

Gender agreement in interface contexts in the oral production of heritage speakers of Spanish in the Netherlands*

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In this paper we present an analysis of Spanish heritage speakers' oral production of gender agreement *outside the DP* as an innovative source of support for the *Interface Hypothesis* (Sorace & Filiaci 2006). We demonstrate that, besides commonly known factors such as the gender, animacy and morphology of the antecedent, the *interface domain* in which gender agreement takes place also seems to play a role in how accurately heritage speakers apply gender agreement. Pronominal reference, located at the *external syntax-discourse interface*, turns out to be more problematic than adjectival predication, which pertains to the *internal morpho-syntax interface*. Furthermore, we discuss the possibility that, besides the amount of input heritage speakers receive, the *quality* of this input may also play a role in their gender agreement accuracy, given that the heritage speakers' error pattern with respect to linguistic factors is very similar to that of first generation immigrants.

Keywords: Heritage speakers, Spanish, Interface Hypothesis, gender agreement

1. Introduction

Heritage speakers are adult bilinguals who grew up in families where a different language is spoken than the dominant language of the mainstream society they live in. As young children they receive much input in their parents' first language: the heritage language. However, when they start going to school, a switch takes place towards the dominant language and the amount of input and activation of their heritage language decreases, usually resulting in either attrition or incomplete acquisition of the heritage language.

Heritage speakers form a very heterogeneous group; they differ with respect to the age of onset of the dominant language, as well as the amount of input and activation of the heritage language. Recently, it has been suggested that in some cases the input that heritage speakers receive may also be *qualitatively* deviant from the monolingual norm, due to the fact that their parents undergo L1 attrition after long-term residence in a country where a different language is spoken than their mother tongue (Rothman 2007; Sorace 2011).

Much research has attested divergent behavior by heritage speakers in several domains of language, especially in phenomena located at the linguistic interfaces, and in particular the *syntax-pragmatics interface* (Montrul 2004, 2010). Interface phenomena are notoriously problematic, not only for heritage speakers, but for all types of bilingual speakers, i.e. highly proficient second language speakers (Sorace & Filiaci 2006; Belletti, Bennati & Sorace 2007), bilingual children (Sorace & Serratrice 2009) and L1 attriters (Tsimpli, Sorace, Heycock & Filiaci 2004). The 'Interface Hypothesis' (hereafter IH) (Sorace 2011 and work cited within) attempts to explain these findings in terms of a processing account. Bilinguals are constantly in the process of inhibiting one of their languages, which requires a great amount of processing costs, thus leaving fewer attentional resources for linguistic tasks, especially the ones that are necessary for integrating different types of information: the interface phenomena. Structures that require purely syntactic computations on the other hand are argued to be completely stable. In its strongest version (Sorace & Filiaci 2006; Tsimpli & Sorace 2006), the IH makes a further distinction between *internal* and *external* interfaces. Internal interfaces are interfaces between two linguistic domains (e.g. syntax and semantics or syntax and morphology) and external interfaces are interfaces between syntax and cognitive systems outside of formal grammar, like pragmatics or discourse. The latter are argued to be the more problematic of the two since it is more costly to coordinate between syntax and more general domains of world knowledge and cognition than between two formal linguistic domains. The majority of research within the IH framework has focused on overt subject pronoun production (e.g. Sorace & Filiaci 2006; Pires & Rothman 2009). Consensus is yet to be reached, since both evidence in favor and contra the IH has been put forward in the existing literature.

The present study focuses on gender agreement as an innovative and fruitful domain to test the IH. We study Spanish heritage speakers in the Netherlands with regard to their oral production of two specific instantiations of gender agreement *outside the DP*, namely *adjectival predication* and *pronominal reference*. These two types of agreement reflect two different interface domains (internal vs. external respectively), for which the IH predicts different behavior. The reasoning behind this line of thought will become clear in the next section, in which we will briefly discuss gender agreement in Spanish.

2. Gender agreement in Spanish

Spanish nouns can have two genders: *masculine and feminine*. Masculine nouns get the determiner *el* and feminine nouns get the determiner *la*. The vast majority of Spanish nouns have a so-called *canonical* morphology, i.e. they end in –o when they are masculine and in –a when they are feminine, but there are plenty of exceptions to this rule: the non-canonical nouns like *el hombre* (the man) or *la mujer* (the woman). Within the DP, gender is marked on both the determiner and the adjective. Most adjectives, but not all, are also canonical, i.e. they end in –o or –a for masculine and feminine, respectively. Examples (1) and (2) illustrate DP-internal gender agreement with canonical nouns and adjectives.

- (1) *El pelo blanco*
 DET-MASC hair white-MASC
 ‘The white hair.’
- (2) *La mesa blanca*
 DET-FEM table white-FEM
 ‘The white table.’

It has been widely attested that agreement *within the DP* is often affected for heritage speakers of Spanish (Montrul Dominguez, Arche, Myles & Marsden 2008; Alarcón 2011). In this paper, we look at agreement *outside the boundaries of the DP*, which is rather uncharted territory in heritage language research. We focus on two types of DP-external gender agreement, namely *adjectival predication*, i.e. the relation between a subject and its adjectival predicate (example 3) and *pronominal reference*, i.e. the use of a third person pronoun to substitute a full DP (example 4).

- (3) *La mesa es blanca*
 DET-FEM table is white-FEM
 ‘The table is white.’
- (4) *Vi una mesa. La voy a comprar*
 I saw a table. **PRO-ACC-FEM** I go to buy
 ‘I saw a table. I’m going to buy it.’

The agreement between a subject and its predicate can be considered a *morpho-syntactic* instantiation of agreement and therefore pertaining to an *internal* interface, whereas pronominal reference is typically regarded as a type of anaphoric relation. Even though we consider pronouns to be gender agreement targets, just as predicate adjectives, the difference is that in anaphoric reference the speaker must make use of the *discourse* context to make the connection between the two elements. Hence, pronominal reference can be argued to be located at an *external*

interface. If the IH is on the right track in arguing that external interfaces are more costly for processing than internal ones, we expect gender agreement in pronominal reference to be more problematic for heritage speakers than gender agreement in adjectival predication, especially in oral production, which requires fast processing.

3. Research questions

In this exploratory study, we will address three main research questions. First of all, before addressing the effect of different interfaces, we have to determine whether heritage speakers of Spanish in the Netherlands indeed make more gender agreement errors outside the DP than monolingual speakers.

If they do, we are interested to see whether certain linguistic factors play a role in their gender agreement accuracy and particularly, whether ‘agreement domain’ has an effect. In view of the IH, we expect the difference between adjectival predication and pronominal reference with respect to the interfaces to which they pertain to be reflected in heritage speakers’ linguistic behavior; that is, we expect them to make more errors with pronominal reference than with adjectival predication.

Finally, we are curious to know whether there is any indication in our data that heritage speakers’ accuracy with gender agreement outside the DP might be related to the *quantity* and the *quality* of the parental input they received while growing up.

4. Methodology

4.1 Participants

17 Chilean heritage speakers, 7 first generation Chilean immigrants and 8 native speakers from Chile participated in the study. 11 heritage speakers (age range 21–42; mean age: 31.3; sd: 6.62) were born in the Netherlands, three arrived in their first year of life, one arrived at age 1,5 and two arrived at age 5. Most of them lived their whole lives in either Amsterdam or other urban areas of the Netherlands. One participant reported having spent some years in Spanish-speaking countries during his childhood, but was nevertheless included in the analysis since his command of Spanish was clearly far from native-like. Half of the heritage speakers grew up in families with two Spanish-speaking parents, and the other half with one Spanish- and one Dutch-speaking parent. The first generation immigrants considered here (age range: 45 to 78; mean age: 55.9; sd: 11.2) all spent their childhood

up until the age of arrival in Chile and the rest of their lives in either Amsterdam or other urban areas of the Netherlands. The total amount of years they reported having lived in the Netherlands ranged from 30 to 36 years. Some of them spent parts of their lives in other Spanish-speaking countries than Chile. The control group consisted of 8 native speakers of Spanish from Chile (age range: 20 to 70; mean age: 42.87; sd: 16.55), all born and raised monolingually in Santiago or Valparaíso, the main urban centers of the country.

4.2 Materials and procedure

The data collection, conducted by the fourth author, consisted of a 25- to 30-minute lasting semi-experimental task in which the participants were instructed to describe videos and images as well as a long oral interview in which the participants were asked open questions regarding their personal lives (for details see Irizarri van Suchtelen, to appear). The length of the interview varied per participant, but the entire set of data has a minimum of approximately 1.5 hours per participant.

4.3 Coding of the data

Heritage speakers were coded for having been brought up by either one or two Spanish-speaking parents. This provided a rough measure of the amount of input they had received in Spanish. Furthermore, for all three groups, all instances of gender agreement outside the DP referring to a clearly identifiable antecedent in the *linguistic context* were coded using the annotation program ELAN,¹ for the following factors:

1. Accuracy (error or correct)
2. Agreement domain (adjectival predication or pronominal reference)
3. Animacy of the antecedent noun
4. Gender of the antecedent noun
5. Morphology of the antecedent noun (canonical or non-canonical)
6. Distance between the agreeing elements, in words

Animacy, gender and morphology of the antecedent noun were taken into consideration because these factors have been demonstrated to affect DP-internal gender agreement not only for heritage speakers (Montrul et al. 2008; Alarcón 2011), but also in L1, L2 and 2L1 acquisition, as well as in L1 attrition and monolingual adult processing (López-Ornat 1997; White, Valenzuela, Kozłowska-Macgregor & Leung 2004; Keating 2009; Ayres 2012). Distance was entered as a variable because distance effects have been reported for agreement outside the DP in Spanish L2 acquisition (e.g. Keating 2009).

In total, 1693 predicate adjectives and 2042 pronouns were coded. A few remarks about the in- and exclusion of certain types of pronominal reference are in order here. First of all, only personal pronouns were included. For object pronouns we analyzed both pronouns with animate antecedents and pronouns with inanimate antecedents, in order to determine the role of animacy. For subjects this was not possible, because (strong) subject pronouns in Spanish generally refer to animates. There were only 6 cases of subject pronouns with inanimate antecedents, and they were all correct. The subject pronouns with animate antecedents were excluded from the analysis.

Furthermore, a considerable amount of cases consist of *chains of referential elements*, for instance a series of pronouns or adjectives referring to one single original antecedent. In coding the variables, we always used the characteristics of the *last overt referential element*, which, in these cases would be the previous pronoun or the previous adjective. Therefore, pronouns and adjectives sometimes served as agreement markers and simultaneously as antecedents for the following marker. Finally, Spanish is a pro-drop language, which means that subject pronouns are not expressed unless they are used in an emphatic or contrastive way. We decided that dropped pronouns should not be taken into consideration as antecedents in this analysis, since some characteristics, like morphology, cannot be determined for a pronoun that is not overtly expressed.

5. Results and discussion

The results of the study will be discussed using the three research questions as a starting point. The first question asked whether heritage speakers of Spanish in the Netherlands make more gender agreement errors outside the DP than monolingual speakers and first generation immigrants. Table 1 depicts the total amounts and percentages of correct and erroneous instances of gender agreement for all three participant groups.

The heritage speakers performed least accurately as a group, with 14.51% errors, which is significantly more than the G1 immigrants and the control group (3.83% and 4.74% errors respectively; $\chi^2 = 120.425$ df=2, $p = 0.000$). The

Table 1. Total amounts and percentage correct and incorrect instances of gender agreement outside the DP, per group

Generation	Correct	%	Errors	%	Total
Heritage speakers	1290	85.49	219	14.51	1509
G1 immigrants	1030	96.17	41	3.83	1071
Monolinguals	1046	95.26	52	4.74	1098

monolinguals and the G1 immigrants did not differ significantly from one another ($\chi^2 = 1.09$ $df = 1$, $p = 0.297$). Heritage speakers thus indeed committed more gender agreement errors than both first generation Chilean immigrants and monolingual Chileans. This finding is in line with previous research on *DP-internal* gender agreement by Spanish heritage speakers in the United States (Montrul et al. 2008; Alarcón 2011).

The second research question concerned the linguistic factors that affect gender agreement accuracy for heritage speakers. To answer this question, a backward binary logistic regression was performed, using eleven steps to arrive at the best fitting model (Nagelkerke = 0,303). The model included a main effect of gender (graph 1) (Wald $\chi^2 = 22.916$, $p = 0.000$) and of animacy (Graph 2) (Wald $\chi^2 = 32.489$, $p = 0.000$).

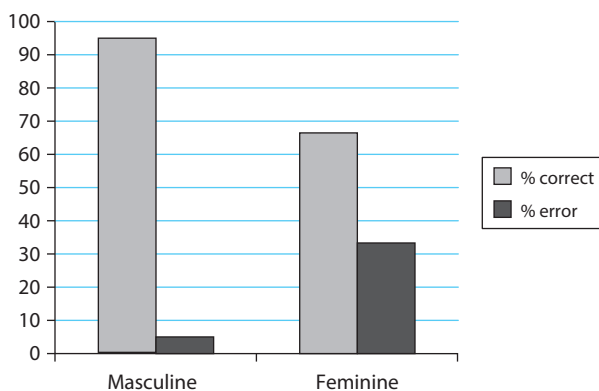


Figure 1. Heritage speakers' accuracy with masculine and feminine nouns

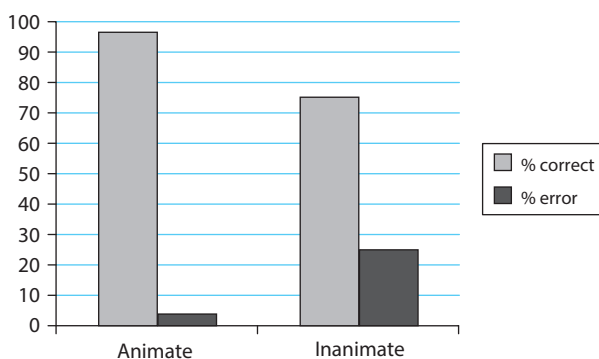


Figure 2. Heritage speakers' accuracy with animate and inanimate nouns

The two main effects of gender and animacy indicate that heritage speakers have more difficulties with nouns when they are *feminine* and/or *inanimate*. The gender effect implies a possible default use of the masculine, which is quite a robust

phenomenon, attested in non-native Spanish as well as in L1 acquisition and monolingual processing (López-Ornat 1997; White et al. 2004; Montrul et al. 2008; Keating 2009; Alarcón 2011; Ayres 2012). The effect of animacy is consistent with most L2 acquisition research demonstrating more difficulty with inanimate nouns than animate nouns (e.g. Alarcón 2009; Ayres 2012), and can probably be accounted for by the fact that the natural gender of animate nouns usually coincides with the noun's grammatical gender, thus facilitating the gender assignment and agreement process. However, the opposite pattern, more difficulties with animate than inanimate nouns, has also been attested (e.g. Sagarra & Herschensohn 2011).

Besides these two main effects, the model included three significant interactions: morphology and animacy (Wald $\chi^2 = 4.076$, $p = 0.043$), distance and gender (Wald $\chi^2 = 6.802$, $p = 0.009$), and agreement domain and animacy (Wald $\chi^2 = 6.918$, $p = 0.009$). These interaction effects show that all three remaining factors, 'morphology', 'distance' and 'agreement domain', albeit to a lesser degree than gender and animacy, are also involved in heritage speakers' gender agreement accuracy. First, the interaction effect of 'morphology' indicates that, at least for inanimate nouns, non-canonical morphology is more problematic than canonical morphology, corresponding well to previous studies demonstrating canonical noun endings as having a positive effect on gender agreement performance for heritage speakers (Montrul et al. 2008; Alarcón 2011), as well as in L1 and L2 acquisition and adult monolingual processing (López-Ornat 1997; Schlig 2003; Keating 2009; Ayres 2012). Second, the interaction effect of 'distance' shows that heritage speakers have more problems with longer distances between agreeing elements, when the antecedent is a feminine noun. Distance effects have been attested in some Spanish L2 production and processing studies (e.g. Keating 2009). Please note that linear distance (in words), not structural distance (in constituent boundaries) was measured in this study.²

The last interaction effect of 'agreement domain', in combination with animacy, is the one we are most interested in for this particular study, because it provides us with an answer to the question: "Is the difference between adjectival predication and pronominal reference according to interface domain reflected in heritage speakers' linguistic behavior?" The results indicate that heritage speakers indeed have more problems with pronominal references (external interface) than with adjectival predication (internal interface), at least when the antecedent is inanimate, as shown in Figure 3.

One might imagine that the observed difference between predicate adjectives and pronouns is actually a side effect of distance, if it is the case that distances in general are bigger for pronominal reference than for adjectival predication. To rule out this possibility, an independent t-test was performed to compare the

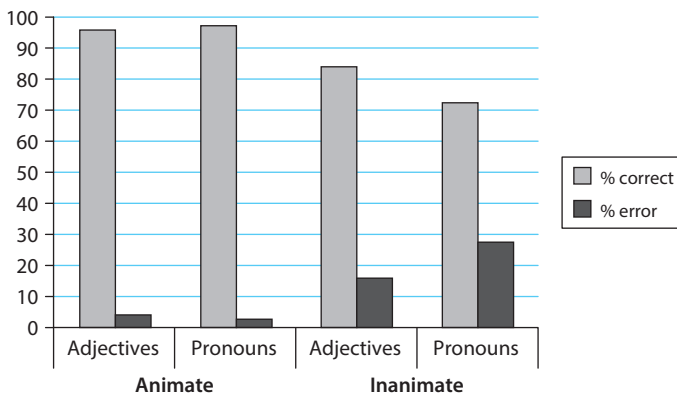


Figure 3. Heritage speakers' error percentages by agreement type and animacy

mean distances within these two groups. Pronouns had a slightly higher mean distance than predicates (2.91 vs. 2.79 words), but the difference was not significant ($t(861.78) = -0.811$, $p = 0.418$).

In fact, we would like to suggest that the effect of interface in this study can be viewed as support for the strong version of the *IH* (Sorace & Filiaci 2006), which claims that, for all bilinguals alike, linguistic phenomena located at internal interfaces between two *linguistic* domains, like morphology and syntax, are less problematic than phenomena situated at the external interface between syntax and other cognitive systems, like discourse. Subject-predicate agreement, depending entirely on morphology and syntax, is an internal interface phenomenon, whereas pronominal reference, where discourse plays an important role, is usually considered to be located at the external interface between syntax and discourse. Our results suggest that pronominal reference is indeed more problematic for heritage speakers than adjectival predication, although this difficulty only surfaces with those nouns that are already in itself more problematic for heritage speakers: the inanimate nouns. Nevertheless, the direction of the difference between the two agreement types is in line with what the *IH* would predict.³

The third research question concerned the role that *quantity* and the *quality* of the input play in heritage speakers' gender agreement accuracy. In order to test the effect of input quantity, the heritage speakers were divided into two groups according to the amount of parental input they received as children, distinguishing between participants who grew up with two Spanish-speaking parents and those who grew up with only half of their home input in Spanish. A between-cases analyses was performed by means of a Chi-square test, which demonstrated a significant difference between the two groups ($\chi^2 = 16.07$ $df = 1$, $p = 0.000$), indicating

that heritage speakers who grew up with both parents speaking Spanish to them, produced fewer gender agreement errors, as illustrated in Figure 4.

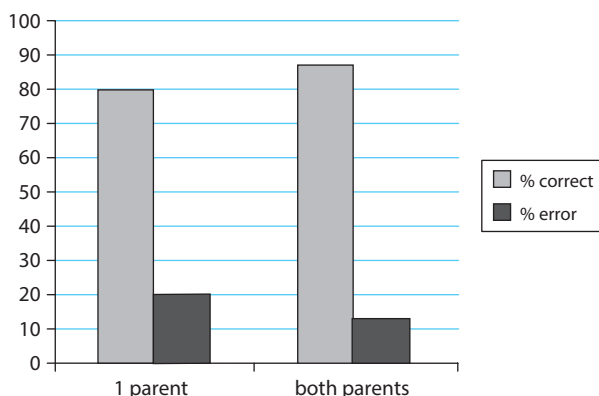


Figure 4. Total percentages of gender agreement errors by heritage speakers with one or two Spanish-speaking parents

Thus, there are indications that quantity of the input plays a role on the basis of this crude measure, but more fine-grained analyses are necessary to further support this claim.

Finally, to test a possible effect of the *quality* of the input, we performed the same backward binary logistic regression analysis on the first generation immigrants and the monolingual control group, because, even though these groups did not produce many gender agreement errors, we were nevertheless interested to see whether the errors they did make revealed a similar pattern to that of the heritage speakers. For the monolinguals, the analysis took 7 steps (Nagelkerke = 0.178) to render a model without any significant effects whatsoever, indicating that the few errors they made were completely random. For the first generation immigrants on the other hand, the analysis (10 steps, Nagelkerke = 0.139) did render significant effects. There was a main effect for gender (Wald $\chi^2 = 5.014$, $p = 0.025$), just as for the heritage speakers. Furthermore, there were three significant interactions involving animacy as a factor: animacy and gender (Wald $\chi^2 = 4.640$, $p = 0.031$), animacy and distance (Wald $\chi^2 = 12.554$, $p = 0.000$), and lastly animacy and morphology (Wald $\chi^2 = 7.672$, $p = 0.006$), which was also present in the heritage speakers' model. Thus, although the factor animacy was not a main effect for the first generation immigrants, it occurred in three interactions, implying that its influence on gender agreement accuracy for these speakers certainly cannot be denied. All in all, the main and interaction effects for the first generation immigrants seem to imply that these speakers too have more problems with feminine, inanimate, non-canonical nouns and longer distances; a strikingly similar error pattern to that

of the heritage speakers. Additionally, the monolingual control group produced relatively more pronouns than both the heritage speakers and the first generation immigrants, as illustrated in Figure 5.

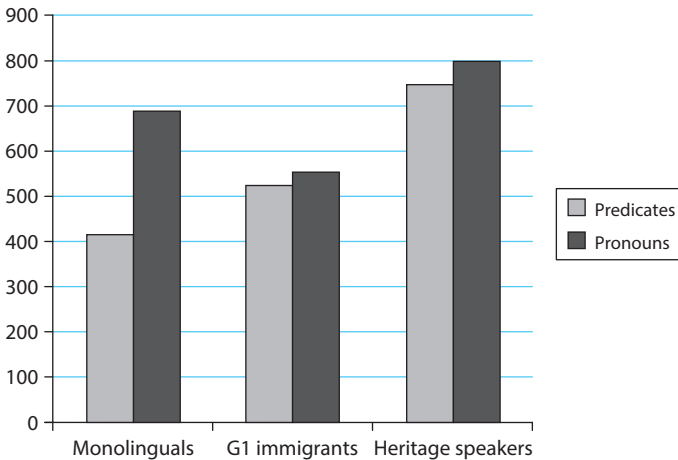


Figure 5. Instances of adjectival predication and pronominal reference for all three groups

The monolinguals produced 62.4% pronouns and 37.6% predicate adjectives. For the heritage speakers and the first generation immigrants the distribution between the two agreement types was much more equal (51.7% pronouns vs. 48.3% adjectives for the heritage speakers and 51.1% vs. 48.9% respectively for the first generation immigrants), and thus significantly different from the monolinguals ($\chi^2 = 37.563$ $df = 2$, $p = 0.000$). Several possible explanations can be offered to account for this discrepancy between the monolinguals on the one hand and the heritage speakers and first generation immigrants on the other hand. First of all, it is possible that the latter two groups *avoid* the use of pronouns and prefer to express a full noun instead, a strategy that has been attested for L2 learners of Spanish (e.g. Mitchell et al. 2008). The explanation may also lie in a transfer effect from Dutch, if pronominal reference turns out to be less frequent in Dutch than in Spanish. Unfortunately, it was beyond the scope of this study to investigate this matter in such detail. A more detailed analysis of the data is necessary to better understand the underlying causes for the observed linguistic behavior.

The similarity with respect to the error pattern and the relative distribution of predicate adjectives and pronouns in the heritage data and the first generation immigrant data can be accounted for in various ways. It may be the case that a general cognitive effect of a decrease in input and activation applies to both groups, causing similar error patterns. Another possible explanation is that the heritage speakers' error pattern is a reflection of the *qualitatively* different input provided to

them by their parents, as suggested by Rothman (2007) among others. Admittedly, the first generation immigrants investigated in this study were not the actual parents of the heritage speakers. To be able to draw firm conclusions about the effect of input quality on gender agreement performance, one would have to look at children in heritage families and analyze the actual input they receive, which will be interesting to further investigate in future research.

6. Conclusion

In this study, we demonstrated that the Spanish heritage speakers in the Netherlands we studied portray deviant behavior regarding gender agreement *outside the DP* in their oral production, compared with monolingual speakers and first generation immigrants. They made significantly more gender errors than the other two groups. This was particularly evident in those speakers who were raised by only one Spanish-speaking parent. Various linguistic factors were found to play a role in heritage speakers' gender accuracy, which is mainly gender and animacy of the antecedent noun, but also morphology of the noun, distance between the agreeing elements, and, crucially, the 'agreement domain': Pronominal reference appeared to be more problematic than adjectival predication. Given that the difference between these two phenomena reflects a difference in interface domain, it was suggested that these results are best explained by the Interface Hypothesis (Sorace & Filiaci 2006). Additionally, even though first generation immigrants did not commit more gender errors than monolinguals, certain *patterns* in their linguistic behavior resembled that of the heritage speakers. These similarities between the two groups suggest the possibility that heritage speakers' performance may, in part, be accounted for by the qualitatively different input they received from their parents. This provides an interesting topic for further investigation.

Notes

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1. ELAN was developed by the Max Planck Institute for Psycholinguistics in Nijmegen, <http://tla.mpi.nl/tools/tla-tools/urg, elan/>. For instructions see Sloetjes & Wittenburg 2008).

2. However, these two ways of measuring distance often correlate (bigger structural distance often automatically implies bigger linear distance), so it is hard to separate the two.

3. This effect of agreement domain was not present for the monolinguals and the first generation immigrants.

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