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Roots, leaves and branches – The typology of sign languages

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1. Introduction

This contribution is intended to summarise and exemplify important findings that have emerged from the systematic comparative study of sign languages over the last years. The increasing availability of data from diverse sign language around the world has made it possible, for the first time in the history of sign language research, to broaden our cross-linguistic data base sufficiently for meaningful typological studies across sign languages to be carried out. This new field of study is known as sign language typology.

The sections below look at the new sub-discipline of sign language typology from a variety of different angles. Rather than being a systematic, exhaustive account of the whole field of study, the aim of this article is to provide illustrative glimpses from different angles.[1] Among others, we will look at the sources whose confluence creates the field of sign language typology (the "roots" in terms of the metaphor in the title), at the different ways of doing sign language typology and the associated methodologies (the "branches") and at some of the fascinating data and their typological and theoretical significance (the "leaves").

The remainder of this article is organised in four parts. In section 2, sign language typology is introduced, focusing on the aims and the methodologies of the field. Sections 3 and 4 illustrate the kinds of findings that emerge from the cross-linguistic study of sign languages. We look at examples of results from large comparative studies as well as data from sign languages used in village communities with hereditary deafness. The latter topic leads to a theoretically profound question about the nature of human language in the visual-gestural modality, showing how a broadening of the data base in sign language typology can lead to theoretically challenging issues. The article concludes by looking at the impact beyond linguistics that research in sign language typology has on communities of deaf people around the world.

[1] Zeshan (in prep.) is an attempt at summarising comprehensively the current state of knowledge in sign language typology.

2. Introducing sign language typology

2.1. The sources of sign language typology

Sign language typology draws upon two source disciplines within linguistics that previously had little contact one another. As the name already suggests, these two disciplines are sign language research and linguistic typology. The interaction between them is schematically illustrated in Figure 1, which shows the double orientation inherent in sign language typology: On the one hand, sign language typology uses theoretical and methodological resources from linguistic typology, but broadens the range of the available languages to include sign languages. Conversely, sign language typology uses results from sign language research, but focuses on linguistic diversity within the group of sign languages from a typological perspective.

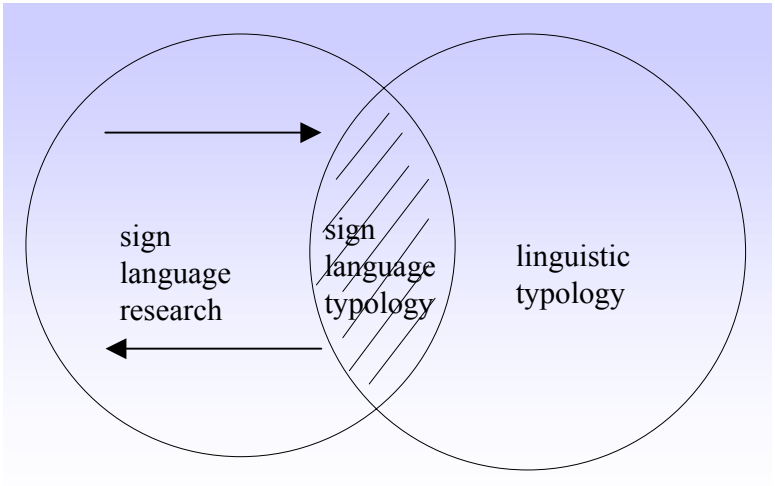

Figure 1: The source disciplines of sign language typology

As far as the entire range of linguistic sub-disciplines in spoken language research is concerned, no field is more naturally predestined to having an avid interest in sign languages than the field of linguistic typology. By and large, since coming into existence in the second half of the 20th century, linguistic typology has been concerned with evaluating how languages are different from or similar to one another. The seminal paper by Greenberg (1963) is often cited as a crucial point in the development of linguistic typology, and the field has developed rapidly since then. Although typologists use a very wide range of language data to study patterns of language variation, including many "exotic" languages in all parts of the world, sign language data have previously been almost entirely absent from research in linguistic typology. Many spoken language typologists

probably share the feeling expressed in Haspelmath (1997:17), where the author explains that sign languages do not figure in his major study on indefinites because "[t]he cross-linguistic study of sign languages is still in its infancy, and my own competence does not allow me to say anything even about an individual sign language."

The second topic that lies at the heart of linguistic typology and is closely related to the first one, somewhat like the flipside of the same coin, is the search for language universals (e.g. Comrie 1989, Whaley 1997, Song 2001). What is it really that all languages have in common and that, therefore, can be said to define the true nature of human language? More than for any other research question, it is immediately obvious here that typologists must be most interested in what sign language research has to say about a totally different type of visual-gestural language that has not been considered before.

Just as typologists have previously ignored sign languages for the most part, sign language researchers have also not taken into account a typologically informed perspective on their data. However, there is much to gain from such a perspective, as will become clear in section 3 below. Indeed, the true extent of linguistic diversity across sign languages only becomes apparent when a typological angle is applied to both known and newly discovered data, and these results continue to surprise even experienced sign linguists.

Despite the clear connection between sign language typology and its two source domains, we are not dealing merely with a merger of the two other fields. Rather, sign language typology brings with it an entire new set of research questions and methodologies. These are detailed in sections 2.2 and 2.3 respectively.

2.2. The aims and methodologies of sign language typology

Sign language typology has two related immediate aims, both of which are associated with different methodologies. The detailed documentation of individual sign languages around the world broadly overlaps with corresponding descriptive research in sign linguistics, but has a somewhat different focus. On the other hand, the systematic cross-linguistic study of broad samples of genetically and geographically unrelated sign languages is a new undertaking that has no previously existing parallels in sign linguistics, but is in many ways similar to corresponding work in spoken language typology. These two types of investigation are intended to lead to a theory of variation across sign languages, which is the most important secondary aim of sign language typology. Accounting for the patterns of differences and similarities across sign languages then also allows us to re-assess the question of language universals that hold both for sign languages and for spoken languages, as well

as the question of modality differences between sign languages on the one hand and spoken languages on the other hand. Figure 2 shows a flow chart of inter-relatedness of the main academic aims in sign language typology. The non-academic aims of sign language typology research are detailed in section 5 of this paper.

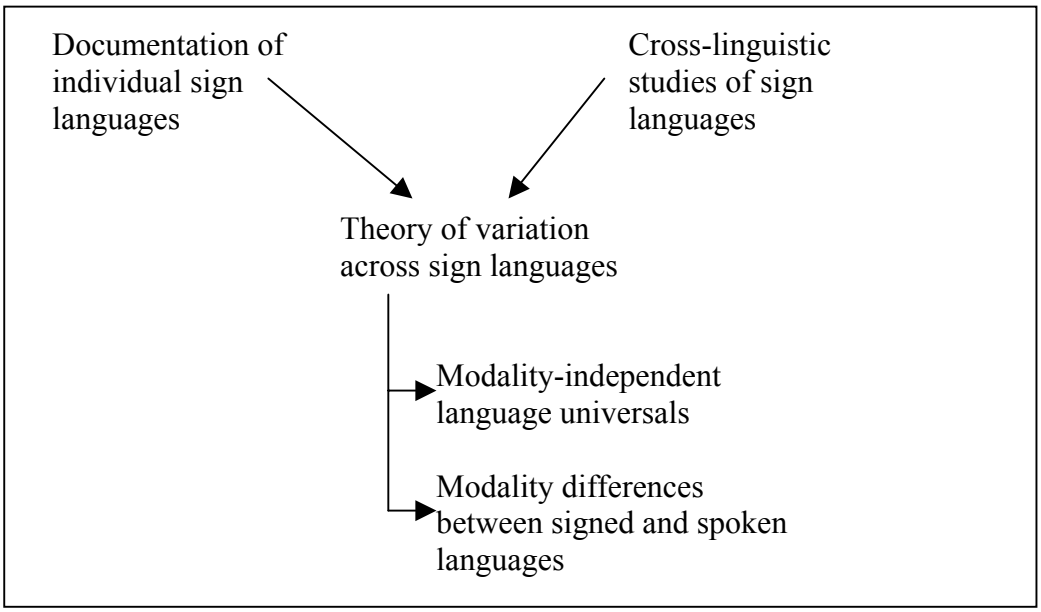

Figure 2: The aims of sign language typology

2.2.1. Documentation of individual sign languages

Since only a minority of the world's sign languages have been documented to date, individual studies of as many different sign languages as possible are essential for sign language typology. Without a data base from a large number of geographically and genetically unrelated sign languages, meaningful typological work would be impossible, and the value of any generalisations drawn from a limited range of, for instance, mainly Western European and North American sign languages would be severely compromised. Therefore, one of the aims of sign language typology must be to collect reliable and adequately structured information on a broad range of sign languages. At the moment, we are still only scratching the surface of the real range of variation that can be found across sign languages.

So far, our state of knowledge about sign languages has developed like a mosaic that at first is rather sketchy and has many empty areas, but is increasingly giving us a clearer picture of the range of diversity in sign languages (see Figure 3). In the first decades since its inception, sign language research has been dominated by "western" sign languages in Europe and North America, first and foremost American Sign Language, and this is still the case to some extent. More recent work has

documented urban sign languages in other parts of the world, such as, for instance, in the Levantine Arab area (Hendriks 2004, Hendriks & Zeshan, forthcoming). For a number of regions, research results are not easily accessible to an international audience because of the language of publications. For instance, most publications on Nihon Shuwa, the sign language used in Japan, are in Japanese, and many publications on South and Central American sign languages are written in Spanish or Portuguese.

The most recent important addition to the sign language data mosaic consists of sign languages in village communities (see the purple trapeze in Figure 3). Village sign languages will figure prominently in section 3.2 and section 4 below. Finally, the final picture in Figure 3 contains a blue triangle marked with a question mark. This stands for any further types of sign languages that will certainly be discovered in due course. Most importantly, various kinds of minority sign languages that may be found to be in use by smaller groups of signers co-existing with "national" sign languages, are in need of further research.

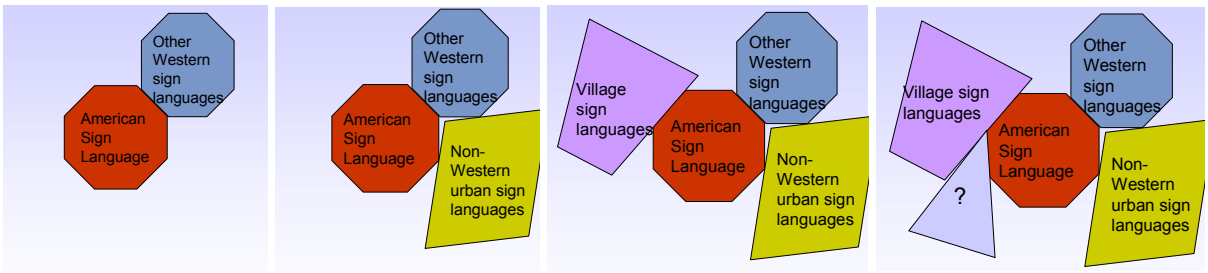

Figure 3: The mosaic of sign language data

For the purpose of sign language typology, not all kinds of linguistic documentation are equally valuable. The most important type of documentation is a reference grammar. Reference grammars are concise, yet in-depth accounts of all grammatical structures found in a language, and they are an important source of information for spoken language typologists, who can rely on several hundred reference grammars, though not all of equal quality. However, to date sign language research has not produced a single reference grammar on any sign language, so the sign language typologists has to rely on other, less than ideal, sources.

The framework of sign language typology is particularly suitable for boosting descriptive work on previously undocumented sign languages because it incorporates a broad perspective based on what is already known about typological diversity across spoken languages. For example, sign language researchers will not only wonder how a sign language expresses plurals, but also whether the language might have a category that is unmarked for number, whether nominal and verbal number is expressed differently or similarly, and how the category of number interacts with other

categories. We will not only ask how a sign language expresses possession, but also whether there is a relationship between possessives and existentials and whether there is a difference between alienable and inalienable possession**.** Typologically informed questions of this nature need to be answered for a large number of diverse sign languages before more extensive work can be done in sign language typology. At the same time, this kind of descriptive information is very useful input for the applied dimensions of sign language linguistics, such as the development of sign language teaching materials. The relationship between typological and applied sign linguistics will be discussed in detail in section 5.

2.2.2. Cross-linguistic studies of sign languages

Whereas the typologically informed documentation of individual sign languages aims at describing a wide range of structures within each one sign language, cross-linguistic studies investigate a particular grammatical domain across a suitably wide sample of different sign languages. Both strands of research are complementary, but cross-linguistic studies pose particular theoretical and methodological challenges that are discussed briefly in this section.

In order to arrive at a theory of variation across sign languages, it is necessary to make generalisations over comparable data from a wide range of sign languages. It is essential that these generalisations should be empirically substantiated, that is, based on real evidence from a range of primary data, rather than based on deductive reasoning and/or assumptions based on very few or even a single sign language. Cross-linguistic studies on sign languages address research questions about the *parameters* of variation that we can find across sign languages, about the *range* of variation that is displayed, and about *patterns* of variation. These are interrelated, yet separate undertakings. For instance, within the domains of questions, parameters of variation to investigate include facial expressions marking questions, the use of question particles, the set of question words in each language, pragmatic uses of questions, and the like. Within each parameter, sign languages in a sample will display a range of variation, and these con be compared to each other. For instance, the range of variation with respect to facial expressions is quite small across sign languages because there is a lot of overlap in the expressions used in many sign languages. On the other hand, question word paradigms (that is, the particular sets of questions words for which there are separate lexical items) show a huge range of variation across different sign languages. Moreover, some questions words and combinations of question words are found more frequently than others, and there is evidence for the inter-relatedness of question words and indefinites (Zeshan 2004b, 2006). Such patterns of differences in variability, frequency of occurrence, inter-relatedness of grammatical domains, etc., need to be accounted for in a theoretical framework of sign language typology. As

research in sign language typology progresses, we will be able to map out the structural diversity across sign languages in increasing detail.

For sign language typology, it is important to look for functional explanations of both similarities and differences across sign languages. Often the previous findings of spoken language typology can be of use here. For instance, the close relationship between interrogatives and indefinites, or between possession and existence, has been found in both spoken and sign languages, and explanations for these patterns have been suggested in the spoken language typology literature. Inventories of patterns, such as a limited number of construction types used to express possession (as in Heine 1997) can often be applied to sign languages as well. However, in other areas it is just as interesting to see that sign languages behave very differently from spoken languages, for instance with respect to some aspects of the domain of negation (see section 3.1.1).

Large cross-linguistic studies across sign languages present particular theoretical and methodological problems, some of which are the same as for spoken language typology. One serious issue, for instance, is the reliability of data. Clearly, since no single researcher can have personal knowledge of dozens of sign languages, how do we know if the information we are gathering is correct? There is no simple answer to this, and the problem of data reliability is inherent in typological work in any of the two language modalities. However, projects in sign language typology are in a somewhat different situation because it is necessary to actually generate a large part of the data within the course of a sign language typology project itself. This is due to the fact that so little published information is readily available, and means that the sign language typologist has greater possibilities of taking direct measures to enhance data reliability.[2] On the other hand, collecting cross-linguistic data also presents its own challenges. An example of how this can be done is discussed in section 3.1.2.

Finally, cross-linguistic studies have to deal with the issue of sampling, that is, choosing which languages will be represented in a cross-linguistic study. Researchers in spoken language typology work with samples of languages for which information about the target domain is available. These samples should be both areally balanced (that is, not include too many languages from the same geographic region) and genetically balanced (that is, not include too many languages from the same language family). For sign languages, however, this is very difficult to do at this stage, since too few data are available to choose from. Moreover, we know too little about how sign languages are historically related, that is, to which language families the known sign languages belong, to even address the issue of a genetically balanced sample. There is currently no

[2] The kinds of measures that can be taken cannot be discussed in detail here, but see Zeshan (in prep.) for a further elaboration on this topic.

theoretically satisfying solution to this problem, so we need to work on the basis of practical considerations and just try to include as much information from as many sign languages as possible in our data in order to get at least a reasonable breadth of coverage. For instance, Zeshan (2004a, 2004b, 2005) used information from 37 diverse sign languages. Nothing can be done at this stage against areal and/or genetic bias in such a sample, except that we should be aware of the issue at all times and frame our generalisations in a careful way accordingly.

In the next section, I present some examples of recent cross-linguistic studies to illustrate the kinds of findings and methodologies that we typically encounter in such projects.

3. Case studies in sign language typology

Results from the first-ever large comparative study in sign language typology have been published in Zeshan (2004a, 2004b, 2005 and 2006). This study focused on interrogative and negative constructions (project duration 2000-2004) and has since been followed by a second large study on possessive and existential constructions (2005 to date; see Perniss & Zeshan, forthcoming). In addition to large-scale projects, smaller-scale cross-linguistic research on sets of sign language of various sizes have been undertaken in recent years, including work by McBurney (2002) on personal pronouns, Eccarius & Brentari (2007) on classifier constructions, and Schwager & Zeshan (forthcoming) on word class systems.

In this section, I illustrate the methodologies and findings that projects in sign language typology produce. A more comprehensive overview can be found in Zeshan (in prep.). Rather than attempting a summary of all the various topics that were investigated, I concentrate on a few points of interest here and show how these are relevant to the theoretical ideas outlined in the above sections. Section 3.1 thus deals with non-manual negation across sign languages, while section 3.2 focuses on patterns of predicative possession.

3.1. Non-manual negation

The cross-linguistic project on interrogatives and negatives mentioned above incorporates data from 37 diverse sign languages, though some are represented rather marginally by minimal data. The data are based on a variety of sources, with the most important part derived from answers to a typological questionnaire that was distributed to co-researchers around the world (Zeshan 2006). In addition to these, primary fieldwork data gathered by myself and published sources also contributed to the data, which were compiled in an MS Access database for analysis.

This study yielded many fascinating insights, of which we can only scratch the surface here. One of the most interesting patterns emerged from studying the non-manual marking of negative clauses across sign languages. In a nutshell, a side-to-side headshake in negative clauses occurs in all sign languages for which data about this topic have been available. However, the grammatical status of this negative headshake and the constraints of use are quite different in different sign languages.

The main typologically relevant difference relates to the relative prominence of manual and non-manual negation in the grammatical systems of sign languages. All sign languages in the data use both negative signs produced with the hands and non-manual marking of negative clauses, mainly in the form of head movements, such as a headshake. Logically then, either the manual or the non-manual negative could be more important to mark the negative clause, or both could be of equal prominence. There are a number of criteria that can be used to determine whether a system of negation has manual or non-manual prominence (see Zeshan 2004a for details). The examples (1), (2) and (3) below, from sign languages in Germany, Turkey and India, illustrate some of these criteria, focusing on the question of which part of the negation – manual or non-manual – is obligatory and which is optional.[3]

Germany (Deutsche Gebärdensprache, DGS):

(1a) neg
ICH VERSTEH
IX1 UNDERSTAND

(1b) neg
ICH VERSTEH NICHT
IX1 UNDERSTAND NOT

(1c) * ICH VERSTEH NICHT
IX1 UNDERSTAND NOT
'I don't understand.'

Turkey (Türk İşaret Dili, TID):

(2a) neg-tilt
BEN ANLAMAK DEGIL
IX1 UNDERSTAND NOT

(2b) * neg-tilt
BEN ANLAMAK
IX1 UNDERSTAND
'I don't understand.'

India (Indo-Pakistani Sign Language, IPSL):

[3] For an explanation of the transcription conventions, see the appendix at the end of this article.

(3a) _____neg
IX1 UNDERSTAND NOT

(3b) _____neg
IX1 UNDERSTAND

(3c) IX1 UNDERSTAND NOT
'I don't understand.'

In each of the example sets, the first sentence (1a, 2a and 3a) is a common and grammatical way of saying 'I don't understand.' In DGS, this involves non-manual negation only, and a manual negative sign is not necessary. Whereas manual and non-manual negation can also co-occur in DGS (example 1b), it is ungrammatical to omit the side-to-side headshake. Together with other evidence that we do not go into here, this allows to conclude that DGS has a non-manual dominant system of negation, where the headshake negation is obligatory. In the data used for the comparative study, this type of system was most common across sign languages including all Western sign languages, and it is the one best described in the literature.

A lesser-known type of system is exemplified by the TID data in (2). The usual way of expressing the same sentence involves both manual and non-manual negation (2a).[4] Unlike in DGS, it is not possible in TID to negate this sentence by using a negative head movement only, which is why example (2b) is ungrammatical. A manual negative sign must be present in the sentence. Since the manual negation is obligatory in TID, this can be called a manual dominant system of negation. Relatively fewer sign languages in the data are of this type, and they are all outside Europe and North America, illustrating the importance of having a wide variety of data available for a typological study. In addition to TID, a manual dominant system of negation is found in the sign languages of Japan, China, and a village community in Bali.

Finally, the IPSL data contrast with both the DGS and the TID data in that none of the IPSL examples is ungrammatical (starred with an asterisk *). IPSL allows clauses to be negated both manually only and non-manually only, though the most common way is to use both, as in (3a). This together with other evidence suggests that neither manual nor non-manual negation is dominant in IPSL, and we can therefore speak of a balanced system of negation. One possibility that is worth exploring further would be that balanced systems of this kind are at a less advanced stage of grammaticalisation, where, in a way, the system has not "decided" yet which way it will go.

The categorisation of sign languages into manual dominant and non-manual dominant systems of negation as illustrated in the above examples is a good example of the kinds of generalisations

[4] The non-manual negation here is a backward tilt of the head accompanied by raised eyebrows, which is an areal feature of some Eastern Mediterranean sign languages. TID also uses a side-to-side headshake in addition to the negative head tilt, but this is not directly relevant to the discussion here.

that can be drawn in sign language typology on the basis of a careful investigation of empirical data. Sign languages can be assigned to one of the three types and the relative frequency of each type can be determined, yielding one pattern of many possible ones that, over time, will contribute to a theory of typological variation across sign language.

3.2. Predicative possession

Data presented in this section come from a study on possessive and existential constructions in sign languages. As will become clear below, both of these notions are closely related to one another, which is why they form a single domain of investigation. This study has again made use of co-researchers in various countries, but the methodology for this project is more sophisticated than in the first project. Figure 4 schematically represents the research cycle for this project.

A project in sign language typology typically starts with identifying the parameters of typological variation within a target domain, in this case within the domain of possession and existence (upper left hand corner of Figure 4). Data collection is based on these theoretical considerations, and in the case of this project, involves not only a typological questionnaire to be answered by co-researchers but also specialised elicitation techniques that are used in a standardised way by all project participants (lower left hand corner).

The elicitation materials consist of a number of game activities with visual content, e.g. pictures, where two or three signers have to interact and the resulting conversations are filmed. Games are targeted to elicit possessive and existential constructions, for instance, using a family tree picture in a game activity that targets kinship terms in possession. On the basis of the videotaped games, co-researchers extract relevant examples and answer questions from a typological questionnaire that covers the various sub-parameters of this domain. Compilation of all these data lead to inductive generalisations, of the kind discussed below, and these results can then secondarily be compared with spoken languages and can ultimately feed back into the theoretical considerations we started out with (right hand side of Figure 4).

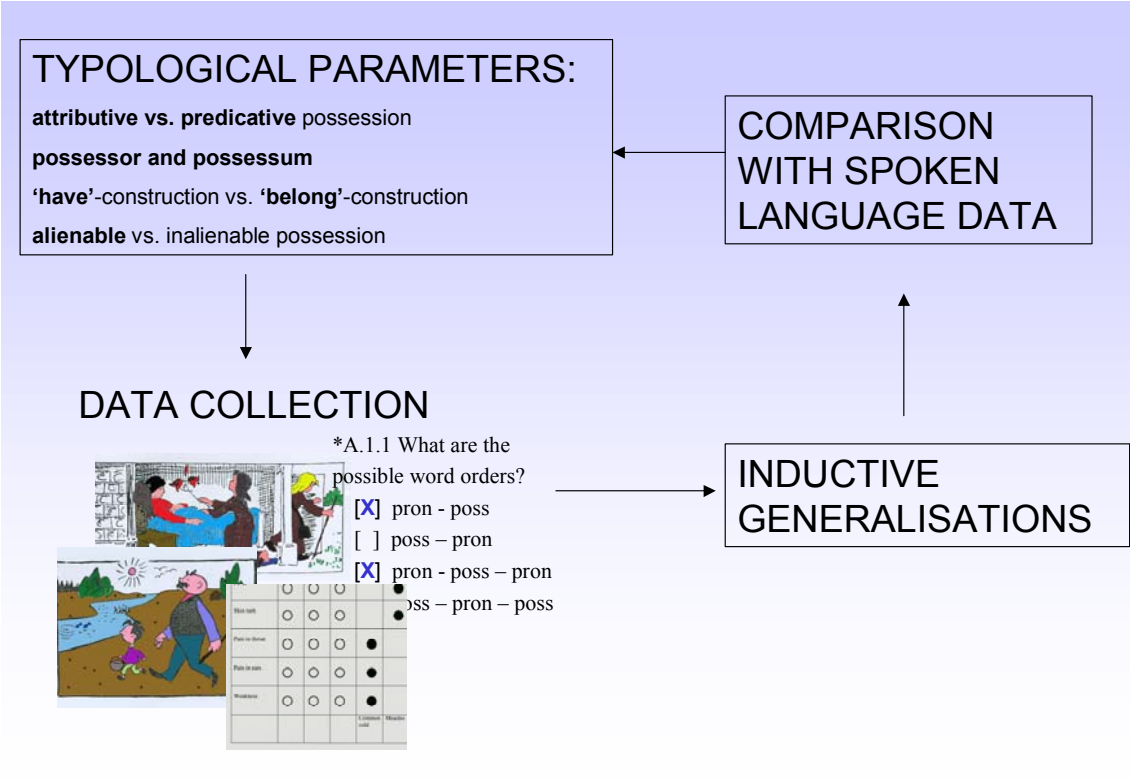

Figure 4: Research design for the cross-linguistic project on possession and existence

One of the sub-domains in this project is predicative possession, that is, ways of expressing utterances such as 'I have a car.', 'How many children do you have?', etc, with possession in a complete sentence rather than only in an NP ('my credit card', etc). In the typological literature on spoken languages, possession is a well-documented domain (e.g. Heine 2006, Baron, Herslund & Sorensen 2001, Payne 1999). A limited number of patterns for predicative possession have been identified in this literature, and this typology can be applied to sign languages as well, with a few modifications due to the nature of the sign language data. I exemplify the various types in the examples below.

a) From "taking, grabbing" to possession

In this type, a sign whose original meaning has something to do with "taking" or "grabbing" is used for possession. South Korean Sign Language has such a sign glossed HAVE-IN HAND (in addition to another sign glossed HAVE/EXIST, for which see below). Examples (4a) and (4b) show that HAVE-IN-HAND can co-occur with both a positive and a negative existential sign. Interestingly, however, the pattern with HAVE-IN-HAND cannot be used for certain abstract notion such as 'have time' (example 4c). For such items, the existential pattern with the sign HAVE/EXIST must

be used, which has a wider, more general distribution than HAVE-IN-HAND. Figure 5 shows an example sentence using both possessive/existential signs.

South Korea (South Korean Sign Language):

(4a)	WORK HAVE-IN-HAND HAVE/EXIST	'have work'
(4b)	WORK HAVE-IN-HAND NOT-EXIST	'not have work'
(4c)	*TIME HAVE-IN-HAND HAVE/EXIST	'have time'

Figure 5: South Korean Sign Language 'I have a car.'

The "taking, grabbing" type of possessive construction is well attested in the data, so it is definitely a strategy that is available to sign languages. However, it is a minor type and not nearly as common as the next one, the existential pattern.

b) From existence to possession

Most sign languages in the data use a particle that expresses both existence and possession (existential particle). For example, such particles are used in the sign languages of India/Pakistan, Turkey, Russia, the US, the UK, Catalonia, Germany, Jordan, Iran, and China. Moreover, it is very common for positive and negative existential particles to be suppletive, that is, to have two entirely different, unrelated forms. Figure 6 shows the positive and the negative existential particles in Türk İşaret Dili (Turkey). The patterns under both (a) and (b) have been described for spoken languages in Heine (2006).

Figure 6: EXIST/HAVE and NOT-EXIST/NOT-HAVE in Turkish Sign Language (Turkey)

In some cases, the existential/possessive particle can be inflected in space, that is, the sign changes its form according to who is possessing something or according to what is the possessed item. Examples of this come, for instance, from sign languages in South Korea, China, Brazil and Germany (see Figure 7).

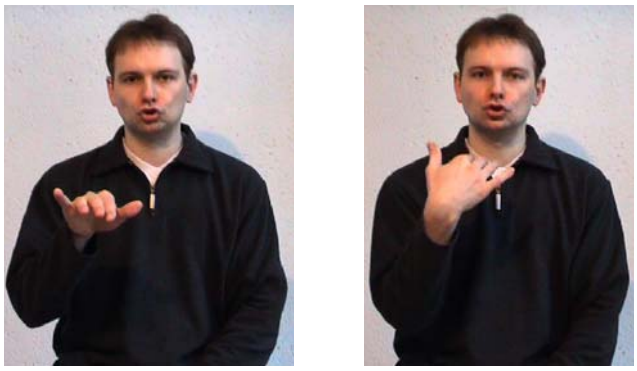

Figure 7: DGS (Germany): HAVE/EXIST in neutral space ('there is, someone has'; left hand picture) and with first person reference ('I have'; right hand picture)

c) From predicative quantifier/modifier to possession

Another very common pattern that can be found in many sign languages is the "predicative quantifier/modifier" construction (Hengeveld 1992). In this pattern, as soon as some further information is given about the possessed item, such as its quantity, or some adjectival information, there is no particle expressing the possessive relationship. Rather, one says something like 'I, the children are three', 'My children are three.' (example 5)

India (Indo-Pakistani Sign Language):

(5a) IX1 CHILD-pl EXIST 'I have children.'
(5b) IX1 CHILD-pl THREE 'I have three children.' (lit. 'My children are three.')
(5c) _____y/n
IX2 CHILD-pl EXIST? 'Do you have children?'

(5d) wh
IX2 CHILD-pl NUMBER WH 'How many children do you have?' (lit. 'How many are your children?')

Several other minor patterns have also been found in the comparative sign language data (cf. Perniss & Zeshan, forthcoming), with the structures in village sign languages being of particular interest, but these cannot be discussed in detail here.

d) The semantics of possession

In the domain of possession, there are many other points of interest, in particular the various constraints on how different categories of possession are expressed. For example, kinship relations ('my parents', 'my siblings', etc) are often expressed differently from the possession of objects. Also, body parts ('my head'), illnesses ('have a headache'), and part-whole relationships ('roof of the house') often use different patterns.

A close investigation of the data also reveals subtle semantic distinctions in the domain of possession that are entirely comparable to the level of complexity found in the domain of possession in spoken languages. Figure 8 shows an example from Turkish Sign Language, where the last sign in the sentence is another possessive in addition to the existential particle in Figure 6.

CAR SPOUSE BOTH-OF-US POSS

Figure 8: Turkish Sign Language 'The car belongs to me and my wife.'

The sign glossed POSS in Figure 8 is much more restricted in use than the general possessive/existential HAVE/EXIST. POSS is only used when the possessed item is something large or important, such as a house, a car, and the like. In cannot be used in conjunction with items such as a pen, a coin, or a pet (except if, for instance, one has a pet breeding business where the pets constitute something of substantial importance). Moreover, the use of POSS is mostly restricted to

inanimates (and sometimes animals) and cannot be used with kinship terms (such as having children), with abstract items (such as having time), or with terms for illnesses and body parts.

In summary, the cross-linguistic investigation of possession and existence in sign languages shows that findings from spoken language typology can be fruitfully applied to sign languages, with some modality-specific modifications such as spatial inflections on possessives, and the project again demonstrates how sign language data can be grouped into typological patterns that have explanatory value. Moreover, the notion of a typologically informed perspective on sign language data as discussed in section 2.2.1 is clearly evidenced in the kinds of subtle distinctions and linguistically rich patterns such as the ones discussed here.

4. Sign languages in village communities

As mentioned in section 2.2.1, it is of utmost importance for sign language typology to collate data from sign languages that are as diverse as possible. In charting the territory of different sign languages, it is useful to consider the sociolinguistic parameters of various settings where sign language using communities exist. These include, among others:

- the age of the sign language
- the size of the user community
- the contact situation with other (spoken/written/signed) languages
- the degree of endangerment
- the relative numbers of first language (L1) vs. second language (L2) users

This section is about a type of sign language that differs radically from the better-known situation of largely urban deaf communities that are users of minority sign languages and members of a minority cultural group, such as is the case in all sign languages discussed in section 3. In contrast to these sign languages, there are also sign languages used in village communities with a high incidence of hereditary deafness, and the sociolinguistic situation in these villages is radically different.

The use of signing in village communities has been identified in many parts of the world, for instance, in a Yucatec Mayan village in Mexico, Adamorobe village in Ghana, Providence Island in the Caribbean, the Urubu-Kaapor tribe in the Brazilian Amazon, Ban Khor village in northern Thailand, a village in the area of St. Elizabeth in Jamaica, the al-Sayyid Bedouin tribe in Israel (cf. Marsaja (2008), for some further details on these communities).

Most known village sign languages have similar characteristics. Hereditary deafness occurs in such a the village over a number of generations, and therefore a local sign language develops in the

community, but there is typically no or very limited contact with deaf people from outside the village. Deaf people are integrated into the hearing majority in daily life, and they do not face communication barriers, since most hearing people in the village community are more or less fluent in the local sign language. Thus the deaf villagers typically do not form a sub-culture, and do not have a sense of "Deaf" identity as is the case in urban deaf communities. Due to the larger number of hearing signers in a "deaf village", most users of the sign language are L2 users, with only the deaf individuals being monolingual L1 users of the village sign language. The village sign language in such a setting typically has time depth and a stable user community, and so is a fully developed language.

Linguistic research on these sign languages, which were previously known only from a socio-cultural point of view, has only just begun in recent years. However, it has already become clear that they include structures that differ radically from what is found in urban sign languages. One such example is the particular use of the signing space and spatial aspects of sign language grammar.

4.1. Use of the signing space in Kata Kolok, Bali

From 2004 onwards, our Sign Language Typology Research Group at the Max Planck Institute for Psycholinguistics and subsequently at the University of Central Lancashire has had an expanding research focus on the linguistic documentation of village sign languages. One of the target sign languages in this sub-project is Kata Kolok (literally "deaf language"), used in a village community in northern Bali. Kata Kolok is the first (and only) language of deaf people in the village. It is also used as a second language to a greater or lesser extent by most hearing people. Kata Kolok is not related to any other known sign language. Although it is in contact with spoken languages, there seems to be no significant influence from spoken languages on the structure of Kata Kolok. However, there is evidence for significant influence of local gestures on Kata Kolok, as would indeed be expected. Sign language is believed to have existed in the village for several hundred years, and the community has several myths about the origin of the sign language. Unlike some other village sign languages, which are under threat from larger urban sign languages in their respective countries, Kata Kolok is not currently endangered, although this situation could change quickly.

Extensive data collection and transcription of Kata Kolok texts has revealed that the use of the sign space in this language is radically different from what is known about other sign languages. In fact, many of the structural features that were believed to be universal across all sign languages

relate to the use of the sign space, such as spatial verb agreement, for instance. Therefore, it is particularly significant to find evidence for differences between sign languages in this domain. In this section, only a very brief summary of initial findings can be given, and further publications will have to explicate each of the phenomena and further justify the analysis in each case (cf. Zeshan, in prep.).

In Kata Kolok. the sign space is much larger than in sign languages used in urban deaf communities and frequently includes movements with the arms fully extended, movements of the entire body (e.g. turning around, bending down) and "acting out" of movements (e.g. "walking"). As in other sign languages, Kata Kolok signers can create complex spatial layouts, including two-handed constructions. The sign space is used extensively to talk about the movement and location of referents and the spatial relationships between referents. However, the choice of locations for setting up referents is peculiar in Kata Kolok in that the language uses absolute spatial reference. This is particularly evidence with respect to index finger pointing. Absolute spatial reference means that rather than selecting arbitrary locations in space to set up reference, e.g. on the right and left sides of the signer, the location of referents in the real world determines where the signer will point. In order for this to work, signers must be able to know the real-world locations of referents (e.g. the homes of people they are talking about) at all times. This ability is not uncommon among a number of tribal communities of hearing people, for instance some Australian Aboriginal communities, and the influence of an absolute spatial reference system can be seen in their use of gestures (Levinson 2003:244ff). Interestingly, spoken Balinese uses an absolute reference frame, so that the spatial logic of the spoken and the signed language overlaps in the case of Balinese and Kata Kolok.

To illustrate how absolute spatial reference works in Kata Kolok, the following is an example of a signed utterance:[5]

(6)

	q		q
MATING	WH	MATING IX:fwd.l	IX:back BAD

'Where/with which one are you mating (your cow)? Are you mating it with this one? That one is bad.

Here the signer uses index finger pointing (IX) to set up two locations referring to two bulls, one of which is good for breeding while the other one is not as good. In an urban sign language, such as Indian, German, Japanese or American Sign Language, the two bulls would probably be localised by the signer on the right and left sides respectively, since setting them up on opposite sides metaphorically reflects the logical contrast being made between the two. However, the Kata Kolok signer points to a location slightly to his left with his arm raised and almost fully outstretched

[5] WH in Kata Kolok is a question sign with general semantics, so it translates into a wide range of question words depending on the context of the utterance.

for the first bull, and points behind himself for the second bull. The reason for this is that in the real world, this is where the two bulls live in the village, and both signer and addressee know the absolute location of the bulls' homes from where they are sitting during the conversation. This principle of localisation is radically different from what signers in urban communities would do in a similar text.

In addition to using absolute spatial reference, the use of sign space in Kata Kolok also differs in other respects from better-known urban sign languages. For instance, Kata Kolok signers do not use a metaphorical time line where the past is located behind the signer and the future in front, and a system a spatial agreement verbs is almost completely absent (Marsaja, 2008). For a more comprehensive account of these differences and their significance for the comparative study of sign languages, see Zeshan (in prep.).

Interestingly, another village sign language, Adamorobe Sign Language in Ghana, also has many peculiarities in its use of the sign space. However, the system is both different from urban sign languages and from Kata Kolok (see Nyst 2007), which is of interest because it precludes any premature conclusions about such differences being due to a unified new "village sign language type". Certainly, this would be too simplistic, and more systematic research into other village sign languages is needed at present.

4.2. Signing in village communities – Is language gradual?

The sign languages used in both Adamorobe village in Ghana and in the deaf village in Bali have been in existence for generations and their linguistic status as full-fledged languages is not in question. The sign language using communities are also sufficiently strong in numbers to be a viable language community, in the case of Kata Kolok, for instance, comprising about 50 deaf people of all ages and the majority of the over 2,000 hearing villagers.[6] However, the linguistic situation is so clear in other rural settings where deaf people live and communicate in the gestural medium. For instance, recent fieldwork has investigated a community in rural Surinam, where 11 deaf people have been identified so far and the known time span of signing in the community has so far not been traced back further than 50 years. The deaf people and some of the hearing people in this community use signed communication, but given the sociolinguistic situation, it is not clear "whether or not their signing is a sign language or a communal home sign system" (van den Bogaerde 2006). Similar situations with any given number of deaf people of course exist in many

[6] However, Adamorobe Sign Language is now endangered due to the influence from Ghanaian Sign Language, which the younger deaf villagers learn at the residential school for the deaf (Nyst 2007).

communities, particularly in developing countries, and the status of their communication poses a real theoretical challenge to linguistics.

In a nutshell, the research question is the following: What is needed for a language to be viable, in terms of both time and space? This question cannot be addressed in the realm of spoken languages because the extreme linguistic isolation that deaf people may face and that produces the known improvised and idiosyncratic home sign systems of somewhat limited functionality (see e.g. work by Goldin-Meadow 2003) does not occur among hearing people. If we think of settings where gestural communication is used by deaf people, this could range anywhere from extremely isolated home signers to large deaf sign language communities, with all intermediate points possible. It is the intermediate situations such as the one possibly obtaining in Surinam, the cases of "communal home sign systems", that pose the greatest theoretical puzzle. In such a case, can something be no longer a limited home sign system but not yet quite a full-fledged sign language? Can language itself be thought of as a gradual phenomenon?

The schematic representation in Figure 9 illustrates this point. They represent two hypothetical types of communities of deaf people. In this situation, there would be just one or two deaf individuals in each of a number of villages (indicated by the dots within the squares), each of whom may well be a home signer to begin with. However, these individuals may have infrequent and unsystematic contact with one another (indicated by the arrows), for example meeting only once or twice a year for a major festival, especially if the villages are quite far away from one another and transport is difficult. When would such a situation be sufficient for a common language to emerge and be maintained between these people? In other words, can a linguistic system be maintained across space? How much distance can be tolerated before the system is disrupted?

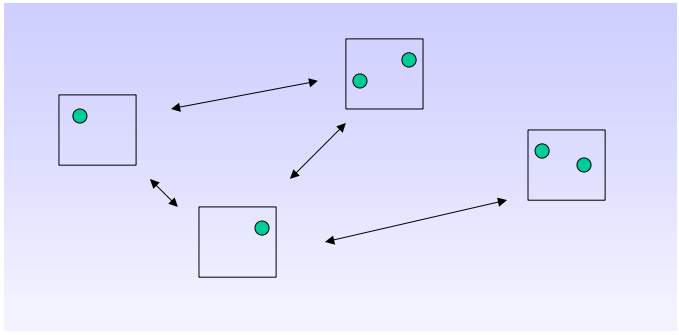

Figure 9: Hypothetical contact situation between deaf people in a rural area

The same question could be asked with respect to time. What does the time scale of contact between deaf individuals have to be like for a true sign language to emerge? How much of a time

gap can be tolerated before the system is disrupted? Spoken languages face this issue mainly when languages are dying out, and it is known that attrition processes begin to affect the linguistic system at a certain point. However, the semi-speakers still using some of this language have adopted another spoken language as their main language, and can therefore not in any sense be called semi-lingual people. The situation with respect to signing in deaf people is different in this respect.

This whole complex of questions has not been addressed by sign language research, and minority signing communities of the type discussed here are only just entering the picture of sign language linguistics. While the answers seem quite far away at present, raising the issue certainly shows how the collection of new evidence from diverse sets of signing communities can be an enriching experience and can raise potentially very profound theoretical questions in linguistics.

5. Conclusion: Sign language typology beyond linguistics

This article has demonstrate the fascinating ways in which results from sign language typology can enrich our understanding of linguistic diversity across sign languages and across human language in general. However, this is not the whole story. Research in sign language typology also has effects on the user communities that go beyond theoretical research. Most of these are well-known in sign language linguistics, but are brought to bear particularly strongly on the field of sign language typology because of the particular range of its research, which goes beyond the more established research pathways in urban deaf communities in Western industrialised societies.

Research on sign languages and deaf communities needs to be particularly sensitive about ethical considerations in the way that research is conducted and results are applied. With spoken language research nowadays also moving into new areas such as the large-scale documentation of endangered languages, ethical concerns have become more prevalent and more openly discussed in linguistics. For instance, the ethics guidelines of the linguistics department at the Max Planck Institute for Psycholinguistics state:

> "Members of the department must, wherever possible, ensure that they contribute to the communities in which they work. Exceptions to this policy can only be considered in truly unusual circumstances where implementation of the policy is impossible, and such exceptions require detailed justification and the approval of the department director." (MPI-EVA 2002).

Signing communities are typically vulnerable and often face linguistic oppression, so most sign language linguists are well aware of their duties to "give back to the community". With the rise of research on more diverse communities under the sign language typology research paradigm, new

questions present themselves that have to do, for instance, with working in a "deaf village", or with situations of sign language endangerment (cf. Nonaka 2004). This is a very complex issue, so rather than going into details here, I briefly discuss potential benefits to sign language using communities that are often associated with research in sign language typology.

The greatest benefit from sign language typology research certainly applies to the many sign languages whose linguistic structures have not been documented to date. Since sign language typology systematically seeks out these languages and has a very strong focus on documentary field linguistics (cf. section 2.2.1), many sign language communities can benefit from additional resources being put into first-time research into their languages.

Over time, this research can generate important language resources, since it is only on the basis of sound descriptive work that projects in applied linguistics, such as sign language teaching, interpreter training, etc., can become truly successful and sustainable. An example of how theoretical and applied research can go hand in hand is documented for India in Zeshan, Vasishta and Sethna (2004).

Strengthening the linguistic, and subsequently the applied dimensions of sign language research is particularly important in many developing countries, and sign language typology is well placed to contribute to such developments. If experienced researchers conduct fieldwork in a region where sign linguistics and its applications has yet to establish itself, important knowledge transfer between the foreign researcher and the local deaf community can take place, and local signers will have the opportunity to receive linguistic training. Consequently, the level of metalinguistic awareness in deaf communities with on previous sign language experience will increase over time.

Finally, participating in a large cross-linguistic project provides an excellent training opportunity for beginning researchers. They will be part of a research group setting and can be guided by the project coordinators and other co-researchers in the project team to pursue a research project that is independent to some extent, yet takes place in a structured environment according to common standards and methodologies of sign language research.

Even though many issues in the domain of empowerment for deaf communities worldwide remain open to date, sign language typology research clearly has a contribution to make and could potentially make a real difference to the situation of deaf communities in many parts of the world.

Abbreviations and transcription conventions:

SIGN	gloss for s manual sign
SIGN/SIGN	sign with two meanings
SIGN-SIGN-…	single sign transcribed with more than one gloss word

WH	generalised question word
IX1	first person pronoun
IX2	second person pronoun
IX:	index finger pointing in a certain direction
fwd.l	forward-left direction
back	backwards direction
-pl	plural form of a sign
_neg	negative headshake
_neg-tilt	backwards head tilt for negation
_q	non-manual expression for question
_y/n	non-manual expression for yes/no question
_wh	non-manual expression for wh-question

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