Scoring sign language vitality: Adapting a spoken language survey to target the endangerment factors affecting sign languages

Abstract

This article explores factors affecting the endangerment levels of sign languages, and how these levels were assessed through an international collaboration using a systematic scoring scheme. This included adapting UNESCO's Linguistic Vitality and Diversity survey and developing a system for determining endangerment levels based on the responses. The survey needed to be carefully revised because even though many spoken language procedures can be also used for sign languages, there are additional challenges and characteristics that uniquely affect sign language communities. In this paper, we present vitality scores for 15 languages, including both national and village sign languages, and the major factors threatening their vitality. The methodology of scoring based on averages is innovative, as is the workflow between the questionnaire respondents and scoring committee. Such methodological innovations can also be useful for spoken languages. In the future, the approach taken in this study might contribute to developing best practice models for promoting sign language vitality and compile diachronic data to monitor changes in endangerment status. The findings can also inform policy work to bring about legal recognition, greater communication access, and the protection of deaf signers' linguistic and cultural identity.

1. Introduction and background

To understand human language, we must study the diversity of its forms and manifestations. But this diversity is drastically diminishing, and many of the world's languages are currently endangered. This threat does not only concern spoken minority languages; signed languages are in similar, possibly even more precarious situations. To study threats to linguistic vitality and diversity, researchers must consider idiosyncratic local factors, general tendencies, and the interaction between the two (cf. Comrie & Jaenecke 2006). This paper aims to show how such factors and tendencies were investigated in a preliminary assessment of vitality for 15 sign languages. This introductory section first offers a brief background on sign language endangerment, using the recently-developed taxonomy[1] of village sign languages (1.1) versus urban or national sign languages (1.2) (e.g. Zeshan & de Vos 2012) and justifies the need to assess sign language endangerment using a specifically adapted tool (1.3).

1.1 Village sign languages

For a long time, sign languages in general have been considered as inferior to spoken ones and sign linguists have worked against great odds to establish the discipline and to prove the equality of sign languages as natural and complex human languages (e.g. Stokoe 1960; Klima & Bellugi 1979; Petitto 1994). In its beginnings, sign language research focussed on western sign languages of larger urban deaf communities, in particular American Sign Language (ASL).

More recently, small-scale signing communities in rural settings with a high incidence of deafness have been documented, e.g. in Ghana (Nyst 2007), Thailand (Nonaka 2007) and Bali (Marsaja 2008). Their sign languages, often called *village* or *rural sign languages*, appear to be unrelated to the official sign languages of their countries (Zeshan & de Vos 2012). Their emergence, courses of development and sociolinguistic settings differ considerably from those of urban sign languages. Many village sign languages exhibit unusual structural features, challenging assumptions about language universals, and a number of them were investigated in the EuroBABEL consortium project 'Endangered Sign Languages in Village Communities' (2009-2012) led by the International Institute for Sign Languages and Deaf Studies (iSLanDS) at the University of Central Lancashire (UCLan) in Preston, UK.[2] Rapid social, demographic and economic transformations and especially contact with larger urban sign languages are seriously threatening the survival of

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[1] Though we use this basic taxonomy to structure this article because it is useful in conceptualising the divergent circumstances in which at-risk sign languages may exist, we wish to point out that the questionnaire (see Appendix) does not assess village and national sign languages separately, nor are there separate questionnaires for village versus national sign languages. Within this paper, every effort is made to indicate one or the other type where it is relevant to the discussion, and to ensure that 'sign languages' as a broad term encompasses both village and national sign languages; however, there may be some remaining ambiguity because it is not feasible to delineate between these two groups of sign languages in every instance.

[2] The authors are very grateful to the iSLanDS Institute at UCLan, as well as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the Foundation for Endangered Languages (FEL). This work and the present article would not have been possible without the immense dedication of these organisations and the many individuals who generously contributed their time and knowledge by providing detailed data on the situation of sign languages all over the world. We greatly appreciate the hard work of the international scoring committee, which includes Kang-Suk Byun, Nick Palfreyman, Cesar Ernesto Escobedo Delgado, and Anastasia Bradford. We are especially indebted to the many deaf signers who have tirelessly provided education and information on their sign languages. It is their expertise and passion above all that drives this work forward.

village sign languages, and some have died out already (e.g. Urubu Kaapor SL[3] and Martha's Vineyard SL, Groce 1985).

These languages are particularly vulnerable to extinction due to their small community size and typically short life cycle. The emergence of village sign languages depends on a particular sociolinguistic constellation, namely the presence of an unusually high concentration of deaf people in small, face-to-face communities (e.g. Zeshan 2010; Kisch 2012; Nyst, Sylla & Magassouba 2012; Nyst 2016). Kisch (2008) refers to them as "shared signing communities" because village sign languages are used by both deaf and hearing people who share a high degree of familiarity and the common "experiential knowledge" of using a visual-spatial language.[4] Often, they are geographically isolated and typically rather homogenous in terms of education and occupation. Changes to their fragile "language ecology" (Nonaka 2012; Haugen 1972) can cause village sign languages to disappear in the course of only one or few generations.

1.2 National sign languages

Endangerment concerns not only rural sign languages but also larger national sign languages (see e.g. McKee 2017, Wilcox, Krausneker & Armstrong 2012, De Meulder 2017). These languages are used by larger communities than rural sign languages, and employed across a variety of domains in everyday life (De Vos & Zeshan 2012). Many national sign languages continue to thrive within deaf communities, and form part of their collective memories (Padden 1990; see also Bickford et al. 2015: 524). However, the closure of deaf schools and deaf clubs in developed countries has had the effect of dispersing and isolating signers, reducing opportunities to acquire and improve signing skills (e.g. Ladd 2003; Padden 2008). Most deaf people first encounter sign language at school, because the vast majority are born to non-signing parents. This makes educational settings highly influential over the uptake of sign languages.

The rejection of a minority (signed or spoken) language or failure to learn it can stem either from bilingual parents not using the language with their children, or from children learning the language at home but then "rapidly reject[ing] the use of the heritage language when they have entered the domains of national schooling and national, urban/metropolitan, transnational or globalised culture" (Anderson 2011: 274). Because such a low percentage of deaf children have parents who are fluent in a sign language (<10%, and possibly as little as 5%, e.g. Mitchell & Karchmer 2004), the likelihood of parent-to-child transmission is already statistically small,[5] and this makes institutions such as deaf schools crucial for sign language transmission. The predominance of spoken language in schools and society creates further disincentives to use sign languages. Medical professionals' advocacy of cochlear implantation is sometimes accompanied by explicit instructions not to use sign language, such that even bilingual signing parents (whether hearing or deaf) may be encouraged to avoid signing with their child (e.g. Wrobel 2014: 29-30).

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[3] https://www.ethnologue.com/language/uks (29 May 2018)

[4] As one reviewer suggested, some village signing communities could well be described as "societies of intimates" (Givón 2002). However, the village sign languages included in this survey might be too diverse in their sociolinguistic features to enable generalisations about their principles of social cooperation, leadership-structure or decision-making as described in Givón (2002).

[5] Hearing children may also learn and value the language, but they are unlikely to use it as their primary or preferred language, due to the overwhelming majority status of speech.

On the other hand, urban sign languages are more likely than village sign languages to be recognised by law and supported by institutions and language policies (De Vos & Zeshan 2012). More than 30 countries have recognised their national sign language, and most of these are in the EU (De Meulder 2015). Urban sign languages that have had explicit governmental recognition, whether as part of a specific sign language act or as part of general language legislation, include those of Uganda (1995), Latvia (1999), Uruguay (2001, 2008), Spain (2007), Estonia (2007), Sweden (2009), Iceland (2011), Zimbabwe (2013), and Denmark (2014), among others (see e.g. De Meulder 2015; Pabsch 2017). Sometimes a government recognises more than one sign language, as Finland did for Finland-Swedish Sign Language and Finnish Sign Language with its Sign Language Act in 2015 (De Meulder 2017: 197). However, legal recognition does not guarantee equal status and the minority sign language(s) do not always receive the same amount of institutional support.

Another potentially protective factor supporting national sign languages in particular is that webcam technology now enables people to communicate in sign language across long distances. This technology and the modern upsurge in international air travel has been harnessed by some deaf community members as a way to engage in cross-cultural signed communication, and exploit multilingual skills and strategies (e.g. Zeshan 2015; Byun et al. 2017; Zeshan & Webster, forthcoming).

1.3 Importance of including sign languages in endangerment/vitality surveys

Some of the factors contributing to sign language endangerment are similar to the factors affecting minority spoken languages, such as socio-political oppression. Others are specific to sign languages, such as the disappearance of sign languages from schools, the increasing use of cochlear implants,[6] and the dearth of support and infrastructure for deaf children and families who want to sign (e.g. Okalidou 2010; Anglin-Jaffe 2013). But sign languages have for a long time been omitted from documentation efforts on the one hand and from policies and campaigns for language protection on the other. As they are an integral part of the world's linguistic diversity and multicultural landscape, their inclusion in language endangerment surveys is essential. Mapping and monitoring the status of endangered sign languages form an important base for developing campaigns to promote signers' rights and lobby for sign language recognition and communication access for deaf people.

The present article addresses this need by exploring factors affecting the vitality levels of sign languages, and how these levels have been assessed for several languages through international collaborative work, using a systematic numerical scoring scheme. This involved adapting UNESCO's Linguistic Vitality and Diversity survey to make it suitable for sign language data, and developing a system for determining endangerment levels based on the questionnaire responses.

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[6] A cochlear implant is an electronic device, implanted through surgery, which can enable deaf or hard-of-hearing people to receive and process sound signals into the auditory nerve and help them to understand and acquire spoken language. In some countries, the majority of children born deaf receive a CI (see https://www.svd.se/fragor--svar-om-cochlea-implantat, 21 May 2018). Apart from technical problems (e.g. difficulty in filtering background noise), many deaf community members express concerns towards the increasing use of CIs as a threat to their linguistic and cultural identity, especially if implantation and speech therapy are done at the expense of sign language acquisition. Many studies confirm that early sign language acquisition supports the development of spoken language in CI-implanted children (e.g. Davidson, Lillo-Martin & Chen-Pichler 2014).

Section 2 covers some of the other scales for rating language vitality and previous work in this area (2.1), and then goes into more detail about UNESCO's survey and endangerment levels (2.2). Section 3 explains how and why the survey was adapted to be used for gathering data on sign languages; the process of collecting and evaluating this data is discussed in section 4. In section 5, the results of this work are presented, starting with the 15 languages rated so far and their scores (5.1), moving on to a specific focus on the threats encountered by village sign languages (5.2) and national sign languages (5.3), and ending with a summary of the general trends discernable from the data (5.4). Section 6 concludes the paper by discussing future perspectives in terms of the further research required as well as how these findings can inform policy work to implement greater protection for these languages and their communities.

2. Rating the vitality of sign languages

To provide some background context for the discussion of how sign languages were assessed, this section gives a brief overview of attempts to measure language vitality (2.1) and a summary of UNESCO's characterisation of language endangerment through its Atlas (2.2).

2.1 Assessing language vitality

Systematic measurement of language vitality began in earnest in the early 1990s (e.g. Fishman 1991), and has been carried out for the purposes of preservation and to advance research into linguistics, cultural heritage, ecology, identity, human rights and education (Sallabank 2010: 57-63). Fishman (1991: 81) portrays such measuring as an essential part of reversing language shift (RLS), noting that RLS

> involves the authoritative allocation of scarce resources, such as intelligence, funds, time, effort and implementational power, to the solution of language status problems, i.e. to problems that are due to the shrinking number of users that a language has or to the meagre importance of the uses with which it is commonly associated [...]. Threatened languages […] are languages that are not replacing themselves demographically, i.e. they have fewer and fewer users generation after generation and the uses to which these languages are commonly put are not only few, but, additionally, they are typically unrelated to higher social status (prestige, power) even within their own ethnocultural community, this being a reflection of the relative powerlessness of the bulk of their users.

However, the way in which scholars define 'threatened' and 'endangered' varies across the literature, as pointed out by Whalen and Simons (2012: 163). They range from being strictly defined as meaning that the language is not usually being passed on to the next generation (as in the UNESCO Atlas, described in section 2.2), to a less acute definition meaning that the language is vital at the moment but is at risk within a few decades of not being passed on to children anymore (Krauss 1992). When the latter definition is used, the word 'moribund' is employed for the stricter meaning, to describe languages that are not being passed down at all (ibid.).

It is notable that vitality scales differ in whether they have a 'positive' or 'negative' orientation. Some attempts to classify the endangerment of languages used a negative orientation, i.e. a higher

rating or number means the language is more endangered; others a positive one, i.e. a higher rating means the language has more vitality. Krauss (2007) uses a positive scale where 'safe' languages are rated as A+, and endangered languages are rated A ('stable'), A- ('unstable' or 'eroded'), B ('definitely endangered'), C ('severely endangered'), and D ('critically endangered'). The final rating of E is for extinct languages. Fishman (1991) recommends the Graded Intergenerational Disruption Scale (GIDS), a negative classification. He compares the categorisation or rating of vitality levels to the Richter scale for earthquakes: "High numbers are indicative of stronger tremors, i.e. of greater disruption of the established, normal geological strata and, accordingly, of greater threat to those living in the vicinity of the quake" (ibid: 87). Likewise, GIDS rates languages on a scale of 1 to 8, to measure "sociolinguistic disruption", with higher numbers indicative of greater disruption and a "more severe or fundamental threat to the prospects for the language to be handed on intergenerationally" (ibid). GIDS is implicational in that a language with a score of 7 for example also features all of the endangerment characteristics of scores 1 to 6 (ibid). This scale was the basis for the Expanded Graded Intergenerational Disruption Scale (EGIDS), which was created by Lewis and Simons (2010) and has 13 levels (see Table 1). EGIDS is designed to be inclusive of any language, even those that no longer have any speakers and those that are currently undergoing revitalisation. Level 0 is for large-scale international languages, and level 10 is for extinct languages; levels 6 and 8 are subdivided into two each, making 13 levels in total (Lewis & Simons 2010: 110-113). To determine a language's level, EGIDS uses five questions about "identity function, vehicularity,[7] state of intergenerational language transmission, literacy acquisition status, and a societal profile of generational language use" (Lewis & Simons 2010: 118).

Table 1: Expanded Graded Intergenerational Disruption Scale (EGIDS), from Lewis & Simons (2010: 110), adapted from Fishman (1991)

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[7] 'Vehicularity' is defined as how much the language is used as a lingua franca, i.e. 'the extent to which a language is used to facilitate communication among those who speak different first languages' (Lewis & Simons 2010: 115).

LEVEL	LABEL	DESCRIPTION	UNESCO
0	International	The language is used internationally for a broad range of functions.	Safe
1	National	The language is used in education, work, mass media, government at the nationwide level.	Safe
2	Regional	The language is used for local and regional mass media and governmental services.	Safe
3	Trade	The language is used for local and regional work by both insiders and outsiders.	Safe
4	Educational	Literacy in the language is being transmitted through a system of public education.	Safe
5	Written	The language is used orally by all generations and is effectively used in written form in parts of the community.	Safe
6a	Vigorous	The language is used orally by all generations and is being learned by children as their first language.	Safe
6b	Threatened	The language is used orally by all generations but only some of the child-bearing generation are transmitting it to their children.	Vulnerable
7	Shifting	The child-bearing generation knows the language well enough to use it among themselves but none are transmitting it to their children	Definitely Endangered
8a	Moribund	The only remaining active speakers of the language are members of the grandparent generation.	Severely Endangered
8b	Nearly Extinct	The only remaining speakers of the language are members of the grandparent generation or older who have little opportunity to use the language.	Critically Endangered
9	Dormant	The language serves as a reminder of heritage identity for an ethnic community. No one has more than symbolic proficiency.	Extinct
10	Extinct	No one retains a sense of ethnic identity associated with the language, even for symbolic purposes.	Extinct

Bickford, Lewis and Simons (2015) discuss adapting EGIDS to make it suitable for sign languages, including allowing for their different trajectories of intergenerational transmission (e.g. most signers learn the language from people outside their family), and effects stemming from institutional support, education, and literacy. For instance, although written literacy may boost the vitality of a spoken language, this is not as applicable to sign languages, whose vitality is more likely to be more influenced by support from schools and the creation of resources and literature (ibid: 519). Furthermore, these protective factors are scarce in the case of village sign languages

(see section 5.2). Therefore, the question of which sign language (e.g. a small-scale indigenous one or a national one) is being used in educational institutions is crucial (ibid: 520). As approximately 95% of deaf children are born to hearing parents, many deaf children do not have the chance to acquire sign language from their caregivers, but have their first contact with sign language (and often, a deaf community) only when they enter school or early childhood education. Also, and this is different from the situation of spoken languages, teaching in sign language is the only way for deaf children to have full access to education. Traditionally, deaf schools are also important centres for the transmission of deaf culture.[8]

Bickford et al. (2015: 521) point out that additional factors must be taken into account when rating sign language vitality, such as the prevalence of deafness in a particular area, and the uptake of technological changes aiming at reducing the incidence of deafness. When the decrease in deafness is causing the language community to disappear, Bickford et al. (2015: 522) suggest placing the sign language at level 6b, which is defined in EGIDS as 'threatened'. This means that 'only some of the child-bearing generation are transmitting it to their children' (Lewis & Simons 2010: 110), and 'it is losing users' (Bickford et al. 2015: 516). They also mention that sign languages have qualities of regenerative resilience that spoken languages often lack, leading to national sign languages in particular being able to survive due to the themes of 'folk explanations' (Padden 1990). They survive despite decades of systematic oppression, unlike the many minority spoken languages which have been rendered extinct by similar marginalisation (ibid: 524; also see section 5.3 below). However, small-scale local sign languages may not be as resilient, as often their communities shift toward the stronger national sign language (Bickford et al. 2015: 524; also see section 5.2).

Another more recent tool for measuring vitality is Lee and Van Way's (2016) Language Endangerment Index (LEI), used in the Catalogue of Endangered Languages (ELCat). ELCat is a key component of the Endangered Languages Project, which runs on Google (ibid.). The LEI includes four criteria: "intergenerational transmission, absolute numbers of speakers, increasing or decreasing numbers of speakers, and domains of use" (Grenoble 2016: 294; Lee & Van Way 2016). The ELCat system differs from UNESCO's because it gives a different weight to each factor, and focuses more on illuminating factors relevant to vitality rather than assessing vitality per se (Grenoble 2016: 294). By taking the factors into account, the LEI provides an overall sense of a language's vitality, and presents a certainty level which is derived from how many factors the researchers used in their evaluation; therefore, it is not necessary to have comprehensive information about all of the factors (Lee & Van Way 2016: 277-278). The ELCat system also does not consider vitality to be adversely affected by gaps in documentation or a lower quality of documentation (ibid.).

2.2 UNESCO's Atlas

For over a decade, one of the main ways in which endangered languages have been catalogued and tracked is through UNESCO's language atlas. The UNESCO *Atlas of the World's Languages in Danger* (Moseley 2010) is a key reference book on endangered languages, with an interactive

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[8] Note that in village sign language communities, where there is often a high proportion of hearing signers and less social separation between deaf and hearing people, deaf children get access to sign language more easily at an early age even if their parents are not deaf.

online version. It contains information on approximately 2,500 endangered languages, including hundreds of extinct languages, and displays the geographic location and an endangerment ranking for each language (see Figure 1). Its aim in mapping minority languages and highlighting how many are in danger of disappearing soon is to increase awareness among policy-makers, communities and the general public about protecting linguistic diversity (Moseley 2010).[9]

UNESCO's system for rating vitality has six levels and involves nine factors (Moseley 2010), which all have the same weight, unlike the four criteria used in the LEI for ELCat (Grenoble 2016: 294). The objective of the UNESCO survey is to provide a methodology for data collection. It relies on a questionnaire with which trends in numbers of language users, language endangerment, and linguistic diversity can be verified. The Foundation for Endangered Languages (FEL) orchestrates the collection and collation of the data, and then passes it on to UNESCO for mapping.
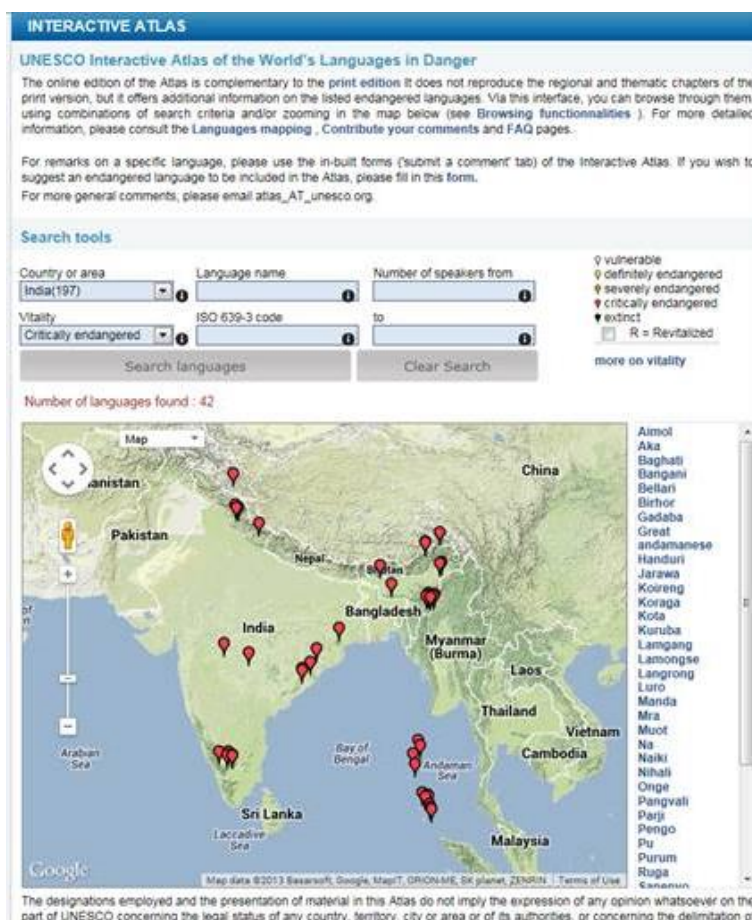

Figure 1: A search using UNESCO's Interactive Atlas, showing that India has 42 critically endangered spoken languages.

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[9] After submission of the present article in 2018, UNESCO launched a new 'Survey of World Languages' (http://uis.unesco.org/en/news/unesco-survey-world-languages-launched) that includes a sign language questionnaire and a spoken language questionnaire, so that they can release an updated version of their interactive Atlas in 2019. This new Atlas is aimed at providing information on the world's languages more generally, rather than focussing only on language endangerment. Unfortunately it is outside the scope and timescale of this paper to analyse the differences between their new sign language questionnaire and the one described herein.

UNESCO's questionnaire has two main sections: "Language Vitality and Endangerment" (which was developed by an international group of linguists between 2002 and 2003) and "Linguistic Diversity Indicators". While this was a helpful starting point for the present work, the questionnaire needed to be adapted in order to collect information about signed languages, and Section 3 explains how this was carried out.

3.   Adaptation of the questionnaire

Between 2002 and 2010, the UNESCO survey was used to gather information on spoken languages only, as the initial group of experts who created the questionnaire did not include any sign language linguists. Scholars at iSLanDS, along with other sign language linguists, NGOs and deaf sign language users, wanted to find out where sign languages fit into the endangerment scale to be able to protect them more effectively. This prompted the update of the questionnaire (see Appendix) so that the questions and answer options could be more specific to signed languages, while enabling the comparability of sign language data with the existing spoken language data.

In June 2010, several academics including Ulrike Zeshan, the director of iSLanDS, met in Paris to discuss the endangered languages survey. In November 2010, a conference on endangered sign languages, organised by the World Federation of the Deaf (WFD) and the European Union of the Deaf (EUD), was held in Norway. The iSLanDS Institute then worked with the WFD Expert Committee on Sign Languages and the aforementioned EuroBABEL consortium project on village sign languages to adapt UNESCO's questionnaire. Ulrike Zeshan took the lead in developing a new version of the survey in 2011, aiming to make the instrument appropriate for the sociolinguistic particularities of sign languages and deaf communities while maintaining highest possible analogy to the original questionnaire. The aim was to choose features from the original survey that were especially important for determining the vitality of a sign language. For example, as explained above, use in education has much more of an impact on the vitality of a sign language than it does on a spoken language.

Comments from numerous peer reviewers across the globe were sought and implemented in this adaptation process. Adjusting the questionnaire was challenging due to the relative dearth of research on signed languages and the lack of reliable demographic statistics (as noted by a questionnaire respondent, who requested guidelines on where to obtain such statistics). For example, 'reference community' is an empirically vital but nebulous concept in the context of sign languages; after obtaining feedback on this problem a description of 'reference community' was provided in the 'definitions' section at the beginning of the questionnaire (see Appendix), including an example calculation:

> For sign languages, it is not obvious what the definition of "reference community" should be because the concept of a "reference community" for spoken languages is not easily applicable to many sign language situations. In principle, the "reference community" means all people who may be expected to be using a particular language variety according to their ethnicity, heritage,

culture, history and geography. […] For many sign languages, it is not easy to say exactly "who should be expected to use sign language" in this sense.

The questionnaire goes on to list the people who may be in a sign language's 'reference community', including deaf people of all ages, except those deafened due to old age; hearing relatives, spouses, siblings, and children of deaf people; and hearing people who are in regular contact with deaf people, such as neighbours, interpreters, and colleagues.

Because not all deaf people are sign language users, definitions of 'sign language user' are also unclear, especially with the ever-increasing number of people with cochlear implants. Some people, for instance, may consider an individual to be a 'sign language user' even though s/he is unaware of the grammar of the sign language and uses lexical signs in the grammatical order of a national or native spoken language. In some places, sign language use can be stigmatised and people may not declare themselves as being signers even though they sign regularly and proficiently. Seemingly intuitive notions like 'fluent user' are sometimes ambiguous in the context of sign languages. Such possibilities were accounted for in footnotes under several of the questionnaire items, and the following definition of 'sign language user' was included at the beginning of the questionnaire (see Appendix), on page 6:

> A sign language user (signer) is anyone who uses the natural sign language variety of the reference community in conversations at least some of the time. This is irrespective of the person's hearing status; that is, sign language users may be deaf, hearing, or hard of hearing. Persons who use a contrived signing system (such as Signed English) only for educational purposes are not sign language users for the purpose of this questionnaire.

The issue of who should fill in the questionnaire was also debated among the committee. The original version specified 'linguists' as the target group, but very few deaf signers are trained linguists due to systemic inequalities and barriers in education and the relative newness of sign language research as a field. This left open the risk of the questionnaire being completed by hearing linguists with little signing skills and/or connection to the target deaf community. To obtain more information about the respondent's background, the following question was added in the box for the respondent to fill in their contact details,: 'Also state how you know the language, e.g. are you a (sign) linguist who is also a native user of the language in question, a (sign) linguist in cooperation with a native user, a non-linguist from the sign language community, etc.'

Other circumstances that had to be allowed for in the adaptation included that sign languages are minority languages compared to dominant spoken languages, but in some countries there are also minority sign languages versus dominant national sign languages. So while endangered spoken languages are usually under threat from more dominant spoken languages, endangered sign languages might be threatened by both spoken languages and more dominant sign languages (e.g. Lanesman & Meir 2012; Zeshan & de Vos 2012). It was essential to consider such circumstances when adapting the questionnaire. However, it was not feasible or desirable to create a separate questionnaire or special questions for village sign languages. The questions were tailored to permit responses about both village sign languages and national sign languages, and the questionnaire does not present a dichotomy. The only specific mention of village sign languages appears at the beginning of the questionnaire, where the term 'reference community' is defined:

In the case of "deaf villages", i.e. rural communities with a high incidence of hereditary deafness where a local sign language has been developed and is used by both deaf and hearing people, the reference community may simply comprise the entire village.

Furthermore, changes in technology, especially cochlear implants, affect sign languages much more directly than spoken languages. Finally, the rhetoric of policies is often less indicative of reality in the case of sign languages; in many cases there is a large gap between the official/legal situation of sign languages and the real situation that signers actually face. This means that questionnaire items on the official status and use of a language in deaf education might reveal little about the actual situation.

Most questions were adapted by necessity in order to account for these and other different factors affecting sign languages, and additional comments were also provided where necessary. In addition, some of the wording (e.g. 'speakers', 'speech community') implied that only oral-aural languages were relevant, and some items (e.g. about use of the language on the radio) were not applicable to signed languages. Other questions required supplemental information, greater specificity, or clarification. For example, when evaluating the use of a sign language vs. "more dominant languages" in education, a sign language may be in competition with a larger majority sign language and/or an artificial signed/manual code such as Sign Supported English.[10] Regarding a question about domains of language use, one respondent providing data about a minority sign language asked, 'What is the comparing target for this question? Shall the domains of language use be compared to spoken language domains or to a dominant sign language?' Such queries were of considerable value when clarifying and specifying the questionnaire items (see Figure 2 for an example of some items in the adapted survey).

As per the remit of the original UNESCO survey, the aim was to gather as many independent reports covering as many signed languages as possible, to enhance the reliability of the data, validate the pertinence of the questions, and ensure that the resulting generalisations are useful in the future for communities, researchers and policy-makers. However, the original survey did not have a scoring mechanism that took individual factors into account in a systematic way; contributors were simply asked to fill in a vitality score based on their knowledge of the language's current situation. In the adapted survey, it was important to generate a more transparently justifiable vitality score for each language by considering the scores for the individual factors, and this process is explained in Section 4.

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[10] Manual systems or codes like Sign Supported English are visual-manual representations of a spoken language. Unlike sign languages, which evolved in deaf communities and have their own grammar, manual codes are contrived systems that follow the grammar of their respective spoken language.

3. Proportion of signers within the reference community	5 ☐	Nearly all use the sign language (>90%)	Reliability Index:	Comments (including the size of the reference community, if known)
	4 ☐	The great majority use the sign language (70-90%)	3 ☐	
	3 ☐	A majority use the sign language (50-70%)	2 ☐	
	2 ☐	A minority use the sign language (30-50%)	1 ☐	
	1 ☐	Very few use the sign language (<30%)	0 ☐	
	0 ☐	None use the sign language (i.e. the language no longer exists)		

Note: Please refer to the definition of reference community above.

Note: The following question is only for situations where a new sign language is emerging, which is used only by younger signers and has no longer history. Therefore, options 2-5 consider only people in age groups of the oldest available signer and younger, where the oldest signer could be at any age, for example, a young adult. It is very difficult to decide whether a variety of signing is a "young/emerging sign language" or an instance of home sign. Criteria include the size and stability of a community of sign language users, the number of generations using the language (time depth), and the level of conventionalisation.. Systems ranking low on these criteria may be home sign systems, but the decision needs to be made by the individual respondent. There is probably a continuous scale of signing varieties along these (and other) criteria. Home sign systems are outside the scope of this questionnaire, so if you think you are dealing with a home sign system, the questionnaire will not apply. See also the note under 4a. about the meaning of "competent" sign language use.

4a. Generational or age-group language use			Reliability Index:	Please specify whether your answers pertain to 'generation' or 'age group', and add further comments if desired.
	5 ☐	All generations / age groups, including most children, use the language competently	3 ☐	
	4 ☐	Most adults and some children use the language competently	2 ☐	
	3 ☐	There are few child signers, and many in the parent generation / age group have considerable interference from language contact with other signed/spoken languages	1 ☐	
	2 ☐	Only some in the parent generation / age group, and older, use the language competently	0 ☐	
	1 ☐	Only grandparents and older generations / age groups use the language competently		
	0 ☐	Nobody uses the language any more		
	☐	Other specific situation (please describe in comments box)		

Note: Using the sign language "competently" means using its own native vocabulary and native grammatical structures. When people use signs in the order of a spoken language to make it parallel to speaking, when a lot of fingerspelling and/or borrowing from another sign language's vocabulary is used, when people accompany their speech with some signs unsystematically, and/or when an artificial signed code is used instead of the natural sign language, these are features of interference from language contact. If you are responding in terms of age groups, you can specify in the comments box what age ranges you are considering.

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9. Use of the target sign language in deaf education	5 ☐	There is a national / regional / local policy to support the use of the target sign language as part of the curriculum in all deaf schools.	Reliability Index:	Comments
	4 ☐	Deaf schools are encouraged to use the target sign language, and resources are provided, but this is done on a choice basis at some schools only.	3 ☐	
	3 ☐	No particular language policies / guidance are implemented in deaf schools, but the target sign language is used widely in an ad hoc way, and attitudes 'on the ground' may be positive.	2 ☐	
	2 ☐	No policy or resources support the use of the target sign language, and there is a negative view towards sign language in deaf education.	1 ☐	
	1 ☐	The use of signing is explicitly discouraged or prohibited in deaf education.	0 ☐	
	0 ☐	Not applicable – there is no formal education for deaf children.		
	☐	Other (please describe in comments box)		

Note: Please comment on whether the target sign language is in competition with an artificial signed code, or with a larger, majority sign language. If the target sign language is not supported in deaf education, but another form of signing is supported, please mention which sign language or signed code is used in education.

10. Reference community members' attitudes towards their own sign language	5 ☐	All members value the language of their community and wish to see it promoted.	Reliability Index:	Comments:
	4 ☐	Most members support the continued use of their language.	3 ☐	
	☐	Most members value the sign language, but the most important stakeholders do not.	2 ☐	
	3 ☐	Many members support language maintenance; some are indifferent or may even promote shift to the dominant language.	1 ☐	
	2 ☐	Some members support language maintenance; many are indifferent or may even support language shift.	0 ☐	
	1 ☐	Only a few members support language maintenance but most are indifferent or may even support shift to the dominant language.		
	0 ☐	No-one cares if the language disappears; all prefer to use the dominant language.		

Note: If available and relevant, you may include information about the attitudes of specific sections of the community in the comments section.

Figure 2: Some items from the adapted questionnaire (see Appendix for the full questionnaire)

After the adaptation of the questionnaire was complete, the updated version was sent to linguists and deaf community leaders starting in 2012 (see Figure 2). Their responses were used by the committee to score the languages, as described in the next section. A video in International Sign with a summary of the project and instructions on filling out the questionnaire are provided on the project   website

4. Data collection and evaluation

Sign language experts from different countries worldwide completed questionnaires, which were then analysed by an international project committee, including linguists and deaf community leaders from Germany, Korea, Mexico, the USA, Austria and the UK (iSLanDS Institute 2013). The aim was to choose features from the original survey that were especially important for determining the vitality of a sign language. For example, use in education has much more of an impact on the vitality of a (national) sign language than it does on a spoken language. The committee identified ten key factors to be used in calculating the vitality score for each language, as these were assessed as being the most relevant to the endangerment of sign languages. As shown in Table 2, some of the factors mirrored those in the original questionnaire, while others were altered to more closely target the particular features affecting sign language vitality, such as use in deaf education and institutional policies.[11]

1. Proportion of signers in the reference community
2. Generational or age group language use
3. Domains of language use
4. New domains
5. Materials for language spread and education
6. Governmental and institutional language attitudes and policies
7. Use of the target sign language in deaf education
8. Reference community members' attitudes towards their own sign language
9. Type and quality of documentation
10. Status of language programmes

For the most part, these factors were taken from the original UNESCO questionnaire for spoken languages, which are listed as follows in UNESCO's document on language vitality and endangerment (2003). Table 2 compares the factors used in the original UNESCO survey and our adapted questionnaire for sign languages.

Table 2: Factors in original UNESCO survey and adapted survey for sign languages

Factor #	Original UNESCO questionnaire	Questionnaire adapted for sign languages
1	Intergenerational language transmission	Proportion of signers in the reference community
2	Absolute number of speakers	Generational or age group language use

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[11] Note that a previous summary report on this work (Safar & Webster 2014) listed nine factors because items 3 and 4 ('Domains of language use' and 'New domains') were combined into one factor for the purposes of the report. In the questionnaire and in the scoring process, these items were treated as separate factors.

3	Proportion of speakers within the total population	Domains of language use
4	Shifts in domains of language use	New domains
5	Response to new domains and media	Materials for language spread and education
6	Availability of materials for language education and literacy	Governmental and institutional language attitudes and policies
7	Governmental and institutional language attitudes and policies, including official status and use	Use of the target sign language in deaf education
8	Community members attitudes towards their own language	
9	Type and quality of documentation	
10		Status of language programmes

The vitality score is calculated based on a combination of these factors, as no factor alone can determine how safe or endangered a signed or spoken language is. However, some modifications and additions to the original set of factors were necessary. One modification concerned the relevance of absolute vs. relative numbers of language users. In the questionnaire, these numbers were addressed separately (see Appendix, Questions 2 and 3) to assess the total amount of users of the sign language as well as the proportion of signers in relation to the reference community.[12] In the introduction on how to fill out the questionnaire (see Appendix, p. 5), guidelines were provided on how to calculate the size of the "reference community". Estimating the size of the reference community for sign languages can be difficult due to the absence of reliable census data and also because it is not straightforward to determine "who should be expected to use a sign language" (see also Johnston 2004; McKee 2017 for a discussion of the challenges in assessing the accurate number of (deaf) sign language users). As mentioned in Section 3, the guidelines suggested including deaf people as well children, siblings, spouses and other relatives of deaf people as well as other hearing people in regular contact with deaf people.

However, in calculating the vitality score for sign languages, Factor 2 for spoken languages (Absolute number of speakers) was removed as sign languages cannot be compared to spoken languages in this respect. As deaf people constitute a minority of the population, the numbers of language users are always small compared to spoken languages, irrespective whether these languages are used in urban or rural settings. The absolute number of signers is thus much less

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[12] The questionnaire states that all signers are to be included, regardless of hearing status, but it may be the case that some respondents did not fully follow this guideline, and only included people who use the sign language as their first or preferred language, especially for national sign languages.

informative than the relative number of signers in the reference community (Factor 1 for sign languages). The absolute number of signers nevertheless constituted important background information for assessing the vitality of a particular sign language. One strength of the workflow of our committee and the close collaboration with contributors is that we could discuss particular scores when we encountered uncertainty. In cases where the score for a sign language was between two vitality levels (as discussed below for AJSL), the absolute number of speakers was a useful criterion to assign a score.

Apart from that, two additional factors were used for the evaluation of the questionnaires: Factor 7 (Use of the target sign language in deaf education) and Factor 10 (Status of language programmes). As argued in Section 2.1, the use of sign language in education is indeed crucial for the vitality of sign languages, even more so than for spoken languages. Because sign language transmission often takes place outside the family a deaf child is born into, language programmes that aim to promote the use and maintenance of a language can be vital and were thus taken into account in the adapted questionnaire. Such programmes can include summer schools, children's summer camps with language elements, programmes that promote sign language teaching to hearing people, and cultural events such as performances of sign language poetry or drama. In the case of village sign languages, the typical scenario of language acquisition is different as these languages are more commonly transmitted within the family and community rather than in schools. In village signing communities, a separate deaf community with its own cultural identity and cultural activities often does not exist.

For each of the ten factors described above, a score between 0 and 5 was assigned based on the responses in the questionnaire, and then the ten factors were averaged. To account for the fact that formal education does not exist at all for deaf people in some locations (especially in village signing communities) and the score for 'use of the target SL in deaf education' was thus 0, Factor 7 was excluded from the average. See Figure 3 for an example of the scoring for Chican Sign Language in Mexico.

Name of sign language: <u>Chican Sign Language</u>

question	area	score (0-5)
Q3	'Proportion of signers within the reference community'	2
Q4a or Q4b	'Generational or age group language use'	3
Q5	'Domains of language use'	5
Q6	'New domains'	0
Q7	'Materials for language spread and education'	0
Q8	'Governmental and institutional language attitudes and policies'	3
Q9	'Use of the target sign language in deaf education'	n.a.
Q10	'Reference community members' attitudes towards their own sign language'	4
Q11	'Type and quality of documentation'	1
Q12	'Status of language programmes'	1
Average		19/ 9 = **2,1**

Figure 3: Example of the scoring process

In case the average value was in between two vitality levels (e.g. a score of 2.5 would lie between *severely* and *definitely endangered*), the committee had to decide which level was more appropriate for the language in question, relying on guidance from the contributor(s), previous research findings, and comparison with languages that had already been scored. A rationale was provided for each language to justify and make transparent how the scoring was assigned. For example, a score between 1 and 2 was calculated for Algerian-Jewish Sign Language (AJSL). After consultation with the contributor and in the light of a study by Lanesman (2012), which argued that this language's sociolinguistic setting has disappeared and it faces possible extinction in the next 15-20 years, the committee decided that a vitality level of 1 (critically endangered) was appropriate for AJSL.

This interactive evaluation process also helped to compensate for the fact that one single scale is used for both village and national sign languages, which may face quite disparate threats. It is still an open question as to how we might better allow for village and national sign languages in the same scale. Spoken languages also differ widely and yet are typically evaluated using the same scales. As aforementioned, the questionnaire is not structured according to the differences between village and national sign languages, and neither is there any intention of creating two different

scales. In fact, the ultimate aim is for a questionnaire and scale that not only works for both groups of sign languages, but is effective cross-modally, for both spoken and signed languages.

Committee members produced each score and rationale by working in pairs, and these findings were cross-checked with the rest of the committee as well as with the original questionnaire contributor(s). The results were submitted to the FEL in several batches for inclusion in the next Atlas (see Section 5).[13] The committee corresponded with the contributors throughout the process in order to establish the modalities of cooperation, including how they wished to be recognised for their input. The systematic numeric scoring scheme on the one hand, paired with the interactive workflow between committee and respondents on the other hand (i.e. the inclusion of a "comments" section in the questionnaire, and communication with respondents in the course of the data analysis), proved to be very fruitful for data collection. We would like to see the implementation of a similar methodological procedure for spoken languages as well, which may increase the accuracy of language vitality ratings and bolster the engagement and linguistic awareness of language communities. However, an analysis of precisely how these innovations could be applied to spoken language research is beyond the scope of this article.

5.   First results

This section presents some results from the scoring of 15 sign languages (5.1), and then focusses more specifically on threats to two sub-sets of these languages: village sign languages (5.2) and national sign languages (5.3). This is followed by a summary of the general trends discernible from the data so far (5.4).

5.1. Vitality of sign languages included in the survey

The team analysed the vitality level of 15 sign languages (see Table 4). The 15 languages represented here were the first batch of reponses the committee received from language experts who completed the questionnaire. The levels of endangerment are comparable to those for spoken languages appearing in the UNESCO Atlas (Moseley 2010), which are shown in Table 3. Instances of safe (level 5) or extinct sign languages (level 0) have not yet been targeted.

Table 3: Levels of endangerment with an example of a sign language at each level (village sign languages are in bold)

Level of endangerment	Score	Example
Safe	5	
Unsafe/vulnerable	4	Austrian Sign Language
Definitely endangered	**3**	**Kata Kolok, Bali, Indonesia**

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[13] At the time of writing, the publication of UNESCO's next edition of the interactive Atlas is expected in 2019.

Severely endangered	2	Finland-Swedish Sign Language
Critically endangered	**1**	**Mardin Sign Language, Turkey**
Extinct	0	

The results for the first 15 sign languages indicate that endangerment deserves the attention of linguists, NGOs, policy makers and governments. Even national sign languages, which are recognised by law and used by larger communities, are to some degree threatened by extinction (e.g. De Meulder 2017; McKee 2017).

Out of the 15 languages, three were scored as *critically endangered*, four as *severely endangered*, four as *definitely endangered* and four as *unsafe/vulnerable*. The languages most threatened by extinction are the ones with the smallest user communities (Algerian Jewish SL, Mardin SL, and Inuit SL, which are used by between 40 and 100 signers). The map in Figure 4 shows the geographic location of each sign language included so far.

Figure 4: Locations of the 15 sign languages that were scored[14]

Table 4 shows the endangerment levels of all the sign languages included in the survey so far and the approximate number of users as well as the names of the contributors who provided data. The low number of users for most of these languages is quite notable, and this perhaps signals that longitudinal data is needed to show trends in user numbers and vitality over time. So far, this table only provides a snapshot and does not indicate future trends.

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[14] NB the pin for India is off-centre due to a technical glitch in this image.

Table 4: Results from the survey on endangered sign languages (village sign languages are in bold)

Name of Sign Language	Name of Contributor	Approximate Number of Users	Country	Level of Vitality
Algerian Jewish Sign Language (AJSL)	Sara Lanesman and Irit Meir	50-100	Israel	1
Alipur Sign Language (APSL)	Sibaji Panda	10,000	India	3
Al-Sayyid Bedouin Sign Language (ABSL)	Shifra Kisch	1,500	Israel	3
Austrian Sign Language (ÖGS)	Austrian Deaf Association (ÖGLB)	20,000	Austria	4
Ban Khor Sign Language (BKSL)	Angela Nonaka	403	Thailand	2
Brazilian Sign Language (Libras)	Ronice Müller de Quadros	Unknown	Brazil	4

Chican Sign Language (ChicanSL)	Cesar Ernesto Escobedo Delgado and Olivier Le Guen	349 (17 deaf, 332 hearing)	Mexico	2
Danish Sign Language (DTS)	Danish Deaf Association	4-5,000	Denmark	4
Ethiopian Sign Language (EthSL)	Eyasu H. Tamene	70,000	Ethiopia	3
Finland-Swedish Sign Language (FinSSL)	Karin Hoyer and Janne Kankkonen	300	Finland	2
Inuit Sign Language	Joke Schuit	40	Canada	1
Kata Kolok	Connie de Vos	1,250	Indonesia	3
Mardin Sign Language (MarSL)	Hasan Dikyuva	40	Turkey	1
New Zealand Sign Language (NZSL)	Rachel McKee	24,000	New Zealand	4

Yucatec Maya Sign Language (YMSL) – Nohkop variety	Olivier Le Guen	34	Mexico	2

5.2. Endangerment of village sign languages

In our survey, we included eight village sign languages. The most prominent factors for the endangerment of these languages, which we identified in our results, are summarised below.

· **Decreasing birth of deaf children:**

> *"The most prominent threat in Chican is the death of its deaf members."* (Questionnaire, Chican SL)

Village sign languages emerge when over the course of one or several generations deaf people are born into a community where they lack access to any established sign language and start to co-create their own language together with their hearing family members. The number of deaf signers in these reference communities can vary, from as small as 14 (in the case of Mardin SL) to as many as 130 (in the case of Al-Sayyid Bedouin SL). If the presence of deaf people in these communities decreases, so does the necessity to use the local sign language. In the case of Yucatec Maya Sign Language in the village of Chican, for instance, the youngest deaf signer is currently 14 years old. Even though most hearing community members are proficient in YMSL, the language will eventually stop being used if no further deaf children are born.

· **Demographic and economic transformations**:

Many rural sign languages emerged in the context of rather tight-knit traditional agriculture or fishing-based societies. As a result of current pressures of globalisation, a shift towards more service-oriented economies can lead to more pronounced social stratification, an imbalance in professional opportunities, and less social cohesion between deaf and hearing community members (e.g. in the case of BKSL, see also Nonaka 2012). While pursuing their traditional occupations, hearing status often did not play a major role, but today, the heightened demand for literacy and formal education on the labour market gives hearing people a professional advantage compared to deaf people. The therefore reduced opportunities for deaf and hearing signers to sign during their daily routines can pose a threat to language vitality. In some cases, the influx of migrants into the community can lead to the presence of more non-signers than before:

> *"There has been very intensive migration into the village the past few years (...) these migrants are non-signers."* (Questionnaire, AdaSL)

· **Dispersion of the language community**:

When deaf signers migrate to urban centres to seek employment (e.g. in the case of Mardin Sign Language) or deaf women get married and move to their husband's village (e.g. in the case Yucatec Maya Sign Language, Nohkop), social networks between signers become loosened or disrupted.

> *"In Nohkop, the fragmentation of the community could be problematic for the safety of the language. Most of the signers are girls and when getting married, they leave their house to go live with their boyfriend/husband. (...) As a result, contact between signers that used to be regular is now scarce."* (Questionnaire, YMSL Nohkop)

In the case of Algerian Jewish Sign Language, the Algerian Jewish community even emigrated to different countries, mainly Israel and France (Lanesman & Meir 2012).

· **Changes in marital patterns:**

In many of the village communities represented in our study, intermarriage between community members used to be common, which meant that rates of hereditary deafness were sustained over many years. Patterns of marriage are changing as social networks extend further beyond community borders, and in some cases, marriage between deaf community members is explicitly discouraged or even forbidden by law (see Kusters 2012: 348).

> *"Deaf people are not allowed to marry and create offspring together (deaf-deaf marriages in this village always have led to deaf offspring in the past). Hence there are almost no deaf children born in this village anymore. The deaf population is thus ageing."* (Questionnaire, AdaSL)

The tendency to marry outside of the community can lead to a decreased incidence of congenital deafness within the village (e.g. in Adamorobe SL or in Kata Kolok). Moreover, it restricts the use of the local sign language if deaf signers from the community get married to (deaf or hearing) signers from elsewhere (e.g. in the case of ABSL).

· **Contact with the national sign language:**

Some village sign languages are linguistic isolates, while others feature variants and may be members of small language families (Hurlbut 2009).[15] A number of rural signing communities are geographically isolated and deaf members did not have the opportunity to meet deaf signers from the cities and/or learn the national sign language. Increased mobility as well as access to communication technology and social media now facilitate interactions with members of urban deaf communities. As a result, there is more and more language contact with the national, dominant sign language(s) (e.g. ISL among ABSL users, TSL among BKSL users, TID among MarSL users). The establishment of formal education for deaf children, typically carried out in the national sign language, is a major factor responsible for the spread of national sign languages into village communities (e.g. Nonaka 2014). The degree of impact of the national sign language on the local village sign language varies; while in Kata Kolok the younger deaf signers *"disfavour Kata Kolok over the varieties of Indonesian sign language used in the deaf boarding school"* (Questionnaire

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[15] We need to acknowledge, however, that it can be very difficult to determine whether two sign languages are distinct languages or varieties of one language (see e.g. Safar 2017). Delineating sign language families by applying comparative lexicostatistical measures, such as those used by Hurlbut (2009), is not straightforward and more in-depth research is needed before we can establish affiliations between sign languages.

Kata Kolok),[16] Mexican Sign Language so far has had only "*superficial influence*" in Chican (Questionnaire Chican SL). Because deaf education often takes place in boarding schools, deaf signers often leave their village (at least during the week) and spend most of their time interacting with deaf pupils from other locations (Kusters 2014). Often, extensive exposure to a national sign language leads signers to shift to the more dominant language because they feel it offers them social and professional advantages:

> *"For deaf Ban Khorians, TSL [Thai Sign Language] is both a lingua franca (for communication with other deaf people) and a prestige code (for potential social, economic, and political mobility)."* (Questionnaire, BKSL)

As they typically do not acquire the national sign language, hearing signers play a key role in maintaining the use of the local village sign language (Lanesman & Meir 2012: 174f.).

On top of these community-internal changes, there are some additional factors to consider.

· **Negative or indifferent language attitudes:**

Government bodies, members of urban deaf communities, and village sign language users themselves may support a shift towards the use of a national, more dominant sign language (e.g. in the case of AJSL, which is threatened by the dominance of Israeli Sign Language; see Lanesman & Meir 2012). Village sign languages are often regarded as less "sophisticated" than institutionalised ones. The pressure from governments or institutions who aim to introduce a more prestigious sign language into the community instead of the local one is often considerable. However, language attitudes from "outside" can also differ from the views of community members, who might consider the local village sign language to be more beautiful, useful, or authentic than the national one (see Safar 2017 for YMSL or Kusters 2014 for Adamorobe SL). However, such positive attitudes do not necessarily lead community members to undertake initiatives of language maintenance or revitalisation:

> *"I would say that language attitudes and ideologies towards Adamorobe Sign Language are positive, but not that the people wish to see the language promoted or maintained."* (Questionnaire, AdaSL)

· **Absence of institutional support**:

Of all village sign languages included in the survey, only Kata Kolok had been implemented in deaf education. Generally, village sign languages are absent from institutional settings and their use is restricted to the private domain. Minority language policies for conservation or revitalisation usually target spoken minority languages or national sign languages, but do not take into account village/indigenous sign languages (e.g. Safar 2015; Nonaka 2004).

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[16] Lutzenberger & de Vos (p.c.) have pointed out that this trend has changed since the completion of the survey. Currently, all younger Kata Kolok signers have stopped attending the deaf boarding school, resulting in less language contact with Bisindo (Indonesian sign language). Many of them are now married to hearing or deaf individuals from within or outside the village. As children are often minded by their parents as well as their grandparents, all residing in the same family compound, they receive their primary input in Kata Kolok.

"The government supports the use of Turkish Sign Language in deaf education, but does not mention MarSL." (Questionnaire, MarSL)

It is somehow ironic that advances in deaf education, i.e. the adoption of national sign languages into the school curriculum, can pose a threat to the survival of village sign languages, which are used by minorities of a minority (see Zeshan 2007).

· **Lack of documentation:**

Linguistic and anthropological research on village sign language communities is only a recent development. Even though the number of publications on village sign languages is increasing (e.g. Zeshan & De Vos 2012), many of their typologically fascinating linguistic structures are at risk of being lost without ever being documented (Nonaka 2004).

"Additional linguistic description is necessary for the linguistic system to be considered documented." (Questionnaire, BKSL)

5.3 Endangerment of national sign languages

National sign languages such as those in in Brazil, Denmark, New Zealand and Austria (all of which have a vitality level of 4) are in general less endangered than village sign languages. Nevertheless, as shown by our vitality scores for seven national sign languages, many are rendered unsafe by the increasing demand for cochlear implants in deaf children, the tendency for deaf pupils to attend mainstream schools, and the disappearance of sign languages from educational settings. These factors are all potential threats to sign language vitality, because they further disrupt generation-to-generation transmission (cf. Anderson 2011: 274).

National sign languages usually have a relatively large community of users, compared to village sign languages. But the increasing pressure by medical institutions promoting cochlear implants, paired with mainstreaming tendencies and the neglect of sign language in the education sector, give many of them an endangered status with progressively waning vitality. For example, the number of New Zealand Sign Language (NZSL) users decreased by 25% in 12 years, from 27,285 in 2001 to 20,235 in 2013, despite the country's overall population increasing by more than 25% (McKee 2017: 332-333).

This sub-section considers three of the most influential factors affecting the seven national sign languages scored by our committee.

● **Increasing pressure by medical institutions promoting cochlear implants**
The use of cochlear implants at the expense of learning to sign and becoming involved in the deaf community is often noted as one of the main issues that threaten sign languages (e.g. McKee 2017: 354). The respondent for NZSL noted that the second largest threat to the language is "*low uptake of NZSL as a communication option following infant cochlear implantation*" (Questionnaire, NZSL). This is highlighted especially by deaf organisations, who are concerned that widespread cochlear implantation may eventually eliminate deaf culture and signed languages (Wrobel 2014: 30), especially when implants are recommended by medical professionals as being aligned with spoken language use and in opposition to sign language use. Many professionals advise parents that their child's post-implantation spoken language development will be impeded by learning a

sign language (e.g. Hall 2017), and most parents perceive speech and signing "as separate options and not in any complementary manner", not realising that "the use of a sign language and the objectives of cochlear implantation may not be incompatible and can both be realisable" (Hyde, Punch & Komesaroff 2010: 175). This factor affects sign languages more in Western countries and less in developing nations where cochlear implants are still largely unaffordable (Wrobel 2014: 30).

- **Mainstreaming tendencies**

Mainstreaming tendencies and inclusive education policies[17] comprise another factor that is felt to decrease the vitality of national sign languages (e.g. McKee 2017: 354). This is because when placed in mainstream institutions, deaf pupils are likely to be isolated from other deaf people. While they may have access to sign language interpreters or teaching assistants who sign, they do not usually have any interaction with deaf signing peers or adult deaf role models, and are not part of a language community. This poses a threat to sign language transmission and to the transmission of deaf cultural knowledge. Mainstreaming policies often ideologically support the majority language and contribute toward decreased vitality for minority spoken languages as well (Garcia 2009), such as the Pangcah language in Taiwan, which is deprioritised for indigenous schoolchildren due to the overwhelming dominance of Mandarin Chinese (Chang 2014).

The respondent for Libras (Brazilian Sign Language), Ronice Müller de Quadros, commented that this stems from a failure among policy-makers to investigate what 'inclusion' really means for sign language users:

> *the government is causing confusion between the "inclusion" policy for handicaps and sign language. They apply the "inclusion" policies to deaf people, reducing the bilingual education to the presence of a sign language interpreter [...] The problem is that a language does not happen between the interpreter and one deaf student in a class with hearing students speaking Portuguese. The deaf community has consistently tried to make the government support bilingual schools for deaf students or a concentration of deaf students in some schools with a true bilingual education. [...] Bilingual education is very important for deaf people, since deaf children will have [most of their] contact with sign language at school (pre-school and elementary school), since almost all of them are born into hearing families.*

(Questionnaire, Libras)

Müller de Quadros reported that the 'inclusion' policy is also contributing to the closure of deaf schools, which she identified as one of the three most prominent threats facing this language (the others being increasing cochlear implantation and increasing fragmentation of the deaf community). Similarly, the respondent for NZSL (Rachel McKee) reported that the primary threat is the sign language community's fragmentation, which is "*the decline of congregated deaf*

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[17] Mainstreaming or inclusive education refers to the increasingly widespread practice of including students with disabilities in regular schools rather than having them attend separate special schools or special classes. While this trend is seen as positive progress by many professionals and people with various disabilities, many members of deaf communities object to these policies, as they isolate deaf students in hearing classes without access to deaf peers and contribute toward deaf communities' dispersion, weakening their capacity as linguistic and cultural collectives.

education settings - schools and units are greatly diminished, so most children are in mainstream institutions" (Questionnaire, NZSL).

The mainstreaming of a high proportion of deaf children is one of three key threats to deaf communities identified by Johnston (2004), in addition to increased cochlear implantation and the declining prevalence of deafness generally. Johnston suggests that governments might paradoxically be *more* determined to meet the linguistic needs of deaf people if they comprise a smaller group, because their needs will be more 'modest' (ibid). But in the case of mainstreaming, this is probably not true, as lower numbers of deaf children will make policy-makers more apt to recommend that they attend mainstream schools, and less willing to fund deaf units or institutions where sign languages are used.

● **Neglect of sign language in the education sector**

In addition to mainstreaming, the neglect of sign language in schools was a common factor in the endangerment of national or urban sign languages. For example, the Danish Sign Language respondent (the Danish Deaf Association) noted that only deaf pupils in years 8-10 are receiving education in this language, and in the future, even this provision will disappear. The Austrian Sign Language (ÖGS) respondent (*Österreichischer Gehörlosenbund*, or ÖGLB, the Austrian Deaf Association) commented that access to sign language in education varies according to the preferences of individual educators: "*Support and appreciation of the national sign language largely depends on teachers and headmasters of schools. ÖGS is not ascribed the same status as German*" (Questionnaire, ÖGS).

If pupils do not use sign language at school, they are less likely to become members of the deaf community. The resulting reduction in deaf community size leads to a weakening of its traditions and organisations, and

> a constrained capacity [...] to undertake all of the work required for active language maintenance and promotion, [...] to ensure that [the language] is taught to those who wish to learn it, to participate in language documentation and educational resource development, to assume advocacy roles, and to run promotional activities.
>
> (McKee 2017: 353-354)

With a smaller capacity, deaf organisations and leaders may find it increasingly difficult to promote their language and lobby for advocacy. Nonetheless, some national sign language communities remain optimistic because of increased governmental and institutional recognition and associated shifts in attitudes, for example in New Zealand (McKee 2017: 354).

5.4 Summary of general trends

This study suggests that more empirically-driven and fine-grained distinctions are required between the notion of 'urban sign languages' versus 'national sign languages' in order to investigate sub-communities within these groupings (Woll & Ladd 2003: 168). Further research is needed to clarify the preliminary distinctions here and determine precisely what it is that different types of sign languages need in order to thrive. As noted in section 5.2, the notion of 'language ecology' (Haugen 1972) could be useful in this determination. It refers to the language-society

relationship, which is affected by five types of environment: historic, regional, political, institutional, and psychological (ibid.).

Even though the situations of the sign languages included in the survey show striking differences, we can already observe some general tendencies regarding their endangerment. Some factors threatening urban sign languages, such as the increase in cochlear implantation, are not among the main factors that endanger village sign languages because these changes have not yet been introduced in certain rural areas. All of the analysed sign languages face a lack of supportive policies and the often indifferent or negative attitudes of governments and policy makers. However, being in a minority language group under threat can sometimes make users feel especially proud and protective of their language (e.g. McKee 2017: 354). Such attitudes may cause them to be optimistic about the future of their language, even when the factors at play suggest that its vitality is decreasing (ibid 2017: 354). We can conclude that the situation of sign languages is comparable in some ways to that of spoken minority languages in that they are similarly affected by phenomena of globalisation, but sign languages also have peculiarities and unique endangerment factors. This emphasises the need for focussed diachronic study and the further development of sensitive instruments for assessment and evaluation.

6.   Future perspectives

The adaptation of UNESCO's survey on language vitality to include sign languages was an important step, but can constitute only the beginning of in-depth research on sign language endangerment. It is notable that other researchers have since employed this tool to evaluate the vitality of additional sign languages; for instance, Hofer (2017) used it to rate Lhasa Tibetan Sign Language as falling between 'severely' and 'definitely' endangered. Moreover, UNESCO now have a new Excel sheet for data entry that specifically allows the inputting of sign language data for inclusion in their language atlas. We hope that further studies will add new languages to the map of sign language vitality and contribute ideas to develop and improve the tool.

Still, far too little is known about the true diversity of sign languages, and there are no reliable facts and figures on how many sign languages exist worldwide, if and how they are related, and how they are changing over the years. Including sign languages in research and policies on endangered minority languages is not just an additional feature, but rather an essential part of studying and protecting the world's multilingual heritage. Making visible the endangerment status of sign languages may help to promote the legal recognition and the creation of policies to improve communication access for deaf people and the protection of their linguistic and cultural identity. Now that more is known about their endangerment, sign languages could be integrated not only in the UNESCO Atlas but also in other related initiatives, e.g. 'Language Hotspots' (Anderson 2011) and World Heritage Sites (Romaine & Gorenflo 2017). For instance, some village sign language communities are in or near conservation areas, so engaging and protecting these communities may "help maintain nature [and] preserve settings that enabled indigenous languages and cultures to emerge and persist" (Romaine & Gorenflo 2017). Clearly, increased knowledge about these languages also supports efforts toward documentation and revitalisation. As pointed out by Anderson (2011: 275):

every language, big or small, dominant or endangered, has the same potential value to its community of speakers as an emblem of ethnic identity and as a storehouse of the history of their community. For many communities, their language is the only such record.

Endangerment usually happens alongside isolation and 'invisibilisation'. This can be combated by mapping work such as that described within the model of 'Language Hotspots', which aims to foster more awareness and solidarity amongst communities (Anderson 2011: 286). In order to establish frameworks for assessing and mapping the vitality level of sign languages, our project shows that it is possible to adopt models that have been developed for spoken languages but that we need to carefully consider some particular features of signed languages. The survey discussed here is a first step, but in order to get a more comprehensive picture about sign language vitality around the world, data on many more sign languages are needed, particularly those that have yet to be documented. This work has also resulted in some innovations for assessing vitality, in particular the robust methodology of scoring based on averages, and the workflow between questionnaire respondents and the scoring committee. These procedures may well be useful for spoken languages too, and though this work has not had a wide enough scope to consider the application of these innovations to spoken languages in detail, this may be a fruitful topic for future research. On a long-term basis, it would also be useful to include diachronic data to be able to monitor changes in the endangerment status of individual sign languages and to develop best practice models for promoting the vitality of endangered sign languages. The expected release of a new UNESCO Atlas in 2019 may help to facilitate the longitudinal study of sign language vitality.

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