11 Methods in Carrying out Language Typological Research

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Chapter Overview

This chapter introduces readers to the field of sign language typology, which undertakes systematic comparisons of linguistic structures in different sign languages to assess cross-linguistic variation. The underlying aim of typology is to chart linguistic diversity by identifying patterns of variation and language universals (characteristics that languages have in common). Sign language typologists use theories and frameworks from language typology to analyze samples of many different sign languages in order to uncover previously hidden patterns. This involves building upon the documentation of diverse sign languages.

Given the relatively recent emergence of sign language typology as a discipline, only a handful of substantial cross-linguistic studies have been conducted

Research Methods in Sign Language Studies: A Practical Guide, First Edition.
Edited by Eleni Orfanidou, Bencie Woll, and Gary Morgan.

thus far. Nevertheless, we present an overview of methodological issues in sign language typology, including a discussion of some of the key decisions that must be made when conducting a cross-linguistic typological study. These issues concern the choice of research domain, the identification of parameters for investigation, and the collection and analysis of data from a wide range of sign languages.

Along the way we note some of the solutions to the challenges that are associated with this kind of research, as well as issues of research ethics. We conclude with some thoughts on what we believe to be an important goal for the further development of sign language typology research: a cross-modal typology that includes both signed and spoken languages.

Linguistic Diversity and Sign Languages

It is still commonplace for those with no knowledge of sign languages to suppose that these languages are the same around the world. Those who are proficient in a sign language and meet someone using a different sign language know that this is not the case. They may also know about the similarities and differences between sign languages and spoken languages, which are becoming ever clearer (e.g. Meier, Cormier, and Quinto-Pozos, 2002). Yet even sign language researchers have asked whether, *within* the visual–gestural modality, it can be said that sign languages are generally similar to one another, or at least much more similar among themselves than spoken languages are (Newport and Supalla, 2000: 100). One of the central tenets of sign language typology is that sign languages around the world exhibit much more diversity than is often assumed and that systematic investigation is the key to identifying variation through cross-linguistic study. In other words, sign language typology offers the tools and theoretical frameworks for researchers to look at sign languages afresh and to assess the degree to which these languages are similar to and different from one another. Given that theories and methodologies from fields such as sociolinguistics and psycholinguistics have been fruitfully applied to sign language data, the application of language typology to sign languages is an even more obvious choice, as the field of typology is, by its very nature, concerned with the diversity of all human language, both in its spoken and in its signed modalities.

Language typologists are concerned with mapping the diversity of languages and with discovering patterns across them through comparative research in various domains. The aims of sign language typology are threefold: to document individual sign languages; to compare structures, systems and constructions across different sign languages; and to determine the extent to which patterns of variation are modality-specific. Cross-linguistic comparison of sign languages depends upon the documentation of individual languages, which enables the creation of the kind of database that is necessary for rigorous sign language typology research. It is usually unfeasible for one typologist to collect primary data from a large number of languages, and because of this typologists usually rely on several data sources.

The documentation of individual sign languages is essential for language typology. It is particularly helpful if descriptive work is informed by a typological perspective. This means producing fine-grained documentation with information that is reliable and well structured, taking into account the different parameters and categories that exist across languages within various domains. Examples of such typologically informed documentation are Lutalo-Kiingi (2013), whose work on Ugandan Sign Language includes a grammatical profile alongside descriptions of domains such as number and quantification, the pronoun system, and several clause types; and the description of Jordanian Sign Language by Hendriks (2008).

Sign language typology has developed at the confluence of two disciplines – sign linguistics and linguistic typology – that have previously had little contact with each other. Even now, it is unusual for spoken language typologists to mention the findings of sign language research; this is not necessarily because spoken language typologists are unaware of sign languages, but it may stem from a lack of familiarity with signed languages that reflects the inaccessibility of sign language data (see Haspelmath, 1997, p. 17). Conversely, the documentation of sign languages has seldom been informed by linguistic typology.

Interestingly, both sign linguistics and linguistic typology emerged as modern disciplines at around the same time, and, as this chapter demonstrates, they have much to offer to each other. Greenberg's (1963) seminal work on spoken language typology has had a lasting influence on subsequent spoken language typologists, who have continued to use and refine central notions such as substantive and implicational universals (see Comrie, 1989; Whaley, 1997). Around the same time, Stokoe (1960) realized that the structure of sign language contained meaningless elements in much the same way as the structure of spoken language; and he published a phonological analysis of American Sign Language (ASL). Much of the early research on sign language focused on ASL, although the number of sign languages that have been studied has steadily increased. ASL research has been very important for the development of sign linguistics, but its dominance has at times led to overt or covert assumptions that what is true for ASL must be true of (all) other sign languages. More significantly, this research has constrained what scholars look for in other sign languages; and this is not dissimilar to the way in which western field linguists have sometimes been influenced by the linguistic structures of Indo-European languages (Gil, 2001).

Language typology offers the framework to generate a more balanced assessment of the range and limits of sign language variation, aiming for increasingly refined and valid generalizations on the basis of a broadening database. Some spoken language typologists, such as those who contributed to Dryer and Haspelmath (2011), have used surveys that include hundreds of languages; but this is not yet possible for sign languages, for reasons that are discussed in the next section. Of the sign language typological studies that have been conducted so far, there have been only a handful of large-scale surveys, such as Zeshan (2006), Zeshan and Perniss (2008), and Wilkinson (2009); and most studies have been smaller in scale. However, all typological studies make an important contribution to our understanding of sign languages. In this chapter we focus more on the large-scale surveys that have been conducted, but most of our comments are applicable to smaller scale projects too, since many of the methodological questions that sign language typologists face are similar regardless of how many sign languages are included.

Before moving on to look at some of these methodological questions, it is worth briefly mentioning some of the other, non-academic reasons for engaging with typology. The quest to show how sign languages are similar to and different from spoken languages is helpful in reinforcing the understanding that sign languages are equal in value to spoken languages, while the commitment of typology to the documentation of minority languages can lead to the empowerment of sign communities, especially those whose sign languages are endangered and devalued. Both of these benefits are particularly valuable in countries where recognition of equality between spoken and signed languages is not yet widespread. There is also much potential for supporting the development of metalinguistic awareness and research skills among deaf[1] people through data collection activities, and such ethical goals are increasingly becoming a non-negotiable part of sign language research (Dikyuva, Escobedo Delgado, Panda, and Zeshan, 2012). The involvement of deaf communities in research can be actively promoted by providing accessible information, effective communication, and mentoring schemes for deaf researchers around the world. We touch upon some of these opportunities here.

Domains and Parameters

The first methodological challenge in a typological study of sign languages is how to identify suitable parameters of variation within a promising domain of investigation. Many of the subsequent methodological issues are influenced by these initial decisions. Research on spoken language typology has covered different levels of linguistic organization (see Dixon, 2010), and the same is true for typological research on sign languages. At the grammatical level, the first large-scale sign language typology projects compared negative and interrogative constructions across 37 sign languages (Zeshan, 2006) and possessive and existential constructions across 28 sign languages (Zeshan and Perniss, 2008). Other grammatical typology studies have included domains such as constituent ordering (Johnston, Vermeerbergen, Schembri, and Leeson, 2007), negation and modals (Pfau and Quer, 2007), first-person plural pronouns (Cormier, 2007), interrogatives (Šarac, Schalber, Alibašić, and Wilbur, 2007), classifiers (Eccarius and Brentari, 2007) and numerals (Zeshan, Escobedo Delgado, Dikyuva, Panda, and de Vos, 2013). Lexical typology studies include Wilkinson (2009) on kinship terms and Zeshan and Sagara (2014), who are conducting a collaborative survey of numerals and of color and kinship terms in over thirty sign languages. The third volume in the *Sign Language Typology* series (Channon and van der Hulst, 2011) focuses on the level of phonology; its authors are currently preparing the SignTyp Database, which will hold approximately 1,000 signs from 15 sign languages (see Suggested Readings for more details).

When conducting cross-linguistic comparisons, it is important to be as sure as possible that target structures in different languages are comparable. This is very difficult to determine internally, by looking at morphosyntactic or phonological structure alone, and so cross-linguistic comparisons are founded on external, functional definitions (Croft, 2003), which require the selection of a particular semantic/pragmatic structure, situation type, or domain. It makes sense to choose a

research domain that appears to be cross-linguistically interesting, where sign languages are known to use a number of different forms or strategies to express a given function. A review of published studies on signed and spoken languages is a good starting point for identifying potentially suitable domains, and it is preferable to choose a domain that is well documented in the literature on spoken languages, so that some useful analytical tools and concepts are potentially available for application – often in a modified way – to the sign language data. There is no set process that ensures the selection of a suitable research domain, but first-hand experience in fieldwork, ideally on an undocumented sign language, is often crucial in terms of generating helpful observations and intuitions. Sometimes only after going through further steps – such as developing lists of parameters and testing them out on smaller sets of pilot data – will it become apparent that a domain is unlikely to yield interesting results.

Once a domain has been selected, it is necessary to determine the parameters of investigation (see Figure 11.1 for an example of parameters in the domain of negation). A scan of the literature on sign languages may quickly present some obvious parameters, although theories and concepts from the literature on spoken language typology can also be useful. Where frameworks already exist for a given domain, they have usually been created with spoken languages in mind and may not account for properties that are unique to sign languages. It can be useful therefore to think of typological research as operating in a cyclical way, starting from a linguistic and cognitive domain (such as negation or possession) and collecting systematic sign language data that can in turn lead to a revision of the initial parameters.

For example, the parameters for Zeshan and Perniss (2008) drew in part upon the ideas of Heine (1997) concerning possessive constructions such as "have" and "belong" constructions in spoken languages. Data analysis leads to bottom-up inductive generalizations, which can then be compared with results yielded by spoken language data. Ultimately a contribution is made to the development of

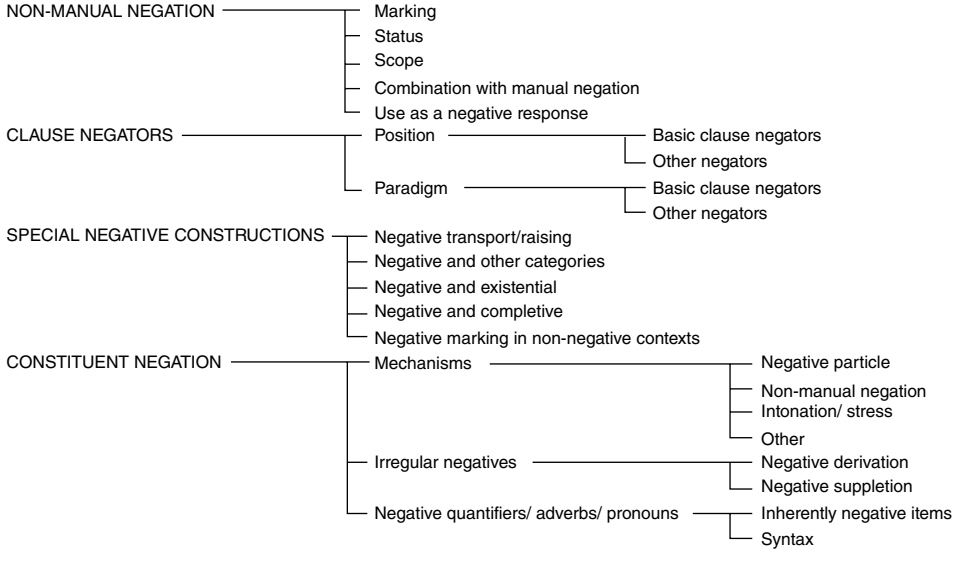

Figure 11.1 Parameters of investigation for negation. From Zeshan, 2004, p. 7.

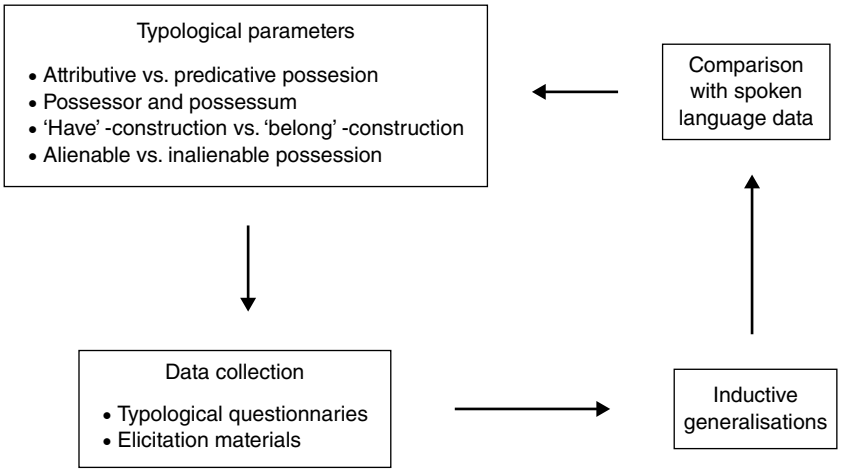

Figure 11.2 The cyclical nature of typological research. From Zeshan and Perniss, 2008, p. 14.

understanding of the linguistic and cognitive domain in question, and generalizations can be refined; this becomes the basis for new lines of enquiry, and so on. This cyclical process is illustrated in Figure 11.2.

Another example of the cyclical nature of defining parameters of investigation can be shown in the area of negation. One may start with a certain list of grammatical distinctions to consider – such as the difference between negation with a separate particle and morphological negation through what is known in sign language as "irregular negative" predicates – and then realize, upon analyzing the data, that the latter category needs to be replaced by several subparameters, in order to represent the difference between morphological negation (by clitics and affixes) and negative suppletion (see Zeshan, 2004).

Collecting Data for Cross-linguistic Studies

In order to make generalizations that are as representative as possible and to avoid bias toward languages of a certain geographical area or language family, language typologists often use data from many geographically and genetically unrelated languages. This is because, if a sample of languages is not broad and diverse enough, the value of the generalizations that are made will inevitably be limited. Choosing which languages to look at for a typological study is known as "sampling." Sampling is one of the most difficult and widely discussed methodological issues in language typology, and these difficulties are compounded in sign language typology for several reasons.

It is unusual for spoken language typologists to have first-hand knowledge of all the languages in their samples, and so they often find the data they need in reference grammars that have been written for different spoken languages. While this is common practice in language typology, the prospect of using a large sample is

problematic for sign language typologists. Compared with spoken languages, sign languages are severely underdocumented, which means that the amounts of data needed to conduct a large-scale typological research project are simply not readily available. To date, not a single reference grammar of a sign language has been published that meets the common standards set by spoken language reference grammars.

In sign language typology it is often impossible to create a geographically balanced sample because the data needed are simply not available for a sufficient number of sign languages. Geographically, the spread of sign languages that have been documented in some detail to date is skewed toward sign languages of urban deaf communities in North America and Western Europe, although recent publications have started to redress this situation (Brentari, 2010; Pfau, Steinbach, and Woll, 2012).

One of the ways in which sign language typologists have significantly broadened the sample beyond these western sign languages has been to include sign languages that are used in small-scale rural communities. Recently several linguistic analyses of such sign languages have been undertaken; and these languages have striking linguistic features, which challenge some of the assumptions that have been made of sign languages (Nyst, 2007; Nonaka, 2011; de Vos, 2012). While most sign languages have developed in the urban centres where deaf people gather, rural sign languages have usually developed in clearly circumscribed small-scale communities, often with limited external contact, where an atypically large number of deaf people live, usually due to endogamous marriages that have resulted in hereditary deafness (Zeshan and de Vos, 2012).

Given the unique features that village sign languages exhibit, it is worth including them in typological studies where this is possible, in order to maximize the diversity of the sample. Zeshan and Perniss (2008) included two rural sign languages – Kata Kolok and Adamorobe Sign Language – while the sample used by Zeshan et al. (2013) includes rural sign languages from three countries, along with the corresponding national sign languages (see Table 11.3 for some of the findings of this study).

Obtaining a genetically balanced sample of sign languages is also a major challenge. To start with, it is not clear what constitutes a "genetic relationship" between sign languages. While it is certain that not all sign languages are related to one another, the genetic affiliations of most of them are not known. Even the notion of "language families" is not well defined in sign linguistics, and not enough is known about historical change or about the results of contact between sign languages. No principled or robust methods have been developed for ascertaining family membership for a particular sign language, for reconstructing its earlier forms, or for deducing its family tree. With these limitations, it is difficult to see how a genetically balanced sample of sign languages could be created.

Finally, it is also important to have clarity concerning the varieties that are being referred to. For example, the distinction between languages and dialects is notoriously difficult to define and may be of no typological relevance (although typological approaches have much to offer to the field of dialectology, and vice versa; see Kortmann, 2004). However, in some domains, such as numerals, dialectal variation can be considerable, and in such cases it may be preferable to include several regional varieties in a typological study. This issue also applies at a transnational level. For instance, it has been argued that British Sign Language (BSL), Auslan in Australia,

and New Zealand Sign Language could be regarded as dialects rather than separate sign languages (Johnston, 2003), and the same has been argued for sign language varieties in the Levantine Arab area (Hendriks and Zeshan, 2009). These issues need not cause concern, but it is advisable to be as clear as possible in describing the language varieties that are being included in the sample.

Although a long-term aim for sign language typologists has to be to produce surveys with representative samples like those in spoken language typology, given the comparatively small number of documented sign languages and the limited information that we have at present on language families, a degree of compromise is necessary. Representative sampling has not been used in most of the large-scale surveys undertaken so far (such as Zeshan, 2006), because excluding geographical or genetic bias would have resulted in the comparison of only a handful of sign languages. Instead these studies aimed to include as many data from as many sign languages as possible, thus maximizing the potential diversity of features in the data. In samples of sufficient geographical diversity, and with some knowledge of the history of the sign languages involved, it is possible to be confident that at least some of the sign languages will not be genetically related – even in the absence of robust proof in each individual case.

So far as collecting data for a particular study is concerned, there are various different options. Although no sign language reference grammars have been published thus far, probably the first will appear before long, and the COST SignGram project team is currently creating a framework for such work (again, see the Suggested Readings section). However, it is unlikely that the next few years will produce enough reference grammars to enable a typological study based on them alone.

An alternative source of data is sign language corpora, which are being created in several countries such as Australia, Britain, Sweden, Germany, Italy, and the US. The recent rise of sign language corpora is particularly exciting for the field of sign language typology, as it eliminates the need to film new sign language data in some cases and creates the possibility of finding relevant data more quickly, from existing corpora. The problem of bias remains, as the vast majority of corpora are based in western countries; only a few are in non-western areas – like those used in de Vos (2012) for Kata Kolok, in Lutalo-Kiingi (2013) for Ugandan Sign Language, and in Palfreyman (forthcoming) for Indonesian varieties of sign language. Furthermore, even if a corpus is optimally annotated (and few are), the time required to access it and to search for and analyze structures in the target domain is not inconsiderable. In spite of this, the emergence of sign language corpora is a very positive and welcome development for typology and will make cross-linguistic studies ever more feasible.

Given the scarcity of data, sign language typology cannot currently proceed in quite the same way as spoken language typology. In most cases it is necessary to go beyond simply collecting and systematizing the existing data and to actually generate them for the project. For this reason Zeshan (2006), Zeshan and Perniss (2008), and Zeshan and Sagara (2014) worked with many research participants from around the world to collect data through questionnaires and other materials that cover the parameters of investigation and can be distributed to sign language linguists, native consultants, and fieldworkers worldwide. In working with international research partners, there will always be a trade-off between quality and quantity of information. The aforementioned projects included research partners who responded to an open call for participation: this has been the only feasible way to include a sufficiently large number of different sign languages. Therefore the collected information predictably

varies in terms of quality, level of detail, and reliability. Not all respondents have extensive training as linguists. However, all receive guidance materials, which may include different versions to choose from, for example shorter and longer versions of the questionnaire or translations into different languages. Given the complex nature of materials collected in this way, it is imperative that the linguists undertaking comparative analyses of these data have extensive first-hand experience with data collection, fieldwork, and the diversity of sign languages. Without such experience it is very difficult to make judgments as to the likely reliability of the information provided and to do effective follow-up with international participants.

The participation of deaf communities in typological research is very important, and this can be actively supported by translating the questionnaires and other materials into International Sign, thereby increasing access for deaf researchers and assistants (see Zeshan and Sagara, 2014). Translations into each individual sign language are not feasible given the large number of participating countries, and in our opinion International Sign is an adequate lingua franca for the purposes of exchange with diverse deaf communities. As long as one contact person in the target country is fluent in International Sign, the content of the project materials can be relayed to other deaf participants in local research groups. Arrangements can also be made to pair novice researchers with more experienced mentors based in different locations, to promote shared learning and mutual support.

In terms of content, questionnaires need to be open enough to be able to accommodate unusual structures, which may be hitherto undocumented, but cannot be so abstract as to be unusable; external research participants need illustrative examples of the potential diversity of structures. It is essential for the research team collectively to have some knowledge of diverse sign languages, so that these examples can be presented in the questionnaire, allowing where appropriate for an option labelled "Other" to accommodate novel structures. The following is an abbreviated example from a questionnaire on color terms:

Q.2 Sign for abstract expression "color"
- There is no sign or expression referring to color in general. → *Proceed to Q.3*
- Yes, there is a single sign for "color." *Provide a picture or video of the sign*
- Yes, there is a complex expression meaning "color":
- A sign for a specific color and a sign meaning "etc.," "various," or something similar, e.g. RED VARIOUS in Indian Sign Language.
- Several signs for specific colors, with or without other additions/modifications, e.g. RED WHITE BLACK in Kata Kolok.
- Any other combination of signs (specify) _____

Q.8 The semantic origin of color signs
- The sign is non-iconic. → *List the signs(s) in this category and provide a picture or video example*
- The sign is semantically related to an object, e.g. TEETH for "white," or ORANGE for "the color orange." → *List the signs(s) in this category, provide a picture or video example, and name the relevant body part/object.*
- The sign is linked to the spoken/written language, e.g. fingerspelling in ASL color signs → *List the signs(s) in this category, provide a picture or video example, and name the relevant word(s) from the spoken/written language*
- Other kind of motivation, namely _____ → *Describe and provide a picture or video example*

The combination of a typological questionnaire with elicitation materials such as those used in Zeshan and Perniss (2008) and Zeshan and Sagara (2014) has proven to be particularly effective, because targeted elicitation creates relevant data, from which examples can then be extracted to illustrate responses to the questionnaire. This is helpful especially where target structures are unlikely to occur frequently in spontaneous data, as is the case with a large range of color terms. Moreover, the use of the same materials for different sign languages is likely to result in data that are more equivalent functionally, since the structures that emerge have been used to deal with similar situations.

Elicitation materials should have a clear goal – and it is worth considering a goal that is ostensibly unrelated to the underlying aim of data collection, so that participants relax and use natural structures. Sentence elicitation, if used at all, should be

Table 11.1 Examples of elicitation materials for possession and existence. Based on Zeshan and Perniss, 2008, Appendix B.

Name	*Goal*	*Linguistic targets*
Family tree game	Player A gets information about player B's family or about the family of a friend of player B and uses this information to create a family-tree chart.	• inalienable possession with kinship terms and possessive pronouns • predicative possessive structures • quantified possessive nominals ("I have two sisters") • first-, second-, and third-person forms
Doctor–patient game	Player A must diagnose player B's illness (headache, weakness, skin rash, etc.) on the basis of the symptoms on a chart.	• body part possession ("my head"), one of the core examples of inalienable possession • predicative possession ("have a headache") • first- and second-person reference
Picture matching game	There are pictures of 15 items and three people, and players A and B decide which items belong to which person.	• alienable possession • third-person reference • may elicit "belong" constructions (in contrast to "have" constructions)
Picture comparison game	Players A and B each have pictures that differ from each other in a number of respects; looking at their own picture only, they must identify the differences.	• possessed items • modified and quantified possessed items • existential statements (positive and negative)

used very cautiously. Basing elicitation activities on real-life situations has proven to be very successful, and informants have responded well to games that require role play. For example, asking participants to bargain for objects (such as a shirt, a cow, or a house) has worked well in eliciting examples of numerals in different sign languages (Dikyuva et al., 2012; Zeshan and Sagara, 2014).

Facilitators must be culturally aware and asked to use elicitation materials flexibly. The precise nature of a task can usually be varied in order to keep elicitation fresh and interesting for the participants, as well as culturally appropriate (for instance, by avoiding materials based on mathematics in contexts where there is no deaf education or where schooling has strong negative connotations for participants). Table 11.1 describes four of the elicitation activities that were used by Zeshan and Perniss (2008).

Typological Analysis: Uncovering Ranges and Patterns

There are two different stages of analysis for typology studies. In the first stage – the initial analysis – data are analyzed according to the parameters of investigation by the individuals or groups of linguists who collected the data and have direct knowledge of the sign language through fieldwork. This work may also be undertaken by participants who are not linguists, so long as they receive instructions and guidance from the lead researcher(s). It may be that those involved in the primary analysis stage collect data expressly for the typology project, or they may be able to refer to data that have already been collected as part of a corpus. For instance, in a questionnaire section about numeral incorporation, the available options might be numeral incorporation with time units, with monetary units, with school grades, with any other units, or not at all. For each sign language, this can serve as a checklist; and, if any instances exist, they are reported along with examples in the form of videos, pictures, and/or glossed utterances, and ideally with the range of numerals that can be incorporated.

At this first stage, the aim is to identify the target structures and categorize them, so as to account for the full range of corresponding forms that can be found in each sign language. In some instances it may be the (principal) typologist(s) who conduct the initial analysis, because they either have access to the sign languages themselves or are working in partnership with the researcher. Of course, where a sufficient number of analyses have already been published – descriptive work, articles, and the like – typologists can work with them directly.

The second stage – comparative typological analysis – involves analyzing target structures across the sample. For instance, evaluating the occurrence of numeral incorporation across 21 sign languages has shown that it is very rare to have no numeral incorporation at all, and that its use is most widespread with time units such as "month," "year," and "week." Moreover, the analysis shows that there is an implicational hierarchy: whenever numeral incorporation is used with respect to money, school systems, or any other domain, it is also used with time units. The fact that all sign languages in the data conform to this implicational hierarchy can be "read off" straightforwardly from a data table into which the findings from each sign language have been entered (see Table 11.2). Identifying such patterns is one of the main goals of typological analysis.

It is crucial, wherever possible, to retain a close link with real examples from the cross-linguistic data samples, and always to bear in mind that reinterpretation and re-evaluation may be necessary in light of the cross-linguistic patterns that start to emerge. However, one of the challenges of using multiple parties to collect and analyze data is the inevitable variation in the coding schemes used. Naturally, researchers use their own schemes, but discrepancies in notation can be confusing at the comparison stage. It is not advisable to circulate a rigid coding schema in advance, since this could be restrictive and could suppress real cross-linguistic variation. In any case, the categories for coding may not always be obvious – the whole point of a typological study is to identify linguistic heterogeneity, not to "enforce" homogeneity by applying predetermined categories or labels.

Typologists often display the presence or absence of features in the form of tables or graphs, so that patterns can be identified more easily. Where values are binary, as in the case of numeral incorporation, tables can be used to show the presence (+) or absence (–) of the phenomenon in question (see Table 11.2 for an example). Table 11.3 shows another example of a binary-values table for numbers up to 100 in six different sign languages. From this table it becomes clear that the three rural sign languages in the sample (Alipur, Chican, and Mardin) use strategies that are not available in the urban sign languages (see the highlighted cells).

The presence or absence of a feature is the most basic distinction, but the outcomes of typological analysis may also be concerned with interrelationships between features, relative frequencies, the hierarchical organization of linguistic features, or abstract observations about the properties of linguistic subsystems. For instance, Table 11.3 also shows that Indo-Pakistani Sign Language is monosystemic with respect to these numerals, using only one of the available numeral strategies (digital). Various graphs can be used to illustrate non-binary findings. For instance, Figure 11.3 shows the frequency of negative particles across all sign languages in the data sample.

Another way to compare parameters in different sign languages is to use data spreadsheets, where each sheet may include multiple parameters per sign language, as in Figure 11.4, or a single parameter expressed in all available sign languages. This has the advantage of producing an automated sorting if data sets are large. In

Table 11.2 Data table on numeral incorporation. Based on data collected for the iSLanDS Sign Language Typology Project, 2010–2014, in Zeshan and Sagara, 2014.

Sign Language	*Time*	*Money*	*School*
Chinese	+	+	+
Hungarian	+	+	+
Icelandic	+	–	–
Indian	+	+	+
Indonesian	–	–	–
Israeli	+	+	–
Japanese	+	+	–
Kosovo	+	–	+
Mexican	+	+	+
Sri Lankan	+	+	+
Ugandan	+	+	–

Table 11.3 A binary values table showing the properties of numeral systems for numerals up to 100 in different sign languages. Adapted from Zeshan et al., 2013.

	Alipur Sign Language	*Chican Sign Language*	*Mardin Sign Language*	*Turkish Sign Language*	*Indo-Pakistani Sign Language*	*Mexican Sign Language*
Base-20 numerals	–	+	+			
Base-50 numerals	+	+	+		Ø	
Subtractive	+	–	+			
Spatial modification	+	–	–			
Additive	+	+	+	+	–	+
Numeral incorporation	+	–	+	+	–	+
Digital	+	–	–	+	+	–

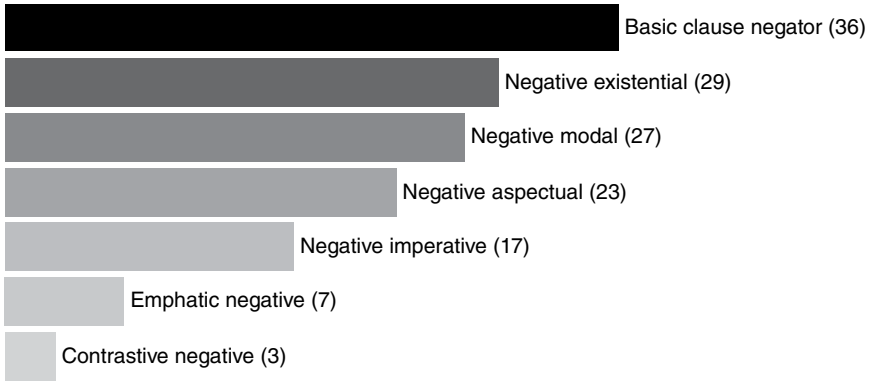

Figure 11.3 A chart showing the frequency of various negative particles across sign languages (n = 37). Based on Zeshan, 2006, p. 48.

addition to notes that concern what is known about the parameters in each variety, it is also important to identify gaps in the data that can be supplemented or, in accordance with a circular approach, it might be possible to combine or redefine subparameters. If suitable expertise is available within a typological project, a database with multiple search functionalities may be ideal, as has often been implemented successfully in spoken language typology.

Whatever tools are used, the aim of the typological analysis is to abstract away from the data on individual sign languages so as to uncover patterns in the domain and the range of structural variation.

PHENOMENON	VALUE	WRITTEN EXAMPLE	PICTURE EXAMPLE	VIDEO EXAMPLE
I. Attributive possession				
A. *Pronominal possessors*				
A1. Personal pronouns	yes	yes; 2 examples	no	yes; 2 examples
A2. Possessive pronouns	yes	yes; 13 examples	yes; 2 examples	yes; 2 examples
B. N*ominal possessors*				
B1. Juxtaposition	yes	yes; 4 examples	no	yes; 1 example
B2. Overt marking	yes	yes; 8 examples	no	yes; 2 examples
C. *Spatial marking*	no	-	-	
C1. How used for possession?	-	-	-	
C2. Restriction to few signs?	-	-	-	
II. Predicative possession				
D. *Basic 'have'-construction*				
D1. Existential pattern	yes	yes; 13 examples	yes; 1 example	yes; 1 example
D2. Locative pattern	no	-	-	
D3. Action pattern	no (but similar)	yes; 3 examples	no	
D4. Zero-marking	no	-	-	
D5. Other pattern	no (no comment)	-	-	
D6. Use of more than one pattern	no (no comment)	-	-	
E. *Extended patterns for 'have'-constr.*				
E1. Possessum categories	same as 'have'	yes; 7 examples	no	yes; 4 examples
E2. Modified possessum	same as 'have'	yes; 6 examples	no	yes; 1 example
E3. Inanimate possessor	yes	yes; 7 examples	no	
E4. Other clause types ('have'-constr.)	no (no comment)	-	-	yes; 3 examples

Figure 11.4 Section from a spreadsheet used to record and compare data from different sign languages.

If the focus of analysis is likely to involve areal typology, it can be helpful, in addition to some of the methods here, to plot the geographical distribution of structures on a map. For example, Zeshan (2011) looks at question particles – signs that indicate that an utterance is a question – in 37 sign languages from different parts of the world. Plotting the data on a map of the world reveals a high incidence of these particles in East Asia, while the sign languages used in Southeast Asia and the South Asian subcontinent do not have any question particles. Furthermore, the four sign languages where the presence of more than one question particle could be established are all in East Asia (Hong Kong, mainland China, Taiwan, and South Korea).

Once such patterns have been identified, it is possible to try and explain them. For instance, the high incidence of question particles in East Asia corresponds to the presence of question particles in the spoken languages of the region, for instance *ka* in Japanese and *ma* in Mandarin, which raises the possibility that spoken languages may have had structural influence on sign languages in the domain of interrogatives (Zeshan, 2011, p. 565). For other patterns it may be viable to form only tentative hypotheses, and often existing work from spoken language typology, for example frameworks of grammaticalization, can be helpful in understanding the data.

Toward a Cross-modal Typology

So far we have focused on sign language typology; we now turn to cross-modal typology, which describes studies that include data from both spoken and signed languages. Cross-modal typology is an important syncretic development for

linguistics, marking a point where signed and spoken language linguists come together. Indeed, the word "cross-modal" could be considered redundant; we use it to emphasize the inclusion of both modalities, highlighting the fact that what is traditionally called "typology" has hitherto excluded sign languages and is better described as "spoken language typology." One of the key questions is whether or not universals are modality-dependent. Are the "universals" that have been identified so far applicable only to spoken languages ("spoken language universals") or only to sign languages ("sign language universals") – or are they genuine, cross-modal universals that are true of all languages, signed and spoken?

Approaches to cross-modal typology have only recently begun to take shape (see Pfau and Steinbach, 2006; Zeshan et al., 2013). Zeshan (2004) compares sign languages with spoken languages and notes that the former "differ strikingly" in terms of the negation strategies that are used (see Table 11.4). For example, sign languages prefer negative particles in post-predicate or clause-final positions, whereas preverbal particles are prevalent in spoken languages. Another notable example is the use of head movements to express negation suprasegmentally, which is universal across sign languages; conversely, suprasegmental marking of negation in spoken languages (via intonation) is extremely rare. Thus it could

Table 11.4 Negation in signed and spoken languages. Zeshan, 2004, p. 51.

Parameter	*Spoken languages*	*Sign languages*
Frequency of negation strategies	• morphological negation (affixing) is general across a word class and common across languages • negative particles are common • intonation is extremely uncommon	• morphological negation is limited • negative particles are very common • intonation is extremely common
Morphological negation	• almost always affixation (both prefixes and suffixes), other morphological processes are very rare	• only suffixation, no prefixes, plus simultaneous internal modification of signs
Syntactic position of negative particles	• predominantly preverbal	• predominantly clause-final
Double marking of negation	• relatively uncommon, especially as a combination with negative intonation, but some instances of double particle constructions	• extremely common, especially with manual and non-manual negation, but no double particle construction
Form of negative morpheme	• arbitrary and not recurrent in unrelated languages	• often iconic and recurrent in unrelated languages

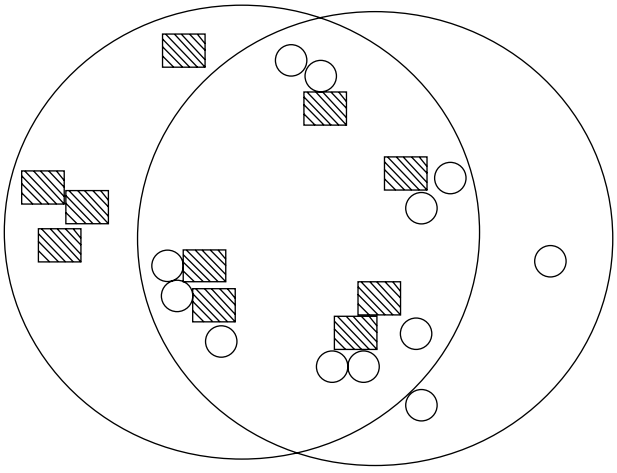

Figure 11.5 The patterning of linguistic features in cross-modal typology. From Zeshan et al., 2013.

be argued that sign languages and spoken languages constitute two different typological groupings.

In other domains, however, a different picture emerges. Zeshan and Perniss (2008) find no evidence that sign languages can be grouped together as a type with respect to possession and existence. Similarly, Zeshan et al. (2013) compare the expression of cardinal numerals in rural sign languages, urban sign languages, and spoken languages and conclude that typological diversity across sign languages is far greater than previously recognized. As shown in Table 11.3, each sign language has its own unique system, and again, neither sign languages nor rural sign languages emerge as a homogeneous subtype. For instance, the numeral system of Mardin Sign Language is, in some ways, more similar to spoken languages that have multiple bases and vigesimal numerals than to sign languages that use a decimal system.

In other words, while typological features may be modality-dependent and thus appear only in spoken languages or only in sign languages, other features may appear in both modalities (see the schematic representation in Figure 11.5). It cannot be assumed that features will always pattern according to modality, and inductive generalizations need to be obtained separately for each domain.

Conclusion

Sign language typology invites linguists to look at patterns of variation both within sign languages and across sign languages and spoken languages. Despite the challenges that sign language typologists face, it is not unfeasible to collect sufficient quantities of data for the purpose of making inductive generalizations that are empirically substantiated. Once a larger number of studies have been conducted, the results of these studies can be synthesized into a theory of variation across sign

languages. Within such a theory, it will be possible to look at the question of *why* the observable patterns occur across sign languages in the way they do (see Zeshan and Perniss, 2008, p. 14). Finding explanations for these patterns depends in turn on reaching a better understanding of the structures and processes that affect sign languages. In this way sign language typology can help identify and frame the questions that sign language linguists need to address.

All these studies work with primary data from sign languages, using a combination of the methodologies discussed in earlier sections, and they rely on published literature for spoken language data. The parallel collection of primary data from both signed and spoken languages is in its infancy and currently represents a methodological gap, explicit approaches to the methodologies of such cross-modal typological studies being almost absent.

Typologists believe that cross-linguistic comparison opens doors to our knowledge of languages, but we believe it is cross-modal typology that offers the most exciting possibilities in terms of developing the field of sign linguistics. The question of how linguistic features interact within and between the two modalities – signed and spoken languages – will inevitably continue to prompt new lines of enquiry in unexpected and fruitful areas. It is largely down to sign language linguists to champion cross-modal approaches and to effect new transformations in our understanding of human languages.

Note

1 No textual differentiation between *Deaf* and *deaf* is made in this chapter. Our use of *deaf* refers to culturally and linguistically deaf signers, and a distinction between this and medical deafness is not relevant to the discussion.

Keywords

cross-linguistic; cross-modal; elicitation; ethics; linguistic domains; linguistic parameters; linguistic research methods; sign language typology

See Also

Chapter 6; Chapter 9

Suggested Readings

Croft (2003) situates typology within broader linguistic traditions and gives many examples of how spoken languages can be compared through terminology and methods that, with care, can be applied successfully to sign languages. Lutalo-Kiingi (2013) examines many aspects of the morphosyntax of Ugandan Sign Language, including how it expresses possession, negation, and number. Zeshan (2004) gives an overview of negative constructions in sign languages and compares sign languages with spoken languages in this domain. Zeshan and Perniss (2008) is a typological study of

possessive and existential constructions in 28 sign languages around the world, including village sign languages in Ghana and Indonesia. Zeshan et al. (2013) look at cardinal numerals in rural sign languages from a cross-modal typology perspective.

As for web resources, COST SignGram (http://parles.upf.edu/en/content/cost-signgram) is the website of a project entitled "Unravelling the Grammars of European Sign Languages." The aim of the project is "to design a blueprint for the creation of reference grammars of individual sign languages which is descriptively thorough and theoretically grounded." The website includes more information and a signed introduction. The SignTyp database, which is currently under development, will hold approximately 1,000 signs for 15 sign languages. It will enable typological analysis of location, handshape characteristics, contact types and locations, path shapes, directions, and orientations. The World Atlas of Language Structures (http://wals.info; see Dryer and Haspelmath, 2011) is an online database of the structural properties of languages, compiled from the descriptive materials of over 50 authors. It contains two chapters on sign languages.

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