Bilingual children and adult heritage speakers: The range of comparison

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Abstract
This paper compares the language of child bilinguals and adult unbalanced bilinguals (heritage speakers) against that of bilingual native speakers of their home language (baseline). We identify four major vectors of correspondence across the language spoken by these three groups. First, all varieties may represent a given linguistic property in a similar way (child bilinguals = adult heritage speakers = bilingual native speakers of their home language). This occurs when either (i) the property in question is highly robust and is acquired by learners without difficulty or (ii) the property is already in decline in the baseline. We illustrate scenario (i) with data from Russian count forms, which are morphologically quite complex. The preservation of these forms in child bilinguals and adult heritage speakers suggests that simplicity of encoding is not the only factor determining robustness of retention. Second, child and heritage speakers may share a linguistic structure that differs from the one found in the baseline (bilingual native speakers of their home language ≠ child bilinguals = adult heritage speakers). This scenario occurs when incipient structural changes in the baseline become amplified in the language of next-generation bilinguals, or when a given structure is rare, confined to a specific register, and/ or reinforced through literacy. Third, a structure may be acquired by bilingual children faithfully, but undergo reanalysis/attrition in the adult heritage language (bilingual native speakers of their home language = child bilinguals ≠ adult heritage speakers). Russian relativization illustrates this scenario; child bilinguals show native-like performance on relative clauses but adult heritage speakers show an exaggerated subject preference in the interpretation of gaps. Finally, a structure that is not fully learned by child speakers may be reanalyzed by adult heritage speakers following general principles, thus bringing the adult heritage representation closer to that of the baseline (bilingual native speakers of their home language = adult heritage speakers ≠ child bilinguals). Heritage speakers' production and comprehension of psychological predicates in Spanish illustrates this possibility.

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Introduction

Linguistic research over the last two decades has uncovered a significant number of properties that, taken together, allow us to identify heritage language as a particular phenomenon within bilingualism. Heritage language (HL) is typically understood as the language that early bilinguals grew up exposed to at home, before becoming dominant in the main language of their society (Valdes, 2000; Polinsky & Kagan, 2007, among others)[1]. The recognition of HL speakers as a special speaker group has inspired a ream of new empirical, experimental, and theoretical studies (see Benmamoun, Montrul, & Polinsky 2013a, 2013b; Montrul, 2016; Scontras, Fuchs, & Polinsky, 2015, for overviews). To date, the bulk of this research has focused on comparisons between adult heritage speakers and adult L1 speakers of the baseline, i.e. the language that constitutes the main input to heritage learners.

Although this research has uncovered a number of structural properties characteristic of HL, the origins of these recurrent properties remain underexplored. In order to fully understand adult HL, it is imperative to consider the language of 'future heritage speakers': childhood bilinguals who are still receiving daily input in the home language but who operate under similar sociolinguistic conditions to those reported for adult heritage speakers. These conditions include residence outside the country where the HL is dominant, lack of formal education in the HL, an (upcoming or ongoing) rapid switch to the dominant language of their society, and decreasing input from the home language as they spend more time in school (He, 2011, 2014).

In comparisons of future and current heritage speakers, two possible approaches seem pertinent: longitudinal studies that follow the same subjects from childhood to adulthood, and experimental studies that compare children acquiring the HL ('future heritage speakers') to HL adults with closely matched linguistic biographies. The work of Silva-Corvalan (2014; this volume) is an example of the former type of study; the author carefully monitors the language development of two siblings growing up in a bilingual Spanish-English environment, showing how English eventually becomes the subjects' stronger language. Longitudinal studies are by necessity limited to a small number of subjects, and while they contain valuable observations, they need to be supplemented by controlled comparisons among larger pools of speakers. Such comparisons should also incorporate the language of first-generation immigrants (the baseline), which provides input for bilingual learners.

In much existing research on HL, differences between a baseline language variant (spoken by first-generation immigrants) and the standard language variant (spoken in the immigrants' country of origin, i.e. the homeland) are disregarded; however, evidence from recent studies suggest that such differences can be significant. Languages with large, diasporic populations do not remain homogeneous. The Spanish of first-generation US immigrants from Chiapas, Mexico cannot be assumed to be the same as Peninsular Spanish or even a different variety of Latin-American Spanish. Recent studies suggest that the language of first-generation immigrants undergoes minor changes that persist and spread rapidly in the HL of subsequent generations. The propensity to use overt rather than null subjects is a well-known feature of HL, for example; crucially, this tendency emerges regardless of the presence of *pro*-drop in the dominant language of the society (cf. immigrant Italian in a Spanish-dominant environment, as discussed in Sorace and Filiaci, 2006; immigrant Russian in a Hebrew-dominant environment, as discussed in Dubinina and Polinsky, 2013; and immigrant Spanish in an English-dominant environment, as discussed by Montrul in this volume, and by Otheguy and Zentella, 2012, p. 9).[2]

Assembling data on baseline speakers, childhood bilinguals, and heritage speakers is a challenging task, and one function of this article is to highlight the need for additional data collection on these crucial three-way comparisons. Once such data are available, it becomes possible to

conduct a structural comparison across the three varieties. When comparing a particular structure across three related linguistic variants, several logical possibilities arise: all three variants may treat the structure in the same way, each may treat it differently, or any two variants may pattern against the third. In what follows, I discuss and illustrate several of these logical possibilities in the context of HLs, using data from recent studies. An important goal of this kind of work is to be able to predict, for a particular phenomenon or population, which logical scenario will develop. Although the present paper is not able to answer this question, it is my hope that, by pulling together disparate study results into a coherent preliminary discussion, we can lay the ground-work for future analyses.

Before I proceed, a clarification is in order concerning the data discussed in this paper. Most of the studies I discuss compare adult speakers to children above the age of three. The underlying assumption in these studies is that children's mastery of the particular structures under investigation has had sufficient time to develop by this age. I adopt the same assumption in my discussion below.[3] This focus on slightly older children allows researchers to consider both simultaneous and sequential bilinguals. Ideally, these two groups should be considered separately, but in practice, they are often collapsed into one group.

In the next four sections, I outline four hypothetical acquisition scenarios describing possible patterns of mastery among bilingual native speakers (BIL), adult heritage speakers (AHL), and child bilinguals (future heritage speakers, CHL).

(1) a. All three groups show equal mastery (or non-mastery) of the property in question (BIL = CHL = AHL).[4]
     b. The property is present in the baseline but undergoes change in child language and the adult HL (BIL ≠ CHL = AHL).
     c. Child bilinguals do not differ from the baseline with respect to the property; adult heritage speakers differ from both groups (BIL = CHL ≠ AHL).
     d. The adult HL patterns with the baseline with respect to property X, while child language differs (BIL = AHL ≠ CHL).

It's language all the way down

First, let us consider scenario (1a); all three groups show equal mastery (or non-mastery) of a given property.

This scenario suggests two possibilities: first, that the property is quite robust and is acquired unproblematically, or second, that the property is undergoing change and restructuring in the baseline and the other varieties (Meisel 1986, 1989, 2001). Below, I illustrate this with data from Russian numerical expressions.

In Russian numerical phrases, the noun varies in form depending on the numeral.[5] Nouns accompanied by numerals five and higher or the words *mnogo* 'many' and *malo* 'few' appear in the genitive plural; nouns occurring with the numerals one-and-a-half, two to four and the word *oba* 'both' require a special paucal form. For the overwhelming majority of Russian nouns, the paucal coincides with the genitive singular.

(2) a. odin   velosiped
         one   bike.NOM
     b. tri   velosiped-a
         three   bike-PAUCAL/GEN.SG
     c. vosem'   velosiped-ov
         eight   bike-GEN.PL

Russian acquisition of case-forms is laborious and strewn with errors (see Gvozdev, 1961; Slobin, 1966; Gagarina & Voeikova, 2009; Eisenbeiss, Narasimhan, & Voeikova, 2008 for monolinguals; Schwartz & Minkov, 2014 for bilingual children). Acquisition of case-forms for numerical expressions may appear equally challenging, although the data are inconsistent. On the one hand, Russian Child Language Data Exchange System (CHILDES) data show no errors with numerical expressions. On the other hand, Gagarina and Voeikova remark that '[e]rrors in [the acquisition of number in the nominal domain] are frequent with all Russian children and are found until the age of five years' (Gagarina & Voeikova, 2009, p. 199).

Russian morphology has a great number of syncretisms; note that, in the discussion below, the crucial question is whether or not children use the correct *case-form*, not the particular *allomorph*. The Russian genitive is actually an ideal domain for investigations of case substitution, as such substitution is particularly common with the genitive of negation (Babyonyshev, Ganger, Pesetsky, & Wexler, 2001; Modyanova, 2006) and genitive of possession.[6] Even so, case substitution does not appear to take place in numerical expressions. Aside from two examples cited by Gagarina and Voeikova (2009), no case substitution errors with count forms are reported elsewhere in the literature. In their examination of case-form production in the speech of Hebrew-Russian bilingual children (ages three years three months to five years three months), Schwartz and Minkov (2014, p. 76) observe 14 case substitutions in 127 contexts where the dative singular is warranted, and only three substitutions in 269 contexts calling for the genitive singular. Even if all three incorrectly used genitives were in numerical expressions (which seems unlikely: see Schwartz & Minkov, 2014, p. 72), that's a remarkably low number compared to the respective number of substitutions of the dative.

To investigate count-form errors among adult heritage speakers, we conducted an analysis of heritage narratives produced by American Russian (*n*=31) and German Russian (*n*=19) speakers (average age 23 years and seven months) (Ivanova-Sullivan, 2013; Denisova-Schmidt, 2014). All the subjects produced a narrative based on the same video clip, so the data were largely comparable. Despite the cross-subject variation in proficiency level, and a number of systematic errors (Ivanova-Sullivan, 2014), there were no errors in the use of count forms.

In another study, 19 American English-dominant heritage speakers (average age 18 years and nine months) were asked to read stimuli with matching or mismatching case forms in the numerical expression (see Xiang, Harizanov, Polinsky, & Kravtchenko., 2011 for the details of the experiment), and rate the examples on a seven-point Likert scale (1: completely unnatural, 7: completely natural). (Note that, since this study included reading tasks, we had to limit participation to heritage speakers literate in Russian). Filler sentences included ungrammatical conditions, in particular ones where the animate accusative appears in place of the dative, as shown below.

(3) Ženja					podaril			syn-u/*syn-a		…
     Zhenya				gave.as.gift	son-DAT/son-ACC
     nov-uju		igrušk-u.
     new-ACC		toy-ACC
     'Zhenya gave his son a new toy …'

Figure 1 shows the ratings obtained for conditions where the noun in the numerical expression appeared in the correct vs mismatched form. Heritage and native speakers perceived the differences between correct and mismatched forms equally clearly; the differences in ratings between the grammatical and ungrammatical conditions were statistically significant for both groups.

Conversely, the ratings for fillers that included the mismatched case of the indirect object were different across speaker groups (Figure 2). Native speakers were equally discriminating of matches
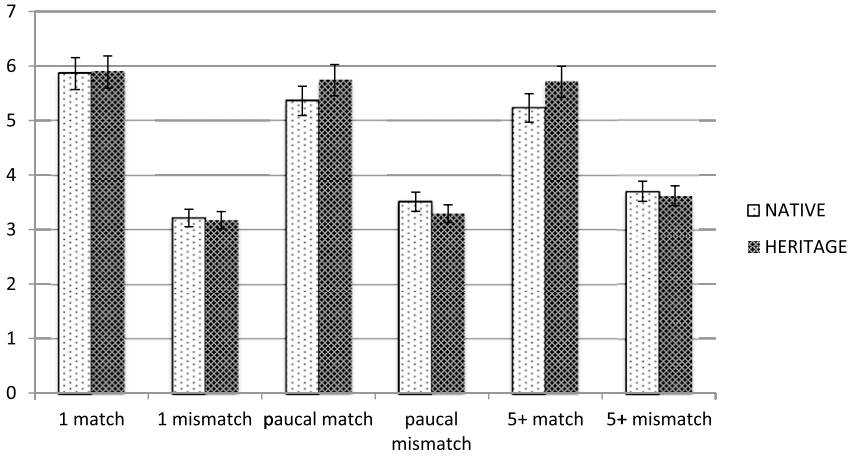
Figure 1. Ratings of numerical expressions (noun-form matching/mismatching the form required by the numeral).
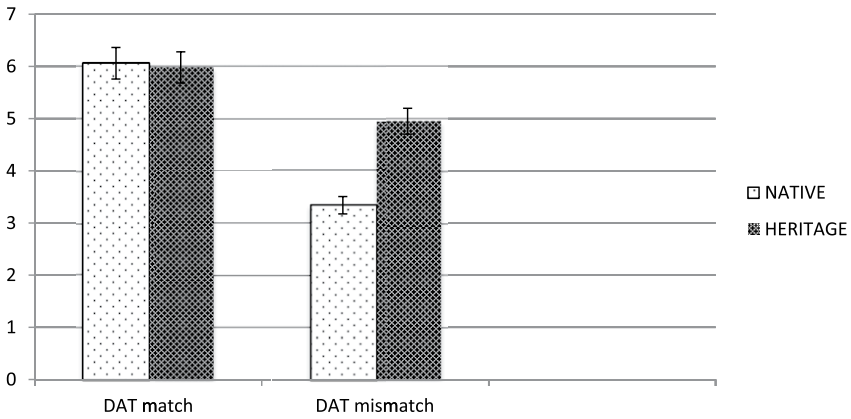
Figure 2. Ratings of sentences with indirect object in the matching dative/mismatching accusative.

and mismatches, but heritage speakers' ratings for both conditions were not significantly different, which suggests that their sensitivity to case mismatches is not global and is much sharper with numerical expressions.[7]

The findings of these studies suggest that Russian speakers from all walks of life use count forms correctly. If so, we have a clear illustration of scenario (1a). This possibility, in turn, raises an interesting question for future research: What are the universal principles governing acquisition of numerality in monolingual and bilingual children?

Difference between the baseline and all heritage speakers

In scenario (1b), a given property in the baseline undergoes a parallel change in the language of child bilinguals and heritage speakers.

Such a pattern may arise under a number of different conditions. For example, a language property that is rare and only available in certain registers may be naturally absent in the language of

speakers whose input is restricted to informal and familiar contexts. Consider the Spanish non-finite absolute construction. The absolute construction is syntactically similar to an adverbial subordinate clause, but lacks any sort of subordinating conjunction that overtly specifies its logical connection to the clause it adjoins to. The predicate of the absolute construction occurs in the participial form, followed by any nominal complements.

(4) [Llegado   el   sacerdote],   la   boda   podia   comenzar.
     arrive.PARTICIPLE the   priest   the   wedding   could   begin
     'The priest having arrived here, the wedding can begin.' (Bruno, 2011, p. 264)

The Spanish absolute construction is sensitive to the external/internal argument distinction: its verbal argument must be interpreted as internal, which rules out the use of unergatives (Alcázar & Saltarelli, 2008; Bruno, 2011; Hernanz, 1991; López, 2001). Spanish-learning children, heritage speakers, and L2 speakers show equal difficulties in producing and evaluating this construction, and especially in enforcing the unaccusative constraint (see Montrul, 2006, p. 44-51, for Spanish heritage speakers, and Montrul 2004, p. 329, for L2 Spanish). These findings suggest that the acquisition of the absolute construction is limited to more formal registers and may happen relatively late in development.

Scenario (1b) may also arise when a particular language structure or property is in the incipient stages of change in the baseline grammar. In this case, HL acquisition of the baseline may amplify this change and make it more apparent. Consider the development of differential object marking (DOM) in Spanish. DOM is a generalization over a set of facts about Spanish grammar – in particular, the requirement that objects which are [+animate] and [+specific] be marked with the preposition *a* ('a personal'), whereas other types of objects appear unmarked.

(5) a. María   quiere   a   un   abogado.   [+animate, +specific]
         Maria   wants   A-PERSONAL   a   lawyer
         'Mary wants a (specific) lawyer.'
     b. María   quiere   un   abogado   [+animate, -specific]
         Maria   wants   a   lawyer
         'Mary wants a lawyer (any lawyer).'

(6) Juan   destruyó   (*a)   la   ciudad   [- animate, +specific]
     Juan   destroyed   A-PERSONAL the city
     'Juan destroyed the city.'

Rodríguez-Mondoñedo (2006) shows that monolingual Spanish children acquire adult-like DOM by the age of three. Montrul and Sánchez-Walker (2013) and Montrul, Bhatt, and Girju (2015) tested DOM in English-dominant heritage speakers of Spanish, first-generation immigrants (whose language serves as the input to the heritage speakers), and L1 speakers from different age cohorts in Mexico, and found that child and adult heritage speakers of Spanish omit *a personal* on a regular basis. The situation is complicated, however, by the fact that the same pattern of DOM omission has been observed in the language of first-generation immigrants. Leaving aside the possible reasons for such a change, it appears that heritage Spanish has picked up an incipient change in the baseline and generalized it, yielding scenario (1b).

Reanalysis in adult language

Reanalysis in (adult) HL may produce opposing results: attrition in the HL versus the baseline and child language (scenario (1c), discussed in the following subsection) or realignment of the HL with

the baseline against child language (scenario (1d), discussed in the subsection "Getting better with age?"). Theoretically, HL reanalysis may also lead to a situation in which all three varieties (the baseline, the language of child bilinguals, and HL) differ; I am not aware of examples instantiating such a situation. The crucial observation underlying all these scenarios is the fact that agents of change—heritage speakers—follow a number of universal principles that are not unique to HL.

Attrition?

In this section, I consider a scenario in which bilingual children (future heritage speakers) pattern with bilingual native-speaker adults with respect to a given property, whereas heritage speakers differ from both groups (scenario (1c)).

In this scenario, a particular structure or language property is initially acquired by bilingual children, but undergoes attrition (in the proper sense of the word) in adulthood. Attrition of this kind is observed in the treatment of A-bar dependencies in adult heritage Russian (Polinsky, 2011).

As a subtype of A-bar dependency, relative clauses offer a window onto structural preferences in language. Consider the subject-extracted relative clause in (7a) and the object-extracted relative clause in (7b). In both cases, the gap and the relative pronoun reference the subject of the matrix clause, *the reporter*.

(7) a. The reporter$_i$ [who$_i$ t$_i$ harshly attacked the senator] admitted the error.
    b. The reporter$_i$ [who$_i$ the senator harshly attacked t$_i$] admitted the error.

It is a well-known empirical generalization that, if a language can relativize at a given position in the Accessibility Hierarchy (Keenan and Comrie, 1977), it can also relativize at every position above it.

(8) subject > direct-object > indirect-object > oblique-object > …

Development of relative clauses more or less follows the scale in (8); children tend to acquire subject and object relatives first, and to acquire them relatively early (Hamburger & Crain, 1982).

Assuming that relative clauses are linguistically robust and acquired relatively early, we might expect them to be resistant to change in heritage grammars. If relativization does not undergo the same processes of attrition that other areas of heritage grammars do – that is, if heritage speakers and native speakers perform equally well in comprehending and producing relative clauses – this finding would support the notion that competence in relativization is independent of quantity or quality of exposure. If, however, heritage speakers do diverge from native speakers in their performance with regard to relative clauses, then the observed differences may inform the trajectory of heritage grammars.

Like English, Russian allows relativization at any point in (8), as the following examples demonstrate.

(9) a. deti$_i$ [kotor-ye   t$_i$ polučili   podarki
       children.NOM.PL   REL-NOM.PL   received   gifts.ACC.PL
       ot   babuški]
       from   grandma.GEN
       '(the) children that/who received gifts from Grandma'
    b. podarki$_i$ [kotor-ye   deti   polučili   t$_i$ ot
       gifts.NOM.PL   REL-ACC.PL   children.NOM.PL received   from
       babuški]
       grandma.GEN
       '(the) gifts that the children received from Grandma'

The similarity between the two systems makes the production of Russian relative clauses by English-dominant heritage speakers a particularly interesting phenomenon: since both languages have parallel restrictions on relative clauses, the likelihood of transfer effects is low. Where the two languages differ, however, is in their approach to scrambling. Unlike English, Russian has widespread scrambling (Bailyn, 2004), from which relative clauses are not exempt: the non-extracted noun phrase in a relative clause may occur either pre-verbally (10a) or post-verbally (10b).

(10) a. deti$_i$ [kotor-ye t_i polučili   podarki]
          children.NOM.PL   REL-NOM.PL   received   gifts.ACC.PL
      b. det$_i$ [kotor-ye t_i podarki   polučili]
          children.NOM.PL   REL-NOM.PL   gifts.ACC.PL received
          '(the) children that received (the) gifts'

Polinsky (2011) used a picture-matching task to investigate the following questions: (i) does heritage Russian allow for the same expressivity in relativization structures observed in the baseline language? (ii) does the presence of scrambling in the baseline Russian grammar (but not in the dominant English grammar) affect the grammar of relative clauses in the corresponding HL?

To answer these questions, speakers were presented with relativization structures that crossed two types of relative clause gaps (subject vs object) with two orders of arguments in the relative clause (noun-verb vs verb-noun). Given the well-established preference for subject gaps in relativization, subject-extracted relative clauses were predicted to be easier for heritage speakers to process than object-extracted structures. In addition to this universal tendency to favor subject gaps, it was also expected that the speakers would show effects of their dominant language. Specifically, Polinsky (2011) predicted that correspondences of surface order between certain Russian and English constructions would lead to differences between heritage speakers and native speakers in the processing of scrambling within relativization structures.

The participants included two paired groups of speakers: age-matched Russian-monolingual and English-bilingual children (average age six) and age-matched Russian-monolingual and heritage-speaking adults. The participants were asked to choose between two pictures in response to an auditory question containing a relative clause. The stimuli all featured reversible actions: for example, 'chasing' in Figure 3. The questions varied in terms of subject vs object extraction and scrambled vs unscrambled argument order in the relative clause.

The monolingual speakers, both adults (*n*=26) and children (*n*=15), found the task almost trivial, choosing the correct picture with ceiling-level accuracy. Bilingual children (*n*=21; average age six) performed equally well. Adult heritage speakers (*n*=29), however, exhibited a stark asymmetry in their performance between subject- and object-extracted relative clauses. These participants performed quite well in subject-extracted identification tasks, but performed at chance in response to questions involving object extraction. In other words, they reanalyzed the Accessibility Hierarchy in (8) as the contrast between subject gaps and gaps in all other positions.

Since both monolingual and bilingual children performed essentially at ceiling, the reanalysis in the adult heritage grammar cannot be attributed to a fossilized child-language variant. Rather, these findings suggest that over their lifespan, the heritage speakers' competence with respect to relative clauses has degraded, leaving the adults speakers capable of comprehending only the easier subject-extracted relative clauses. Thus, it appears that relativization is a less robust area of linguistic competence than we tend to think: with reduced input and insufficient maintenance, competence in
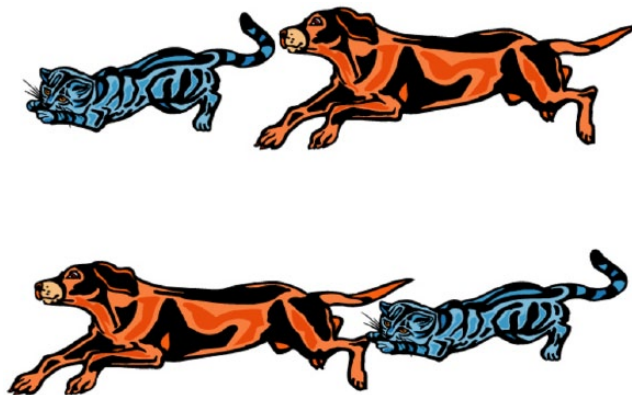
Figure 3. An example item (Polinsky, 2011).

this area can decline. The observed attrition undoubtedly relates to a loss of morphological knowledge. If the heritage speakers did not process the nominative vs accusative distinction, no further clues were available to clarify the orientation of the relative clause; they simply observed a clause with a transitive verb, a single overt argument, and a gap. In the absence of morphological cues, the default preference of these speakers was to treat such clauses as subject-extracted relatives.

At first blush, it is natural to attribute the observed attrition to pressure from the dominant language, in this case English. However, if English were to blame, then relative clauses without scrambling (i.e. those mapping directly onto the word order of the analogous English sentences) should have been easier for heritage speakers to process. The results of the study showed that this was not the case: heritage speakers performed equally well in identifying both scrambled and unscrambled subject-extracted configurations, and equally poorly in identifying both scrambled and unscrambled object-extracted configurations. Thus, we must conclude that attrition in Russian heritage grammar, at least in the domain of relative clauses, is not the result of English transfer effects. Instead, it is most likely a result of restructuring in the absence of sufficient maintenance or input.

Getting better with age?

Our final scenario, (1d), inverts the pattern just discussed: here, the adult HL patterns with the baseline, while the child language differs.

U-shaped learning — where a child makes developmental errors and then recovers, eventually developing an advanced, target-like knowledge — is a clear instance of (1d). While we will ultimately need to compare U-shaped learning in monolingual and bilingual child language acquisition, such a comparison is beyond the scope of the current discussion. Clear cases of scenario (1d) in the context explored in this study — comparisons between the performance of later child bilinguals and their adult counterparts — have yet to be identified. The case I will discuss in this section, which to my mind offers the best illustration of this scenario to date, also reflects innovations acquired from the baseline language, and thus bears some resemblance to scenario (1b), discussed above.

The development I will discuss here pertains to Spanish psych-verbs such as *gustar* 'like', which Pascual y Cabo investigates in his dissertation (2013). Psych-verbs are rarely uniform within a given language (e.g. Belletti & Rizzi, 1988; Landau, 2010); in Spanish, they fall into at least three

classes. Pascual y Cabo concentrates on Spanish class III psych-verbs, among which *gustar* is the most common. This class of verbs has several properties relevant to the discussion below. First, for all these verbs, the experiencer precedes the verb (*Katherine* in (11a)), but it is the post-verbal theme (*los kiwis* in (11a)) that serves as the syntactic subject of the sentence. Second, verbs of this type necessarily receive a stative reading. As statives, they resist passivization, (11b).

(11) a.   A   Katherine   le   gustan
                PRP   K.   3SG.DAT.CL   like.PRESENT.3PL
      los   kiwi-s.
      the   kiwi-PL
      'Katherine likes kiwis.'
      b.   *Los   kiwi-s   son   gustad-os
             the   kiwi-PL   be.PRESENT.3PL   like.PARTICIPLE-M.PL
            (por   Katherine).
            by   K.

The argument structure of stative psych-verbs has been the subject of much discussion in the literature on L1 and L2 acquisition of Spanish. Gómez Soler (2011) analyzes spontaneous child speech and shows that children start producing target-like *gustar* constructions quite early, at approximately one year and ten months. In a subsequent comprehension study, Gómez Soler (2012) shows that children as young as three are able to comprehend this class of psych-verbs, but that their performance tends to vary with the specific verb used. Specifically, children perform remarkably well (at 79% accuracy) with *gustar*, but at chance (52%) with less common stative-only psych-verbs such as *faltar* 'lack'. As is so often the case, different tasks yield different findings; Torrens, Escobar, and Wexler (2006) report that children do not have adult-like comprehension of these psych-verb constructions until the age of six. Although the exact timing of the acquisition of stative-only psych-verbs in Spanish is still up for debate, the evidence at hand supports the modest claim that these verbs are acquired *later* by monolingual Spanish children than agentive predicates.

Assuming that the atypical argument structure of psych-verbs such as *gustar* contributes to their encumbered acquisition, Pascual y Cabo (2013) examines English-dominant heritage speakers of Spanish, who often lack formal schooling in their home language. Based on a comprehension study of class III psych-verbs in Heritage Spanish, Pascual y Cabo hypothesizes that heritage speakers may reanalyze the psych-verb *gustar* as optionally agentive, rather than strictly stative. If this reanalysis has taken place in the grammar of heritage speakers (turning class III psych-verbs into class II psych-verbs), we should find evidence of *gustar* appearing in passive constructions such as example (11b) above. The results of an acceptability judgment task confirm this prediction: as expected, native speakers in this study judge passive constructions of stative-only psych-verbs as categorically unacceptable, while heritage speakers at varying levels of proficiency are more likely to accept these constructions. Pascual y Cabo takes this result as confirmation of his hypothesis that heritage speakers (at least sometimes) reanalyze stative class III psych-verbs as agentive.

In the next stage of his research, Pascual y Cabo considers the possible trajectory of this reanalysis, comparing the performance of the original population of heritage speakers to child bilingual and monolingual speakers. He posits that, if the reanalysis of *gustar* were due to attrition, then at some earlier point in HL development, we should find more target-like behavior, which is later lost. Concretely, we should expect monolingual (and bilingual) children to perform better than heritage adults at judging passive *gustar* constructions unacceptable. However, this prediction is not borne out: both monolingual and bilingual children perform worse at this task than the (adult) heritage speakers. The fact that heritage speakers behave more like adult native speakers than child

monolingual speakers suggests that heritage speakers actually improve their mastery of these psych-verbs over time.

Following Lightfoot (1991, 1999, 2012), Pascual y Cabo argues that 'superficial performance innovations provided in the input from the immigrant generation contribute to the changes in H[eritage] S[peakers'] grammars' (Pascual y Cabo, 2013, p. 131). In other words, he attributes the heritage speakers' poor performance to flawed input from the original source: L1 monolingual immigrants. These immigrant parents sometimes produce target-like *gustar* constructions, and sometimes do not; the next-generation immigrant speakers (i.e. HL learners) receive this already-non-standard input from their parents and create an ambiguous mental representation of the syntax of the constructions at issue. This ambiguity forces heritage speakers to (economically) reanalyze the psych-verb construction to allow the otherwise off-limits agentive structure. Note that an additional reanalysis trigger could come from English. All the Spanish heritage speakers surveyed by Pascual y Cabo were dominant in English, which lacks quirky subjects such as the class III psych-verbs. Thus, structural transfer from English may emerge as an additional factor forcing reanalysis in the heritage grammar.

Conclusions and predictions for future work

The speech of childhood bilinguals offers several important insights for HL research. On the one hand, child bilingual speakers, unlike true heritage speakers, are still receiving daily input in the HL; on the other hand, they are receiving that input under the same sociolinguistic conditions as are reported for adult heritage speakers: absence of bilingual education, rapid switch to the dominant language of their society, and decreasing input in the home language as they spend more time in school. Information about the baseline language – the language that serves as input to bilinguals during their acquisition of the home language – is a critical ingredient in any study that seeks to understand childhood bilingualism and ensuing HL competence. Comparing the language of childhood bilinguals exclusively to the language of monolingual adults may lead to missed generalizations.

Comparisons between L1 and L2 under second language acquisition are inspired by the need to understand how language learners deploy universal grammatical principles in adapting their L1 knowledge to the L2. Two questions raised by the discussion presented here are: (i) Which universal grammatical principles are of primary importance in language acquisition and attrition? and (ii) Which configurations of a given language survive 'under stress,' that is, in the context of restricted or noisy input? The HL development scenarios I have explored in this paper provide windows onto general properties of language design. Heritage speakers' reliance on universal language principles speaks directly to Plato's problem in language: data from heritage speech reveals how grammar is acquired under conditions of reduced input and usage.

Altogether, this paper has identified four major possible vectors of correspondence among the language of baseline speakers, childhood bilinguals, and heritage speakers. These possibilities include cases where all three language varieties represent a given linguistic property in a similar way (1a) and cases where two of the three varieties show a parallel representation, but the third variety differs (1b)-(1d). A fifth scenario, in which all three varieties differ in the representation of a given property, is theoretically possible, but (to my knowledge) is not attested.

All three varieties will show the same treatment of a given property (BIL = CHL = AHL) when the property in question is highly robust in the language and is acquired by learners without difficulty. Identifying commonalities in the language of baseline speakers, childhood bilinguals, and heritage speakers can offer important insight into fundamental configurations or properties of natural language. Note that the example I offer in this paper – the case of Russian nominal forms in numerical

expressions (count forms) – is morphologically quite involved. On a broad level, this suggests that general simplicity of encoding is not necessarily a defining characteristic of a robust pattern.

A situation in which a particular structure in the baseline differs from the structure in child and adult heritage speech (BIL ≠ CHL = AHL) may arise when incipient structural changes taking place in the baseline become amplified in the language of next-generation bilinguals. Patterns of this kind may therefore serve as a window into changes in the baseline. Such a scenario may also arise when a given structure is rare, confined to a specific register, and/or reinforced through literacy. Child bilinguals may simply not have access to such a structure, and adult heritage speakers, whose literacy is often subpar, may not be exposed to it either.

Finally, two mirror-image possibilities exist in which one heritage-speaker group (childhood or adult speakers) patterns with the baseline group, while the other does not. When a structure is acquired by bilingual children faithfully, but undergoes later reanalysis in the adult HL (BIL = CHL ≠ AHL), this process of attrition can expose universal principles of language structure. We saw in this paper that, despite expectations based on language transfer, the reanalysis of relative clauses by Russian heritage speakers consistently follows the subject preference in the interpretation of gaps; this finding supports the robustness of a general subject-extraction preference cross-linguistically. Conversely, a structure that is not fully learned by child speakers may be reanalyzed by adult heritage speakers following general principles, thus bringing the adult heritage representation closer to that of the baseline (BIL = AHL ≠ CHL). Table 1 below summarizes the different scenarios considered in this paper.

Table 1. Correspondences between baseline, language of child bilinguals, and heritage language.

Correspondence type	Underlying reasons	Example
Baseline = language of child bilinguals = adult heritage language	Structure X is robust and is acquired unproblematically	Russian count forms
Baseline ≠ language of child bilinguals = adult heritage language	Structure X may be vulnerable or subject to ongoing change in the baseline, and this change is amplified in heritage language	Loss of pro-drop in Spanish
Baseline ≠ language of child bilinguals = adult heritage language	Structure X is part of a particular register and its knowledge requires literacy	Absolute construction in Spanish
Baseline = language of child bilinguals ≠ adult heritage language	Structure X undergoes reanalysis in the adult language possibly leading to attrition	Relative clauses in Russian
Baseline ≠ language of child bilinguals ≠ adult heritage language	Structure X undergoes reanalysis in the adult language	Not attested
Baseline = adult heritage language ≠ language of child bilinguals	Structure X undergoes reanalysis in the adult language and becomes closer to the baseline structure	Psych-verbs in Spanish

Identification of these possible scenarios allows us to track and categorize developmental trajectories in the language of bilingual children and adults. The patterns of correspondences can also serve as tools in mapping out robust and vulnerable units of language design.

The next major question to be addressed is more challenging: is it possible to predict what scenario will arise for a given language property within a given bilingual population? The answer to this question is far from clear, but I would like to offer some initial thoughts.

First, consider age-of-acquisition effects. Cognitive development, proficiency at a given age, biological age, and socioeconomic status of the learner together constitute significant factors in

language development. In monolingual speakers, acquisition is ultimately successful, but it may take some time and is prone to errors (Montrul, 2008). In the HL of child learners, a relatively late age of acquisition for certain phenomena or structures may mean that those structures are never acquired perfectly and remain weak in the adult grammar. We can thus anticipate that phenomena or structures associated with a relatively late age of acquisition will be vulnerable under unbalanced bilingualism. However, it remains impossible to predict at this point whether such vulnerable domains will undergo transfer, loss, or reanalysis. On the face of it, all these possibilities should all be available and should be examined on a case-by-case basis.

Age of acquisition is related to amount of exposure/input, although the two phenomena should be kept separate (Johnson & Newport, 1989). Indeed, significant exposure to a language does not guarantee that all the received material will be internalized by the learner; in other words, the *intake* (what is internalized and processed by the learner) and the *input* do not necessarily match (see Gagliardi, 2012, for a recent discussion of this issue in L1 acquisition). The role of exposure in determining intake is significant in monolingual acquisition; when two languages are in competition, the exposure factor may be even more salient. The precise interaction of input and intake in early HL acquisition is still to be determined, but in my opinion, this interaction is one of the crucial factors affecting the outcome of bilingual acquisition.

Bilingual acquisition data are not available for all languages. In particular, exemplary studies such as Kupisch (2006), which illustrates a much-needed balance between the input in the dominant language and HL, are rare. As a result, linguists often rely on monolingual L1 data when estimating the amount of input and exposure received by HL learners. Empirical gaps of this sort serve as a reminder that we need more data on the input bilingual speakers receive in *both* their languages, at different stages of linguistic development. In addition, corpora of child-directed speech and child speech in bilingual contexts can also serve as a resource that would allow us to track incipient changes in the baseline, such as those observed for baseline Spanish by Pascual y Cabo (2013) or by Montrul and Sanchez-Walker (2013).

Age of acquisition and input both relate to what might be considered the 'ecological' aspects of language. Both factors have a direct bearing on the reorganization of language structure in vulnerable domains. Many factors can make a language domain vulnerable; here, I will highlight just two general trends. The first has to do with the difficulty of going from one module of grammar to another, a phenomenon captured under the rubric of the Interface Hypothesis (Sorace, 2011; Sorace & Filiaci, 2006). Assuming that grammatical operations that intersect two components of grammar increase cognitive load for speakers, we can anticipate that such operations will pose some difficulty both in initial acquisition and in ongoing maintenance. This area has so far been best investigated with respect to the interface between discourse and syntax (especially in the licensing of null pronominals), and we need to explore other interfaces (for example, between syntax and prosody) with similar vigor if we are to make more progress in understanding developmental trajectories in bilingual speech. The prediction is clear: if a phenomenon at an interface is challenging to a bilingual child learner, learning will deviate from the trajectory of the baseline, and this difference will persist in adult heritage speech. So far, this prediction has been confirmed in two notable cases: the persistent emergence of *pro*-drop in child and adult heritage speech (see the discussion of Spanish above) and the divergent use of topic marking by heritage speakers of Japanese and Korean (Laleko & Polinsky, 2016). The difficulty in the acquisition of these arguably interface-related phenomena is apparent in child learners and seems to linger on in adult heritage speakers. Whether such lingering effects can be completely ascribed to insufficient input, however, remains an open question.

The second structural trend that deserves special consideration has to do with low tolerance for ambiguity in language (Benmamoun et al., 2013b). This intolerance for ambiguity seems to be a general heuristic, leading to an across-the-board desire for one-to-one mapping between meaning and structure; assuming that lack of ambiguity allows heritage speakers to communicate more

effectively, we can predict that certain ambiguous structures in a language are likely to be reanalyzed by heritage speakers of that language. As an example, consider the well-known ambiguity between strict and sloppy readings in ellipsis, illustrated in the following English example.

(12)   The linguist promoted his new theory and the logician did too.
  (i)   The linguist promoted his new theory and the logician promoted the linguist's new theory. [STRICT READING]
  (ii)   The linguist$_i$ promoted his$_i$ new theory and the logician$_k$ promoted his$_k$ new theory. [SLOPPY READING]

The sloppy reading, in which the linguist and the logician each promoted their own separate theories, is attributed to the presence of a bound variable dependency. The strict reading, on the other hand, represents a simple coreference: the pronoun picks up as its antecedent *the linguist* and this referent is carried over into the unpronounced VP. Ambiguity under ellipsis has received significant attention in both theoretical linguistics and processing. Within processing, a number of researchers have shown that monolingual speakers prefer the sloppy (bound variable) reading and process it more quickly than the strict reading (Frazier & Clifton, 2000; Koornneef, 2008; Shapiro, Hestvik, Lesan, & Garcia, 2003; Vasić, 2006). For heritage speakers, one might then predict that they will generalize this processing preference and eliminate the ambiguity altogether, assigning only the sloppy reading to the elliptical structures (as in example 12). This is a testable prediction that can be explored in child and adult HL, with a general expectation that whatever ambiguity is allowed in the baseline will be reduced in the HL.

Notes

1. Not all researchers consider a shift in dominance from the home language to the societal language to be an essential feature of HL (see Polinsky & Kagan, 2007; Cantone, Müller, Schmitz, & Kupisch, 2008, for a discussion of different approaches). The studies reviewed in this article all adopt this definition; for the sake of consistency, I consider "heritage speakers" to include specifically those speakers who have shifted substantially away from their home language to the societally dominant language.
2. Baseline variants may also preserve an older version of the standard language while speakers in the country of origin innovate, which may lead to the impression that HLs are more conservative.
3. As a reviewer quite rightly points out, it is certainly not the case that all linguistic structures are fully mastered by the age of three. However, most of the specific structures examined in the studies I discuss are acquired relatively early in L1 acquisition.
4. Abbreviations: ACC-accusative, AHL—adult heritage language, BIL—baseline input language, CBL— child bilinguals' language, DAT–dative, HL–heritage language.

5. The entire numerical expression also carries its own case. The salient pattern for our purposes arises when the numerical expression is in the nominative or accusative form.
6. Other cases prone to substitution include the dative case and cases licensed by prepositions (Gagarina & Voeikova, 2009; Lepskaja, 1997; Polinsky, 2006).
7. The ratings of the indirect object condition, as in (3), confirm the observation that heritage Russian speakers often replace the dative with the accusative (Polinsky, 2006).

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