on the extraction of wh-phrases in this study, in part because it has been the focus of much research on this phenomenon. \bar{A} -movement includes, for example, relativization: “This is the person who I thought (*that) met Sue”.

Consider the sentence in (1a). The subject *wh*-phrase ‘who’ has been extracted from the embedded clause headed by a covert complementizer,² and the sentence is acceptable. On the other hand, when the overt complementizer ‘that’ is present in the embedded clause, as in (1b), the sentence becomes unacceptable. This restriction on extracting a subject *wh*-phrase over an overt complementizer is known as the *that*-trace effect.

As we discuss in further detail in § 2.2, the *that*-trace effect has traditionally been accounted for in purely syntactic terms, but there are also accounts that look beyond syntax (cf. Pesetsky, 2015, for review). For example, there are accounts based on the interface between syntax and prosody (Kandybowicz, 2006, 2009).³

While the relevant data and generalizations have been fleshed out in the more than four decades since Perlmutter’s original observations, the underlying source of the *that*-trace effect and related effects continues to be controversial (Pesetsky, 2015). Part of the debate involves the degree to which extra-syntactic factors play a role in the *that*-trace effect, and we contribute to this debate by offering novel evidence from two different types of bilingual speakers to help disentangle the role of extra-syntactic factors.

We explore whether syntax alone accounts for the *that*-trace effect by looking at data from Spanish-English bilinguals. This group of speakers is interesting because of the ways in which both acquiring and knowing two languages make them different from monolinguals. For example, according to the Interface Hypothesis (IH) (Sorace & Filiaci, 2006, et seq) interface phenomena, such as between syntax and semantics or syntax and prosody, are one source of these differences. This, in turn, makes predictions about theories of *that*-trace effect that involve the interfaces, allowing us to explore whether syntax alone accounts for restrictions on extraction.

Ultimately, we will see that there is a contrast between early and late Spanish-English bilinguals in their sensitivity to the *that*-trace effect, and this contrast suggests that the *that*-trace effect is underlyingly a combination of syntactic and extra-syntactic factors.

2. We use the term ‘covert complementizer’ to refer to sentences where the embedded complementizer is not present in the surface form, but we do not take a stance on whether this is because the complementizer is phonologically null or absent from the structure.

3. Whether there is a specific syntax-prosody interface or only a more general interface between syntax and phonology depends on both terminology and framework. For a review of theories of the syntax-prosody/phonology interface see Elordieta (2011).

2. The *that*-trace effect

2.1 Extraction restrictions in Spanish and English

Before discussing in more detail how the IH can contribute to our understanding of the *that*-trace effect, we need to discuss the key properties of the effect and how these are generally accounted for. We discuss both Spanish and English in order to lay the groundwork for interpreting Spanish-English bilinguals' acquisition of the *that*-trace effect.

When a *wh*-object is extracted from an embedded clause in English, the sentence is acceptable whether you have a covert complementizer (2a) or an overt complementizer (2b).⁴

- (2) a. What_{*i*} do you think John bought t_{*i*}?
- b. What_{*i*} do you think that John bought t_{*i*}?

This contrasts with extraction of a *wh*-subject, as in (3). When the complementizer is covert (3a), the sentence is acceptable, but when the complementizer is overt (3b), the sentence becomes unacceptable.

- (3) a. Who_{*i*} do you think t_{*i*} bought the book?
- b. *Who_{*i*} do you think that t_{*i*} bought the book?

In Spanish, however, it appears that object extraction with a covert complementizer is ungrammatical, as in (4a). In contrast, with an overt complementizer (4b), the sentence is perfectly grammatical.

- (4) a. *¿Qué_{*i*} crees Juan compró t_{*i*}?
 what believe.2P Juan bought
 'What do you believe Juan bought?'
- b. ¿Qué_{*i*} crees que Juan compró t_{*i*}?
 what believe.2P that Juan bought
 'What do you believe that Juan bought?'

Note that even when there is no extraction, as in (5), the sentence is still unacceptable with a covert complementizer (5a), but acceptable with an overt complementizer (5b).

4. The 't' here represents a 'trace', the argument position of a phrase before movement, and is only for illustrative purposes.

- (5) a. *Creo Juan compró el libro.
 believe.1P Juan bought the book
 ‘I believe Juan bought the book.’
 b. Creo que Juan compró el libro.
 believe.1P that Juan bought the book
 ‘I believe that Juan bought the book.’

In other words, Spanish does not have a restriction on extraction but rather on covert complementizers. The same pattern holds with subject extraction, where a covert complementizer (6a) is ungrammatical, but an overt complementizer is grammatical (6b).

- (6) a. *¿Quién_i crees t_i compró el libro?
 who believe.2P bought the book
 ‘Who do you believe bought the book?’
 b. ¿Quién_i crees que t_i compró el libro?
 who believe.2P that bought the book
 ‘Who do you believe bought the book?’

We see, then, that there is a restriction on extracting a subject over an overt complementizer in English but not in Spanish, hence there is no *that*-trace effect for Spanish.

2.2 Syntactic accounts of the *that*-trace effect

Now we are in a position to look at how the *that*-trace effect is accounted for in more detail, beginning with syntactic accounts. There is still a great deal of debate about the precise mechanism, but there is sufficient evidence that *that*-trace is part of a larger set of cross-linguistic restrictions on extraction over complementizers known as ‘comp-trace’ (Pesetsky, 2015). For example, comp-trace effects have been observed in French (Perlmutter, 1971), Russian (Pesetsky, 1982),⁵ Wolof (Martinović, 2014), and Nupe (Kandybowicz, 2006). Here we are interested in the implications that this class of accounts has on the acquisition of the *that*-trace effect and the predictions they make for early and late Spanish-English bilinguals, so we will not focus on the details of the individual accounts.

5. Some Russian speakers also find object extraction to be ungrammatical in the same contexts, but Pesetsky (1982, pp. 298–299) notes that these same speakers still detect a difference in acceptability, with object extraction being preferred. Pesetsky (2015) suggests this serves as evidence for a Poverty of Stimulus argument for the *that*-trace effect.

It is important, however, to emphasize the cross-linguistic nature of the *that*-trace effect, and comp-trace effects more generally. Whatever the underlying syntax of the effect, the phenomenon appears to be universal. Crucially, however, it is sometimes obviated by language-specific properties. For example, this is the case in languages such as Spanish and Italian which allow postverbal subjects.

While the initial position of the subject before extraction is not directly observable, Rizzi (1982) provides direct evidence from Italian that the subjects must have been extracted from a postverbal position. This evidence leverages the fact that Italian quantifiers such as *alcune* 'some' require the genitive clitic *ne* when they appear preverbally. For example, the subject of an unaccusative verb does not permit the genitive clitic, as in (7a), but that same subject requires the genitive clitic when appearing in postverbal position (7b).

- (7) a. *Sono cadute alcune in mare.
 are fallen some in sea
 'Some fell into the sea.'
- b. Ne sono cadute alcune in mare.
 CL.GEN are fallen some in sea
 'Some of them fell into the sea.'

Taking advantage of the relationship between the quantifier's position and the genitive clitic's distribution, we can replace *alcune* with a wh-quantifier and test the position of extracted wh-subjects. First, we can see the generalization still holds with wh-questions by looking at (8), as *ne* continues to be obligatory with wh-object extraction. Crucially, the genitive clitic remains obligatory when the wh-subject is extracted, as in (9).

- (8) a. *Quante_i hai detto che hai preso t_i?
 How many have.2P said that you have taken
 'How many did you say that you took?'
- b. Quante_i hai detto che ne hai preso t_i?
 How many have.2P said that CL.GEN you have taken
 'How many did you say that you took?'
- (9) a. *Quante_i hai detto che t_i sono cadute?
 How many have.2P said that are fallen
 'How many of them did you say fell?'
- b. Quante_i hai detto che ne sono cadute t_i?
 How many have.2P said that CL.GEN are fallen
 'How many of them did you say fell?'

Since the genitive clitic is only obligatory when the quantifier, including a subject wh-quantifier, is postverbal, the wh-subject must have been extracted from a post-verbal position.

Returning to the *that*-trace effect, notice that, as long as the subject is extracted from postverbal position, as in (9b), extraction of the subject over an overt complementizer is fully acceptable. This suggests that the *that*-trace effect applies not to wh-subject extraction in general but only to preverbal wh-subject extraction. While drawn from Italian, the results should apply to any language allowing post-verbal subjects, including Spanish. This observation regarding the role of preverbal subjects is useful for making predictions about whether participants' will evidence the *that*-trace effect, although it still leaves unanswered more fundamental questions regarding what drives the *that*-trace effect. We return to the role of preverbal subjects in the experimental design.

2.3 Interface-based accounts

The second class of accounts of interest are those involving an interface between syntax and another linguistic (or extra-linguistic) module (e.g., de Chene, 2000; Kandybowicz, 2006, 2009). Here we focus on accounts based on the syntax-prosody interface. A variety of researchers have observed that placing an adverbial expression between the complementizer and the verb noticeably ameliorates the *that*-trace effect (Bresnan, 1977; Culicover, 1993), as in (10), taken from Culicover (1993).

- (10) a. Robin met the man who_i Leslie said **that** for all intents and purposes t_i was the mayor of the city.
 b. I asked what_i Leslie said **that** in her opinion t_i had made Robin give a book to Lee.

One possible explanation for the amelioration is that adverbial expressions force the complementizer and the verb into separate prosodic phrases. Additional evidence comes from de Chene (2000), who claims that a syntactic operation, known as Right Node Raising, introduces a prosodic boundary adjacent to the complementizer, as seen in (11) with complementizer 'that'.

- (11) a. That's the meeting I've been wondering if, and Jim's been saying **that**, t is going to be canceled.
 b. *That's the meeting I've been thinking, and Jim's been saying, **that** t is going to be canceled.

The example in (11a) shows a prosodic boundary following the complementizer, which ameliorates the *that*-trace effect, according to de Chene. When the prosodic

boundary instead precedes the complementizer (11b), the effect is no longer ameliorated. It should be noted that some speakers do not show the amelioration in (11a).

To account for this and other data, Kandybowicz (2006) proposes a prosodic constraint according to which a sentence is not acceptable if both (i) the complementizer and the trace of the extracted *wh*-phrase are in the same prosodic phrase and (ii) the complementizer is aligned with a prosodic boundary. According to this approach, the *that*-trace effect in (11a) is ameliorated because the first condition is not met, since the complementizer 'that' is in a separate prosodic phrase, as indicated by the comma, from the trace 't'.

As we have seen, some research suggests that syntax alone can account for the *that*-trace effect, while other research instead suggests crucial factors beyond syntax. To distinguish between these two classes of accounts, we propose taking advantage of the ways in which bilingualism and interface phenomena interact.

3. The Interface Hypothesis

In this paper, we employ the Interface Hypothesis (IH) (Sorace & Filiaci, 2006, et seq) to help disambiguate between syntax-only and interface approaches to the *that*-trace effect. Interface phenomena require integration of information between a linguistic module and either a cognitive domain (e.g., syntax-pragmatics) or another linguistic module (e.g., syntax-semantics). Because the IH concerns interface phenomena, its predictions are useful for disambiguating between the major types of accounts for the *that*-trace effect: syntax-only and syntax-prosody accounts.

The IH proposes that integration between modules results in non-monolingual-like linguistic behavior in bilingual speakers. This effect has been studied with various types of bilingual speakers: second language learners (e.g, Sorace & Filiaci, 2006; Sorace & Serratrice, 2009; Tsimpli & Sorace, 2006), bilingual first language acquisition (e.g., Montrul, 2004, 2008; Serratrice, Sorace, & Paoli, 2004), and first language attrition (e.g., Montrul, 2008; Wilson, Keller, & Sorace, 2009). The observed differences between monolinguals and bilinguals has been attributed to differences in processing resources, resulting in indeterminacy (e.g., Sorace, 2005; Sorace & Serratrice, 2009), or otherwise non-convergence (Iverson, Kempchinsky, & Rothman, 2008; Slabakova & Ivanov, 2011) for interface phenomena.

Evidence against the IH argues that interfaces that are predicted to be vulnerable to non-convergence (cf., Tsimpli & Sorace, 2006; White, 2009) can still evidence monolingual-like behavior (cf., Donaldson, 2011; Ivanov, 2012). Crucially, the interface at issue here, syntax-prosody, has been minimally studied, and the work has largely focused on prosody as it relates to information structure (e.g., Bae, 2015) rather than the phonological side which is more relevant here. For that reason, we

make the default assumption that the large body of work supporting the IH holds in this case, *pace* previously cited work in other domains.

Here we examine two potential stances on the *that*-trace effect based on research on the phenomenon: *That*-trace is either syntactic or a syntax-prosody interface phenomenon. Prosody has been observed to differ from the monolingual variety in contact situations (e.g., Colantoni & Gurlekian, 2004; Elordieta, 2003; O'Rourke, 2003), including for phenomena at the syntax-prosody interface (cf., Bullock, 2009).

Given the expected difficulty at the syntax-prosody interface, the IH can be used to make two predictions with regard to the *that*-trace effect. If *that*-trace is syntactic, the IH predicts that Spanish-English bilinguals should not deviate from monolinguals with regard to it: Spanish-English bilinguals should have a restriction on the *wh*-subject extraction from an embedded clause in English. The other option, *that*-trace is an interface phenomenon, predicts that Spanish-English bilinguals will differ from monolinguals. The following section presents our approach for testing these predictions.

4. Subject placement and the *that*-trace effect

In order to examine the bilingual acquisition of the *that*-trace effect, and the predictions that the IH makes for interface accounts thereof, we need a way of determining whether learners have acquired or are sensitive to the *that*-trace effect. We argue here that the distribution of acceptable subject positions for a given speaker predicts whether or not that speaker will be sensitive to *that*-trace effect.

As we saw in § 2.1, Spanish and English differ with regard to the position *wh*-subjects are extracted from. In Spanish, the subject raises from a postverbal position, and consequently there is no *that*-trace effect. In English, in contrast, subjects must be preverbal, whether in interrogative or declarative sentences. It is then from this preverbal position that *wh*-subject extraction is unacceptable.

The requirement that subjects appear in preverbal position, generally SpecTP, has traditionally been attributed to the Extended Projection Principle (EPP) (Chomsky, 1981), and we adopt the term here as well. Note that we are not using 'EPP' in a technical sense, nor are we committed to a specific theoretical analysis of EPP. We are interested in the degree to which a subject is required to appear preverbally, whatever underlying syntactic processes derive that requirement. With that caveat in mind, we will continue to refer to the requirement for sentences to have an overtly expressed preverbal subjects as the EPP for the sake of exposition.

If a requirement for preverbal subjects, i.e. the EPP, is syntactically necessary for *that*-trace effect, as previously argued, then this has important implications for

acquisition of the effect. Given the cross-linguistic evidence for the *that*-trace effect, and comp-trace effects more generally, it appears that the underlying syntax behind *that*-trace is universal. If the ultimate source of any restrictions on *wh*-subject extraction is based on fundamental syntactic principles, then these do not need to be acquired. Instead, sensitivity to *that*-trace will depend on acquiring those language-specific aspects of a language which create the necessary context for applying *that*-trace. One key part of that context is obeying the EPP (i.e., requiring preverbal subjects). English obeys the EPP and therefore has *that*-trace, and Spanish does not always obey the EPP, allowing extraction from a postverbal position, and therefore has no *that*-trace effect.

We take advantage of the relationship between the EPP and the *that*-trace effect to gather additional evidence regarding whether early and late bilinguals can acquire the effect in English.⁶ To do that, we look at preverbal subjects in two different contexts. First, we contrast the requirements regarding subject position in *wh*-questions in English and Spanish in Experiment 1. In English subject *wh*-question formation, the subject must be preverbal, i.e. English obeys the EPP, and the tense head raises to the position of the complementizer head.⁷ Spanish, on the other hand, requires the subject to remain in situ but the verb to raise to T, leaving the subject in a postverbal position. The tense head remains in T, rather than raising to C as in English (Suñer, 1994). In this way, the subject position in *wh*-questions provides evidence regarding the contrasting EPP requirements of the two languages.

Second, we look at the EPP requirements for English non-finite clauses in Experiment 2. In this case, we contrast the availability of a dummy pronoun or expletive in preverbal and postverbal positions. Two types of sentences with non-finite complements are used that share a linear order but are structurally distinct: one type has a postverbal DP in the matrix clause and the other a preverbal DP in the embedded clause. Bilinguals are compared to monolinguals with regard to their sensitivity to underlying syntactic differences in these structures reliant on the EPP.

Finally, the two predictions from the IH are tested in Experiment 3. Early Spanish-English bilinguals are tested for restrictions on extraction of overt complementizers in English as compared to monolinguals and another group of bilinguals, second language learners. Evidence of a monolingual-like restriction on

6. Note that, to our knowledge, the only direct evidence for the relationship between the position of the subject and the *that*-trace effect comes from Italian data as reviewed in § 2.2. We refer to this as the EPP, as stated above, though for our purposes the underlying reason behind the relevant subject positions is not important and may not be EPP *per se*.

7. When there is no separate head to host the tense morphology, such as an auxiliary or modal, a dummy 'do' is inserted, in a process known as do-support.

extraction from a preverbal position would suggest that *that*-trace is indeed syntactic. However, divergence from the monolingual pattern would instead support an interface account.

5. Experiment 1

5.1 Methods

The participants for Experiment 1 were 24 early Spanish-English bilinguals from the Chicago area whose families largely spoke Mexican varieties of Spanish. All bilinguals had learned both languages by the age of 6 and were highly proficient English speakers (English dominant). Proficiency in English was measured by an English cloze test (Ionin & Montrul, 2009) on which participants scored at least 34/40. The bilinguals were also intermediate to advanced Spanish speakers. Each participant completed the modified DELE from Montrul (2004), and they scored at least 20/30 on part 1.

Participants completed an untimed acceptability judgment task (AJT) on a 1–7 Likert scale. The 1–7 scale was used in this experiment because it was completed as part of a larger experiment in which participants were asked to rate code-switched sentences (Ebert, 2014). Due to the stigma associated with code-switching, a more granular scale was used to compensate for some participants not assigning 7/7 to otherwise acceptable items (see González-Vilbazo et al., 2013 for discussion of this type of methodological consideration).

The stimuli for Experiment 1 were English and Spanish translation equivalent matrix questions. Recall that this serves to test early bilinguals' use of the EPP in one of two contexts, here in *wh*-questions. For each lexicalization ($N = 4$ per language), three versions were made, varying with regard to the position of the subject: preverbal SV order (12), auxiliary-subject-participle (13), and postverbal VS order (14).⁸

- (12) a. *What your brothers have eaten this month?
b. *¿Qué tus hermanos han comido este mes?
- (13) a. What have your brothers eaten this month?
b. *¿Qué han tus hermanos comido este mes?
- (14) a. *What have eaten your brothers this month?
b. ¿Qué han comido tus hermanos este mes?

8. Notations regarding ungrammaticality (*) are based on the canonical monolingual judgments.

In addition to the 12 target items that participants saw in each language, Experiment 1 also included 156 English distractors and 152 Spanish distractors.

Additional materials included a background questionnaire and two proficiency measures. The background questionnaire ascertained their age of acquisition, self-rated proficiency, and percentage of use in both languages. Each proficiency measure was composed of a cloze test (English: Ionin & Montrul, 2009; Spanish: Montrul, 2004). The Spanish proficiency measure additionally included 30 multiple choice items. The total possible score for the English proficiency measure was 40, and the total possible score for the Spanish proficiency measure was 50.

Participants first completed the background questionnaire. They then completed the two monolingual judgment tasks in counterbalanced order. Before each judgment task, participants completed a proficiency measure for the language that they would be judging in order to prime them into the target language and help ameliorate the effects of syntactic priming.

5.2 Results

The results for the first experiment appear in Figure 1.

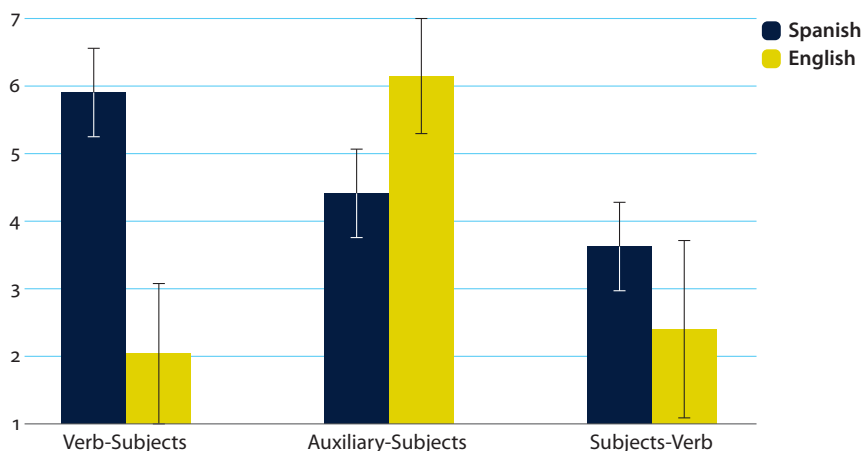


Figure 1. Average ratings by Language and Word Order

For Spanish, bilinguals preferred the canonical VS Spanish word order ($M = 5.891$) to the canonical English word order (auxiliary-subject-participle) ($M = 4.417$) and the marked SV word order ($M = 3.620$). A one-way ANOVA revealed a main effect for Order in Spanish ($F = 18.391$, $p = 0.000$, $\eta^2 = 0.444$). Post hoc Bonferroni analysis showed that VS was rated significantly higher than both auxiliary-subject-participle and SV.

The results for English favor English canonical word order. The canonical auxiliary-subject-participle order was preferred ($M = 6.141$) over both VS ($M = 2.036$) and SV ($M = 2.401$) orders. Analysis of the English ratings with a one-way ANOVA again resulted in a main effect for Order ($F = 66.781$, $p = 0.000$, $\eta^2 = 0.744$). The post hoc found that the auxiliary-subject-participle order was rated significantly higher than the other two orders, which did not differ between themselves.

6. Experiment 2

6.1 Methods

The participants for the second experiment were 20 English monolinguals and a different group of early Spanish-English bilinguals ($N = 20$). The English monolinguals reported not having learned any other languages. The bilinguals were selected by the same criteria as Experiment 1. The bilinguals were proficiency-matched in English to the monolinguals using two cloze tests, the one from Experiment 1 (Ionin & Montrul, 2009) and an additional cloze test from White, Genesee, & Steinhauer (2012). Bilinguals scored at least 34/40 on the Ionin and Montrul (2009) measure and 20/30 on the White et al. (2012) measure. The bilinguals' Spanish proficiency was also controlled using the same criteria as Experiment 1.

The stimuli for Experiment 2 were English sentences with a matrix verb and a non-finite complement. Recall that this serves to test early bilinguals' use of the EPP. For half of the sentences, Optional Control verbs were used in the matrix clause (15)–(16). These verbs can either appear in Subject Control sentences or with a non-finite complement that has a preverbal DP (15). The presence of the overt complementizer *for* demonstrates that the DP in (15) must be in the embedded clause. Due to the fact that preverbal position is an EPP position, a dummy pronoun expletive *there* can also appear in its place (16).

- (15) Embedded Clause Preverbal DP
Cathy wanted for Peter to polish the wood.
- (16) Embedded Clause Preverbal Expletive
Jeff wanted for there to be an explanation.

The other half of the sentences featured Object Control verbs (17–18), which necessarily have a postverbal internal argument DP (17). Unlike preverbal position, which is optionally an argument position, the postverbal position is always an argument position in English. As is true of all arguments, an expletive cannot appear in its place (18).

- (17) Matrix Clause Postverbal DP
Ciara forced Chuck to eat the cookie.
- (18) Matrix Clause Postverbal Expletive
*Haley forced there to be management.

Participants saw 10 lexicalizations in the Embedded Preverbal condition and 10 Matrix Postverbal condition. Each lexicalization was used to create two items, one with a DP and one with an expletive, for four stimulus types: Embedded Preverbal DP (15), Embedded Preverbal Expletive (16), Matrix Postverbal DP (17), and Matrix Postverbal Expletive (18). Participants saw all 40 items, as well as 7 practice items and 126 non-related items, including the target items from Experiment 3.

The background questionnaire and proficiency measures were the same as Experiment 1. For the Spanish proficiency, only the multiple choice section was used since the experiment was in English. Instead, participants were proficiency-matched on a second English proficiency measure, a cloze-test from White et al. (2012), to better ensure proficiency comparable to monolinguals. The two measures were highly correlated ($r = 0.723$, $p = 0.000$).

Participants first completed the background questionnaire, followed by a timed AJT on a 1–5 Likert scale. A timed AJT was used to reduce the effect of explicit knowledge in the task (Ellis, 2005). The design of the AJT was based on the recommendations from Han and Ellis (1998). First, a sentence appeared on the screen for 2,200 ms. Second, participants were asked to judge the sentence on a 1–5 Likert scale, with both judgment and reaction time measured. Participants had a maximum of 3,500 ms to judge the sentence before it disappeared, and then the procedure repeated. Non-responses and outliers at 2 standard deviations were removed from the data.

The proficiency measures followed the AJT. Both groups completed the English proficiency measures, and the bilinguals additionally completed the Spanish proficiency measure.

6.2 Results

The results for Experiment 2 suggest a descriptively similar pattern in each group. For the Matrix Postverbal sentences, both groups preferred a DP complement to an expletive complement, reflecting the general ban on expletives in argument positions. Both groups rated the two complement types similarly for Embedded Preverbal sentences where an expletive can be used to satisfy the EPP. The results for the monolingual and bilingual groups in Experiment 2 are reported in Figure 2.

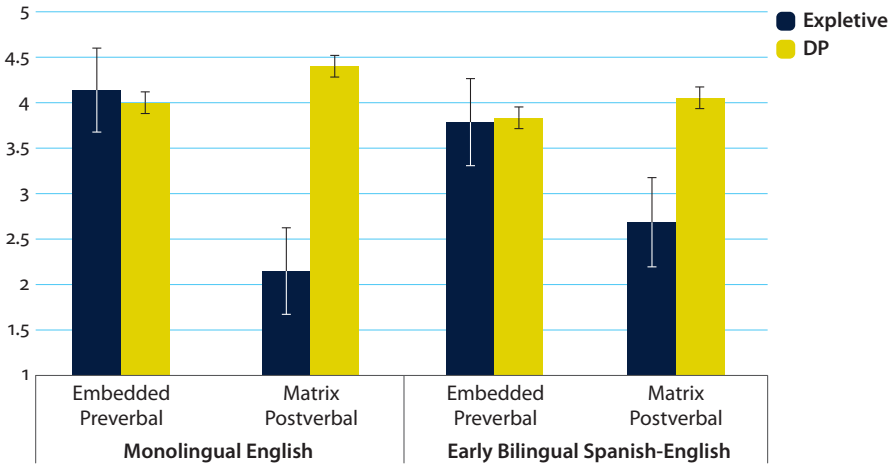


Figure 2. Average ratings by Group, Sentence Type, and Complement

For inferential analysis, Levene’s test of Equality of Variances was significant for three of the four subtypes, indicating unequal variance among the groups. Due to this difference, separate two-way repeated measures ANOVAs were run for each group. Each ANOVA had two within-subjects variables, Sentence Type (Matrix Postverbal, Embedded Preverbal) and Complement (Expletive, DP).

The repeated measures ANOVA for the monolinguals had main effects for Sentence Type ($F = 92.834, p = 0.000, \eta^2 = 0.830$) and Complement ($F = 114.834, p = 0.000, \eta^2 = 0.858$) and an interaction between Sentence Type and Complement ($F = 154.010, p = 0.000, \eta^2 = 0.890$). The interaction indicated that the monolinguals preferred a DP complement to an expletive complement (cf. (17)–(18)) for the Matrix Postverbal sentences only). Follow-up paired *t*-tests confirmed this inference (Monolingual Matrix Postverbal: $t = -12.643, p = 0.000$; Monolingual Embedded Preverbal: $t = 1.852, p = 0.080$). The analysis for the bilinguals had similar results: main effects for Sentence Type ($F = 10.381, p = 0.004, \eta^2 = 0.331$) and Complement ($F = 24.250, p = 0.000, \eta^2 = 0.536$) and an interaction ($F = 29.665, p = 0.000, \eta^2 = 0.586$). Post-hoc analysis revealed that the bilinguals also had a preference for DP complements for Matrix Postverbal condition ($t = -5.710, p = 0.000$) but not Embedded Preverbal ($t = -0.041, p = 0.968$).

6.3 Interim discussion

Recall that Experiments 1 and 2 served to test early bilinguals’ use of the EPP in two different contexts: *wh*-questions and sentences with non-finite complements. As previously seen, the *that*-trace effect restricts extraction of *wh*-phrases over

an overt complementizer specifically from a preverbal position. By establishing whether these speakers obey the EPP in English, and hence require a subject in preverbal position, we can determine whether they have this key ingredient for exhibiting the *that*-trace effect.

The results of Experiments 1 and 2 suggest that early bilingual Spanish-English speakers have the same, contrasting requirements regarding preverbal subjects that monolingual Spanish and English speakers have in their respective languages. In Experiment 1, subject position in *wh*-questions was investigated in both of the bilinguals' languages. For English, bilinguals strongly preferred the canonical auxiliary-subject-participle word order, which involves a preverbal subject. The bilinguals had more variability in their Spanish, reflecting the fact that they were English dominant. Importantly, they did prefer the canonical postverbal subject position over the other orders.

In Experiment 2, bilinguals' use of expletives to satisfy the EPP in non-finite clausal complements was compared to that of English monolinguals. Bilinguals correctly allowed expletives to satisfy the EPP in Embedded Preverbal structures, and like their monolingual counterparts, they disallowed expletives in Matrix Postverbal position where the EPP does not apply, specifically in lieu of an internal argument. Like Experiment 1, these results suggest that Spanish-English bilinguals have a monolingual-like EPP, as they only permitted expletives to satisfy the EPP.

Note that whether or not the subject is extracted from a preverbal or a postverbal position is relevant not just for purely syntactic accounts but also for interface accounts. For example, the prosodic filter that Kandybowicz (2006) proposes to account for the *that*-trace effect, as discussed in § 2.3, begins with a syntactic structure in which the complementizer and the trace of the extracted *wh*-phrase are linearly adjacent. The filter does not apply at all to extraction from a postverbal position.

7. Experiment 3

7.1 Methods

The methods for Experiment 3 only differed from Experiment 2 in two ways. First, a second language (L2) learner group was added to test for wider applicability of the IH because it has been shown to apply differentially to early and late bilinguals (e.g., Tsimpili, 2014). The L2 group were highly proficient late learners of English whose first language was Spanish ($N = 19$). The L2 learners were all born in Spanish-speaking countries and moved to the US at age 17 or later. None reported having learned English at home. The L2 learners were proficiency matched to the

monolinguals and early bilinguals on the English proficiency measures (Ionin & Montrul, 2009; White et al., 2012).

The second change was the target items. Items were composed of two extraction conditions, subject extraction and object extraction with either an overt or covert complementizer.

- (19) Subject Extraction, Covert Complementizer
Who do you think opened a bakery?
- (20) Subject Extraction, Overt Complementizer
*Who do you think that opened a bakery?
- (21) Object Extraction, Covert Complementizer
What do you think Benjamin grabbed?
- (22) Object Extraction, Overt Complementizer
What do you think that Benjamin grabbed?

Participants saw one version (e.g., (21) or (22)) of each lexicalization, resulting in each participant seeing 9 tokens of each sentence type (19)–(22) and 36 total target items.

7.2 Results

The average ratings from Experiment 3 appear in Figure 3.

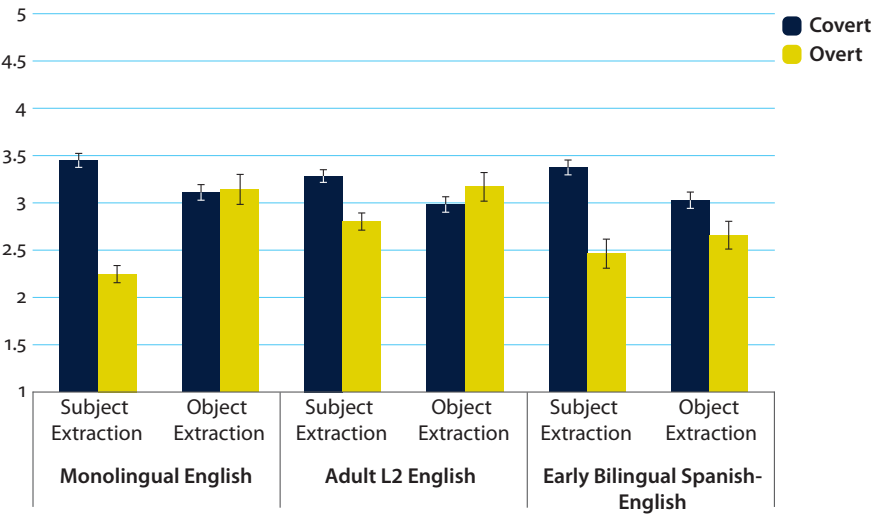


Figure 3. Average rating by Group, Extraction Type, and Complementizer

All of the average ratings for Experiment 3 were less than 3.5, indicating some degree of unnaturalness in judging questions without a context (e.g., Schutze, 1996). Regardless, the monolinguals displayed the expected pattern: monolinguals preferred covert complementizers to overt complementizers for subject but not object extractions, i.e. the *that*-trace effect.

The bilingual groups also preferred covert to overt for subject extractions, although the magnitude of the difference in ratings was less than for the monolingual speakers. The two bilingual groups differed with regard to the object extractions. The L2 learners had a small preference for overt complementizers ($M = 3.187$) rather than covert complementizers ($M = 2.998$). The early bilingual speakers, however, preferred covert complementizers ($M = 3.040$) to overt complementizers ($M = 2.674$).

For the two covert complementizer sentence types (Subject Extraction Covert, Object Extraction Covert), Levene's test of Equality of Variances was significant. The three groups were then analyzed separately using two-way repeated measures ANOVAs with the within-subjects factors Extraction (Subject, Object) and Complementizer (Covert, Overt).

The analysis of the monolingual group revealed main effects for Extraction ($F = 6.967$, $p = 0.016$, $\eta^2 = 0.268$) and Complementizer ($F = 19.304$, $p = 0.000$, $\eta^2 = 0.504$) and an interaction between them ($F = 53.030$, $p = 0.000$, $\eta^2 = 0.736$). The interaction was driven by the preference for covert rather than overt complementizers in the subject but not the object extraction condition, which was confirmed with follow-up paired t-tests (Monolingual Subject Extraction: $t = 7.796$, $p = 0.000$; Monolingual Object Extraction: $t = -0.172$, $p = 0.865$). For the L2 group, only an interaction between Extraction and Complementizer was found ($F = 17.000$, $p = 0.005$, $\eta^2 = 0.378$). Like the monolingual group, follow-up analysis showed that the interaction was driven by a difference in the subject ($t = 2.578$, $p = 0.019$) but not object ($t = -1.056$, $p = 0.306$) extractions.

Finally, the early bilingual group had a strong main effect for Complementizer ($F = 23.590$, $p = 0.000$, $\eta^2 = 0.529$) and a weak interaction between Extraction and Complementizer ($F = 5.068$, $p = 0.035$, $\eta^2 = 0.194$). The main effect for Complementizer indicated an overall preference for covert complementizers, whereas the weak interaction was driven by a lower acceptance of object extractions overall. These observations were confirmed by follow-up paired t-tests indicating that early bilinguals statistically preferred covert to overt complementizers for both subject ($t = 4.616$, $p = 0.000$) and object ($t = 2.369$, $p = 0.028$) extractions.

Note that a Bonferroni correction was not applied because interpretation of the results differs depending on whether one or both t-tests are significant (e.g., Cabin & Mitchell, 2000; Rice, 1989). A significant result for only one condition indicated that participants distinguished between the two extraction types (monolinguals and

L2s). Significant results for both tests indicated that participants did not distinguish (early bilinguals). These findings are reflected by the strength of the interaction (see Garamzegi, 2006 for relevant argumentation about avoiding Type I errors with effect size).

8. Discussion

Together, the three experiments provide a robust picture of the *that*-trace effect in early bilinguals. First, Experiments 1 and 2 provide two types of evidence regarding whether or not these speakers obey the EPP in English, a necessary precursor to manifesting the *that*-trace effect.

Experiment 1 takes advantage of the contrast in the position of the subject between certain Spanish and English *wh*-questions, where Spanish requires a postverbal subject and English requires a preverbal subject. The results of Experiment 1 show that the early bilinguals do in fact require a preverbal subject for English while preferring a postverbal subject for Spanish.

The fact that early bilinguals do not accept a postverbal subject in English *wh*-questions but prefer a postverbal position in Spanish *wh*-questions shows that they can selectively apply the EPP according to the requirements of the language. If they instead allowed Spanish word order (i.e. postverbal subjects) with English *wh*-questions, this would open up the possibility that they would allow extraction of a *wh*-subject from a postverbal position. This is problematic when the position that the *wh*-phrase is extracted from cannot be directly observed.

The second experiment focuses on the contrast between a matrix postverbal position and an embedded preverbal position in non-finite complements, where the latter allows expletives due to the EPP. The results for Experiment 2 show that early bilingual speakers are monolingual-like in their use of expletives, only allowing them in the preverbal position.

Taken together, the results of these two experiments predict that early bilinguals should exhibit the *that*-trace effect, preferring covert to overt complementizers with *wh*-subjects but not *wh*-objects. This is not exactly what we found in Experiment 3. Early bilinguals do prefer extraction of a *wh*-subject over a covert complementizer compared to extraction with an overt complementizer, like monolinguals; however, they also prefer extraction of a *wh*-object with a covert complementizer compared to an overt complementizer, unlike monolinguals. Descriptively, bilinguals have extended the *that*-trace effect to extraction from a postverbal position. This is particularly surprising given that these results come from these speakers' dominant language and the language of immersion, English. The fact that the bilinguals are English dominant strongly suggests that this result has something to do with

bilingualism itself.⁹ In addition, the monolingual control group exhibited the expected *that*-trace effect, providing evidence that this is not a task-based effect.

We are now in a position to test our prediction regarding the IH. Again, if the *that*-trace effect can be accounted for in purely syntactic terms, the IH predicts that Spanish-English bilinguals should not deviate from monolinguals with respect to the phenomenon as long as they are sufficiently proficient, something our experiments controlled for. On the other hand, if *that*-trace is instead an interface phenomenon, Spanish-English bilinguals are predicted to differ from monolinguals. Since the Spanish-English early bilinguals were not monolingual-like with respect to *that*-trace, this suggests that the phenomenon is in fact an interface phenomenon.

These results provide an additional piece of evidence suggesting that accounts of the *that*-trace effect must include extra-syntactic factors. The early bilingual speakers appear to have generalized the *that*-trace effect's restriction on *wh*-subject extraction to extraction more generally, and any purely syntactic account will have to allow for this kind of extension based on the syntactic features and principles involved. To our knowledge, current syntactic accounts of *that*-trace do not easily allow such an extension. Since *that*-trace involves the preverbal subject position, syntactic accounts tend to rely on properties involving this position which do not easily extend to object position or internal arguments.

Instead, the results support an interface analysis of the *that*-trace effect, begging the question of which interface is involved. The most likely candidate is the syntax-prosody interface for two reasons. First, to our knowledge, no other interfaces have been implicated in the research. Second, the amelioration effects of Right Node Raising on *that*-trace (de Chene, 2000) are particularly strong evidence that a syntax-prosody account is warranted. This result fits well with literature on prosody and contact varieties. Contact varieties, typically spoken by bilinguals, are characterized by differences from monolingual varieties in both prosody and syntax-prosody phenomena. The current results complement the diachronic evidence from contact varieties with synchronic evidence from early Spanish-English bilinguals.

Finally, the current study has implications for the IH itself. The L2 learners, like monolinguals, exhibited a restriction for extraction over a complementizer from subject position only, whereas the early bilinguals extended the restriction to extraction from object position. This result suggests that the underlying grammar of *that*-trace is acquired early and thus more subject to variation in early

9. This does raise the question of what happens in these speakers' Spanish. Perhaps they also prefer covert complementizers in Spanish, though some pilot data suggests that this is not the case. Future research comparing the acceptability of overt and covert complementizers in both Spanish and English could address the questions this possibility raises.

bilinguals (see, e.g., Tsimpli, 2014). Additionally, the pattern of results suggests that cross-linguistic influence did not play a role. In Spanish, the overt complementizer is preferred no matter the type of extraction, yet the L2 learners preferred the covert complementizer with subject extraction in English and the early bilinguals preferred the covert complementizer with both subject and object extraction in English.

9. Conclusions

In this paper, we set out to contribute to the debate regarding how to best account for the *that*-trace effect, and comp-trace effects more generally. Rather than focusing on monolingual speakers as is traditionally done, we drew our data from two kinds of bilinguals, Spanish-English early bilinguals and L1 Spanish L2 English late bilinguals.

Evidence from three experiments showed that the early bilinguals were not monolingual-like in their acceptability judgments of the *that*-trace effect, in spite of testing in their dominant language. L2 learners, however, were sensitive to *that*-trace effect. The current literature on the IH has rightly been concerned with the similarities between different types of bilinguals and what their similarities can elucidate about bilingualism. This paper instead contributes to a growing body of research about differences among types of bilinguals, which may allow for a better understanding of the relationship between bilingualism and interface phenomena.

The findings of the current study highlight the need for further research. Here we provide evidence of an extended *that*-trace phenomenon in early Spanish-English bilinguals. First, the distinctions regarding prosody from § 2.3 need to be tested with early bilinguals. If the extension of *that*-trace is due to prosodic factors, early bilinguals may be expected to show different amelioration patterns than those in (10)–(11). Second, we are currently running a replication and extension of this study including parallel examples in Spanish. Data regarding the use of complementizers in Spanish would allow for elimination of explanations involving transfer.

Finally, we hope to have shown that experimental data can be used to answer theoretical questions. Given debates in the field such as the one surrounding *that*-trace, the ability to triangulate evidence from various measures is helpful in developing confidence in any particular account. Theoretical linguistics' existing methods are fruitfully complemented by independent evidence from applied linguistics.

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An initial examination of imperfect subjunctive variation in Catalanian Spanish

A contact linguistics and usage-based approach

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While most Romance languages have only one morphological form for the imperfect subjunctive, Spanish exhibits variation between two morphological paradigms: *-ra* and *-se*. The present study investigated the distribution of these forms according to linguistic factors in Catalanian Spanish, a variety in close contact with Catalan. A corpus of 1,075 imperfect subjunctive tokens was compiled from the letters to the editor section of the regional newspaper *La Vanguardia*. Results show that the overall distribution of *-se* is slightly higher than what has been reported for European Spanish. Furthermore, a multivariate analysis revealed that structural priming, the existence of a cognate verb in Catalan and the combination of local frequency and morphological irregularity in the imperfect subjunctive significantly favor the use of *-se*.

Keywords: Catalanian Spanish, morphosyntax variation, variationist sociolinguistics, contact linguistics, usage-based linguistics, cognates, structural priming

1. Introduction

Over the past century the variation between the Spanish imperfect subjunctive variants *-ra* and *-se* has been well documented.¹ The examples in (1) show both forms in a similar construction, taken from the letters to the editor page of the Catalanian newspaper *La Vanguardia*.

1. In this paper, the terms ‘s-allomorph’ (i.e., *-se* in Spanish and *-és/ís* in Catalan) and ‘r-allomorph’ (i.e., *-ra* in Spanish and *-ra* in Valencian) will be used when comparison are made between the imperfect subjunctive across the languages.

- (1) a. *No me sorprendió, en absoluto, que pasados los Reyes no quedara un solo perro en la tienda.* (Rosa María Rosés, March 9th, 2014)
 ‘It did not surprise me, at all, that there were no dogs left at the store after the Three Wise Men’s celebration.’
- b. *En resposta a una carta publicada en este mismo periódico, me gustaría que quedase claro que el actual modelo de inmersión lingüística es el mejor para mantener la cohesión, en todos los sentidos, de la lengua catalana.*
 (Marc Arimany i Coll, October 5th, 2011)
 ‘In response to the published letter in this same newspaper, I would like it to be clear that the current model of linguistic immersion is the best way to maintain cohesion, in all its meanings, of the Catalan language.’

Other Romance languages, such as Catalan, do not have morphological variation in the imperfect subjunctive.² An example of the imperfect subjunctive in Catalan is found in (2), also taken from *La Vanguardia*’s letters to the editor.

- (2) a. *A continuació, li vaig demanar en castellà que em passés amb algun company que parlés en català, al que va contestar-me que tornés a trucar al 902-53-00-53 i demanés “los servicios de un traductor”.*
 (Carles Juaní i Poch, September 7th, 2009)
 ‘Then, I asked him in Spanish to pass me to a coworker who spoke Catalan, to which he told me to call 902-53-00-53 again and ask for “translation services”.’

The intense Spanish-Catalan contact that began in the 16th century in Catalonia has given rise to a unique variety of Spanish that contains many innovative features attributable to language contact (Blas Arroyo, 2011; Davidson, 2015; McKinnon, 2012; Sinner, 2004; Vann, 1998). One possible linguistic outcome of language contact in Catalonia is that parallel linguistic structures may become similar to one another, either through a language shift or borrowing dynamic. Given that there is a parallel form for the imperfect subjunctive in both Spanish and Catalan, which was derived from the Latin pluperfect subjunctive (i.e., *-se* in Spanish and *-és/ís* in Catalan), the present study will examine the possibility of an increased use of *-se* in Catalan Spanish, drawing upon psycholinguistics, usage-based theory, and language contact.

2. This paper distinguishes between Catalan and Valencian. Following Croft’s (2000) social definition of a language, these two language varieties could be considered sibling languages, since some Valencian speakers view their variety as a separate language (Lledó, 2011). This differentiation is important to the present study since there is a crucial structural difference between Catalan and Valencian: the former only uses the s-allomorph for the imperfect subjunctive (Institut d’Estudis Catalans) while the latter uses the r-allomorph (Acadèmia Valenciana de la Llengua, 2006).

2. Literature review

2.1 The Spanish imperfect subjunctive

Given that there are two forms that express the Spanish imperfect subjunctive there is debate as to whether *-ra* and *-se* are interchangeable without a change in meaning or if there are (extra-)linguistic factors that condition the observed variation. The position of the former camp can be found in Spanish second language textbooks and the official Spanish language grammar manual from *la Real Academia Española* (RAE). For example, the RAE (2009, p. 457) states “today in European Spanish the alternation [between *-ra* and *-se*] is practically free”, but that Latin American Spanish “has a marked preference” for *-ra* although *-se* is “amply registered in written language.” The idea that *-se* is more characteristic of European Spanish and written language was proposed in some of earliest work on the topic (Graham, 1926; Lemon, 1925; Wright, 1926), as well as in some more recent studies (DeMello, 1993; Kempas, 2011).

However, some scholars have attempted to explain the observed variation based on linguistic factors. For example, Bolinger (1956, p. 346) proposed that “*-se* implies ‘remoteness, detachment, hypothesis, lack of interest, vagueness, greater unlikelihood,’ while *-ra* brings everything into relatively sharper focus” based upon his Castilian-speaking informant. This view was partially echoed by Goldberg (1995, p. 402), who suggested that speakers use variation in the imperfect subjunctive to “distinguish events from each other in terms of their saliency,” with *-ra* being used to put emphasis on the utterance while *-se* “give[s] an impression of insistence.” Another view on the meaning of the *-ra/-se* can be found in Lunn (1995), whose survey of modern Argentine, Spanish and Peruvian novels notes a high percentage of *-se* in contrary-to-fact clauses. Additionally, Guzmán Naranjo (2017) in his study using the *Corpus Oral de Referencia de la Lengua Española Contemporánea* (CORLEC) found that abstract subjects, adversative and temporal sentences and non-modal verbs favored the use of *-se*.

Meanwhile, other linguists have employed variationist sociolinguistics to quantitatively investigate variation in the Spanish imperfect subjunctive. Using the Caracas (Venezuela) Sociolinguistic Corpus, Asratíán (2007) found that the overall use of *-se* was 6%. Although its use was very limited a multivariate analysis revealed that the compound tense with *haber*, negative clauses, the use of *-ra* in the previous clause, the middle class, participants between 30–45 years old and non-prototypical uses of the imperfect subjunctive favored the use of *-se*. Different results were found in Schwenter (2013) who used the *Corpus de Referencia del Español Actual* (CREA) to examine the imperfect subjunctive alternation in Argentina, Spain and Mexico. The main finding from this study was the asymmetrical effect of morphosyntactic

priming: if there was a prior *-se* right before the selected token then this token was *-se* 68% of the time compared to 23% when there was no prior imperfect subjunctive form, while if there was a prior *-ra* the analyzed token was *-ra* 84% of the time compared to 77% when there was no prior form. Schwenter proposed that structural priming may be responsible for the persistence of the older form *-se* in Spanish. Furthermore, Rosemeyer and Schwenter (in press) argue that while the use of *-se* without priming is generally restricted to the 3rd person singular form that *-se* priming can subsequently activate the whole morphological paradigm for later use, as seen by the increased use of *-se* with non-3rd person singular forms after being primed by a prior use of *-se* in the *Corpus del Español* (CdE).

Finally, of particular interest to the present study, Blas Arroyo and Porcar Miralles (1994) examined the imperfect subjunctive variation with speakers from Castellón in the Valencian Community. Through a sentence completion task the authors found that the use of *-se* was 23% overall, but that the monolingual Valencian speakers used *-ra* more than their bilingual Spanish/Valencian and monolingual Spanish counterparts. Blas Arroyo and Porcar Miralles (1994) tentatively propose that since Valencian speakers have one imperfect subjunctive form in their more dominant language (i.e., *-ra*) that this influences their choice of the variants in Spanish, by preferring to use the parallel *r*-allomorph. The present study will investigate this possibility as well, but we hypothesize opposite results – that is, the preference for the *s*-allomorph with Catalan Spanish speakers since the Catalan imperfect subjunctive *-és/ís* parallels the Spanish *-se*.

2.2 The effects of cognates and structural priming

To explore possible cognitive factors that affect the linguistic productions of speakers from the Spanish-Catalan speech community this study will be closely examining two relevant factors from the psycholinguistics literature: cognates and structural priming. Cognates are lexical items that share a high degree of phonological and/or orthographic similarities with a lexical item of the same semantic concept in a different language. For example, the Catalan word *gat* and the Spanish word *gato* would be considered cognates because they share the same semantic concept (i.e., ‘cat’), have a similar phonological form (i.e., /gat/ for *gat* and /gato/ for *gato*), and the orthography is very similar.

Researchers have proposed that these similarities increase the amount of lexical and phonological activation in the mind of bilingual speakers, leading them to both recognize and produce cognates faster than non-cognates (Costa, Caramazza, & Sebastián-Gallés, 2000). This cognate facilitation effect has been robustly demonstrated in recognition tasks (Dijkstra, Grainger, & Van Heuven, 1999), translation

tasks (de Groot, 1992; de Groot, Dannenburg, & Van Hell, 1994) and word selection tasks (Costa et al., 2000; Starreveld, de Groot, Rossmark, & van Hell, 2014). Furthermore, scholars working within a usage-based framework have provided evidence that one language can influence the phonetic production of cognates in the other language (Amengual, 2012; Brown, 2015; Brown & Amengual, 2015; Brown & Harper, 2009).

Based on recent Spanish imperfect subjunctive research (Rosemeyer & Schwenter, in press; Schwenter, 2013), the present study also examines the effects of structural priming, i.e., the use of one variant of a particular linguistic construction makes it more likely that the same variant will be used in the next use of that particular construction (Bock, 1986; Bock & Griffin, 2000). Structural priming has been shown to have strong effects on morphosyntax, across a variety of linguistic contexts, such as bilingualism (Bernolet, Hartsuiker, & Pickering, 2012; Flett, Branigan, & Pickering, 2013), corpus linguistics (Gries, 2005; Szmrecsanyi, 2005), second language acquisition (McDonough, 2006; Kim & McDonough, 2008; Shin & Christianson, 2012), sociolinguistics (Cameron & Flores Ferrán, 2003; Travis, 2007) and syntax (Bock, 1986; Bock & Griffin, 2000; Weiner & Labov, 1983).

Since the present study involves a bilingual speech community, the relationship between bilingualism and priming is of particular interest. For example, Bernolet, Hartsuiker, & Pickering (2012) investigated whether the activation of the phonology of one language via cognates could increase the effect of syntactic priming in another language, and they found that the existence of a Dutch-English cognate in a primer L1 Dutch sentence that contained an *of*-genitive (e.g. ‘the apple of the girl is blue’) increased the production of this structure in a translation task into L2 English. Additionally, structural priming in the L2 has been shown to have a greater effect on the L2 sentence processing than their L1 structural preferences for highly proficient L2 speakers (Flett, Branigan, & Pickering, 2013). These two studies seem to suggest that structural priming can work two different ways in bilingual speech, with effects possible from both the L1 and the L2.

2.3 Theoretical frameworks

In order to examine Spanish imperfect subjunctive variation in Catalonia this study will be employing two theoretical frameworks: usage-based theory of language (e.g. Bybee, 2006, 2010) and an evolutionary model of language contact and language change (Croft, 2000). Proponents of a usage-based account of language argue that “grammar is the cognitive organization of one’s experience with language” (Bybee, 2006, p. 711). One of the central tenants of this theory is that the construction of a speaker’s grammar is mostly a cognitive process, by which strategies such as

categorization, chunking, rich memory storage, analogy and cross-modal association are used to create and change exemplar representations of particular linguistic structures. These exemplars are affected by new tokens which, with tokens that are “identical to an existing exemplar mapp[ing] onto that exemplar, strengthening it”, while those that “are similar but not identical (differing in slight ways in meaning, phonetic shape, pragmatics) to existing exemplars are represented as exemplar themselves and are stored near similar exemplars to constitute clusters or categories” (Bybee, 2006, p. 716).

This insight into how the human mind can organize linguistic experiences into clusters of related properties is relevant for this discussion of the imperfect subjunctive exemplars for the two languages in contact in Catalonia. In Catalan, the imperfect subjunctive exemplar is relatively straightforward; speakers of this language hear the *s*-allomorph (i.e., *-és/ís*) in the linguistic input of their speech community, which then is categorized into their mental representation via phonetic cues (e.g., variants of the *s*-allomorph, such as [es] [esis] [esim]) and grammatical meaning (i.e., imperfect subjunctive) of the token. This exemplar is strengthened in Catalan through several of the cognitive processes mentioned in Bybee (2010), such as categorization (e.g., the component part of the *s*-allomorph in a word is recognized as the imperfect subjunctive, and is stored as such) and rich memory (e.g., the phonetic detail, context of use and meaning of the *s*-allomorph), in addition to the frequency of *s*-allomorph as the imperfect subjunctive (i.e., this form is highly frequent because it is the only form used for the imperfect subjunctive in Catalan). Therefore, when we take all these processes together we can claim that the imperfect subjunctive exemplar in Catalan is the *s*-allomorph.

Spanish, however, presents a more complex puzzle for theorizing an imperfect subjunctive exemplar representation with its two imperfect subjunctive variants. For example, by applying the cognitive process of categorization, tokens that have the *s*-allomorph or *r*-allomorph will be stored in the speaker’s mental representation of the imperfect subjunctive grammatical category, in addition to rich memory, which will include the meaning, context of use and phonetic details of the *r*-allomorph (e.g. [ra], [ras], [ramos]) and the *s*-allomorph (e.g. [se], [ses], [semos]). However, one of the key differences between these two variants is their frequency, as it has been well attested that the *r*-allomorph is more frequent in both European and Latin American Spanish. Since the *r*-allomorph is more frequent in the speaker’s environment there is a greater opportunity to use the cognitive processes of categorization and rich memory to form an imperfect subjunctive exemplar. This *r*-allomorph exemplar will guide the speaker in producing the construction, which will then go on to be present in the linguistic input of all his/her interlocutors, thereby creating a possible feedback loop that could affect the exemplar representation on a societal level. With this in mind, the question now becomes ‘to what extent

do these two imperfect subjunctive exemplars interact in the mind of bilingual Catalan-Spanish speakers?’

To help answer this question, Croft’s (2000) evolutionary model of language contact and change will be used, which proposes that a speaker’s grammar is the knowledge and structure of a language that is acquired through a subset of the language available in their input. These linguistic structures, called ‘linguemes’ in Croft’s terminology, can be perfectly replicated in speech or slightly altered to create an innovation that may have the potential to propagate in the speech community; linguemes are analogous to exemplars since they are the mental representations of linguistic structures that are created, shaped and changed by experience. Individual bilingual speakers are central to Croft’s application of his model to language contact, given that speakers “possess some knowledge of both languages that [they speak], that is, possess linguemes (replicators) of both languages” (p. 201). The degree of bilingualism of the individual speakers creates the social environment that determines the direction and amount of innovation and propagation (i.e., language shift or borrowing situations).

If we apply this evolutionary model of language change to Catalonia, we can see that the high level of societal bilingualism gives rise to the possibility of Spanish and Catalan becoming structurally similar to one another. According to Croft (2000), this language-contact dynamic can take place when there is multilingualism and openness to linguistic innovations, whereby the bilingual speakers can select features from one lingueme pool to use in the other language. Furthermore, as we have previously examined with the psycholinguistics literature, the selection of new innovative features may be facilitated by similarities between the two languages (e.g., cognates). If we specifically examine the lingueme under investigation in the present study, the Spanish imperfect subjunctive, we can see that the lingueme pool in Catalan is restricted to one form, the s-allomorph, while in Spanish the pool contains two variants, the s- and r-allomorphs. Bilingual members of Catalonia have access to both lingueme pools and activation in Catalan may have the potential to prime the selection of the orthographically similar s-allomorph in Spanish production, especially if the Spanish verb to be selected in discourse has a Catalan cognate.

The main question that emerges from the discussion of these two theories is how similar grammatical categories are represented in minds of speakers who belong to a bilingual speech community – that is, do they have one separate imperfect subjunctive exemplar for each language or do they have only one exemplar that is impacted by tokens of experience from both languages? Furthermore, if we take into consideration the literature review on priming and cognates, how do these linguistic factors affect which Spanish imperfect subjunctive variant is selected in the discourse of bilingual speakers who only have one imperfect subjunctive form in their regional language? Therefore, the present study is guided by two research

questions: (1) when compared to previous research on Peninsular Spanish, is there a greater use of the *-se* imperfect subjunctive form in Catalan Spanish?; (2) are there linguistic factors that condition the use of *-se* in the Spanish of Catalonia?

3. Method

This study's corpus was compiled by searching for the two Spanish imperfect subjunctive variants in the online letters to the editor pages of the Catalan Spanish newspaper *La Vanguardia*. Investigating journalistic prose provides us with an

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CARTAS DE LOS LECTORES

Regeneración
La mayoría estaremos de acuerdo en que si un edificio con familias en su interior amenaza ruina, lo prioritario sería apuntalarlo para impedir el derrumbe. Esta era la realidad económica de España hace tan sólo dos años. Reconducir esta situación no ha sido tarea fácil ni agradable para nadie. La reforma laboral, tan denostada por sindicatos y oposición, se podrá discutir si es justa o injusta, pero en el contexto de una economía globalizada es absolutamente necesaria. La recuperación macroeconómica, en una crisis que dura más de seis años, es condición sine qua non para impulsar la economía real. Ahora, lo prioritario es el desempleo. Pero hay más. Sigue pendiente el adegazamiento de la Administración, con la supresión de miles de empresas e instituciones públicas, innecesarias, refugio de políticos en paro. Como conclusión, la ley de Abdicación del Rey debería servir de base para la regeneración del sistema democrático, con el fin de devolver la confianza de una sociedad decepcionada con sus partidos e instituciones. Todo ello sólo requiere de la voluntad política y el consenso de, al menos, los dos grandes partidos. Lamentablemente, albergo serias dudas, porque supone romper la cadena de privilegios, y el modus vivendi de la clase política.
JOSE ANTONIO GRAN
Suscriptor

HOY EN LA VANGUARDIA.COM

TENGO UN BLOG. Uno de los elementos que hacen especial *Adria's News* (de Adria Guxens) son, sin duda, las entrevistas, especializadas en la cultura

CONCURSO. Responda a la pregunta que le planteamos al término del Acústik y gane el disco firmado del cantautor *Jordi Ninus Camina*

GALERÍA DE FOTOS. ¿Participará en la fiesta de la *Patum de Berga*? Envíe sus fotos por Twitter con #Patumlv o a participacion@lavanguardia.es

PARTICIPACIÓN. Los usuarios apoyan *maltar a los padres* por las borracheras de sus hijos, aunque también proponen alternativas a las sanciones

CARTAS. ¿Qué opina del conflicto entre *taxistas* y apps que ponen en contacto a conductores particulares? Escriba a participacion@lavanguardia.es

EL CONTADOR

¿Le parece bien que TMB asuma la reparación de Can Vies?

Han opinado 1.547 personas. Hasta las 21.00 horas.

☐ Sí 8%

☒ No 91%

☐ No sé 1%

LA PREGUNTA DE MAÑANA

¿Aprueba que los padres paguen por las borracheras de sus hijos?

Vote en www.lavanguardia.com/participacion/encuestas o enviando un mensaje al 27723 con la palabra VOTAR espacio 1, 2 o 3, según sea la opción elegida: Sí, No o No sé. Coste del SMS 1,42 IVA incluido. Servicio prestado por WOT, dirección de cliente: 902 204 205. info@wot.es

INSPECTORES DE HACIENDA PUEEN UN DEBATE PARA LEGALIZAR LA PROSTITUCIÓN Y ALGUNAS DROGAS

Pues sí, porque para bien o para mal siempre habrá, entonces mejor que esté controlado, que coctien.
Mónica Agut Aguilera

Ya tarda. Yo viví en Holanda. Las chicas están protegidas en todos los sentidos.
Ignacio Perisno

Lo que hay que hacer es intentar que las mujeres salgan de la prostitución. Es una forma de esclavitud.
Dolores Masot

Lo que me faltaba por ver, y en vez de ayudarla a salir! Que la mayoría no está ahí por gusto. Ahora les saldrá otro chulo más.
Carmen Muñillo Gole

Ambas cosas es evidente que existen, pues que se legalicen y critiquen como cualquier otro trabajo o como el tabaco y el alcohol.
Sergio Nicos Galindo

La prostitución sí, las drogas nunca.
Daniel Velasco

Illeis quan els convé i el gran nombre d'impediments que sorgeixen quan no, no trobeu?
JOSEP E. BORDES VIDAL
Barcelona

Nequit
Malaudament, sé quins productes hem de comprar a cada supermercat perquè ens surtin més barats. Sé quina és la benzina més econòmica de la zona on visc. Sé quins són els requisits mínims per passar la ITV. Sé exactament quan arriba la carta per pagar l'impost de circulació i en quins mesos hi ha d'haver més diners al compte bancari per pagar l'assegurament del cotxe. Sé quants dies de pròrroga ens dona la companyia de la llum o de l'aigua abans de tallar-nos el subministrament i coneix el número de telèfon de la meua sucursal bancària, que més d'un cop he evitat contestar. Sé quina és la sensació que té una persona que acumula dos mesos de lloguer per pagar l'insomni que comporta. També coneix el neguit d'una mare i no m'agrada. Tinc 21 anys i el que de veritat no sé és quantes famílies estan en les mateixes o condicions pitjors. Però si us sóc sincer, no se si vull saber-ho, perquè quan hi penso em ve una por demesurada.
GERMAN BARTOLOME
Bilmes

Figure 1. Sample letters to the editor page from *La Vanguardia*

opportunity to examine an infrequent lingueme (Collantine, 2010) that might otherwise be difficult to elicit in spontaneous speech.³ It was decided to use opinion

3. From corpus data, only about 7.5% of verb forms in written and oral mediums are in the subjunctive, and this does not distinguish between the subjunctive types. Furthermore, asking specific types of questions that are meant to elicit the imperfect subjunctive in an interview format

pages instead of other sections of the newspaper, such as international and national news, due to the possibility that these pages might have included articles published outside of Catalonia; although *La Vanguardia* publishes daily in both Spanish and Catalan the letters to the editor appear in the language the authors used to write them, meaning that the authors' language choice was deliberate and the observed linguistic production is their own. Furthermore, if a speaker were to write a letter to the opinion page of a regional newspaper they would most likely form part of the local speech community and have contact with the local variety of Spanish. Figure 1 shows an example of a Spanish print-version of the newspaper, with a Spanish letter to the editor in the left column and a Catalan letter in the right column, while Figure 2 presents a screenshot from *La Vanguardia*'s online search function.

Figure 2. *La Vanguardia*'s online search function in 2014

The chosen verbs come from one-third of the Spanish Frequency Dictionary (Davies, 2006) by taking the verbs that appear in x000-x333 position (e.g., 1–333, 1000–1333, 2000–2333, etc.) in the list of the 5000 most frequent words in the

may in fact prime a specific variant of the imperfect subjunctive form, especially since Schwenter (2013) and Rosemeyer and Schwenter (in press) have shown that *-se* is easily primed by a prior *-se* form.

Spanish language.⁴ A sample of the verb tokens that were extracted is provided in Table 1.

Table 1. Sample token verbs, with the number of verbs in each category in parenthesis

Frequency listing (N)	Sample verbs
0–333 (89)	<i>hacer</i> ‘to make,’ <i>haber</i> ‘to have,’ <i>llevar</i> ‘to carry’
1000–1333 (82)	<i>comprar</i> ‘to buy,’ <i>luchar</i> ‘to fight,’ <i>parar</i> ‘to stop’
2000–2333 (58)	<i>bailar</i> ‘to dance,’ <i>doler</i> ‘to hurt,’ <i>llover</i> ‘to cry’
3000–3333 (67)	<i>cazar</i> ‘to hunt,’ <i>nadar</i> ‘to swim,’ <i>oler</i> ‘to smell’
4000–4333 (51)	<i>aburrir</i> ‘to bore,’ <i>desafiar</i> ‘to challenge,’ <i>entrevistar</i> ‘to interview’

In total, we searched for the two variants of the 1st and 3rd person singular imperfect subjunctive with the 347 verbs obtained by this selection method; however, only 153 of these verbs (44.1% overall) had at least one token in the opinion pages of *La Vanguardia*. Tokens were excluded if they fell under the following criteria: (a) the author of the opinion piece wrote from other regions of Spain (e.g. Madrid, Galicia, Andalusia, etc.) or abroad (e.g. Argentina, the United States); (b) forms of the verbs *ser* ‘to be’ and *ir* ‘to go’ which have the same orthography as the lexical item *fuera* ‘away’; (c) modal uses of the verbs *querer* ‘to want’ and *deber* ‘to ought to,’ since there is not a parallel linguistic structure in Catalan.⁵ In total, 1075 tokens were submitted for statistical analysis.

The coding scheme for the present study closely followed that of Schwenter (2013), which is one of the most recent variationist studies on the imperfect subjunctive in Spanish. Each token was coded for sentence type (5 types), polarity (2 types), structural priming from a prior form (*-ra* vs. *-se* vs. none), local frequency and morphological irregularity in the imperfect subjunctive form. Structural priming

4. The data presented in this paper is the result of preliminary data collection conducted between March and April 2014. Initially, the goal of this project was to later expand it, however, the search function of *La Vanguardia*’s website has been changed from the search function in Figure 2 to a simple Google search; it is now impossible to search for imperfect subjunctive tokens in the letters to the editor section in a systematic manner. Consequently, several reviewer suggestions (e.g. more tokens, including the whole verbal paradigm, including all the verbs in the Frequency Dictionary, including modal verbs and employing a more complex measure of priming) could unfortunately not be implemented.

5. Catalan would use the conditional morphology while Spanish would allow for the use of the imperfect subjunctive. For example, “*Señor Artur Mas, no quisiera ser presuntuoso, pero estoy seguro que usted convendrá conmigo que la familia es una institución muy importante en Catalunya*” [Josep Pagès Martí, *La Vanguardia*, November 4th, 2013] is possible in Spanish, but Catalan would only allow the use of the conditional (e.g., *No voldria ser presumptuous* ‘I wouldn’t want to be presumptuous.’)

was coded for as the most immediate previous use of the imperfect subjunctive, if there was one, within the same letter in which the analyzed token appeared.

Local frequency was also included in the analysis due to recent studies showing that frequency is a powerful linguistic factor that can affect morphosyntactic variables (e.g. Erker & Guy, 2012); following Erker and Guy (2012) frequent verbs were classified as those verbs that constituted at least 1% of the corpus. As shown in Table 2, upon exploring the data, collinearity (i.e., two independent variables that are highly correlated) was discovered between the factors of morphological irregularity in the imperfect subjunctive and local frequency. As can be seen from this cross-tabulation, many of the frequent verb tokens are morphologically irregular in the imperfect subjunctive while many infrequent verbs are morphologically regular in the imperfect subjunctive; this unbalanced distribution was confirmed by a Chi-square test, $\chi^2 = 512.13$, $p < 0.0001$.

Table 2. Frequency counts for morphological irregularity and local verb frequency

	Frequent verbs	Infrequent verbs	Total
Regular in the imp. subjunctive	118 (15.9%)	293 (88.5%)	411 (38.2%)
Irregular in the imp. subjunctive	626 (84.1%)	38 (11.5%)	664 (61.8%)
Total	744 (69.2%)	331 (30.8%)	1075

As non-collinearity is a test assumption of multiple regressions a new independent variable was created by combining these two factors into one: Local Frequency x Morphological Irregularity. However, due to the low token count of irregular, infrequent verbs this category was collapsed with the regular, infrequent verbs; this is to say, this new variable has three levels (i.e., regular and frequent verbs, irregular and frequent verbs, and infrequent verbs).

To operationalize Spanish-Catalan cognates we define them as a pair of words that share the same semantic concept and have a high (50% or more) degree of orthographic similarity. It was decided to focus exclusively on orthographic similarities instead of phonological since the tokens come from a written medium. Using morphological networks of association (Bybee, 2010), the cognate status of Spanish verbs was calculated based on the number of one-to-one grapheme correspondences between the Catalan and Spanish verb present in the Spanish verb, divided by the total number of graphemes in the base form of the Spanish verb.

For the statistical analysis, a series of chi-square tests were performed to examine the frequency distribution of *-ra* and *-se* according to several factors; additionally, a multivariate analysis was conducted using R (R Core Team 2015) and the statistical package Rbrul (Johnson, 2009). A mixed-effects model was used in order to take into consideration the individual verbs as a random effect. The dependent

variable was the imperfect subjunctive variant (with an application value of *-se*), and the fixed effects are those outlined in Table 3.

Table 3. List of independent variables

Factor	Variables
Sentence type	<i>Adjectival clauses (e.g. gracias a él he conocido a muchas personas que nunca hubiera conocido)</i> <i>Adverbial clauses (e.g. tuvimos que refugiarnos en un establecimiento hasta que amaneciera)</i> <i>Apodosis clauses (e.g. si los dirigentes españoles utilizaran sólo un poco del seny catalán -sensatez en castellano-, otro gallo nos cantara.)</i> <i>Nominal clauses (e.g. por una parte, me gustaría que la UE tomase buena nota y que no se escondiese detrás de una pretendida democracia)</i> <i>Protasis clauses (e.g. si ahora se celebrase un referéndum votaría sí a la independencia)</i>
Polarity	<i>Presence of negation (e.g., le recomendaron que no lo hiciera)</i> <i>Absence of negation (e.g., le comentaría que hiciera esta misma reflexión)</i>
Prior form	<i>No prior imperfect subjunctive forms</i> <i>Prior -ra before the token</i> <i>Prior -se before the token</i>
Local frequency x Morphological Irregularity	<i>Frequent and irregular verbs in the imperfect subjunctive (e.g., estar)</i> <i>Frequent and regular verbs in the imperfect subjunctive (e.g., explicar)</i> <i>Infrequent verbs (e.g., estudiar)</i>
Cognates	<i>Cognate (e.g., Sp. tener, Cat. tenir)</i> <i>Non-cognate (e.g., Sp. llegar, Cat. arribar)</i>

4. Results

To begin, Table 4 provides the overall frequency rate of *-ra* and *-se* from the *La Vanguardia* corpus of opinion pieces, alongside previous research on imperfect subjunctive variation in Peninsular Spanish. Although the methods and genres of these studies are different from the present study all are based on corpora; future research should directly compare the results of this study with letters to the editor from other regional newspapers in Spain.

From Table 4 we can see that the rate of *-se* in Catalanian Spanish (21.3%) is higher than other studies conducted on Peninsular Spanish; a series of chi-squares revealed that the *-ra* and *-se* distribution in Catalanian Spanish was statistically different from DeMello (1993), i.e. $\chi^2 = 6.93, p < 0.01$, Schwenter (2013), i.e. $\chi^2 = 7.77, p < 0.005$, Rosemeyer & Schwenter (in press), i.e. $\chi^2 = 12.29, p < 0.001$, and Guzmán

Table 4. Overall token frequency count of *-ra* and *-se* in Catalanian Spanish as compared to previous research on Peninsular Spanish

Study	<i>-ra</i>	<i>-se</i>	Total
Present study: Catalanian Spanish, letters to the editor	846 (78.7%)	229 (21.3%)	1,075
DeMello (1993): Corpus of “educated speech” in Madrid and Seville	298 (85.1%)	52 (14.9%)	350
Schwenter (2013): <i>CREA</i>	58,633 (82.0%)	12,877 (18.0%)	71,510
Rosemeyer & Schwenter (in press): <i>CdE</i>	599 (85.3%)	103 (14.7%)	702
Guzmán Naranjo (2017): <i>CORLEC</i>	1,078 (84.9%)	191 (15.1%)	1,269

Naranjo (2017), i.e. $\chi^2 = 15.46$, $p < 0.0001$. However, it should be noted that *-ra* is still overwhelmingly the preferred imperfective subjunctive variant in this corpus of Catalanian Spanish.

Table 5 shows the results of the multivariate analysis from Rbrul. The linguistic factor groups are presented in the leftmost column, organized by the most to least significant factors selected by the model. Only the linguistic factors that are significant are listed in the table, along with the centered factor weight for each of the individual variables; values that are above .50 indicate that the factor favors the use of *-se* while values below .50 indicate that *-se* is disfavored.

Table 5. Linguistic factors contributing to the use of *-se* in Catalanian Spanish

Factor group	Factor	Centered factor weight	Percent <i>-se</i>	<i>n</i>	% of data
Prior form ($p < 0.0001$)	Prior <i>-se</i>	0.78	56%	40	7%
	No prior form	0.41	21%	147	65%
	Prior <i>-ra</i>	0.29	14%	42	28%
Existence of a Catalan cognate ($p < 0.015$)	Yes	0.59	22%	211	88%
	No	0.41	14%	18	12%
Local Frequency	Frequent and regular	0.57	27%	32	11%
x Morphological Irregularity ($p < 0.05$)	Infrequent	0.53	22%	74	31%
	Frequent and irregular	0.40	20%	123	58%
$N = 1075$	input = 0.22	deviance = 1019.43			

Overall, the independent variable that most affects the use of *-se* in Catalanian Spanish is the prior use of the imperfect subjunctive, specifically the prior use of *-se*. The next most significant factor is the existence of a cognate in Catalan, which favors the use of *-se*. Finally, both frequent verbs that are morphologically regular in

the imperfect subjunctive and infrequent verbs favor the use of *-se*, while frequent verbs that are morphologically irregular in the imperfect subjunctive disfavor *-se*.

Despite the power of a prior imperfect subjunctive form in the determination of the variant choice of the next imperfect subjunctive use, nearly two-thirds of the corpus did not have a prior use of the imperfect subjunctive. Therefore, a second Rbrul analysis was carried out on this subset of the data to see if any linguistic factors would still predict the use of *-se* in Catalanian Spanish. These results are presented in Table 6.

Table 6. Linguistic factors contributing to the use of *-se* in Catalanian Spanish in the absence of a prior use of the imperfective subjunctive

Factor group	Factor	Centered factor weight	Percent <i>-se</i>	<i>n</i>	% of data
Existence of a Catalan cognate (<i>p</i> < 0.015)	Yes	0.59	22%	136	88%
	No	0.42	13%	11	12%
<i>N</i> = 701		input = 0.21 deviance = 700.83			

As can be seen from Table 6, in the absence of priming the only linguistic factor selected which affects the use of *-se* in Catalanian Spanish is the existence of a Catalan cognate: the presence of a Catalan cognate favors the use of *-se* in the use of the Spanish imperfect subjunctive.

5. Discussion and conclusion

The present study set out to empirically examine imperfect subjunctive variation between two forms, *-ra* and *-se*, in Catalanian Spanish, a variety in close contact with Catalan. The imperfect subjunctive was chosen to examine possible contact effects because the Spanish *-se* form closely parallels the *-és/ís* imperfect subjunctive form in Catalan; this is to say, both languages share the *s*-allomorph, which may result in Spanish becoming more like Catalan with a higher use of *-se* and a lower use of *-ra*, when compared to Peninsular Spanish in general. Furthermore, this study investigated how cognitive factors, such as cognates, frequency and morphologically irregularity, affected the observed variation.

With regard to the first research question, it was found that there was a higher rate of *-se* in this corpus of Catalanian Spanish than what has been found in other corpus-based studies of Peninsular Spanish (DeMello, 1993; Guzmán Naranjo, 2017; Rosemeyer & Schwenter, in press; Schwenter, 2013); in the present study, the *-se* variant was found with 21.3% of the tokens collected, while in previous

studies the use of *-se* ranged from 14.7% (Rosemeyer & Schwenter, in press) to 18.0% (Schwenter, 2013). While this result may point to the possibility of language contact, caution must be taken: (1) the corpus used in this study was different from the large corpora employed in the previous studies and is therefore not completely comparable; (2) there is still a marked preference for *-ra* in this study's corpus, as it was used with 78.7% of the tokens.

With respect to the second research question, the multivariate analysis revealed that three linguistic factors significantly condition the variation between the two forms: (1) prior use of the imperfect subjunctive; (2) the existence of an orthographic cognate in Catalan; (3) the combination of local frequency and irregularity in the imperfect subjunctive.

The most significant linguistic factor chosen from the multivariate analysis was the prior use of the imperfect subjunctive (i.e., structural priming); it was shown that a prior use of *-se* primed the analyzed token to also employ *-se*, while the use of *-ra* or no prior use of the imperfect subjunctive disfavored the use of *-se*. This finding parallels previous Spanish morphosyntactic research that has examined structural priming, in that the prior use of one form of a variable structure can prime the next use of that linguistic structure to employ the same form (Cameron & Flores-Ferrán, 2003; Rosemeyer & Schwenter, in press; Schwenter, 2013; Travis, 2007). Moreover, this study provides more evidence to the claim made by Schwenter (2013) and Rosemeyer and Schwenter (in press) that the priming of *-se* may be helping to preserve this older variant in the Spanish language.

The present study also found that the existence of a Catalan-Spanish cognate favors the use of *-se* in this contact variety, crucially even in the absence of a prior use of *-se*. As was discussed in the literature review, cognates can activate both languages in a bilingual's mind during speech perception and production. Based on the results from this study, we would propose that when a Spanish-Catalan speaker is conjugating a cognate Spanish verb into the imperfect subjunctive that the r-allomorph (i.e., Spanish *-ra*) and s-allomorph (i.e., Spanish *-se* and Catalan *-és/ís*) can both become activated. Consequently, due to the activation of Catalan and its parallel imperfect subjunctive structure this may in turn cause speakers to favor the *-se* form with cognate verbs over non-cognate verbs, which would not activate both languages in the bilingual's mind to the same extent as do cognates.

With access to both linguistic pools and their distribution of variants (Croft, 2000), it appears that these speakers, where bilingualism is the norm, may have a different distribution of *-ra* and *-se* according to cognate status. At a societal level, the increased use of Catalan in Catalonia has presumably increased the presence of the s-allomorph in the input of all speakers of this autonomous region. For example, when these speakers hear or read the Catalan verb *quedar* 'to remain' in the imperfect subjunctive form (i.e., *quedés*) both Spanish imperfect subjunctive

variants of the cognate verb *quedar* (i.e., *quedase* and *quedara*) become activated; however, because of the close similarities between *quedés* and *quedase* the connection between these two s-allomorphs is stronger and therefore strengthened in the mind of the bilingual speaker. Conversely, with a non-cognate Catalan verb such as *arribar* ‘to arrive’ and its imperfect subjunctive form *arribés*, there is not as strong of a connection with the semantically similar Spanish equivalent *llegar* and its two imperfect subjunctive forms (i.e., *llegase* and *llegara*). Since the frequent exposure to the Catalan s-allomorph is in competition with the overall frequent use of the r-allomorph in Spanish this makes Catalonia an interesting locus to examine the possibility of a Spanish structure becoming more like its parallel structure in Catalan.

The other significant linguistic predictor from the multivariate analysis in Catalanian Spanish was the combination of local frequency and irregularity of the Spanish imperfect subjunctive form, with *-se* being favored by frequent verbs that are morphologically regular in the imperfect subjunctive and infrequent verbs. These findings are supported by usage-based approaches to language since infrequent verbs are susceptible to regularization, while frequent verbs that are morphologically irregular resist such regularization via a conserving effect: “frequency strengthens the memory representations of words or phrases, making them easier to access whole and thus less likely to be subject to analogical reformation” (Bybee, 2006, p. 715).

If we apply the conserving effect to help account for the distribution of *-ra* and *-se* it is not surprising that infrequent verbs and frequent verbs that are morphologically regular would favor *-se*. Since bilingual speakers have access to both lingueme pools a speaker of Catalanian Spanish may begin to simplify the Spanish imperfect subjunctive structure from two variants to just one (i.e., the s-allomorph that is present in both Spanish and Catalan). The evidence for this possibility comes from multivariate analysis finding that frequent verbs which are morphologically irregular are the ones that are least likely to use *-se*; since they are highly frequent the forms become entrenched in the speaker’s mind and become resistant to change – in this case, the change would be from a more complex system with two imperfect subjunctive variants to a simpler system with one variant that is analogous across both languages. Furthermore, the morphological irregularity may decrease the amount of shared orthography and phonology between the Spanish and Catalan verbs conjugated in the imperfect subjunctive (e.g. the cognate verb *poder* ‘to be able to’ is *pudiese* in Spanish and *pogués* in Catalan), which may in turn decrease the effects of cognates.

On the other hand, since infrequent verbs are not often used in discourse they may be susceptible to simplification to the form that is most present overall at a societal level (i.e., 100% in Catalan and 21.3% in Spanish): the s-allomorph. This

is to say, when confronted with an infrequent verb that they do not conjugate on a regular basis the bilingual speakers may resort to using the allomorph that they are exposed to most often in their environment. A similar process could also occur with the frequent verbs that are morphologically regular in the imperfect subjunctive, especially since the orthographic and phonological similarities between the conjugated Spanish and Catalan verbs are largely maintained (e.g. the cognate verb *pasar/passar* ‘to pass’ is *pasase* in Spanish and *passés* in Catalan).

Despite these linguistic factors favoring the use of *-se* in Catalanian Spanish it should be noted that this variety does not deviate from the general trend observed in modern-day Spanish: *-ra* is still the preferred imperfect subjunctive form. Therefore, one possible explanation for the slightly higher use of *-se* in Catalonia is that the language contact with Catalan may be slowing down the language change occurring in Spanish which is replacing *-se* with *-ra*; this possibility has been raised in previous studies on Spanish in contact with Catalan with other morphosyntactic constructions (Blas Arroyo, 2008; Enrique-Arias, 2010). However, without a similar corpus from monolingual regions in Spain this study does not currently have the evidence needed to make this claim, but we raise this possibility with the hope that it will be explored in future research.

Despite the significant results from this study caution must be used in generalizing these results to the Catalanian Spanish speech community at large. For example, newspaper discourse involves a more formal register, as well as it being an older medium of communication, and therefore it is possible that the study’s corpus skewed towards older and more educated speakers. Additionally, the corpus might in fact be biased towards speakers who prefer to use Spanish over Catalan, since those who self-identify as Catalan-dominant might not write an opinion piece in Spanish, but rather may choose to write it in Catalan; recall that *La Vanguardia* publishes its letters to the editor in the original form in both language versions of the daily newspaper. This is important to note because it was impossible for the present study to take into account the writer’s level of bilingualism, and therefore future research should better control for this important variable; this is especially pertinent given that Blas Arroyo and Porcar Miralles (1994) found that participants who self-reported exclusive or near-exclusive daily use of Valencian used more *-ra* in Spanish, possibly since Valencian only has the *r*-allomorph. Taken together, while the demographics of the speakers who form the basis of the corpus may not be representative of Catalanian society as a whole the results of cognates and local frequency/irregularity may in fact be conservative given that Catalan-dominant speakers may be choosing to write letters to the editor in Catalan more than in Spanish.

In sum, the present study examined the distribution of the Spanish imperfect subjunctive in the contact variety of Catalanian Spanish. It was found that

the overall rate of *-se* was higher than previous research on Peninsular Spanish, and that the linguistic factors of structural priming, the existence of a cognate in Catalan and the combination of local frequency and irregularity of the imperfect subjunctive were significant linguistic factors that favored the use of *-se*. Given the nature of this study's corpus, we tentatively propose that the parallels between the Spanish and Catalan *s*-allomorph, aided by cognates, frequency and morphological regularity, may be working with structural priming to help maintain the use of this variant in Catalanian Spanish. Future research should be conducted on a comparable monolingual Peninsular Spanish corpus and also with other Spanish varieties in contact with a language that only has one imperfect subjunctive form, such as Galician Spanish, to further investigate the predictions related to cognates, frequency and morphological regularity presented in this paper.

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Testing English influence on first person singular “yo” subject pronoun expression in Sonoran Spanish

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The present investigation seeks to explore the impact that contact with English has on the variation of first person singular “yo” subject pronoun expression in Sonoran Spanish by analyzing sociolinguistic interviews from sixteen monolinguals from Sonora, Mexico and sixteen bilinguals from Arizona, United States from Sonora born parents/grandparents. Based on previous research, it is expected that if there is English influence on the Spanish of the bilinguals, there will be an increased rate of expressed pronouns, the bilinguals will show decreased sensitivity to switch reference, there will be a decrease of expressed pronouns in coordinate clauses with the same referent, and community (Arizona/Sonora) will be a significant factor. These hypotheses are not born out and thus the results show a lack of evidence for English influence on the variable for the bilinguals in the study.

Keywords: subject pronoun expression, bilingualism, variation, contact, Spanish, English

1. Introduction

The present investigation seeks to explore the impact that contact with English has on the variation of first person singular “yo” subject pronoun expression in Sonoran Spanish. In Spanish, subject expression is variable, allowing for both unexpressed pronouns as in (1) and expressed pronouns like the examples in (2).

- (1) Los fines de semana **trato** de limpiar la casa, lo que no **hago** entre semana porque no **tengo** tiempo. **Lavo** la ropa, y lo de toda la semana (H03)
‘On the weekends (IØ) **try** to clean the house, whatever (IØ) **don’t do** during the week because (IØ) **don’t have** time. (IØ) **wash** cloths and everything from during the week.’ (H03)

- (2) De antes de lo que **yo me recuerdo**, o sea cuando **yo nací**, pues **yo como nací** a ser del Pitic pues, o sea **yo no salía** de esa área. (H12)
 ‘From before I **can remember**, when I **was born**, I **was born** to be from the Pitic, I **didn’t leave** that area.’ (H12)

Subject pronoun expression in Spanish has been the topic of a vast array of variationist studies which have explored the realization of the variable in the speech of adults in monolingual communities (Cameron, 1993; Solomon, 1999; Soares de Silva, 2006; Lastra & Martín Butragueño, 2015; among many others) and bilingual communities (Elizaincín, 1995; Flores Ferrán, 2004; Otheguy, Zentella & Livert, 2007; Torres Cacoullos & Travis, 2010a, 2010b; Carvalho & Child, 2011; Otheguy & Zentella, 2012; Lapidus Shin & Montes-Alcalá, 2014; Carvalho & Bessett, 2015; de Prada Pérez, 2015; Michnowicz, 2015; among countless others). The goal of the bilingual studies has been to determine if there exist influences, be it contact induced or due to bilingualism, among the bilingual speakers in the studied communities when comparing their subject pronoun expression patterns to those of monolingual speakers. This previous research can be divided between those that argue in favor of contact influences (Silva-Corvalán, 1994; Lapidus & Otheguy, 2005; Otheguy, Zentella, & Livert, 2007; Otheguy & Zentella, 2012; de Prada Pérez, 2015; Michnowicz, 2015; among others) and those that argue against influences of contact (Hurtado, 2001; Flores Ferrán, 2004; Torres Cacoullos & Travis, 2010a and 2010b; among others).

Several different approaches to data collection have been applied to assess the impact of English on Spanish in the United States, including comparing bilingual dialects to monolingual varieties (Silva-Corvalán, 1994; among others), comparing differing generations of bilingual speakers (Silva-Corvalán, 1994; Hurtado, 2001, among others), comparing Spanish dominant speakers to bilingual speakers (Torres Cacoullos & Travis, 2010a, 2010b), comparing immigrants with first generations (Lapidus & Otheguy, 2005; Otheguy, Zentella, & Livert, 2007; among others), and comparing a specific monolingual community to bilinguals who descended from speakers of the same community (Abreu, 2009). The methodology of the present study follows that of Abreu (2009), utilizing data collected from sociolinguistic interviews with Spanish-English bilingual speakers in Southern Arizona, who are descendants of family from Sonora, Mexico, and comparing it to interviews with monolingual Spanish speakers in Sonora. The comparison of these two corpora, collected and analyzed following identical procedures, allows for a systematic, precise measure of any possible influences English has on Arizona Spanish by minimizing the influence of dialectal differences. Given the geographic adjacency and common origins, any major differences between the two communities are most likely due to language contact.

In order to assess possible influences of contact, the present study utilizes four linguistically motivated measures that are found in previous research: the overall frequencies of the variable (expressed versus unexpressed pronouns), the switch reference constraint, clause type, and using group (monolingual or bilingual) as a factor.

The overall frequency of expressed pronoun use has been seen to increase in bilingual communities. In the context of Spanish in contact with English, some studies have postulated that since English has such a high rate of expressed pronouns, Spanish in contact with English should show a higher rate than monolingual Spanish (Otheguy, Zentella, & Livert, 2007; Otheguy & Zentella, 2012; among others). This is born out in the overall rates of New York born participants who show an increase of 8% of expressed pronouns over their newcomer (new to New York from a monolingual community) counterparts (Otheguy, Zentella, & Livert, 2007; Otheguy & Zentella, 2012). Similarly, Florida born bilinguals show an 11% increase in expressed pronoun usage as compared to Puerto Rican born monolinguals (Abreu, 2009). However, this trend is not absolute. Both Colombian-American and Puerto Rican-American participants maintain overall expressed pronoun rates similar to (4% difference for Colombian-Americans) or identical to (Puerto Rican-Americans) monolingual comparison communities (Hurtado, 2001 and Flores Ferrán, 2004, respectively). Outside the context of Spanish in contact with English, higher rates of expressed pronouns among bilinguals have been found even when Spanish is in contact with another pro-drop language, for example Maya, leading to the idea that high rates may be an effect of bilingualism in general, rather than a linguistic influence due to contact (Michnowicz, 2015). Regardless of which mechanism is causing this pattern, the fact that bilinguals have been shown to have increased expressed pronoun frequencies supports the incorporation of this factor as a means of testing possible contact influences in a bilingual community.

The second factor to be considered in the present study is the switch reference constraint, which looks at the relationship of the subject of the present verb to the subject of the previous verb. In Spanish (in both monolingual and bilingual communities), a change in the referent from the previous verb is a context that highly favors an expressed pronoun while the same referent disfavors an expressed pronoun (Cameron, 1993; Silva-Crovalán, 1994; Flores Ferrán, 2004; Otheguy, Zentella, & Livert, 2007; Orozco & Guy, 2008; de Prada Pérez, 2009; Lapidus Shin & Otheguy, 2009; Carvalho & Bessett, 2015; de Prada Pérez, 2015; Michnowicz, 2015; among numerous others). While this trend holds true for both monolingual and bilingual speakers, some studies suggest that bilinguals show less sensitivity to the switch reference constraint (Lapidus Shin and Otheguy, 2009; Otheguy and Zentella, 2012; Michnowicz, 2015). For example, while switch reference is third in the hierarchy for both monolinguals and Maya-Spanish bilinguals, the range is about half (17 as compared to 31) for the bilingual group. Additionally, the bilinguals highly favor

expressed pronouns with co-referential objects, while the monolingual groups disfavor expressed pronouns in the same context. Similarly to overall frequency, less sensitivity to switch reference is not always resultant in bilingual communities (Silva-Corvalán, 1994; Hurtado, 2001; Torres Cacoullos & Travis, 2010b; de Prada Pérez, 2015). For example, Catalan-Spanish bilinguals show equal sensitivity to the Spanish monolingual counterparts in both the ordering of the factor groups and the range for the switch reference factor (36 for monolinguals and 32 for bilinguals) (de Prada Pérez, 2015).

The third factor group to be considered as a possible measure for influence of English contact on subject pronoun expression in Spanish is clause type. Lapidus Shin and Montes-Alcalá (2014) find that in English, pronouns are unexpressed in two main contexts, when the verb is conjugate in an imperative construction, and in a coordinate clause that has the same referent as the previous verb. When examining the Spanish of bilinguals in New York City, they find that the increase in expressed pronouns is less pronounced for this clause type (with the same referent) than the others.

The last, and perhaps most direct, factor for measuring contact effects on subject pronoun expression is combining the monolingual and bilingual groups into one run of the statistical model and creating the additional factor group of community. In New York, the factor of community group shows that New York born bilinguals differ in their pronoun usage from their new comer monolingual counterparts (Otheguy, Zentella, & Livert, 2007; Otheguy & Zentella, 2012). Similarly, in Yucatan, Maya-Spanish bilinguals favor expressed pronouns while Spanish monolinguals disfavor expressed pronouns (Michnowicz, 2015). On the other hand, the difference in pronoun usage between Spanish monolinguals and Spanish-Catalan bilinguals is not significant (de Prada Pérez, 2015).

Through a review of previous research on subject pronoun expression, we have identified four main factors that can be used to measure the effects of contact or bilingualism: overall frequency rates, the switch reference constraint, clause type, and using group (monolingual or bilingual) as a factor. The results of these studies show that contact induced linguistic change is possible, but not always present in the four factors listed above. The current investigation seeks to explore the possible effects of contact on the realization of first person singular “yo” subject pronoun expression among the bilingual speakers in Arizona by comparing Arizona bilinguals to Sonoran monolinguals and using the four aforementioned measures of contact. Based on the research outlined earlier, we can form four hypotheses that assume that if there is English influence on the Spanish of the bilinguals in the study:

1. There should be a significant increase in the overall rate of expressed pronouns.
2. The bilinguals should show decreased sensitivity to the switch reference constraint.

3. There should be less of an increase in expressed pronouns in coordinate clauses with the same referent than in other clause types.
4. When using community (Arizona/Sonora) as a factor group, it should be significant and Arizona speakers should favor expressed pronouns.

2. Methodology

2.1 Participants

The corpus used for the study consists of 32 participants, 16 of whom are monolingual speakers from Hermosillo, Sonora, México and the other 16 are bilingual speakers from Tucson/Nogales, Arizona. Sonora and Arizona make up part of the Mexico-United States border (see Map 1).



Map 1. Arizona and Sonora border. Map courtesy of Google Maps

The population of Hermosillo is 784,342 according to the 2010 census (Instituto Nacional de Estadística y Geografía). Tucson is home to 520,116 inhabitants, 42% of whom are Hispanic or Latino and Nogales boasts 20,837 residents, 95% of whom are Hispanic or Latino (United States Census Bureau). Evidence for both language shift and language maintenance has been found in Arizona. The language maintenance comes in the form of constant new waves of immigration of Spanish speakers and language shift in the pattern of the first generation being Spanish monolingual speakers, the second generation being bilingual speakers, and the third generation being monolingual English speakers (Jaramillo, 1995).

The two communities are connected not only in geographic proximity, but also in the trans-frontier movements of the people residing in them. The participants in both the Sonora and the Arizona groups report crossing the border on a regular basis. The Sonoran participants state that they visit Arizona to be with family and to go shopping and the Arizona participants mainly identify that they cross into Sonora to be with family. The practice of crossing the border frequently by members of both communities creates a situation of intense contact between the bilingual speakers in Arizona and the monolingual speakers in Sonora.

The bilingual participants that took part in creating the corpus were born in the United States or arrived before the age of 10 (except for one participant who arrived at the age of 15) and are part of the first or second generation of families who emigrated from Sonora, Mexico. The participants in this group auto-evaluated their proficiency in both English and Spanish using a scale of zero (very low proficiency) to ten (very high proficiency). In order to be included in the study, the participant needed to rate his/her proficiency at least a six out of ten in both English and Spanish. The speakers also proved their bilingual abilities by participating in a conversation in Spanish for the duration of the hour-long interview, as well as a post interview conversation in English. The participants all also attend(ed) school in the United States (with English instruction), and they live and work in a bilingual community where they are called upon to speak and interact in both languages.

2.2 Data collection

All participants were asked to take part in an hour-long sociolinguistic interview at a location that was familiar and convenient each particular participant.

The first 100 instances of first person singular “yo” were extracted from the sociolinguistics interviews of all 32 speakers. The decision to limit the scope of the current investigation to first person singular ‘yo’ is in line with recent studies that have begun to analyze grammatical persons separately in their analyses (e.g., Lapidus & Otheguy, 2005; Torres Cacoullos & Travis, 2010a, 2010b; Gudmestad, House, & Geeslin, 2013; de Prada Pérez, 2015).

Omitted from the analysis are subject-headed relative clauses, as seen in Example (3) below.

- (3) Yo era el que les **destruía** las cosas. (H01)
 'I was the one who Ø destroyed everything on them.'

This type of construction is removed as the context disallows expressed subject pronouns, as the subject of the verb is the head of the clause. In contrast, other relative clauses do provide a variable context and thus are included in the analysis, as seen in Example (4).

- (4) Nosotros vivíamos en esa casa que te **digó** que esta por la Benito Juarez. (H07)
 'We lived in that house that I told you about that is off of (the) Benito Juarez.'

Along the same line, set phrases that do not offer a variable context are not included. Two such phrases that never appear in the corpus with an expressed pronoun can be seen in Examples (5) and (6).

- (5) ¿Cómo te **diré**? (H20)
 'How will (IØ) tell you?'
 (6) ¿Cómo te **digó**? (H20)
 'How will (IØ) tell you?'

Reported speech is also excluded when the utterance being reported is not from the participant. Considering that the choice of expressing (or not) a pronoun is not made by the participant, but related to the original speech act, these types of utterances are omitted. Example (7) illustrates this context.

- (7) (Participant's name), te **cuidaré**, diría mi abuela si viviera. (H15)
 '(Participant's name), (IØ) will take care of you, my grandma would say if she were alive.'

All tokens were coded for the linguistic variables outlined in the introduction that were necessary to answer the hypotheses (switch reference and clauses type), as well as two other common factors that are commonly included in studies on subject pronoun expression (tense, mood, aspect, and reflexive verb):

1. Switch reference

- Same subject: the subject of the verb is the same as the previous verb
- Same object: the subject of the verb is the same as the object of the previous verb
- Switch: the subject of the verb represents a complete switch from the previous verb

- 2. Tense, mood, aspect (TMA)
 - Present indicative, preterit, imperfect indicative, periphrastic future, simple future, conditional, present subjunctive, imperfect subjunctive, and perfect (all perfect tenses were combined)
- 3. Reflexive verb
 - Verb is Reflexive
 - Verb is not reflexive
- 4. Clause type
 - Main clause, relative clause, other subordinate clause, coordinate

Lastly, the extralinguistic factors that divided the speakers within each group were included. These are gender, education level, and age. Table 1 shows the distribution of the participants by the extralinguistic factors.

Table 1. Distribution of the participants by community, age, gender, and education level

Sonora		Less than a bachelor's degree	At least a bachelor's degree	Total gender	Total age
Young	Women	H07; H06	H13; H20	4	8
	Men	H22; H23	H12; H14	4	
Adult	Women	H25; H27	H03; H15	4	8
	Men	H09; H24	H18; H01	4	
		Total education level: 8	Total education level: 8		
				Total community: 16	
Arizona		Less than a bachelor's degree	At least a bachelor's degree	Total gender	Total age
Young	Women	T11; T18	T01; T02	4	8
	Men	T17; T23	T12; T22	4	
Adult	Women	T08; T14	T21; T25	4	8
	Men	T15; T24	T13; T26	4	
		Total education level: 8	Total education level: 8		
				Total community: 16	

Once the data was coded, it was run through the GoldVarb X statistical program for Mac users (Sankoff, Tagliamonte, & Smith, 2005).

3. Results

3.1 Hypothesis 1: Overall frequencies

A total of 1,211 tokens were analyzed from the 16 monolingual speakers in the Sonoran group. Of these, a total of 202 or 16.7% are expressed. The bilingual speakers in Tucson showed a very similar result in that of 1,423 occurrences 274 or 19.3% are expressed. The difference in frequency among the bilingual speakers is minimal, only 2.6%. When comparing the results from this study to previously studied Mexican communities, it is evident that both Sonoran monolingual and bilingual speakers have lower frequencies than other Mexican communities (New Mexico, Mexico City and Yucatan), as shown in Table 2 below.

Table 2. Overall percentage rates of expressed first person singular “yo” pronouns in Mexican communities

Community (Study)	Overall %
Sonora Spanish monolinguals (current study)	16.7%
Arizona Spanish-English bilinguals (current study)	19.3%
Yucatan Spanish monolinguals (Michnowicz 2015)	21.0%
Mexico City Spanish monolinguals (Lastra & Martín Butragueño 2015)	24.70%
New Mexico Spanish-English bilinguals (Torres Cacoullos & Travis 2010b)	32.0%
Yucatan Maya-Spanish bilinguals (Michnowicz 2015)	35.5%

The results from this subsection help to test the first hypothesis offered in the introduction, which stated that if there is evidence of English influence in the bilingual community, there should be a significant increase in the overall rate of expressed pronouns. Since the increase in expressed pronouns in the bilingual community is only 2.6% we must reject the hypothesis and conclude that in terms of overall frequency there does not appear to be evidence for English influence in the Spanish of the Arizona speakers.

3.2 Constraint hierarchy of the factor groups

Before continuing with a discussion of the results that pertain to the remaining hypotheses established in the introduction, it is pertinent to first briefly discuss the hierarchy of the linguistic factors included in the analysis. Along the tradition of comparative sociolinguistics as outlined in Tagliamonte (2003), Meyerhoff (2009), Poplack & Levey (2010), changes in the order of factors between the two groups (Arizona and Sonora) can be seen as a difference that reflects English influence.

Table 3 shows the constraint hierarchy for the factors that were selected in each community.

Table 3. Comparison of the constraint hierarchy of the linguistic factors for the probability of an expressed “yo” between Sonora monolinguals and Arizona bilinguals¹

Sonora		Arizona	
Factor group	Range	Factor group	Range
TMA ¹	36	= TMA	71
Clause Type	23	= Clause Type	49
Switch reference	20	= Switch reference	37
Reflexive	[5]	= Reflexive	17
Log likelihood = -508.833		Log likelihood = -575.95	
<i>p</i> < 0.05		<i>p</i> < 0.05	

Both groups follow the same order: tense, mood, and aspect (TMA), followed by clause type, switch reference, and finally reflexive verb. The main difference is that while reflexive verb is not significant in the monolingual group, it is in the bilingual group. In her work, de Prada Pérez (2015) postulates that the increase in range of lower ranking factor groups causing them to become significant in the analysis of bilingual groups may be evidence of bilingualism. However, reflexive is significant for mainland newcomers to New York City (Otheguy, Zentella, & Livert, 2007). It may be that the significance of the reflexive factor in the bilingual community and the failure to reach significance in the monolingual community is a product of the sample and not an indication of bilingualism effects. Regardless, it does appear that in terms of constraint ranking, the two groups are linguistically similar, attesting to the fact that they pertain to a larger community of Sonoran Spanish that transcends the political border that divides Arizona and Sonora.

3.3 Hypothesis 2: Loss of sensitivity to the switch reference constraint

Among the bilingual Arizona speakers and the monolingual Sonora speakers, switch reference is the third most robust constraint. Table 4 shows the results.

1. While TMA and Reflexive were included in the analysis, they do not form part of the four hypotheses and therefore are outside the scope of this paper. See Appendix 1 for the distribution of the factors within each factor group.

Table 4. Comparison of the switch reference constraint for the probability of an expressed “yo” in Sonora and Arizona

Sonora					Arizona			
	fw	%	n			fw	%	n
Switch	0.62	23.1%	99/428	=	Switch	0.70	32.1%	207/438
Same object	0.51	17.0%	24/141	=	Same object	0.35	8.7%	8/92
Same subject	0.42	12.3%	79/642	=	Same subject	0.33	8.6%	59/686
Log likelihood = -508.833					Log likelihood = -575.95			
$p < 0.05$					$p < 0.05$			

The switch reference effect is strong in both communities. For both groups, a switch in the subject most strongly correlates with an expressed pronoun, followed by a switch in the subject while the object of the previous verb is the subject of the present token, and lastly same subjects strongly disfavor expressed pronouns. These results are in line with several studies that indicate no loss of sensitivity for the constraint on the part of bilingual speakers (Silva-Corvalán, 1994; Hurtado, 2001; Torres Cacoullós & Travis, 2010b; de Prada Pérez, 2015). Furthermore, the range of the effect is higher in Arizona (range = 37) than in Sonora (range = 20), going against the expectation for English influence or an effect of bilingualism set forth in research by Otheguy and associates and Michnowicz (Otheguy, Zentella, & Livert, 2007; Lapidus Shi & Otheguy, 2009; Otheguy & Zentella, 2012; Michnowicz, 2015). The range is discussed here because it has been used as evidence in previous studies, however it is pertinent to mention that range should not be compared between independent runs. The range is dependent on the number of tokens and the number of tokens in each category, thus it is run dependent and not comparable between runs. The statistical program identifies a range of factor weights, and produces one value for each factor weight (the true value could be higher or lower), again rendering range a bad method of comparing two independent runs. Much preferred is using the variable ranking (determining if the factor group is lower in the hierarchy for the bilingual group), which is again not the case in this study.

Hypothesis 2 predicted that the bilinguals would show decreased sensitivity to the switch reference constraint. Whether we measure this difference in terms of the constraint hierarchy of the linguistic factors, the order of the within-group factors, or the range of the effect, there is no indication of an effect of contact or bilingualism since both groups follow the same pattern and the range is higher for the bilingual, not the monolingual group. Therefore, hypothesis 2 is also rejected.

3.4 Hypothesis 3: Clause type

Before reporting the results of Hypothesis 3 (dealing with coordinate clauses with the same referent), it is useful to report the overall results of clause type, which can be found in Table 5.

Table 5. Comparison of the constraint hierarchy of clause type in Sonora and Arizona

Sonora					Arizona			
	Range	%	n			Range	%	n
Main	0.57	19.9%	75/377	✓*	Main	0.74	39.3%	127/323
Coordinate	0.51	16.4%	98/596	≠	Subordinate	0.47	13.8%	24/174
Relative	0.43	15.9%	7/44	✓	Coordinate	0.43	12.9%	112/870
Subordinate	0.34	11.3%	22/194	✓	Relative	0.25	19.6%	11/56
Log likelihood = -508.833					Log likelihood = -575.95			
$p < 0.05$					$p < 0.05$			

* The check mark indicates the factor in the Sonora column also favors/disfavors expressed pronouns in Arizona, while the ≠ sign indicates the factor does not match in the two communities. For instance, while coordinate clauses slightly favor expressed pronouns in Sonora, they disfavor expressed pronouns in Arizona.

As shown in Table 5, clause type presents another area in which both communities behave in a similar way. For both the Sonora and the Arizona group main clauses favor expressed pronouns while subordinate and relative clauses favor unexpressed pronouns. There is a discrepancy between the two groups in that coordinate clauses favor expressed pronouns in Sonora but unexpressed pronouns in Arizona. One possible explanation for this is that the coordinate clause factor became somewhat of an “other” category due to the fact that in a string of main clauses it is sometimes impossible to tell whether the series are separate main clauses or whether they are coordinate clauses lacking the conjunction, and thus the slight difference in behavior is not unexpected.

Returning to Hypothesis 3, it was predicted that there should be less of an increase in expressed pronouns in coordinate clauses (with the same referent) than in other clause types when comparing the bilingual community (Arizona) to the monolingual Sonoran speakers. This hypothesis was formed due to findings from Lapidus Shin and Montes-Alcalá (2014) who note that in English, like Spanish, coordinate same-referent clauses disfavor expressed pronouns. Since English disfavors expressed pronouns in this context, and bilinguals are seen to increase the percentage of expressed pronouns overall, the increase should be less for coordinate clauses with the same referent as opposed to other clause types with the same referent. In order to explore how this hypothesis bears out on the data in the current

study, Table 6 provides a cross-tabulation of clause type with only same referent tokens included.

Table 6. Comparison of cross-tabulation of expressed “yo” in clause type with the same previous referent in Sonora and Arizona Spanish

Sonora			Arizona		
	%	n		%	n
Coordinate	13.00%	48/362	Main	17.00%	21/124
Other subordinate	12.00%	10/81	Other subordinate	9.00%	7/79
Main	11.00%	20/167	Coordinate	7.00%	31/470
Relative	8.00%	1/12	Relative	0.00%	0/13

While at first glance it can be observed that coordinate clauses actually show a decrease from the monolingual to the bilingual group (13% for monolinguals and 9% for bilinguals, a decrease of 6%), further analyses reveals that the other subordinate clause types also decrease (other subordinate decreases by 4% and relative clauses decrease by 8%²). The only clause type that increases in expressed pronoun use is the main clause type. If the decrease in expressed pronoun use in coordinate clauses were due to English influence, we would not expect the other subordinate clause types to decrease as well. These results do not follow those of Lapidus Shin and Montes-Alcalá (2014) who find less of an increase only in coordinate clauses. Hypothesis 3 must also be rejected, providing another context where there is a lack of evidence of contact influence on the first person singular subject pronoun expression of these Arizona bilinguals.

3.5 Hypothesis 4: Community as a factor

In an additional run, the data for both the Sonora and Arizona groups was combined into a larger data set. For the purpose of this analysis the same factors outlined in the methods section were included. The factor of community was also added and Table 7 shows the constraint hierarchy for the linguistic factors groups that are significant.

2. The 8% decrease in relative clauses is based solely on a one token difference between the two groups.

Table 7. Constraint hierarchy of the linguistic factor groups with community (Sonora/Arizona) as a factor for the probability of an expressed “yo”

Factor	Range
TMA	50
Clause type	32
Switch reference	30
Reflexive	9
Log likelihood = -1115.656	
$p < 0.05$	

The most important piece of information found in Table 7 is the absence of community as a significant factor; they factor was not selected by Golvarb. The lack of community as a significant factor demonstrates another instance in which there is a lack of evidence of an English influence on the output of the variable on behalf of the bilingual participants. It is also interesting to point out that the same first three factors that were selected in the previous run when Arizona and Sonora were separate have remained the same, TMA, followed by clause type, and then switch reference. These results lead us to reject hypothesis 4 that community would be selected as a factor and that the bilingual group would favor expressed pronouns while the monolingual group favored unexpressed pronouns.

5. Conclusion

This study measured the effects of English influence on the realization of subject pronoun expression of first person singular ‘yo’ in the Spanish of English-Spanish bilinguals in Arizona. A direct comparison was made between a sub-group of the Arizona speech community, composed of decedents of families from Sonora, and the monolingual Sonoran speech community. This direct comparison allowed for a direct analysis in that the differences seen between the two groups could be attributed to English influences rather than dialectal variation.

The results for all four tests for measuring contact showed no indication of contact induced language change (or effects of bilingualism) on the Spanish spoken by the bilingual speakers in the Arizona community. Table 8 summarizes the results of the hypotheses outlined in the introduction.

Previous studies have formulated arguments in favor or against contact influence of subject pronoun expression based on one or a few factors that differ. This study has shown how it is possible to identify linguistically motivated factors and use them as predictors which, when analyzed together, can be used as a clearer

Table 8. Summary of hypotheses and their result

Hypothesis	Result
1. There should be an increased overall rate of expressed pronouns among the bilingual speakers	Rejected
2. Tthe bilinguals should show decreased sensitivity to switch reference	Rejected
3. There should be a less of an increase of expressed pronouns in coordinate clauses with the same referent compared to other clause types	Rejected
4. When using community (Arizona/Sonora) as a factor group, it should be selected and Arizona speakers should favor expressed pronouns	Rejected

method of determining whether or not contact influenced change is present in a given bilingual community. Future studies may consider identifying predictors of contact before reporting the results, measuring more than one piece of evidence for contact, and comparing constraint ranking while refraining from comparing ranges.

The null-contact finding in this may be due to one, or a combination of several, factors. First, the participants in this study were all highly proficient in both English and Spanish, as opposed to having a varying degree of bilingualism. Second, the type of community in this study may be generally different to other bilingual communities in the US given the close proximity to the US-Mexico border. In addition to waves of new immigrants in the community, there is a constant presence of monolinguals from Sonora that come to visit Arizona. The bilinguals in this study report using Spanish with Sonoran visitors in their work and in the community. Many of the participants also report traveling regularly to Sonora to visit family. Lastly, the careful comparison of monolinguals from Sonora to bilinguals in Arizona who are members of families from Sonora created a controlled comparison group.

These findings do not claim to negate that some communities do show evidence of influence of contact on subject pronoun expression in Spanish (i.e. Silva-Corvalán, 1994; Lapidus & Otheguy, 2005; Otheguy, Zentella, & Livert, 2007; Otheguy & Zentella, 2012; de Prada Pérez, 2015; Michnowicz, 2015). However, in conjunction with evidence from other communities that show a lack of such influence (i.e. Hurtado, 2001; Flores Ferrán, 2004; Torres Cacoulllos & Travis, 2010a, 2010b), there is support for the conclusion that bilingualism/language contact does not unequivocally lead to contact induced language change in terms of subject pronoun expression.

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Appendix 1

TMA comparison between Sonora and Arizona

Sonora					Arizona				
	Range	%	n			Range	%	n	
Periphrastic Future	0.61	25.0%	4/16	–	Conditional	0.88	60.0%	6/10	
Imperfect indic.	0.59	19.9%	59/296	✓*	Present sub.	0.75	33.3%	3/9	
Present sub.	0.59	12.5%	1/7	✓	Present indic.	0.49	21.3%	139/653	
Present indic.	0.53	18.9%	95/503	–	Imperfect indic.	0.60	22.4%	77/344	
Imperfect sub.	0.43	8.3%	1/12	✓	Preterite	0.45	13.1%	45/343	
Preterite	0.41	12.1%	38/314	✓	Periphrastic Future	0.44	11.1%	1/9	
Conditional	0.40	11.1%	1/9	–	Imperfect sub.	0.39	11.1%	1/9	
Perfect (all)	0.25	5.7%	3/53	✓	Perfect (all)	0.17	4.3%	2/46	
Log likelihood = –508.833					Log likelihood = –575.95				
$p < 0.05$					$p < 0.05$				

* The check mark indicates the factor in the Sonora column also favors/disfavors expressed pronouns in Arizona, while the – sign indicates the factor does not match in the two communities. For example, the imperfect indicative favors expressed pronoun usage in both communities.

Reflexive verb comparison between Sonora and Arizona

Sonora					Arizona				
	Range	%	n			Range	%	n	
Not reflexive	[0.51]	16.8%	175/1044	=	Not reflexive	0.52	20.3%	253/1244	
Reflexive	[0.46]	16.2%	27/167	=	Reflexive	0.35	11.7%	21/179	
Log likelihood = –508.833					Log likelihood = –575.95				
$p < 0.05$					$p < 0.05$				

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Contemporary trends in Hispanic and Lusophone Linguistics offers a panorama of current research into multiple varieties of Spanish from several different regions (Mexico, Puerto Rico, Spain, Costa Rica, Argentina, Bolivia, Peru, Honduras), Catalan, Brazilian Portuguese, as well as varieties in contact with English and Purépecha. The first part of the volume focuses on the structural aspects and use of these languages in the areas of syntax, semantics, sociolinguistics, diachrony, phonetics, phonology and morphology. The second part discusses the effect of interacting multiple grammars, namely, first language acquisition, second language acquisition, varieties in contact, and bilingualism. As a whole, the contributions in this volume provide a methodological balance between qualitative and quantitative approaches to Language and, in this way, represent contemporary trends in Hispanic and Lusophone linguistics.

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