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Sign Languages in the Context of Heritage Language: A New Direction in Language Research

Abstract

A *heritage language* is defined as a minority language that differs from the dominant language used in a particular community. Codas (children of Deaf adults) who sign but may be dominant in the spoken language of their community present an interesting case due to the added difference of a spoken/signed modality in their linguistic repertoire. The relatively new field of research on heritage sign languages builds on our knowledge of the phenomena at play when both the heritage language (HL) and the community language use a spoken modality (e.g., varying degrees of proficiency in the HL, interference by the community language on the HL). It also addresses issues specific to bilinguals who balance their use of signed and spoken language by blending, for example (i.e., they simultaneously sign and speak rather than code-switch). One crucial aspect of the study of heritage language is the assessment of its production. This can be carried out by using cloze tests or eliciting narratives (using picture books or silent video clips as prompts) and then determining the rate of speech or the number of errors. Methods are also being developed to assess comprehension and perception in signed languages. The study of heritage sign languages promises to provide new insights into strong tendencies already established in heritage spoken languages (e.g., speakers' difficulty with optionality and ambiguity; speakers' command of verbs in their heritage language, which exceeds their grasp of nouns).

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A HERITAGE LANGUAGE is a minority language used in a specific sociocultural context, one in which a different language is dominant in the community. Heritage speakers have typically been defined as second-generation immigrants who live in a bilingual environment (Benmamoun, Montrul, and Polinsky 2013, 132), and the heritage language is the language the children are first exposed to at home. Later they become dominant in the language of the broader society in which they live (see also Rothman 2009 and Montrul 2016 for similar definitions, as well as Kupisch and Rothman 2016 on heritage speakers as a subtype of native speakers).

Typically, the heritage (home) language is the weaker component of the bilingual dyad controlled by a heritage speaker. Linguistic, psycholinguistic, sociolinguistic, and pedagogical studies have identified a series of areas that are differentially affected in heritage language grammars. These include phonology, vocabulary, morphosyntax (the area of particular vulnerability for heritage speakers), word order, complex structures, pronominal reference, knowledge of semantics and pragmatics, and many others. Theoretically grounded studies of heritage language systems show that in many respects heritage language grammars are systematic and can be accounted for by restructuring the original system. Comprehensive studies of different aspects of the grammar are important in helping us to understand the structure of heritage languages. Because dominant language transfer also plays a distinctive role in the linguistic patterns attested in heritage speakers, these studies also inform existing theories of language contact and diachronic change.

Heritage languages and their speakers have lately moved to the forefront of descriptive, experimental, and theoretical research, in part because the type of unbalanced bilingualism instantiated by heritage speakers is increasingly common and in part because heritage languages create research opportunities.[1]

With regard to the latter, heritage languages can shed useful light on the current theoretical discussion about the nature of language, allowing us to adopt a novel approach to Chomsky's (1986) important question: *What do we know when we know a language?* We may have intuitions about what a native speaker knows about language, but the concept of heritage language forces us to consider exactly what it

means for a person to be a native speaker. The consensus is that native speakers and signers differ from nonnative speakers and signers of a language because they acquired their language from natural input at a very early age; although this differentiates native speakers from L2 speakers, it makes them identical to heritage speakers. Heritage speakers, just as native speakers, acquire a home language naturally and at an early age; the difference is that, at the same time, they also acquire a large, distinct community language, which they gradually come to rely on as their primary language in the dominant society (for example, Chinese at home and English at school and elsewhere).

Sign Language as Heritage Language

The definition of heritage language makes no mention of modality, and it is about time that we integrate sign languages into heritage language research. In principle, a bilingual sign dyad can be one of the following pairs (the possibilities multiply if we include more than two languages, but, for the sake of exposition, I discuss just the following two):

Dominant and Heritage Languages across Modalities

Heritage Language	Dominant Language
sign language A	sign language B
sign language	spoken language
spoken language	sign language

OK as set?

Although cases in which two sign languages form the bilingual dyad exist in the Deaf community, they have not been systematically studied (but see Chen Pichler, Koulidobrova, and Palmer [forthcoming] for an overview of existing studies). The other two scenarios pertain to hearing members of the Deaf community. I am not aware of situations in which the spoken rather than the sign language is heritage,[2] whereas the opposite is quite common in the case of Codas (children of deaf adults).

When acquiring both their sign and spoken language, Codas follow the model of heritage language acquisition: They acquire sign language at home with their parents (and, in some cases, with the

broader Deaf community) and the spoken language of their country with other people (hearing family members, colleagues at school, neighbors, and other hearing people). In some cases, this acquisition model can lead to a nonnative mastery of sign language in adulthood, a pattern observed among spoken heritage languages. "The bilingualism present in the [D]eaf community is a form of minority language bilingualism in which the members of the community acquire and use both the minority language (sign language) and the majority language in its written form and sometimes in its spoken or even signed form" (Grosjean 2010b, 134).

In principle, heritage speakers of sign language may have weak mastery of their L1, or their L1 competence may more closely resemble that of balanced bilinguals (see Pizer 2008; Pizer, Walters, and Meier 2013). In terms of the balance between the languages they are acquiring, even young Codas exhibit considerable variability (Lillo-Martin et al. 2014) .This variation can be attributed to both the extent of spoken language used in the home (Deaf parents may produce or understand the spoken and written languages to varying degrees, depending on location) and the level of support the children receive for their signing. Balanced bilingualism is most readily achieved by Deaf families who encourage their children to sign with Deaf people in different contexts, as the wider society does not value sign language (Chen Pichler, Lee, and Lillo-Martin 2014). Schools and the surrounding spoken language environment push these children to use English much more than their heritage language (see also Lillo-Martin, de Quadros, and Chen Pichler 2016). For heritage signers, just as for speakers of other heritage languages, the attitude of the children's input providers plays a role in their language choice (see Döpke 1992 and Lanza 1997 for unimodal bilinguals; van den Bogaerde and Baker 2009 for NGT-Dutch bimodal bilinguals; and Kanto, Huttunen, and Laasko 2013 for FinSL-Finnish bimodal bilinguals). Over time, however, the sign language generally tends to become the weaker language as bimodal bilinguals begin to privilege the spoken language, even with Deaf interlocutors (Peyton, Ranard, and McGinnis 2001; Kondo-Brown 2006).

On the other hand, since signed and spoken languages use different articulators, bimodal bilinguals differ uniquely from other heritage

speakers in their ability to produce content in both of their languages simultaneously (code blending) (Emmorey et al. 2008). Whereas unimodal bilinguals must learn to suppress one of their languages even when they code-switch, bimodal bilinguals can simultaneously use grammatical knowledge and lexical items from both languages, separately or combined, while continuing to observe language constraints (Lillo-Martin et al. 2014, 13). Moreover, sociolinguistic factors influence the use of code blending by young bimodal Codas in the sense that they decide whether or not to code-blend, depending on whom they are conversing with (ibid.). What is more, adult Codas tend to employ certain grammatical facial expressions in sign language even when conversing in a speech-only modality with monolingual speaking people (Pyers and Emmorey 2008). One of the goals of research on code blending is to examine the lexical and structural ramifications of code blending for heritage signers in both of their linguistic modes (speech and sign language).

The studies mentioned earlier give us a good general insight into the linguistic behavior of bimodal bilinguals. To date, however, relatively few studies have attempted to identify specific grammatical patterns in the combined speech and signing of these language users. The more general heritage language literature provides some important models for such work.

In particular, research on spoken heritage languages often mentions the significant variation found among heritage speakers, some of whom are close to the native baseline, whereas others have extremely low language proficiency (so-called recessive bilinguals):

> Since the heritage language is the family language used and heard in restricted environments, there are varying degrees of deterministic consequences for the complete acquisition and/or maintenance of the heritage language, depending on when and how the societal majority language is introduced (i.e., simultaneously or successively). Although it is largely accepted that a heritage language learner need not be a fluent speaker of the heritage language, it is assumed that a heritage speaker has, to a greater or lesser degree, acquired some level of proficiency.
>
> —Rothman 2007, 360

This variance, which is one of the hallmarks of heritage language competence, is captured in terms of the heritage language continuum,

in which low-proficiency speakers are farther away from the monolingual baseline (Polinsky and Kagan 2007, 371–72). As in creole studies, *acrolectal* refers to the varieties that are closest to the baseline (the input language), *mesolectal* varieties are farther away from the baseline, and *basilectal* varieties are the most different from the baseline, as illustrated in the following:

Continuum of Heritage Language Proficiency							
Basilectal HL	>	Mesolectal HL	>	Acrolectal HL	>	Native baseline	

Codas are an example of variance multiplied by variance: variance in both the knowledge and the retention of sign language under the dominance of a spoken language. In recognition of such immense variance, it makes sense to follow Emmorey et al. (2008) in referring to heritage speakers of sign language as "bimodal bilinguals" because they have two languages in two different modalities (sign language and speech). Applying the definition of heritage speakers (Benmamoun, Montrul, and Polinsky 2013, 133) to bimodal bilinguals, *bimodal bilinguals* are early bilinguals who grew up *seeing (and signing)* the heritage language (L1) and hearing (and speaking) the majority language (L2) either simultaneously or sequentially in early childhood (that is, up to roughly age 5). For these individuals, however, the L2 became the primary language at some point during childhood (at, around, or after the onset of schooling). As a result of this language shift, a bimodal bilingual may, by early adulthood, be strongly dominant in the majority language (spoken language), whereas the heritage language (sign language) will now be the weaker language. How can we assess some of that variation, and in what main areas should we look for variation?

Assessment

Assessing the linguistic knowledge of heritage speakers is an enormous undertaking. The most effective approach is to make a combined study of both their production and their comprehension. Assessment for pedagogical reasons (e.g., placing a heritage speaker in a language class) more often relies on the production data, whereas a linguistic assessment (e.g., to first determine a speaker's linguistic competence and then use that knowledge in experimental work) typically

combines production and comprehension data in such a way that the former serve as a basis for investigating the fine details of the latter.

Starting with the *assessment of production,* heritage speakers, especially those who are less proficient, may be reluctant to speak in their home language, and this reluctance may be enhanced by the presence of a fluent native speaker. Therefore, whatever specific techniques one may use to elicit heritage speakers' production, the primary goal is to make them feel comfortable about speaking or signing. Achieving that goal may mean collecting more data and then discarding those from the very beginning of a study, when the participant is still trying to get a feel for the experimental situation.

Collecting narratives based on a set of pictures or a video clip (without sound) is one of the most effective and tried-and-true methods of eliciting production. The best-known prompts for elicitation include the "frog story" (based on Mayer 1969 and extensively used in the study of narrative development; see Berman and Slobin 1994). The participants examine the twenty-four picture plates of the frog story and then are asked to retell the story. The advantage of using the frog story is that one can compare the heritage data with the monolingual data already available from a number of languages, as collected in the project by Berman and Slobin (ibid.). The disadvantage in modern times is that participants find the use of picture plates rather artificial and prefer talking about a video. Researchers can prepare their own video clips; pretty much everything works, as long as the clips illustrate enough action to maintain the participants' interest, are understandable without sound, and are not too long. Some popular choices include clips of Sylvester and Tweety from the Looney Tunes series, which sign language researchers have successfully used in their investigation of other sign languages (e.g., Al-Sayyid Bedouin Sign Language) (cf. Sandler et al. 2005; Meir et al. 2010). Reynolds (this volume) uses wordless cartoons from the French series *Minuscule* to elicit ASL and spoken English narratives from Codas.

The data collected in such narrative tasks can then be used to measure a subject's speech rate in words or mean length of utterance. This rate has been shown to be a good predictor of general proficiency. Several studies have shown that speech rate in the weaker language correlates with proficiency in other measures. For example,

one study of native speakers of Turkish who were learning German in a Turkish school and Turkish returnees (immigrant children who arrived in Germany before age 2 and returned to Turkey at around age 15) used the measure of speech rate to show that the native speakers outperformed the returnees in Turkish (Daller et al. 2011). The returnees also performed below native-speaker level on a number of grammatical measures. In addition, the rate of speech measure correlated with biographical information on the returnees, in particular the age of acquisition of German. In my own work, I have found a robust correlation between the rate of speech on the one hand and production and comprehension on several grammatical variables on the other (Polinsky 1997, 2006). The global status of this measure is still under discussion, and its use with respect to sign language warrants investigation.

In addition to the measurement of speech rate, the narratives produced by heritage speakers provide detailed data on what heritage speakers do well and on the source of errors in their speech. Using the same prompts (picture plates or video clips) affords the researcher maximum comparison across speakers. Possible measures that can be used include (but are not limited to) tallying actual errors, estimating the richness of a speaker's vocabulary (how many lexical items and different lexical categories a speaker used),[3] and assessing disfluencies in a speaker's utterances.

Cloze tests are another effective way to assess a heritage speaker's knowledge. With this type of test, an examinee's abilities are measured when the linguistic message is introduced with some noise or interference. In the test, words or parts of words are deleted; the rationale is that languages are naturally redundant, which makes it possible for speakers to supply missing linguistic items under such conditions, whether in spoken or in written form, preferably the latter (Babaii and Ansary 2001). There has been some controversy regarding cloze tests as a measure of proficiency. Advocates applaud their high reliability and concurrent validity indices (e.g., Eckes and Grotjahn 2006), ease and efficiency of test administration, objectivity of scoring (e.g., Klein-Braley and Raatz 1984), and its alleged measure of integrative use of language (e.g., Dörnyei and Katona 1992; Klein-Braley 1997). On the other hand, cloze tests have also been subject to criticism for

their poor item discrimination (e.g., Cleary 1988) and unclear construct validity (e.g., Grotjahn 1987). (See Babaii and Ansar 2001 for further discussion.) Yet, if structured and administered at the appropriate level, cloze tests provide useful information about the proficiency of a given participant.

Creating a cloze test for heritage speakers is a tall order, and success is achieved only when people who create such tests are themselves experts in the language in question; in that case their own research and longitudinal observations feed back into the testing techniques. And, of course, resources available for individual languages vary; if sign language researchers choose to implement cloze tests for heritage and L2 signers, it would make sense to pool resources and compile cloze tests that could be used for speakers of a particular sign language in multiple testing situations.

Assessing comprehension and perception can be done using a variety of tasks. A researcher can ask the participants to rate individual stimuli (recording both their ratings and their reaction times), to compare two or more members of a minimal pair targeting a particular phenomenon, or to repeat a cue under elicited imitation. Methodologies vary; no method is perfect, so it is good to know what can and cannot be achieved with a particular technique for studying comprehension. Whatever methodologies work well for a good language study should also work for heritage language studies. In that regard, the methodologies currently being developed in the field of sign language research (see http://signlang-assessment.info/index.php/home-en.html for descriptions of existing tests for a variety of sign languages) could potentially be developed for use in heritage sign language research. For example, the ASL-Sentence Reproduction Test (Supalla, Hauser, and Bavelier 2014) has been administered to both adult Coda and Deaf native ASL signers. The results showed that the Coda participants made more phonological, morphological, and lexical errors than their Deaf native counterparts. For younger Codas who are still developing their spoken and signed language grammars, a series of tests exists for different aspects of grammatical and phonological development in ASL or Libras (comparing them to English or Brazilian Portuguese, respectively) (Quadros et al. 2015); although those tests were developed for the express purpose of

particular research programs, they may eventually form the basis for standardized tools appropriate for assessing heritage signer proficiency.

Patterns of Variation and Recurrent Patterns

Let me now turn to variance in heritage languages. The striking range of variation observed in these languages often leads to the suggestion that their grammar is not systematic. Research on spoken heritage languages shows that this is not true. To offer just one example, when in a bilingual mode, bilingual speakers who are fluent in sign language and spoken language (in this case, ASL and English) rarely code-switch (Emmorey, Borinstein, and Thompson 2005; Emmorey et al. 2008). Instead, most bilingual speakers code-blend by producing sign language simultaneously with the spoken language. Nouns and verbs are the elements most often involved in blends, and typically they are semantically equivalent in the two languages. Code blending alone can be a good indicator of higher-proficiency heritage signers, and this property parallels the use of code switching by heritage speakers of spoken languages. In spoken heritage languages, the more balanced a bilingual, the more likely he or she is to code-switch extensively (Polinsky, 2018). Similarly, Quadros (this issue) observes that the incidence of code blending and well-formedness of the signed portion of blends was higher for Brazilian Codas who had greater proficiency in Libras.

Turning to less balanced bilinguals, we find that, because of their exposure to the home language throughout childhood and, for some, even into early adulthood, heritage speakers' strongest suit is generally comprehension; in their production, they may control only some registers or styles present in the baseline. This is exacerbated by heritage speakers' lack of literacy skills or comparable skills that are acquired by full immersion in the baseline culture.[4]

Despite the rich cross-linguistic variation, different heritage languages share a number of patterns in terms of how their grammatical systems differ from the baseline. In the spoken modality, several striking similarities are found across heritage languages. These include a strong verb bias in the maintenance of lexical categories (heritage speakers know and recognize verbs better than nouns or adjectives; see Polinsky 2005), a heavy reliance on those elements that are perceptually more salient, difficulty with long-distance dependencies, and

difficulty with ambiguity. Although these aspects of heritage language have been investigated in the spoken modality, it remains to be seen whether they are also prominent in heritage signed languages.

Let me briefly comment on the verb bias mentioned in the preceding paragraph. If we compare heritage speakers' knowledge of different word classes (lexical categories), in particular verbs versus nouns, we find that, in their heritage language, even lower-proficiency speakers have a better control of verbs than of nouns. They use verbs more accurately and do not replace them by circumlocutions as they often do nouns. This pattern seems to recur in a number of heritage languages. For instance, one study examined production in heritage Arabic and found that nouns were the most frequently switched category, followed by adjectives, then verbs, prepositions, and adverbs (Albirini, Benmamoun, and Saadah 2011). I myself used a lexical decision task to determine whether heritage speakers of Russian differentiate between lexical categories and also found a stronger pattern of maintenance with verbs (Polinsky 2005). What can explain such verb bias in the production and comprehension of a heritage language? A tempting explanation is that verbs are a smaller class than nouns and therefore are easier to maintain. But determiners and adjectives are an even smaller class than verbs, yet heritage speakers do not use them without effort. Another explanation might point to the higher frequency of certain verbs (as compared to nouns); we can expect verbs such as "eat," "sleep," or "run" to be retained particularly well. However, even if we compare nouns that are matched by frequency, heritage speakers still favor verbs, as I have shown in a comprehension study of Heritage Russian (ibid.). This makes the frequency explanation untenable. The proposal advanced in my earlier work (ibid.) is that it is less "costly" for a heritage speaker to lose a noun than it is to lose a verb. Verbs are noted for their conceptual complexity (Gentner 1981; Langacker 1987; Markman 1989). The underlying structure of verbs is more complex than that of many (but not all) nouns because verbal structure includes information on the predicate and its arguments. This is the basis of the so-called relational meaning associated with verbal semantics (Gentner 1981). Next, verbs refer to events, which are less static than entities and can involve more complex semantics. If a noun is inaccessible, one can use a deictic, a generic

placeholder (*that thing, the thing*), or a paraphrase. Such replacement is much more difficult to accomplish with verbs; it is hard to replace "read" with "do." As a result, the loss of information associated with verbs is quite significant. The conceptual importance of verbs is an intuitive explanation. Ostensibly their importance can be formalized in a number of ways (e.g., by appealing to the function of verbs as predicates that carry information about both their own content and the role of their arguments). If a predicate cannot be recovered (or produced), the comprehension or production of the rest of the clause is in jeopardy.

Research on heritage languages has zeroed in on several well-documented observations that are ultimately related. In particular, it has been noted that heritage languages have rather low tolerance for optionality, a property also made manifest in a preference for one-to-one mapping between form and function (Polinsky 2018). Relatedly, heritage speakers have problems with ambiguity and vagueness, which is particularly apparent in the resistance to and avoidance of material that is not perceptually salient in both morphology and syntax. These two tendencies often lead to categorical restructuring in heritage languages; privative oppositions get restructured as equipollent, scalar categories are avoided, and perceptually salient, overt elements supplant light or silent elements.

To conclude, the interaction of spoken and sign language in bilingualism opens up new, exciting possibilities in language research. First, inquiry into this kind of bilingualism is a novel way of understanding universal principles of language design, principles that underlie both modalities. Next, comparing spoken and sign languages allows us to better understand what counts as the default, base option in both modalities. Heritage speakers tend to employ a restricted set of operations and avoid less common or more complex structures, all the while balancing this avoidance with a preference for perceptually more salient elements. The defaults that emerge under such restrictions are not always predictable, and heritage language contexts are a valuable source of empirical data on such defaults. Finally, the interaction between two modalities allows us to push the limits of existing models of code mixing to account for not only code switching but also code blending.

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Notes

1. Although immigrant languages in the United States have been the driving impetus for the rapid expansion of the field since the 1990s, in the last ten years the study of heritage languages has also gained momentum in Europe and other parts of the world. This is apparent from the widespread acceptance of the term *heritage language* (cf. Spanish *lengua de herencia,* French *langue d'héritage,* German *Erbsprache*), which was virtually unknown in Europe ten years ago. Kupisch (2013) offers a helpful discussion of differences between heritage languages in the United States and minority/heritage languages in Europe.

2. As suggested in the introduction to this issue, such cases, although possible in principle, probably do not even exist.

3. Lexical proficiency is also a good predictor of heritage speakers' knowledge of both the linguistic structure of the home language and their overall competence in it. In particular, a strong correlation exists between a speaker's comprehension via oral translation of lexical items, measured in terms of a basic word list and grammatical phenomena (e.g., agreement, case marking, aspectual and temporal marking, pro-drop, coreference, embedding); see Polinsky (1997, 2006) for examples of these correlations and further discussion.

4. It is often assumed, without much justification, that heritage speakers are fully bicultural, but this claim needs to be examined and evaluated in systematic studies. The biculturalism of hearing bilinguals can be assessed on the basis of three main criteria (Grosjean 2008, 2010a, 2014). First, biculturals take part, to varying degrees, in the life of two cultures. Second, they adapt, at least in part, their attitudes, behaviors, values, and language to these two cultures. Finally, they combine and blend aspects of the cultures involved in such a way that certain characteristics (e.g., attitudes, beliefs, values, behaviors) come from one culture or the other, whereas other characteristics are blends based on these cultures. Furthermore, hearing bilinguals do not always reach the level of biculturalism that may be expected in an ideal world (Grosjean 2008, 2014). In the meantime, both the distinctness of the Deaf culture and its ongoing acceptance of new members point to a potentially greater degree of biculturalism in Codas than in heritage speakers of spoken languages. Most Codas meet the two criteria of biculturalism identified here: They are members of the Deaf community, and they adopt the attitudes,

behaviors, and values of that community and often promote them. It appears that they also blend aspects of both of the cultures they belong to, but that may be more of an impression than an established fact. It therefore needs to be examined more closely.

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