

RESEARCH REPORT

Sign language endangerment and linguistic diversity

BEN BRAITHWAITE

University of the West Indies at St. Augustine

It has become increasingly clear that current threats to global linguistic diversity are not restricted to the loss of spoken languages. Signed languages are vulnerable to familiar patterns of language shift and the global spread of a few influential languages. But the ecologies of signed languages are also affected by genetics, social attitudes toward deafness, educational and public health policies, and a widespread modality chauvinism that views spoken languages as inherently superior or more desirable. This research report reviews what is known about sign language vitality and endangerment globally, and considers the responses from communities, governments, and linguists.

It is striking how little attention has been paid to sign language vitality, endangerment, and revitalization, even as research on signed languages has occupied an increasingly prominent position in linguistic theory. It is time for linguists from a broader range of backgrounds to consider the causes, consequences, and appropriate responses to current threats to sign language diversity. In doing so, we must articulate more clearly the value of this diversity to the field of linguistics and the responsibilities the field has toward preserving it.*

Keywords: language endangerment, language vitality, language documentation, signed languages

1. INTRODUCTION. Concerns about sign language endangerment are not new. Almost immediately after the invention of film, the US National Association of the Deaf began producing films to capture American Sign Language (ASL), motivated by a fear within the deaf community that their language was endangered (Schuchman 2004). More recently, as language endangerment and language documentation have grown in significance within the field of linguistics, sign language linguists have also begun to consider how language endangerment may be affecting signed languages. Johnston's (2004) paper on the uncertain future of Australian Sign Language (Auslan) and Nonaka's (2004) discussion of sign language endangerment in Thailand were particularly important early contributions, and the literature has been growing rapidly since then. Major sign language documentation projects are now underway around the world (see, for example, Schembri 2010). In 2011 the World Federation of the Deaf (WFD) and European Union of the Deaf (EUD) organized the conference Sign Languages as Endangered Languages, and a project at Lancaster University's International Institute for Sign Languages and Deaf Studies (iSLanDS) conducted a survey on sign language vitality, which found that none of the languages surveyed was safe (Safar & Webster 2014). Coming out of this work, UNESCO's *Atlas of the World's Languages in Danger* now includes sign languages, and a Consultative Expert Meeting on Sign Language Endangerment was held at UNESCO in February 2017. Meanwhile, *Ethnologue* has recently developed an adapted method for assessing the vitality of sign languages (Bickford, Lewis, & Simons 2015), and the number of sign languages listed in that work has been steadily growing.

* This article grew out of work with signing communities around the Caribbean, where the tremendous diversity of signed languages is largely undocumented and facing immediate critical threats from multiple sides. I am indebted to signers around the region, and especially to Ian Dhanoolal and Bryan Rodrigues for their invaluable collaboration. I am grateful to Diane Lillo-Martin and an anonymous referee for valuable feedback, and I owe special thanks to Andries Coetzee for encouraging me to develop this paper beyond the scope that I had originally imagined for it.

However, this work seems to have had a rather limited impact on the academic literature of language endangerment and language vitality. In the title of her article, Nonaka (2004) described sign languages as ‘forgotten endangered languages’, and recent work on language endangerment has indeed largely overlooked them. In their introduction to the *Cambridge handbook of endangered languages*, editors Austin and Sallabank (2011:7), for example, refer to Ahmad’s (2008) observation that most overviews of language endangerment make no mention of signed languages, but their (otherwise excellent) publication makes no real attempt to rectify the situation: the index of languages lists 320 languages and language varieties, none of which is a signed language.¹

A major problem is that remarkably little is known about the variety of signed languages in the world. The list of ‘Deaf sign languages’ in *Ethnologue* currently stands at 142 (Simons & Fennig 2018), but there is no question that this figure significantly underestimates the real number of distinct sign languages in the world. Skutnabb-Kangas (2011) has suggested that there may be as many signed languages in the world as there are spoken languages, though she acknowledges that ‘[t]here is today no idea of how many Sign languages there are’ (Skutnabb-Kangas 2011:182). Most sign language linguists, however, seem to feel that this is probably an overestimate. In the *Concise encyclopedia of languages of the world*, Sandler (2009:940) rather conservatively reckons that 103 is ‘probably an underestimate’, while Zeshan (2009:953) suggests that the number may be three or four times that. The problem, as Zeshan has noted elsewhere, is that the vast majority of research into signed languages to date has been focused in North America, Western Europe, and Australasia, and that ‘barely anything is known about most sign languages in Asia, Africa, South America and Central America’ (Zeshan 2013). As a result, statements about the numbers of sign languages (and, by extension, languages generally) have had to be based on speculations and hunches.

Official responses to concerns about sign language vitality also seem to have been limited, even for those sign languages that have achieved some level of official recognition. For example, McKee (2017:323) reports that:

Whereas the health of the official indigenous language of New Zealand, Te Reo Maori, is regularly surveyed to guide and reevaluate revitalization priorities ... , no wide-ranging survey has similarly informed an increasing level of investment in LPP [language policy and planning] with regard to NZSL [New Zealand Sign Language], which is also an official language.

It appears that linguists have not always responded to the endangerment of signed languages with the same degree of urgency that has led to major developments in the field since the call to arms in the 1992 special issue of *Language* (Hale et al. 1992). Krauss’s (1992:8) comparison between language loss and species loss has become typical of the discourse around language endangerment in linguistics (though Mufwene’s work provides an alternative perspective):

Surely we linguists know, and the general public can sense, that any language is a supreme achievement of a uniquely human collective genius, as divine and endless a mystery as a living organism. Should we mourn the loss of Eyak or Ubykh any less than the loss of the panda or California condor? (Krauss 1992:8)

What if we were to replace Eyak and Ubykh with Jamaican Country Sign and Providence Island Sign Language? Does the question retain the same rhetorical ring? If we take the view that all languages are indeed equally precious, then how is it that we find ourselves, twenty-six years after Krauss, without even a clear idea of how many sign

¹ Plains Indian Sign Language and New Zealand Sign Language are mentioned in passing in the book, but neither appears in the index of languages.

languages there are in the world? If we do indeed equate the loss of Jamaican Country Sign with the loss of the panda, how is that we have done so little since Dolman (1986:241) wrote that ‘a language and even a way of life are likely to be lost forever’?²

The purpose of this research report is to discuss some recent findings on sign language vitality. The discussion is not comprehensive, since new work is being produced quite rapidly, and there is so much that we do not yet know. The intention is to provoke further consideration of some key questions, such as the following: How does modality affect language vitality? To what extent are the forces that lead to the birth, maintenance, endangerment, and loss of signed languages the same as those that affect spoken languages? Should we and can we do more to safeguard this aspect of the world’s linguistic diversity?

In the next section I describe some of the conditions that give birth to signed languages and various types of sign language communities (§2). Section 3 considers sign language endangerment arising through language contact and language shift, and §4 discusses the ways in which changing demographics and the use of new technologies can lead to language endangerment. Some of what we know about dialect diversity in signed languages and whether this is also under threat are described in §5. Finally, I assess some of the reactions to sign language endangerment from linguists, communities, governments, and the media (§6) and then conclude (§7).

2. SIGN LANGUAGE BIRTH AND SIGNING COMMUNITIES. Mufwene (2017) encourages us to consider language endangerment within the broader context of linguistic vitality, including the opposite end of the linguistic life cycle, the emergence of new languages. For Mufwene, a new language emerges by ‘speciation’ (Mufwene 2004), when it is sufficiently different from its parent and sister languages. In this respect, signed languages differ from spoken languages. For many of the signed languages that have been studied, it has been possible to estimate, sometimes quite precisely, the point at which they first appeared, and in many cases, these languages seem not to have had linguistic parents. Most famously, it has been argued that Nicaraguan Sign Language emerged from a community without exposure to any developed sign language, apparently a true parentless language (Senghas, Kita, & Ozyürek 2004:1779).

The claim that sign languages often emerge *ex nihilo* is frequently made, though not uncontroversially. Meir and Sandler (2008:292) have described Al-Sayyid Bedouin Sign Language (ABSL) as ‘[l]anguage out of nothing ... developing without a language model’. Kisch (2012) disputes this view, pointing out that ABSL, which emerged around the middle of the twentieth century, is used, like many other rural sign languages, by both hearing and deaf people. The hearing people are bilingual in ABSL and the local spoken language, and so ‘[i]n this respect, no shared sign languages can be considered to develop without exposure to a language model’ (Kisch 2012:88). But the influence of spoken languages on signed language development in such settings seems to vary significantly from case to case. In the village of Benkala, Bali, for example, de Vos (2011) reports very little apparent influence on the local sign language from the surrounding spoken languages, despite the fact that, as with ABSL, the majority of signers are hearing. This raises interesting questions about how relationships between languages of different modalities should be conceived of within a ‘genetic’ model.

² In fact, there has been recent work from Cumberbatch (2012, 2015) and Gayle (2016) on this language, but it is striking that it took two decades for this to happen, and that so many similar languages have remained largely ignored.

Sign language quantification and classification are complicated by the existence of communicative systems developed by deaf people who have not been exposed to a sign language and have not had contact with other deaf people. Goldin-Meadow (2003) has demonstrated that these ‘homesign’ systems show many properties of human language, including simple morphological structure (Goldin-Meadow et al. 2007) and grammatical subjects (Coppola & Newport 2005). There is currently great interest both in investigating how these systems change when homesigners are given the opportunity to mix with deaf people from outside their immediate families and in developing a better understanding of the distinction between gesture and signing (see Goldin-Meadow & Brentari 2015 and commentaries).

Accepted linguistic boundary construction is further problematized by Moriarty Harrelson (2017) on the basis of her observations of the complex multimodal communicative practices of some deaf Cambodians, which include gestures, writing, drawing, the use of objects, and signs from ASL. ‘Dismissing the communicative resources deaf people deploy that may not align to conventional understandings of language’, she argues, ‘is a form of epistemic violence’ (Moriarty Harrelson 2017:16).

Such issues notwithstanding, it is generally agreed that for a new sign language to be born, there must be deaf people, and they must have the opportunity to interact on a regular basis. Such situations may arise in a variety of ways. In smaller communities, this might come about as a result of the appearance of genetic deafness. In Bangkala, for example, a sign language known as Kata Kolok arose as a result of a sudden increase in the incidence of genetic deafness (de Vos 2016). In the village of Ban Khor, Thailand, the sudden appearance of genetic deafness in the early 1930s led to the birth of Ban Khor Sign Language, which spread quickly throughout the village over a few decades (Nonaka 2014).

In other cases, genetic deafness may have been present in a community since its first establishment. Many of the families who settled in Providence Island, Colombia, in the mid-nineteenth century came from the Cayman Islands, where there is also known to have been a very high incidence of genetic deafness (Doran 1952). It is very likely that they brought the genes for deafness with them (Lattig et al. 2007). Whether these settlers also brought a sign language is not known. We know that there was a sign language in Grand Cayman, and Washabaugh (1981) observed some similarities between Old Caymanian Sign Language and Providence Island Sign Language. Recent genetic research has confirmed that deafness in Providence is associated with two different etiologies, so the situation may be even more complicated (Lattig et al. 2007). Many Caymanians also settled in the Bay Islands, Honduras, where there is currently a village with a high incidence of deafness and a sign language (Ali et al. 2017). The genetic condition found in this community, Usher syndrome, is known to have been prevalent in the Cayman Islands.³ It is also possible that there are genealogical connections between all of these populations and those in Top Hill, Jamaica, where Jamaican Country Sign developed. Similarly, it has been suggested that the historic deaf population on Martha’s Vineyard had its origins in the Kentish Weald (Groce 1985:16).

The dense social networks that are usually characteristic of rural communities may also play a key role in the birth and development of signed languages. Subsistence economies

³ Because Usher syndrome causes not only congenital deafness but also progressive loss of sight, the language used in this community is expressed in both visual-gestural and tactile-gestural modalities (Ali et al. 2017). Ongoing research into the emergence of the tactile variety of this language promises to add an extra dimension to many of the issues discussed here.

in which most community members spend much of their time engaged in common activities further increase the likelihood of regular sustained deaf-deaf and deaf-hearing interactions, encouraging the language to develop and spread (Nonaka 2014). As a result, there are usually a large number of hearing signers in these communities.

Such languages have been called ‘shared sign languages’, based on the fact that they are typically used by both deaf and hearing community members (Kisch 2008, Nyst 2012). They have also often been referred to as ‘village sign languages’, though this is a rather misleading name. In some cases such languages are restricted to single villages, as in Kata Kolok and Adamorobe in south-east Ghana (Kusters 2014). ABSL is used in the village of Al-Sayyid, but Kisch (2012) reports that there are signing deaf people in neighboring villages too, though the degree to which the signing in other villages is related to ABSL is not currently known. Islands often produce appropriate conditions for the appearance of sign languages. Examples include Providence Island, Colombia (Washabaugh 1986), Martha’s Vineyard (Groce 1985), Grand Cayman (Washabaugh 1981), and Amami Island (Osugi, Supalla, & Webb 1999). In such cases, signers may be distributed across a number of different villages. Linguistic variation between villages is likely to depend on the nature of social networks, which may in turn be influenced by geographical factors, such as how easy it is to get from one village to another (Washabaugh 1980). As discussed above, it is even possible that sign languages from different islands may be related to each other.

In larger, more urban communities, rates of genetic deafness tend not to be so high, and social networks may be less dense (Beggs, Haines, & Hurlbert 1996). Nonetheless, sign languages may still emerge in ‘deaf spaces’ within cities (Kusters & Friedner 2015), such as the deaf community that had by the eighteenth century emerged in Paris, prior to the establishment of any formal structures like a deaf school (Gulliver 2009). In Bamako, Mali, Nyst (2015a:134) identifies the Malian ‘*grin*, where people get together to socialize while preparing and drinking concentrated, black Chinese tea’ as the cradle of Langue des Signes Malienne (LaSiMa). In the case of Lhasa, Tibet, Hofer (2017) suggests that migration from rural areas into the city has meant that there are more deaf Tibetans living in close proximity now than at any previous time, encouraging the emergence of a distinct sign language. Indeed, she reports that some deaf people moved to Lhasa because they hoped to meet other deaf people more easily.

Following the global spread of deaf education over the last two centuries, deaf schools have also provided important meeting places for deaf children who might otherwise have been isolated, and new sign languages have appeared as a result. While there is some debate over the relative contributions of indigenous sign languages, including Martha’s Vineyard Sign Language and Plains Indian Sign Language (Davis 2010), and of French Sign Language, brought by one of the first teachers, Laurent Clerc (Woodward 1978, Shaw & Delaporte 2014), as well as various gestural systems (Fischer 1996), there is no doubt that the establishment of the first deaf schools was a key moment in the development of modern ASL and that these schools have since played a crucial role in its transmission. As in the ASL case, deaf schools have sometimes brought together pupils and teachers with different signing backgrounds and led to the development of new languages and varieties (see Meir & Sandler 2008 for the history of Israeli Sign Language). In other cases new languages seem to have emerged without any input from existing sign languages. The best-known example of the emergence of a sign language from a deaf school is probably Nicaraguan Sign Language (Senghas 1995), but similar examples can be found from around the world. Many of these languages are now used by national signing communities.

Since hearing people do not generally attend deaf schools, the languages that emerge there tend to be used primarily by deaf people, though there has recently been a huge increase in the numbers of hearing people learning some national sign languages. For example, the number of students enrolled in higher-education ASL classes grew by 3698% between 1990 and 2002 (Welles 2004), and according to a report by the Modern Language Association, by 2013 ASL had become the ‘foreign’ language with the third most enrollments in American universities, behind only Spanish and French (Goldberg, Looney, & Lusin 2015).

Kusters (2009) points out that, while rural signing communities are often presented as ‘deaf utopias’ in which deaf people are well integrated and do not face the language barriers experienced by those living in large Western deaf communities, very little research has been done on exactly how many hearing people sign and how well. Moreover, she points out that accounts of these communities often report the opinions of hearing people with regard to the integration of deaf people, but have rarely interviewed deaf people about their own experiences and perspectives.

In addition to the kinds of language emergence discussed so far, new sign languages may also come into being in the same way that spoken languages do, by gradually diverging from a parent language. Auslan and NZSL, for example, are derived from British Sign Language (BSL), but have diverged to some extent as a result of their different locations and histories. As with spoken languages, distinctions may be reflective more of national boundaries than of linguistic differences, and Johnston (2003) has argued that BSL, Auslan, and NZSL should be considered varieties of a single language. In some cases it has not yet been possible to establish the relationship between two signed languages. For example, Hochgesang and McAuliff (2016:231) are not sure whether Haitian Sign Language is derived from ASL or just influenced by ASL as a result of language contact. Tests of language relatedness have had to be developed specifically for signed languages in order to take into account factors such as lexical similarity resulting from shared iconicity (Woodward 2010).

It is also important to recognize diversity among signed languages. In recent years a variety of sign language typologies have been put forward. Meir et al. (2010), for example, use the term ‘emerging sign languages’ to refer to languages that have appeared relatively recently, and further distinguish between emerging ‘village sign languages’ and ‘deaf community sign languages’. Schembri (2010) distinguishes between ‘micro-community’ and ‘macro-community’ sign languages, and Woodward (2003) between ‘indigenous’, ‘link’, ‘modern’, and ‘national’ sign languages. Kisch (2008) calls the village where ABSL is used a ‘shared signing community’ because the language is shared between deaf and hearing people, and Nyst (2012) adopts the term ‘shared sign language’ to refer to other similar situations. While these terms can be useful for focusing on particular aspects of sign language communities, I agree with Kusters (2009:13) that the typologies are probably all in need of revision, based on detailed descriptions of a wider range of languages.

3. LANGUAGES IN CONTACT AND LANGUAGE SHIFT. By far the most common mechanism of spoken language endangerment and loss is through speakers shifting to a different language. Genocides, natural disasters, and epidemics can also lead to the loss of languages, but abrupt language death of this kind is relatively rare and not often discussed in the literature. For at least some sign languages, especially those associated with large national deaf communities, language shift is not the main threat. Johnston’s (2004) influential article on the endangerment of Auslan, for example, makes no men-

tion of language shift at all.⁴ This section reviews the role of language shift in signed language endangerment and loss and considers ways in which it is similar to and different from language shift in spoken languages.

3.1. CONTACT BETWEEN SIGNED AND SPOKEN LANGUAGES. There is a large literature dedicated to the effects of contact between signed and spoken languages. As Quinto-Pozos and Adam (2013) point out, signing deaf people almost always live in multilingual situations in which signed language exists alongside one or more spoken languages, and often one or more written languages. It is clear from this literature that spoken languages can have quite profound effects on the structures and development of signed languages, but this kind of contact does not seem to lead to deaf individuals shifting from a signed language to a spoken language, even in situations where signed languages are deliberately persecuted. In Trinidad and Tobago, for instance, signing was banned in the first school for deaf children, and a policy of oralism was enforced for three decades after the school opened. Despite this, and apparently unbeknownst to most of the hearing teachers, the deaf children created and transmitted a new sign language (Braithwaite 2018b). This type of situation appears to have been quite common around the world throughout the twentieth century, as the policy of forcing deaf children to speak and of banning signing failed to eradicate sign languages and even gave rise to new ones. Such policies can have significant effects on the structural properties of signed languages, however. For example, Schembri (2010) describes how the strict oralist policy in deaf schools in New Zealand seems to have led to the loss of some of the derivational morphology and lexicon found in NZSL's parent language, BSL.

Oralism was followed, in many parts of the world, by the introduction of artificial signing systems in which grammatical features of the spoken/written language of the educational system were combined with the (sometimes altered) lexicons of natural sign languages. These systems, which were designed to assist deaf students in acquiring the spoken/written language, have been seen as a threat to the sign languages from which they draw most of their vocabularies. For instance, Turner (1995) argues that signing influenced by the structures of spoken and written languages poses a serious threat to the transmission and vitality of BSL.

3.2. CONTACT BETWEEN SIGNED LANGUAGES. As with spoken languages, contact between two signed languages can lead to language shift and endangerment. This seems to be especially true in the case of village sign languages. Indeed, Zeshan and Dikyuva (2013:31) claim that '[t]he endangerment of village sign languages is usually due to pressure from larger urban or national sign languages', and Safar and Webster (2014:1) also identify 'contact with larger urban sign languages' as a particular threat to village sign languages.

An example can be seen with Mardin Sign Language (MarSL), which emerged in a small town in south-eastern Turkey in the mid-twentieth century as a result of genetic deafness within a particular family. It was developed and used by hearing and deaf family members, as well as by other deaf people living close by (Dikyuva 2012:397). In the last three decades, however, many people, including all of the deaf family members, have moved away from Mardin to large urban centers, Izmir and Istanbul. The deaf children attend deaf schools in those places, where they learn Turkish Sign Language (TİD), and the older deaf people have come into contact with TİD-signing deaf com-

⁴ Instead, the dangers he identifies have to do with the shrinking of the deaf signing population (discussed further in §4).

munities. Dikyuva (2012) reports that while the older deaf adults are bilingual and still use MarSL with hearing relatives who remain sign-monolingual, the younger deaf people are now monolingual TID signers. Because it is not being transmitted to children, 'MarSL is now on the brink of extinction' (Dikyuva 2012:397). Because the TID-using community is itself fighting for the recognition and implementation of basic linguistic rights, Zeshan and Dikyuva (2013) say that there are few available resources for MarSL and predict that 'the more successful TID will be in its bid for status and recognition, the more pressure will be exerted on MarSL' (Zeshan & Dikyuva 2013:40).

Nonaka (2014) describes a similar situation in Ban Khor, where deaf signers of the micro-community Ban Khor Sign Language (BKSL) have begun shifting to Thai Sign Language (TSL). Language attitudes have also shifted rapidly: in 2000, Nonaka reported that signers compared BKSL favorably with TSL, but just twelve years later, comparisons favored TSL. In accounting for this shift, Nonaka emphasizes the role of changing social and economic factors. A sudden move from a subsistence to a cash economy has had a profound impact on the relationship between deaf and hearing villagers. Previously, almost everyone in the village was engaged in the same everyday economic activities, which provided opportunities for sustained contact between deaf and hearing villagers. As a result, the number of signers expanded rapidly as the language spread among hearing people. More recently, as subsistence farming has decreased, the amount of contact between deaf and hearing villagers has also been reduced, and there has been considerable social stratification. Increased in-marriage and in-migration have also had a significant impact, and deaf people have increasingly begun to identify with the national TSL-signing deaf community. As was the case with MarSL, hearing signers have not shifted from the local language to the national sign language. Nonaka (2014:68) concludes that local factors are crucial to understanding the vitality of such languages: 'The manifestation of any given village sign language and its attendant speech/sign community ... is profoundly influenced by language ecological, language socialization, and language ideological factors and processes specific to that situation'.

However, contact between micro- and macro-community sign languages does not inevitably lead to language shift. In her description of the language situation in Adamorobe, Ghana, Kusters (2014) argues that Adamorobe Sign Language (AdaSL) continues to be positively valued by both deaf and hearing signers, despite contact with Ghanaian Sign Language (GSL). Deaf children from Adamorobe have begun attending a residential school away from the community, where they learn GSL. They use GSL with other deaf children, and even among themselves. Despite this, when they return to Adamorobe, they gradually switch back to AdaSL. Crucially, Kusters reports that people in Adamorobe value both AdaSL and sign bilingualism. As in Ban Khor, Kusters observes that an influx of migrants and economic diversification have reduced the amount of contact between deaf and hearing people. One reason that these changes have not yet had the same impact on language attitudes seems to be that villagers associate AdaSL with the local spoken language, and both languages function as important unifying forces in the village. This indicates that the linguistic vitality of signed and spoken languages may be intertwined, and that, despite modality differences, they occupy overlapping linguistic ecosystems.

As we saw in the Adamorobe case, deaf schools can play a critical role in sign language contact. In the first descriptions of Jamaican Country Sign (JCS), a sign language used in a rural part of Jamaica, Dolman (1985, 1986) described the effects of the establishment of a deaf school. Though established in the community where JCS was in use,

the school adopted Jamaican Sign Language (JSL) instead. As children at the school learned JSL and increasingly had the opportunity to communicate with members of the wider Jamaican deaf community, Dolman anticipated that JCS would be lost. More recent work suggests that Dolman's fears were well founded (Cumberbatch 2012, Gayle 2016). Interestingly, Cumberbatch (2012) reports that prior to the establishment of this school, deaf children had often been educated at a school for the deaf in the capital, Kingston, but she indicates that this had not had the same effect on JCS, since children would usually return to the village, and to JCS, after finishing school.

These patterns of language shift and maintenance are very similar to those found in spoken languages. Mufwene (2017) describes how rural African languages are often maintained even when children attend schools outside their home communities. Despite acquiring and using the urban vernacular, children tend to return to ethnic, ancestral local languages as they return home and settle back into village life. This is quite reminiscent of Kusters's account of the sign language situation in Adamorobe, and may help to account for the fact that JCS only began to be lost when a deaf school was established within the signing community.

It is not just village sign languages that can be affected by language shift. As ASL has spread around the world, brought primarily by hearing and deaf educators and missionaries, it has come into contact with emerging national sign languages. In Trinidad and Tobago, this led to the introduction of ASL in deaf schools in the 1970s, despite the fact that a local deaf community sign language had already emerged (Braithwaite 2018b). The relative prestige of ASL, along with the fact that it is the language usually learned by hearing educators in deaf schools and taught to deaf children, has meant that the older ways of signing are being lost (Braithwaite 2018b), though, as Parks points out, many community members accept the use of both ASL and Trinidad and Tobago Sign Language (Parks 2014). It seems likely that the vulnerability of a local language in such circumstances is related to the levels of institutional support, as well as the degree to which it functions as a marker of identity.

The patterns of language shift for signed languages may differ in certain respects from those found for spoken languages. For example, the speed at which language shift can take place may be greater for signed languages. In cases like MarSL, it is striking that even adult native signers shifted to using TID among themselves quite quickly. This is consistent with research showing that deaf people are generally much better able to adopt new (signed) languages than hearing people are. Zeshan and Panda (2015), for instance, found that signers of Burundian Sign Language (BurSL) studying in India quickly started using Indian Sign Language (IndSL), in addition to sign shifting between IndSL and BurSL among themselves. In a similar vein, Bickford and McKay-Cody (2018) argue that contact between signed languages often results in a gradual language mixing, leading to the emergence of a continuum of signing varieties, rather than a straightforward shift from one to another. This certainly seems to have been the case for Trinidad and Tobago Sign Language, where contact with ASL has resulted in mixed forms and a continuum (Braithwaite 2018b), and similar kinds of mixing have been reported by Clark et al. (2016) in relation to contact between ASL and Hawai'i Sign Language.

Another modality-specific factor that influences language shift is the difference in behaviors of deaf and hearing signers. In all reported cases where deaf signers switched from a micro-community language to another sign language, hearing signers did not. The extent to which this is sufficient to prevent or delay language loss depends on whether the relationships between deaf and hearing community members are main-

tained, particularly as new generations of deaf children are born. For instance, Lanesman and Meir (2012) describe how Algerian-Jewish Sign Language (AJSL) has survived for several decades despite being transplanted from its birthplace in Algeria to Israel, resulting in contact with Israeli Sign Language (ISL). They contrast AJSL's survival in Israel for over fifty years with the rapid disappearance of many other sign languages brought there by deaf immigrants around the same time. Above all, what made AJSL different from immigrant sign languages like Russian Sign Language (RSL) (Yoel 2007) was the fact that it was used not only by deaf people but also by their hearing family members. Because the hearing signers were not involved in the new Israeli signing community, they did not learn ISL. The deaf signers therefore continued using AJSL with them, even after they had acquired ISL and adopted it as their principal language outside the family. Deaf members of a signing micro-community are more likely to shift to a national sign language when they identify with the national deaf community. Lanesman and Meir argue that, for some time, certain factors limited the extent to which deaf AJSL signers felt a full part of the wider Israeli deaf community, and that this may have been a factor in AJSL's survival. Where identification with the local signing community remains strong, the local language is more likely to be maintained and a sign bilingual situation may hold, as in Kusters's description of Adamarobe.

4. DEAF DEMOGRAPHICS AND SIGNING COMMUNITIES. Just as the emergence of a new signed language depends on the existence of a community of signers, the viability of a signed language may be endangered by various factors that alter the demographics of the community. Most crucially, sign languages require deaf signers, and a drop in the number of deaf people within a community may have profound linguistic consequences. This can happen as a result of genetic, cultural, medical, legal, and educational factors.

Mufwene (2017:e206) observes that 'nobody is wedded to their ancestral cultures in the same way they are to their genes'. While of course it is true that genes do not predispose anyone to acquiring any particular language, spoken or signed, there is a link between genetics and language modality. In fact, the interplay of genes and language is quite complex in signing communities. Genetic factors play a key role in the vitality of sign languages, and the use of sign languages can affect the genetics of a community. Nance and Kearsy (2004:1082) argue, for example, that the use of a sign language can make the genes for deafness more common, since it improves 'the social and economic circumstances of the deaf, along with their genetic fitness' and makes it more likely that deaf people will marry each other as a result of 'mate selection based on the ability to communicate in sign language'.

Aoki and Feldman (1991) have proposed a formula for sign language 'persistence' based on the frequency of recessive deafness alleles in the population, the proportion of children who learn to sign with only one signing parent, and the rate of assortative mating, that is, deaf people choosing to marry other deaf people. Their formula predicts that assortative mating patterns should support the persistence of sign languages. Gialluisi et al. (2013), however, point out that such models do not work well when tested against village signing communities. As briefly described below, the lack of assortative mating strengthened ABSL because it promoted the spread of signing among hearing people. Moreover, given the endogamous mating patterns, marriages between deaf and hearing villagers actually increase the frequency of the recessive deafness allele in the community, thereby maintaining the stability of the deaf population (Gialluisi et al. 2013).

As Kusters (2009:7) notes, there are many significant differences between different signing communities with respect to marriage patterns. Deaf women have more prob-

lems than deaf men finding a partner in Yucatec Maya villages, but in Adamorobe, the situation is reversed. While marriage patterns, including factors such as birth rate and whether polygamy is practiced, are clearly important to sign language vitality in such cases, close examination of specific language ecologies is necessary for understanding exactly how this might work in particular cases, and this must include a wide range of factors, including sociocultural attitudes toward deafness.

In rural communities in which deafness is genetic, marriage patterns can have a major impact on the vitality of a shared sign language. In Adamorobe, for example, a prohibition on marriage between deaf villagers in 1975 has contributed to a dramatic reduction in the proportion of deaf people in the village, from 11% in 1961 to 1.1% in 2012 (Kusters 2012:2766). Substantial immigration into the village was also a key factor in this drop.

As another example, deaf-hearing marriages were the norm until recently in Al-Sayyid, when marriages between deaf women from the village and deaf men from outside have become more common (Kisch 2012). This poses a threat to ABSL in various ways. It often involves the women moving out of the community to marry ISL-using members of the wider national deaf community, and generally shifting to homesign (with hearing in-laws) and ISL (with their husbands). Historically, intermarriage between hearing and deaf people in Al-Sayyid played a key role in increasing the number of fluent hearing signers, and as this becomes less frequent, the number of hearing signers may also decline (Kisch 2012:112), in addition to the number of deaf people.

When a relatively isolated community with a high incidence of deafness experiences a sudden increase in people moving in from outside, this is very likely to result in a reduction in the incidence of deafness, as in Adamorobe (Kusters 2012). Greater levels of exogamy reduce the frequency of recessive deafness alleles in the community, and thus the chances that they will be inherited. Additionally, of course, an influx of hearing people automatically reduces the proportion of deaf people in the community.

This was a major factor in the disappearance of Martha's Vineyard Sign Language (Groce 1985). Recessive deafness in Martha's Vineyard was brought with settlers from England in the late seventeenth and early eighteenth centuries and spread as a result of a prolonged period of isolation, during which there was substantial consanguineous marriage. The number of deaf people increased gradually, reaching a peak of forty-five in the 1840s (Groce 1985:41). But toward the end of the nineteenth century, the incidence of deafness declined rapidly, and the last deaf person died in 1952. The decline in deafness was partly a result of an increase in marriages between hearing Islanders and outsiders, including Portuguese immigrants who came around the turn of the century, mainlanders, and people who had started coming to the island for summers. Deaf children from Martha's Vineyard had also started attending the new residential deaf school in Hartford, Connecticut, in the 1820s, and over time, several deaf Islanders married deaf people not from Martha's Vineyard with whom they attended school. Again, because their spouses were extremely unlikely to share the same deafness alleles, this also contributed to the disappearance of deafness in the population, and the consequent disappearance of Martha's Vineyard Sign Language.

A similar situation appears to currently be taking place in Providence Island, where a substantial influx of people from mainland Colombia has caused the population to rise dramatically over recent years. Since this reduces the proportion of deaf people in the community, alters the social structures that support the language, and makes it less likely that the genes for deafness will continue to be inherited by future generations, it is probably the most serious threat to the vitality of Providence Island Sign Language.

Urbanization is also affecting the genetics of deafness. When people from rural communities with high rates of deafness move to larger cities, it increases the likelihood of exogamy. It can also lead to the dispersal of community members, the disruption of social networks, and other factors that make the continued survival of a shared sign language unlikely (though see Lanesman and Meir's (2012) description of AJSL and the brief summary given above for a case where such a language has survived for several decades).

Recent developments in genetic screening have raised additional questions about the future of genetic deafness. Blankmeyer Burke and colleagues (2016) discuss new technologies associated with genetic research that provide methods by which it is possible, in principle, to drastically reduce the incidence of genetic deafness. In Providence, genetic testing has clarified the different etiologies of genetic deafness in the island, and it has been followed by genetic counseling, encouraging people to avoid unions that are more likely to result in deaf children (Lattig et al. 2007). Deaf Studies researchers have been leading the way in interrogating the connections between new genetic technologies and sociocultural attitudes toward deafness (Boudreault et al. 2010, Enns et al. 2010, Blankmeyer Burke et al. 2016). Even in large national deaf communities where genetic deafness accounts for a relatively small proportion of the total deaf population, a reduction in genetic deafness is likely to have significant linguistic consequences. As discussed in §5, deaf children of deaf adults play a key role in the transmission of traditional regional varieties (Stamp et al. 2014), which might otherwise be more likely to be lost.

For larger urban and national sign languages, where genetic factors may not be the most significant cause of deafness, there are other causes of shrinking deaf populations. The single biggest cause in many parts of the world is the implementation of vaccination programs targeting rubella. Johnston (2004) identified the successful eradication of rubella in Australia as a major factor in the reduced rate of severe and profound deafness, which, he argues, contributes to an existential threat to the signing deaf community. The same effect can be seen in many other parts of the world in which similar vaccination programs have been implemented, with similar consequences for the vitality of national sign languages. Across the Caribbean, major rubella outbreaks in the early 1960s and 1980s led to large cohorts of deaf babies. Many new deaf schools were established across the region in this period as a consequence, and these schools brought together deaf children and provided both the foundations for new communities and centers for the transmission of emerging national sign languages (Braithwaite 2016). But the eradication of rubella across the region by the turn of the twenty-first century has left many of these schools almost empty. Some now place deaf children alongside children with a range of disabilities, while others have closed. In small states without high rates of genetic deafness, rubella epidemics may have been sufficient to spark new deaf communities into existence, and the eradication of rubella may be enough to end them.

The closure of residential schools across many parts of the world as a result of shrinking deaf populations and the adoption of certain models of 'inclusion' within education systems also pose a major threat to the future of deaf communities, given that deaf schools have historically played a key role in the transmission of sign languages. The increased use of technological interventions including hearing aids and cochlear implants has the potential to shrink signing populations even further, and the mainstreaming of deaf pupils can critically disrupt sign language transmission (Vonen 2006).

The development of cochlear implants (CIs) has been of special concern recently, particularly with respect to the language policies that accompany implantation. As Davidson et al. (2014:248) say: 'For many children, a CI provides sufficient access to

spoken language for it to be used in a range of communicative and educational settings'. This does not preclude the acquisition of a signed language, but often deaf children with CIs are placed in programs that insist on speech-only environments. This is based partly on research such as Geers et al. 2017, which claims that spoken-language-only input has a positive effect on the development of speech by children with CIs, and that such children do not benefit from acquisition of a signed language. Such findings are, however, widely disputed, and Geers et al. 2017 was heavily criticized in a series of responses for methodological and analytic shortcomings (Caselli et al. 2017, Dye et al. 2017, Hall, Schönström, & Spellun 2017, Martin et al. 2017, among others). Indeed, there is a growing body of research by linguists indicating that acquisition of a natural sign language by children with CIs does not harm spoken language acquisition, and may in fact be beneficial to spoken language development (e.g. Davidson et al. 2014). Researchers have also observed the potential for serious damage that may be a consequence of denying a deaf child early access to signed language (Hall, Eigsti, et al. 2017, Hall, Levin, & Anderson 2017). Beyond the extremely serious consequences for individuals, this issue has potentially drastic consequences for sign languages and signing communities. Large-scale implantation programs are already happening, and when these are accompanied by speech-only educational environments, signing communities and signed languages face potentially existential threats. This can affect both macro- and micro- sign language communities. In their description of another shared sign language in Israel, Kafr Qasem Sign Language, Kastner et al. (2014) observe that a significant number of deaf children have recently received CIs and that the parents of these children often seem to reject sign language.

Even when signing is encouraged as part of the education of deaf children, it may be accompanied by impoverished and damaging language ideologies. For example, evidence that early access to signed language may assist in the development of spoken language and literacy may lead to the view that sign languages are therefore valuable primarily, or only, as tools for achieving the ultimate goal of speech and literacy. Alternatively, it may be accepted that the use of a sign language is important, but that it does not matter which one. I recently conducted research in a village in Guyana where there is a micro-community sign language that has been transmitted for several generations. There had been an intervention from a national organization in which the local teacher, a fluent hearing signer of the micro-community sign language with no previous knowledge of ASL, was encouraged to use ASL to teach the deaf children. The view of those responsible for the intervention was that, so long as the children were being taught using a sign language, it did not matter which one, and it was easier to find teaching resources in ASL. The fact that the use of ASL could well cause the loss of the local language was seen as a small price to pay. Again, this view seems to be related to the idea that a sign language is merely a tool for achieving certain kinds of educational outcomes, rather than the 'supreme achievement of a uniquely human collective genius' (Krauss 1992:8). Of course, this modality chauvinism is specific to signed (and probably tactile) languages.

5. LINGUISTIC VARIATION. Alongside concerns about the large-scale disappearance of languages around the world, there has been a growing interest in whether there has been a similar reduction in the amount of dialectal variation within languages. A growing body of work is concerned with endangered dialects and investigates how this kind of linguistic diversity is changing over time. For example, Wolfram and Schilling-Estes (1995) argue for the importance of studying endangered dialects of safe languages, and

Britain (2009:149) describes ‘a number of features of dialects in England that were relatively healthy a hundred years ago, which are now dead or dying’. The loss of distinctive local dialects, he observes, has been associated not with a move toward a standard variety, but rather with the emergence of new supralocal or regional koinés. Dialect leveling (Kerswill 2004) can result in both the disappearance of traditional dialects and the emergence of new varieties. This section considers similar issues with respect to signed languages. What do we know about dialect diversity in signed languages, and to what extent do we have evidence of the disappearance of traditional dialects and the emergence of new ones?

The compilation of major national sign language corpora has allowed for new insights into the nature of linguistic variation within national sign languages. Work on the BSL corpus, for example, has uncovered significant regional variation. Stamp et al. (2014) found considerable lexical variation across a range of semantic fields and support for Quinn’s (2010) argument that variation is associated with the locations of the main schools for deaf children in England. They found evidence of loss of regional variation over time, and particularly that younger signers are using fewer regionally distinct variants for numbers and color terms. They also found that signers whose parents were deaf tended to favor the use of traditional signs, while those with hearing parents were less likely to use them, indicating ‘the importance of deaf native signers in maintaining and transmitting BSL regional variation’ (Stamp et al. 2014:10). They take this reduction of variation to be a result both of leveling, with a movement toward variants associated with the London region and those that are common across regions, and of significant English language influence. They suggest that the closure of deaf schools may have contributed to leveling, given the key role these schools have played in the transmission of regional variation. McKee and McKee (2011) report similar findings for NZSL, and observe that many newer variants seem to attest to the increased influence of Auslan.

Concern about the loss of regional varieties has also been expressed by Crasborn and de Wit (2005) for Sign Language of the Netherlands (Nederlandse Gebarentaal; NGT). In this case, a key threat to linguistic diversity comes from institutional efforts at standardization, which was made a condition of recognizing the language officially. The loss of traditional variants has serious consequences, they argue, since older signers and new sign language interpreters often report having difficulty understanding each other.

Spoken languages also can have a major influence on the development of sign language varieties, as can be seen in the case of Finland-Swedish Sign Language (FinSSL) (Hoyer 2004). FinSSL shares a common origin with Finnish Sign Language (FSL), but the varieties diverged over time, with FSL developing in those deaf schools where spoken/written Finnish was the main language of instruction during years of oralist education, while FinSSL developed in a school where spoken/written Swedish was adopted. The closure of the school, which had been the primary vehicle for the transmission of FinSSL, has left the language severely endangered.

Snoddon (2016) argues that Canadian varieties of ASL are at risk of being replaced by standard varieties, such as those associated with Gallaudet University, and makes the case for the need for language revitalization work to preserve them. She warns: ‘In failing to privilege endangered varieties of ASL spoken by deaf Canadians, both ASL curricula and classrooms may inadvertently elide the existence of those varieties and of the deaf community history of which they speak’ (Snoddon 2016:1013). Here, as elsewhere, the limited documentation of these varieties poses an additional challenge. Reporting on a project to document the regional variety of ASL associated with Philadelphia, Fisher et

al. (2016) also express concern at the possibility of dialect leveling and discuss the methodological difficulties of distinguishing between regional variation and differences between older and younger signers.

Studies of regional variation in ASL tend to focus exclusively on North American varieties, leaving the extent of variation in ASL varieties used around the world an under-researched topic. ASL has been introduced by missionaries and through educational institutions across much of the Caribbean and Latin America (Woodward 1991, Parks 2014, Braithwaite 2018a), West Africa (Nyst 2010), and parts of South East Asia (e.g. Woodward 1996). In some places it may be acquired as a first language, and in others as a second language, and this seems likely to have led to many distinctive new varieties. Transplanted languages may flourish and evolve into such varieties, but they themselves might also become endangered. This has happened in the case of a variety of Irish Sign Language used in Australia (Australian Irish Sign Language; AISL), which is now critically endangered (Adam 2012).

In addition to regional variation, there has been work on gender-based variation in Irish Sign Language, which has been attributed to the historical segregation of boys and girls in Irish deaf schools (Leeson & Grehan 2004, LeMaster 2006). LeMaster (2006) describes how the introduction of a sign language dictionary in deaf schools beginning in 1979 led to a reduction in the use of distinctive female forms. As Irish Sign Language has gained greater recognition and legitimacy in recent years, there have been efforts from within the community to revitalize older female forms of signing (LeMaster 2006).

Even less is known about ethnolectal varieties of sign languages. McCaskill et al. 2011 reports on the first major investigation into the variety of ASL associated with African American signers, known in the literature as Black ASL. Once again, the origin of this type of variation can be traced to school policies: Black ASL emerged out of the segregated deaf school system of the American South. While, again, there has been some concern about the loss of traditional language variants and some evidence of convergence between the signing of black and white ASL signers, the project also found that, even among the younger generation, ethnicity appeared to remain a significant marker of linguistic variation.

Beyond these cases, there is still very little known about dialect variation within sign languages. Recent work has begun to document dialect diversity in a few of the world's best-studied sign languages, and in most cases this work has suggested that such diversity may be under threat. Again, there are patterns that are familiar from research on spoken languages (such as dialect leveling), but factors such as the closure of deaf residential schools and the role of deaf native signers in preserving variation uniquely affect sign languages.

6. RESPONSES TO SIGN LANGUAGE ENDANGERMENT. Despite the fact that sign language research has had a significant impact on the field of linguistics generally, it is striking that efforts to document the world's sign languages seem to have been rather limited. There are quite a number of signed languages that are known in the academic literature through only one or two articles. For example, Washabaugh's 1981 article described an indigenous way of signing in Grand Cayman, but noted that it had already been replaced among younger signers as a result of changing educational practices. While the paper is fairly widely cited in sign linguistics publications, it seems that it did not inspire any follow-up research.⁵ Similarly, Woodward (1991) identified four dis-

⁵ On a recent research trip I found that there were still a few signers who remembered the older ways of signing, and there may still be time to document a few fragments of what once existed.

tinct sign languages used in Costa Rica, including two micro-community languages that he called Brunca Sign Language and Bribri Sign Language, and he suggested that there were probably several more. Again, this did not prompt further investigation of those micro-community sign languages.

However, things are clearly changing. A collection of work on village sign languages was published in 2012 (Zeshan & de Vos 2012), and new descriptions of previously undescribed sign languages have been appearing on a regular basis since then, including a special issue on rural sign languages in the journal *Sign Language Studies* (de Vos & Nyst 2018). Such languages have attracted a considerable amount of theoretical interest. Meir et al. (2010:267), for instance, see emerging sign languages as ‘a natural laboratory for studying the development of linguistic structure and its interaction with the nature of the language community’, and de Vos and Pfau (2015:265) state that village sign languages ‘provide a unique window into the social dynamics that may shape the structures of modern human languages’. Goldin-Meadow (2005:223) has argued that homesign ‘can serve not only as an empirical test of linguistic theory but also as a source of hypotheses for linguistic theory, in particular, as a source of candidate properties for Universal Grammar’. Sign languages have also assumed a prominent place in challenges to universal grammar (for example in Evans & Levinson 2009). These theoretical issues have no doubt spurred some of the recent surge in research. Emerging and endangered sign languages have also attracted a great deal of media interest (for instance, Friedman 2013, Erard 2014, Alesevich 2015, Romm 2015, Perlin 2016, Rubin 2016), at least one popular book (Fox 2007), and press conferences to announce the discovery of previously undocumented languages (see e.g. <https://manoa.hawaii.edu/news/article.php?ald=5600>).

It is striking how many small signing communities were stumbled upon by chance, by linguists who were doing something else. For example, Tervoort (1978) recalls seeing what appeared to be an indigenous sign language while conducting an assessment of schools in Suriname; van den Bogaerde (2005) was on holiday when she noticed signers in a Saramaccan village in Suriname; and Washabaugh came to Providence Island because he was interested in the Creole language spoken there and only began working on the sign language afterward. But this is perhaps not surprising. Shared signing communities are often not very visible: they are usually in relatively isolated locations, rarely have any institutional representation, and may not even be known to national deaf associations, all of which may help to account for our relative ignorance about these languages globally.

There may also be good ethical reasons for linguists to be cautious about carrying out research on previously undocumented shared sign languages. The majority of professional sign language linguists work in countries with relatively large established deaf communities. Many see their work as having important social functions, and many are involved in promoting awareness and greater use of those languages. In shared signing communities, however, most people may already sign, and, as Zeshan (2007) has pointed out, it may not be clear whether there is any need for this kind of language promotion. In the absence of such needs, what, if anything, can a linguist contribute to such a community? Given the current interest in these languages, there is also a concern that publishing an initial linguistic description may lead to a sudden influx of researchers (not to mention journalists), with unpredictable and possibly damaging consequences for community members. It may lead to genetic research and subsequent genetic counseling aimed at reducing the incidence of deafness in the community (Zeshan 2007). Despite such concerns, Pfau and Zeshan (2016:556) argue that research in sign language typol-

ogy has had positive effects on deaf communities, since it ‘fosters networking among and professionalization of deaf academics who, in turn, advance research in this field’. There is clearly much more work to be done in this area in removing barriers restricting the progress of deaf academics, and supporting the training and professional development of deaf researchers from a broader range of geographical, socioeconomic, and educational backgrounds.

With regard to linguistic fieldwork, there is very little published literature that specifically focuses on signed languages. In one of the first published papers addressing the special issues involved in carrying out fieldwork on signed languages, Fischer (2009:4) cautions that ‘I’ve even seen some deaf people use the term “linguist” as a pejorative, based on the attitudes of linguists they’ve met’. Nyst 2015b is a welcome addition, but there is a clearly a need for much more. The lack of materials on field methods for sign language research may be both a consequence of and a contributing factor to the relatively narrow geographical scope of most sign language research to date.

Another possible reason for the apparent lack of urgency among linguists is the view that (some types of) sign languages have naturally short life cycles. Nonaka (2004) describes how village sign languages may arise suddenly, flourish briefly, and disappear quickly. If this is the typical way of things, then it may not be appropriate for linguists to intervene and try to ‘save’ such languages. However, I believe that this review has shown that most documented cases of sign language endangerment seem to be linked to factors that did not pertain in the past, such as new technologies, urbanization, and the spread of new global and national sign languages.

There is sometimes a degree of ambivalence about the endangerment of emerging national sign languages caused by the introduction of foreign sign languages as a medium of instruction in schools. Often, as in Trinidad and Tobago, the introduction of a foreign sign language also marked a shift away from the damaging practice of oralism (Braithwaite 2015). While the potential loss of the local language may be regretted, the move toward institutional acceptance of a sign language may be celebrated. As Schembri (2010:124) observes, ‘at least, sign language instruction is being adopted!’.

Another factor to consider is that the consequences of sign language loss may differ in other ways from the consequences of spoken language loss. When spoken languages are lost, their speakers and their speakers’ descendants shift to other languages. When signed languages are lost, however, they may not be replaced, and the consequences for future generations of deaf people may be catastrophic. In Trinidad and Tobago, for example, there was no sign language, as far as we know, before the establishment of the first deaf school. Since vaccination programs have successfully eradicated rubella in the country, the number of deaf babies being born has fallen dramatically (Braithwaite, Drayton, & Lamb 2011). The single residential deaf primary school that was once the cradle of a new language is now under pressure to justify its existence, as the dormitories that were once full currently house only a few pupils. If the school were to close, there would be a very real prospect that future generations of deaf children (however small in number they may be) would be left without accessible language models. Developing a better understanding of sign language vitality may provide our best hope as we help to plan for sustainable solutions to such challenges.

If it is true that there has been some reticence to act on the part of linguists, this cannot be said of various other groups. In 2016 alone, the Starkey Hearing Foundation (SHF) was active in providing hearing aids to people in Zambia, Mexico, Tanzania, Rwanda, Kenya, Indonesia, the Marshall Islands, Peru, Colombia, Canada, Afghanistan, USA, India, China, the Democratic Republic of Congo, Guyana, Nicaragua, Portugal, Vietnam,

the Dominican Republic, Samoa and American Samoa, and Ecuador (information from <https://www.starkeyhearingfoundation.org/>). Whatever the motivations for such work, it is quite likely that it will have an impact on sign languages around the world. Often it appears that this work promotes a linguistic ideology that sees signed languages as inferior, encouraging people to believe that a hearing aid can make signing obsolete. It may also be spreading a pathological view of deafness that is at odds with work in the field of Deaf Studies, and with existing epistemologies of deafness in some communities.

Missionary organizations have also been extremely active in seeking out deaf people internationally, including in many parts of the world that sign language linguists have not yet reached (Woodward 1982). I have worked with signing communities in Trinidad and Tobago, Guyana, Honduras, and Colombia that have received little or no previous attention from linguists. In all of these places, missionary organizations had already been in touch with the communities, including with almost every deaf individual I have met, several of whom have told me they had been contacted by more than one competing missionary group. Indeed, when we meet deaf people for the first time in these places it has usually been necessary to explain that my research team and I are not missionaries. These missionaries invariably bring some sign language with them. In some cases, they bring a national sign language into communities with their own shared sign languages, and in others they bring a variety of ASL. Even if we think that academic linguists should be extremely cautious in approaching small signing communities, we should also bear in mind that many of these communities may already be the targets of groups whose influence could have major consequences for local linguistic ecologies. Ethical issues of the type raised by Zeshan (2007) clearly deserve to be considered further. We are in a better position to have such conversations now as our knowledge of signing communities around the world increases.

At an official level, there has been a steady increase in the number of sign languages with some kind of institutional recognition, whether through specific legislation, national constitutions, or in other ways. The impact of recognition on language vitality seems to have been somewhat mixed. De Meulder (2016), for example, discusses at length the role of legal measures in addressing the challenges of language endangerment and vitality, and argues that such measures must address the issue of language vitality directly. However, McKee (2017) argues that official recognition of NZSL has not arrested a decline in the number of signers and has not been followed by the kind of sociolinguistic monitoring that might inform efforts at revitalization. Vonen and Hjulstad (2004) even argue that the official recognition of Norwegian Sign Language has coincided with a growing risk of language endangerment.

The issue of revitalizing sign languages has also received very little attention, perhaps partly because a major danger facing many sign languages is the threat of shrinking deaf populations. Traditional techniques of language revitalization can do little about this. In other respects, most of these languages are more vital than ever before, in that they are beginning to receive more institutional support and are being used in a wider range of domains, with expanding descriptive literatures. If the deaf communities that sustain sign languages disappear, however, it is unlikely that any type of language revitalization program will make a difference.

As we have seen, many rural sign languages are facing imminent threats from language shift and might well be candidates for revitalization work. But things are somewhat complicated by the fact that organizations that might be expected to lead such work, especially national deaf associations, often have their hands full fighting linguistic discrimination, not to mention the existential threats to their national sign language.

Given this background, it would be quite understandable if the potential loss of small sign languages as a result of language shift to the national sign language was not necessarily seen as the most pressing challenge. As Zeshan and Dikyuva (2013:40) observe in relation to Turkey:

Government departments and official institutions are unaware of even the existence of MarSL, and, since they are struggling to implement legislation relating to TİD, it is highly unlikely that there will be any systematic response to the endangerment of MarSL.

There have recently been steps taken to revitalize Plains Indian Sign Language (Bickford & McKay-Cody 2018), and this is surely an area that requires further work. Given the wide variety of language situations and diversity of pressures, any revitalization efforts that are undertaken should be based on a thorough understanding both of the particular ecologies surrounding a language endangerment situation and of the factors that influence sign language vitality generally.

7. CONCLUSIONS. This report has shown that there does appear to be a global threat to the diversity of signed languages and language varieties. It is impossible to fully understand the current situation, since we do not yet have a clear picture of the number of signed languages in the world. Previously undocumented sign languages are increasingly appearing in the academic literature for the first time. Often the first descriptions of sign languages will also observe that the language is under immediate threat, and even the most widely used and well-supported sign languages face potentially existential challenges.

The causes of sign language endangerment overlap with those that have been discussed in the literature on spoken languages. For example, socioeconomic factors that underlie patterns of language shift or maintenance in spoken languages affect signed languages as well. As with spoken languages, the vitality of signed languages is dependent on local ecological factors, while at the same time being influenced by global trends. Migration, urbanization, the spread of prestigious world languages, educational policies, and missionary activities all affect signed languages in ways that are by now familiar in the literature on language endangerment. But there are also many specific issues that may place particular pressures on signing communities. The ecologies of signed languages may be crucially influenced by genetics, medical and technological innovations, sociocultural attitudes toward deafness, and the differential roles of hearing and deaf signers. Most sign languages, even those that appear to be quite stable, have a relatively tiny number of users, and this makes them inherently vulnerable.

Likewise, the mechanisms of sign language loss overlap with but differ from those described for spoken languages. Signers may shift from one language to another under language contact, but it seems that the process of language shift may happen more quickly for signed languages and there may be characteristic patterns of language mixing associated with contact between signed languages.

Responses to sign language endangerment resemble the responses to spoken language endangerment: media reports focusing on ‘the rush to save a dying sign language’ have proliferated recently, and sign language linguists have made efforts to carry out major programs of language documentation on a wider variety of different languages. But endangered sign languages still appear to occupy a somewhat marginal place in the wider literature on language vitality, endangerment, and documentation. The responses of communities and governments also seem to have been muted. This is not necessarily an indication that the loss of sign language diversity should be considered less serious than the disappearance of spoken languages. Rather, it reflects partic-

ular properties of signing communities, such as the ways that sign languages are transmitted, ethical concerns identified by sign language linguists, and the stubborn persistence of certain misconceptions about the nature of signed language.

My hope in writing this report is that it might encourage a wider debate on some fundamental questions. Research on sign languages has opened up new avenues for investigating the biological, social, and cultural foundations of language, and has caused us to adjust the ways we understand the basic structural properties of human languages. It has uncovered surprising cross-modal similarities and extended our understanding of linguistic diversity. As we face up to the possibility of a drastic reduction in the world's diversity of signed languages, it is an opportunity to articulate more clearly what these languages mean to the field of linguistics. Rather than assuming that the arguments that have been made for documenting spoken languages can be straightforwardly carried across, we should consider the diverse range of visual-gestural languages on their own terms. Hale et al. (1992) saw what was at stake as far more than the loss of sources of precious data for building and assessing our linguistic theories. Likewise, we must take a broad view that places at the center the roles these languages play in the lives of the people who use them, and that is informed by the literature of Deaf Studies.

But this should not be a matter only for sign language specialists. Sign languages exist alongside spoken languages, and their ecologies are often intertwined. Linguists of all kinds stand to learn much from these languages and have much to contribute toward a more conscious, informed, and coordinated response.

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[ben.braithwaite.best@gmail.com]

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