Knowledge of Noun-Drop across Various Lexical and Functional Categories in Heritage Spanish Bilinguals

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1. Introduction

Recently, language acquisition research from the generative paradigm has turned its attention to investigating heritage language bilingualism in the hopes that studying the adult competence outcomes of these childhood bilinguals can inform key issues pertaining to bilingual acquisition more generally as well as issues relating to L1 attrition and adult L2 acquisition theorizing (see Montrul 2008a; Rothman 2007, 2009). Heritage speaker bilingualism occurs under specific environmental circumstances. Crucially, a language qualifies as a heritage language if it is a minority language in its context as a heritage language and is the home language of the heritage speaker acquirer. Under such a scenario, the heritage language, like the case of monolingual acquisition, is acquired naturalistically at a very young age on the basis of an interaction between primary linguistic data and innate linguistic principles. More often than not, it is the sole first language of the heritage speaker despite the fact that in adulthood heritage speakers are likely to show deficits in knowledge as compared to monolingual controls. Understanding the variables that conspire to explain the competence differences between these childhood bilingual and monolingual adults, in addition to posing interesting new research questions specific to heritage language bilingualism, innovatively informs the age of exposure/acquisition debate and helps researchers choose between opposing approaches (see Montrul 2008a). To date, Montrul's extensive body of work on the acquisition of Spanish as a heritage language in the United States has demonstrated that heritage speaker competence in adulthood is selectively different from that of monolinguals, effectively dispelling the notion that language acquisition in childhood is virtually synonymous with complete convergence and questioning the extent to which the age of exposure debate is properly informed or contextualized.

Another general research program to which heritage speaker acquisition studies contributes significantly is the so-called Interface Vulnerability Hypothesis (IVH), which claims that narrow syntactic features are acquired unproblematically whilst the acquisition of properties that require integration of information across cognitive-linguistic modules, otherwise known as interface-conditioned properties (in the sense of Jackendoff 2002 and Reinhart 2006), remain susceptible to incomplete acquisition, attrition or delays in full convergence depending on the type of learning scenario (e.g. Belleti, Bennati and Sorace 2007, Sorace 2005, White to appear). Although recent accounts hold such vulnerability to external interfaces (the syntax-pragmatics interface) as opposed to internal ones (the syntax-semantics interface) based on the fact that the latter actually results in ungrammaticality as opposed to gradient levels of infelicitousness like operations at the syntax-discourse interface and the former requires a higher processing load (Tsimpli and Sorace 2006; Sorace and Serratrice 2009), the IVH claims that linguistic properties dependent on the discourse interface would be the primary locus for incomplete acquisition and L1 attrition in heritage bilingual grammars. Alternatively, grammatical properties that rely strictly on the computational system should be acquired in a straightforward manner for all language acquirers, including heritage language bilinguals, provided that the input they receive provides the necessary syntactic triggers. The general position of IVH is supported by the fact that in child language, monolingualism and bilingualism, interfaces, particularly the syntax-pragmatics interface, cause delays in acquisition (Platzack 2000; Grinstead 2004; Paradis and Navarro 2003; Serratrice, Sorace and Paoli 2004) or are loci for cross-linguistic influence (be that delays or bootstrapping, see Müller and Hulk 2001, Cornips and Hulk 2006), with

children mastering interface properties only at later stages of development, well after related narrow syntactic properties are converged upon. In adult second language acquisition, assuming continued access to UG, it is claimed that interfaces, in addition to causing delays similar to those seen in child language acquisition, can be inevitable loci for fossilization and result in residual optionality (see Sorace 2005), effectively keeping adult language learners from converging on the target grammar in specifically predictable domains and accounting for the disparity between monolinguals and adult L2 learners (but see e.g. Iverson, Kempchinsky and Rothman 2008).

How can the IVH be tested in the domain of heritage language competence outcomes? Can its predictions serve to explain what the results of a growing number of empirical studies that consistently demonstrate significant differences in the performance (and presumably competence) of heritage language speakers relative to monolingual controls? In other words, are the predictions of the IVH borne out in the empirical data on heritage language bilingualism? Recent work by Montrul (2008b, 2009) testing the application of the IVH against the predictions of the Regression Hypothesis (Jackobson 1941), a hypothesis originally offered to account for the progression L1 attrition claiming that attrition occurs in the opposite direction of child acquisition sequencing, argues that the IVH is more explanatory than the Regression Hypothesis for incomplete acquisition.

Since the IVH predicts that heritage language grammars will diverge from the monolingual norms most significantly for properties that involve the syntax-pragmatics interface, it is reasonable to interpret the IVH as also predicting that, narrow syntactic properties, such as gender and number features which are acquired relatively early in child Spanish (see Montrul 2004), should be acquired without problem and retained through the passing of time with increased exposure to and shift in dominance towards the majority society language. Is this actually what is observed in available data? If so, then interface vulnerability is confirmed as the sole or primary source of heritage speaker vs. monolingual competence asymmetry. If these predictions do not hold, then it is necessary to explore other avenues in addition to interface vulnerability to explain heritage and monolingual childhood acquisition outcome differences.

The present study examines intermediate and advanced heritage Spanish speakers' knowledge of noun-drop, a purely syntactic reflex of the acquisition of nominal phi-features present in Spanish and lacking in English (see section 2) compared against a monolingual control. Given that noun-drop is a narrow syntax property, the IVH would predict that both sets of heritage speakers would have little problems demonstrating full knowledge of this syntactic property insofar as their input provides the nominal features necessary. Since there is no argument that emerging Spanish-English contact varieties cease to instantiate grammatical gender, sufficient exposure to any variety of Spanish in childhood should result in complete acquisition of this property. The IVH predicts no difference by proficiency here, precisely because noun-drop is a narrow syntactic property and both sets of learners clearly demonstrate that their Spanish grammars have grammatical gender instantiated. However, the results demonstrate that proficiency level is a significant factor in determining the extent to which heritage speakers demonstrate nativeness in this narrow syntax domain. Whereas both groups demonstrate knowledge of noun-drop across all relevant lexical and functional categories, only the advanced heritage speakers are able to consistently disallow the English type structure in judgments, suggesting that the intermediate heritage grammar is in part like monolingual Spanish and crucially different than English, yet has overt influence from English in that it does not preempt the English possibility. Taken together, the data to be presented highlight the influence of the dominant language on the heritage grammar even in the narrow syntax and suggest that overall proficiency is a more accurate predictor of influence/comparative difference than perhaps the interface status of a particular property. While this does not indicate directly that the IVH is misguided in its attempts to explain heritage speaker competence differences, it does suggest that the IVH alone is insufficient in explaining all such differences.

2. Agreement and Noun-Drop in Spanish

Spanish, like all Romance languages, has morphological gender and number agreement between nouns, determiners and adjectives. Gender is an inherent grammatical property of every noun in

Spanish, whether overtly marked or not (although most nouns are overtly marked, see Teschner and Russell 1984 for patterns and distributional frequency). Spanish nouns fall under one of two gender classifications, described as being masculine or feminine. Many details aside, masculine nouns and adjectives generally end in –*o* and feminine nouns and adjectives generally end in –*a*. Number is usually marked with /s/, or some allomorph +es+ or +ø+. Gender and number marking, as well as the definite determiner paradigm, can be seen in the examples in (1) below:

(1) a. *el   perr+o   roj+o*
       the.masc.sing dog.masc.sing red.masc.sing
       'the red dog'

   b. *los   per+o+s   roj+o+s*
       the.masc.plural dog.masc.plural red.masc.plural
       'the red dogs'

   c. *la   taz+a   roj+a*
       the.fem.sing cup.fem.sing red.fem.sing
       'the red cup'

   d. *las   taz+a+s   roj+a+s*
       the.fem.plural cup.fem.plural red.fem.plural
       'the red cups'

Beyond mere description, gender and number are understood linguistically as being part of a set of nominal phi-features found within the Determiner Phrase (DP) in Spanish. These features are assumed to be interpretable on the head noun and uninterpretable on the adjectives and determiners that agree with the head noun (see Carstens 2002; Demonte 2008). This feature composition is important since under the Principle of Full Interpretation (Chomsky 1999), the interpretable feature assumes a probe/goal relationship with its corresponding uninterpretable feature(s), thus valuing and deleting them during the syntactic derivation. And so, the interpretable gender and number features on the noun share a probe/goal relationship with the other elements of the DP whereby the interpretable features are checked and deleted against the uninterpretable features of the determiner and/or adjectives in order for the syntactic derivation to obtain parsimoniously. Not surprisingly, a language's instantiation (or lack thereof) of gender features goes beyond the morphological reflexes of DP-element concord, but has several necessarily related syntactic and semantic reflexes as well.

One such syntactic reflex of having a full set of phi-features on the DP that crucially includes grammatical gender is the possibility of noun ellipsis, or noun-drop, which obtains obligatorily in Romance languages, as is the case with all languages with grammatical gender (including German and Dutch) as opposed to languages that lack grammatical gender such as English (see Synder, Senghas and Inman 2001). Noun-drop is a phenomenon by which the head noun, after it has been introduced into the discourse explicitly or is otherwise clear to both interlocutors, may be dropped in various lexical and functional categories where the gender (and number) marked on the non-elided determiner and adjective provides the necessary information to recover the reference and provide an LF interpretation that is unambiguous. English, which lacks gender features, cannot elide the head noun, but rather replaces it with the proform 'one' in its analogous construction to avoid repeating the noun. This is seen in (2) below:

(2) *(Yo) no quiero el   gato   blanco;   (yo) voy a*
     I   no   want   the.masc.sing car.masc white.masc.sing; I   go
     comprar el   negro.
     to buy   the.masc.sing black.masc.sing
     'I don't want the white cat; I'm going to buy the black **one**.'

Noun-drop can occur in, at least, three syntactic positions, all stemming from the same syntactic licensing source (see Liceras, Díaz and Mongeon (2000)) : in adjectival phrases (AP), prepositional phrases (PP) and clausal/complementizer phrase (CP) complements, as seen in (3):

(3) (a) **AP**: *Quiero el **rojo***.
           'I want the red one.'
     (b) **PP**: *Quiero el **de Italia***.
           'I want the one from Italy/the Italian one.'
     (c) **CP**: *Quiero el **que ladra***.
           'I want the one that barks.'

Since ultimately interpretation of instances of noun-drop is not dependent on any other cognitive-linguistic module (i.e. interfaces with semantic, pragmatics), gender/number features and the resulting possibility of noun ellipsis (noun drop) are assumed to take to be narrow syntactic properties; that is, an obligatory consequence of having the target Spanish feature composition for the relevant functional category (DP) and the lexical items that are manipulated within this functional category.

3. Methodology
3.1. Participants

The participants for this experiment were divided into three groups: a control group of monolingual native Spanish speakers (n=10, referred to here as 'natives'), and heritage Spanish speakers at intermediate (n=12) and advanced (n=19) proficiency levels. Spanish proficiency of the participants was assessed independently via a standardized 50-point cloze test/vocabulary task used in generative L2 Spanish acquisition studies[1]. Participants were considered to be of advanced proficiency if they scored at least 40 out of 50 and of intermediate proficiency if they scored 30-39 out of 50.

To determine the qualification of the experimental participants as heritage speakers, the linguistic profile of each was assessed via a lengthy questionnaire, which probed their cultural relationship to and exposure to the Spanish language among other sociolinguistic considerations. Herein, a heritage speaker is one who received naturalistic Spanish input (i.e., not formal instruction) in childhood, either as an exclusive L1 or as simultaneous bilingual with English, but was raised in the United States where Spanish is a minority language without high levels of prestige. Few of the participants were born in Spanish-speaking countries, however, even in such cases these subjects moved to the United States at or before the age of 5. All subjects reported that English is now their dominant language, although Spanish remains the preferred language within their immediately family unit and with particular individuals (such as extended family members, older family friends). All subjects reported that they often code-switch, especially with other Hispanics of similar backgrounds and of the same age.

The data reported on here is part of a larger project that tests other DP properties as well as properties of other functional categories. Data collection took place in Salvador, Brazil as all of these learners were enrolled in a summer program to learn Portuguese. The data presented here was collected within the first two weeks of the subjects' stay in Brazil and all subjects had not studied Portuguese (or Spanish formally) prior to their trip to Brazil. Such was a requirement for inclusion in the study to avoid any possible effects (positive or negative) from the learning process of Brazilian Portuguese, which instantiates the same properties under investigation herein.

3.2. Experimental Task

Herein, I focus on one of two tests employed to assess knowledge of noun-drop (the other task was a picture recognition task). The grammaticality judgment task with correction asked subjects to judge grammatical and ungrammatical instances of noun drop with AP, PP and CP compliments (6 grammatical and 6 ungrammatical tokens for each complement type), among 50 fillers testing for other grammatical phenomena). If subjects judged a sentence to be ungrammatical, they were asked to

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fix the sentence to make it grammatical, or they could indicate that they knew the sentence was ungrammatical but they did not know how to fix it. Examples of grammatical and ungrammatical tokens for each complement type are given in (4), (5), and (6) below, with the ungrammatical element in bold:

(4) a. Adjective Phrase-grammatical
Necesito comprar unos bolígrafos, pero la tienda no tiene muchas opciones de colores, por eso tengo que comprar los azules.
"I need to buy some pens, but the store doesn't have many color options, so I have to buy the blue ones."
b. Adjective Phrase-ungrammatical
*Carlos tiene varios coches pero va a vender los viejos **unos** porque necesita dinero.*
"Carlos has various cars, but he is going to have to sell the old ones because he needs money."

(5) a. Prepositional Phrase-grammatical
No quiero llevar la pulsera de oro hoy; prefiero la de plata.
"I don't want to wear the bracelet made of gold today; I prefer the one made of silver."
b. Prepositional Phrase-ungrammatical
*Hay dos cantantes extranjero en nuestro coral. El chico de Francia canta mejor que el **uno** de Italia.*
"We have two foreign singers in our chorus. The boy from France sings better than the one from Italy."

(6) a. Complementizer Phrase-grammatical
Mi hermana quiere el coche que tiene dos puertas pero yo quiero el que tiene cuatro.
"My sister wants a car that has two doors, but I want one that has four."
b. Complementizer Phrase-ungrammatical
*Quiero comprar un anillo de oro para mi novia, pero en este momento me falta dinero; voy a comprar el **uno** de madera que vimos el otro día y que le gustó.*
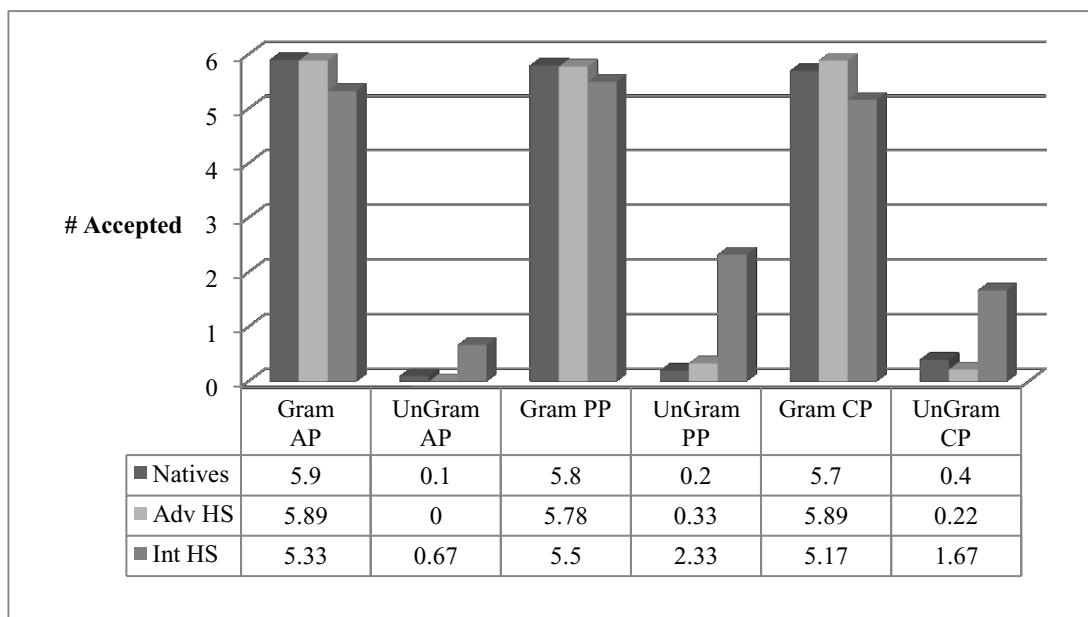"I want to buy a ring made of gold for my girlfriend, but right now I don't have the money; I'm going to buy the one made of wood that we saw the other day that she liked."

It should be noted that in the ungrammatical examples, the ungrammaticality was due to the insertion of a proform 'uno/una/unos/unas', as is required in English.

4. Results

The mean group ratings of grammatical and ungrammatical tokens with AP, PP, and CP complements are given in figure 1 below. Scoring was assed as follows: an answer was deemed correct if it was in line with the native controls and, crucially, in the case of ungrammatical exemplars was accompanied by a felicitous correction.

Figure 1. Groups means, N-Drop GJT

	Gram AP	UnGram AP	Gram PP	UnGram PP	Gram CP	UnGram CP
■ Natives	5.9	0.1	5.8	0.2	5.7	0.4
■ Adv HS	5.89	0	5.78	0.33	5.89	0.22
■ Int HS	5.33	0.67	5.5	2.33	5.17	1.67

Gram = Grammatical; UnGram = Ungrammatical

Descriptively, all groups accept the grammatical tokens at high rates (average number accepted > 5.17 for grammatical tokens of all types); however, there is much more indeterminacy with the ungrammatical items for the heritage speakers at the intermediate level of proficiency. While both the native and advanced heritage speaker groups have low instances of acceptance for all ungrammatical uses of noun drop (< 0.4 for all types), the intermediate group shows fewer tendencies to reject these (with acceptance ranging from 0.67-2.33, recall this is out of 6). Overall, it might be concluded that both the advanced and intermediate groups are comparable to the natives with regards to grammatical items, while only the advanced group is with ungrammatical items. Given some inherent limitations to GJT tasks, even when accompanied by correction (see e.g. Schütze 1996) it is reasonable to take the position that the most meaningful part of a GJT is the recognition of what a grammar should disallow as opposed to passive acceptance of what is possible. Then, we must question the extent to which HS of intermediate proficiency have the same underlying representation for the syntax of Spanish that licenses noun-drop, a point to which I return below.

For the statistical analyses, a mixed-model ANOVA and Bonferroni post-hoc tests were used to compare the groups' performance, with factors of Group, Type (complement type) and Grammaticality, with a 0.05 level of significance. The initial ANOVA showed a main effect for Type ($F(2,38)=9.029$, $p = 0.005$) and interaction between Group and Grammaticality ($F(2,38)=6.099$, $p=0.005$), necessitating post-hoc tests. There were no other significant interactions between the variables ($p>0.146$ for all tests). A post-hoc test for Type showed that AP complements were judged differently than both PP complements ($p<0.001$) and CP complements ($p=0.015$), which were not significantly different from each other ($p=1.0$). The post-hoc test for the Group/Grammaticality interaction showed that while Grammaticality is not a significant factor for the Native and Advanced groups (i.e. they show similar knowledge in their judgments of grammatical and ungrammatical items, $p=1$ in both cases), it was for the Intermediate group ($p<0.001$), in which case they had significantly poorer knowledge of ungrammatical items. The statistical analysis confirms the suspicions that arose after looking at the results descriptively. All groups show statistically similar knowledge of grammatical instances of noun drop across all three types of complements, correctly accepting them, while the Intermediate group differs from both the Native and Advanced groups in rejection of ungrammatical items, failing to reject them at a comparable rate (they were less apt to reject them).

5. Discussion of Results

From the results of this experiment, we can infer what properties are contained within each group's Spanish grammar. The Native group, as expected, shows knowledge of both grammatical and ungrammatical uses of noun drop, as does the Advanced group. It is fair to conclude, then, that these groups share the same mental representation of nominal phi-features, one of whose syntactic reflexes is noun-drop. This is not surprising in light of previous research, which has shown similar results for such a group (Montrul, Foote and Perpiñán 2008). Alternatively, the Intermediate group performs well with respect to grammatical instances of noun-drop, but, somewhat surprisingly, has less determinate knowledge when judging ungrammatical occurrences. Given that the ability to license noun drop hinges on the acquisition of gender features, that all of these groups had significant exposure to Spanish during childhood (a language in which gender features are instantiated, see section 2), that all dialects of Spanish, even those that are emerging new varieties in contact with English, have an intact gender and number morphological system, that gender and number morphological markings is abundantly frequent in the input and that all the groups accept grammatical uses of noun drop, it can be inferred that gender features are unquestionably present in the grammars of these participants as well. What is left to be explained (and what is not predicted by the IVH), however, is the Intermediate learners' acceptance of non-target forms.

It is reasonable to suggest that the intermediate learners' grammar has more overt influence from English, and in this case such influence results in a grammar that has a representation for gender, but does not have the same degree of syntactic reflexes that one would expect of such a grammar. So, while the Spanish grammars of all the intermediate heritage speakers licenses noun-drop this fact does not preempt the possibility of also having the English equivalent requiring the insertion of a pro-form for at least some of the intermediate heritage speakers, which of course is ungrammatical in monolingual Spanish. What cannot be determined *a posteriori* is the point at which such influence took hold of these speakers grammars; that is, are we observing the start of attrition or did incomplete acquisition obtain whereby the introduction of English as a dominant language arrested the full development of Spanish? Incomplete acquisition here is unlikely for the following reasons. Since noun-drop should be a reflex consequence of relevant syntactic features, one would need to explain how their grammar can seemingly have gender features and not have full convergence of target-type noun-drop. Moreover, gender and number features are, based on the frequency of their morphological counterparts, acquired quite early by monolingual Spanish children (see Synder et al. 2001) and so if arrested development were to be the main explanatory factor, one would need to assume that English became the dominant language much earlier than it was for some of the learners that demonstrate less than target knowledge.

Interestingly, one of the few speakers who was not born in the United States and who moved here at the age of 5, is one of the individual intermediate heritage speakers with the most disparate performances. By all accounts of what is known about child Spanish acquisition, it is safe to assume that he acquired fully the nominal-phi features at the age of 5 (Montrul 2004, Synder et al. 2001). So, on the basis of this fact it is fair to assume that, at least for some individuals, what we are dealing with here is some type of attrition to what was previously acquired in their Spanish. This is an interesting prospect on several fronts. First, from the perspective of both the Regression Hypothesis and the Interface Vulnerability Hypothesis (IVH) what we have observed is unexpected, albeit for different reasons. According to the Regression Hypothesis, one would not expect the erosion of the properties we investigate since they are converged upon earlier than other properties known to be acquired later in child acquisition but are still exemplified in heritage speaker grammars of the same proficiency level (see Montrul 2008a). As it relates to the IVH, knowledge of noun-drop should be unaffected given its grammatical representation within the narrow syntax since attrition (and incomplete acquisition for that matter) should be isolated to interfaced-conditioned properties. What evidence like the present data tells us is that neither the Regression Hypothesis, which was never intended to apply to heritage speaker acquisition by its author, nor the IVH are sufficient to explain all comparative

competence outcomes in heritage speaker grammars. If the assumption about attrition I take based on timing of acquisition and availability of triggers within any Spanish (monolingual or contact variety) input available to heritage speakers is on the right track to explain the divergence from monolingual and advanced heritage speaker norms, then this questions the idea that attrition does not affect the core grammar, that is, the narrow syntax (see e.g. Schmid 2002, Tsimpli et al. 2004; Sorace 2005). In doing so, the present data joins other recent experimental work that challenges this assumption (e.g. Domínguez 2009; Cazzoli-Goeta, Rothman and Young-Scholten 2008). It would appear that any viable ultimate explanation of heritage grammar differences as compared to monolinguals will need to consider multiple sources that conspire to explain incomplete acquisition.

6. Conclusion

The IVH states that interfaces, points in the grammar that require the integration of knowledge from multiple linguistic modules, are inherently more complex (although such complexity has never been adequately explained, but see Sorace and Serratrice 2009 for steps towards remedying this) and that their acquisition and use can be problematic, resulting in delays, fossilization, susceptibility to cross-linguistic influence and attrition that can manifest in various groups of language acquirers. Conversely, it claims that narrow syntactic properties should be acquired straightforwardly, that those who have acquired these properties should demonstrate full knowledge of them, and that these properties should not be subject to the same problems seen with interface properties. With respect to heritage language speakers, it predicts that the status of a particular property of a language as either an interfaced-conditioned property or one housed strictly within the narrow syntax, is a better predictor of full knowledge of that property, rather than the proficiency of a given heritage speaker as long as available input would have provided sufficient triggers and prior to the onset of arrested development due to the introduction of or shift to dominance in the majority language L2. The data present here do not falsify the IVH's application to heritage speaker acquisition per se, but do suggest that the IVH alone cannot explain all heritage grammar differences. Future research that is able to look further into the possibility that attrition can and does occur in the core syntax in a more controlled fashion is welcome.

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