

9 Methods of Research on Sign Language Grammars

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Chapter Overview

Over the last decade or two, sign language research has expanded to include more research with gesture, new sign languages, and cross-linguistic work. This has led to the development of methods that allow elicitation and testing across speakers, hearing gesturers, and signers of different sign languages. Materials such as photographs, illustrations, and video clips are useful as a means of comparing responses and linguistic judgments within similar communicative frames. These tasks also avoid pitfalls with translation-type exercises, which can be difficult or impossible for little-studied sign languages. Some tasks are designed for pairs of signers where one conveys to the other a description that requires a judgment about meaning. Communicative tasks such as these draw the focus to the discursive aspects of language, where signers engage in conversation as well as produce language responses. The easy portability of laptops and lightweight video allows testing and interviews of language users in situ, in their homes and in settings with other language users.

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Much of the work on sign language grammars in the last 50 years has involved established sign languages, many of them “national sign languages,” with multiple communities and large numbers of signers (Sandler and Lillo-Martin, 2006). Even when the linguist shares the same language as the consultants or is sufficiently fluent in it and can carry out productive elicitation sessions, it is important to explore different approaches to developing grammatical descriptions. Fischer (2009) provides an excellent guide on how to work with a single signer or with groups of signers eliciting sign language forms and structures. More recently, the SignGram project (www.signgram.eu) has involved collaboration between European researchers to create a blueprint for reference grammars of sign languages; these should include the development of methodological guidelines and common elicitation materials for sign language research.

As the field of sign language research expands in ambition, we see more such research developing across different regions of the world, particularly on “small sign languages” in villages and towns and on larger sign languages in little-researched areas like Eastern Europe and India (Brentari, 2010; Mathur and Napoli, 2011; Zeshan and de Vos, 2012). From these studies new findings emerge on grammars of diverse sign languages, related and unrelated, each having different community characteristics and histories. Many of these studies are carried out outside the laboratory and directly in the field. As it turns out, these methods are also useful in a new area of language research: comparing pantomime and gestures produced by hearing non-signers with home signers and signers of new and established sign languages (Gibson, Brink, Piantadosi, and Saxe, 2011; Goldin-Meadow, So, Ozyurek, and Mylander, 2008; Hall, Mayberry, and Ferreira, 2013; Langus and Nespore, 2010; Padden et al., 2013).

Usually, when linguists begin to work on a spoken language, they already know something about its history, or at least about the history of languages like it. They can identify where the language is spoken; and there may already be published records comparing its grammar to those of other languages in the region. To use an example, a linguist who begins to study a Mayan language in Mexico can find some kind of published work as a starting point for research. There may be a written grammar, or preliminary notes on some aspect of the grammar. She can also use published studies of grammatical features of related languages to guide her work.

But, more often than not, the resources about the history of a particular sign language are limited. For some sign languages, a first step is to identify schools that signers may have attended. From this information the linguist can track the geography of the language, establishing patterns of sign language acquisition, social use, and contact with other language(s) of a region. In the Middle East, Asia, and parts of Africa, schools for deaf¹ children date only to the last half of the twentieth century; this situation results in a different pattern of sign language contact and spread by comparison to that of North American and European sign languages with histories dating to the eighteenth century or earlier (Padden, 2010; Woodward, 1996). In some areas of the Middle East there are unrelated sign languages within a hundred kilometers of each other (Al-Fityani and Padden, 2010), which reflects the political geography of the region.

In this chapter I discuss methods for investigating four areas of sign language grammar: basic vocabulary; lexicon studies; verb classification and grammatical roles; sentence types and discourse structure. The goal here is not to be

comprehensive or exhaustive, but to give examples of methods designed for comparative sign language work. Using translation and paradigm studies can be difficult in communities where there are few signers and they are unaccustomed to outsider interest in their language. Such sign languages have long been overlooked in favor of sign languages with long institutional histories and large communities of signers. Now, with more work on sign languages around the world, from the very small to the very large, we see more use of these kinds of testing materials in collecting linguistic data.

Basic Vocabulary

Translation is a time-honored approach to research on an unknown language, and it works if the linguist and the consultants share a common language. If the community is new to any kind of study of its sign language, it may take some time before consultants understand what kind of translation linguists want. Translating with the help of written sentences is a honed skill, which requires literate knowledge and an awareness that sign languages can present small differences in grammatical form and meaning. Metalinguistic knowledge of the kind of detail that linguists want requires time and experience to develop. Asking a signer to read sentences – say, one with a conditional clause and another with a counterfactual – and then to show how they would be signed differently can stump even bilinguals. Susan Fischer (2009) advises against translation, except for basic vocabulary, because signers may inadvertently change their language to more closely mirror the written sentences.

Instead of translation, pictures of objects and videos of actions can be used to develop a basic dictionary. Simple pictures can be used for naming, and then more complex ones can elicit signs for abstract concepts. In communities with little tradition of schooling, signers may give *syntagmatic* responses instead of naming the object in the picture, for example “this tree is tall and leafy like the one outside,” or, for a specific type of tree, “a tree that bears the fruit of dates.” *Paradigmatic* strategies, or providing a single sign for each picture, is common among those who have attended school. They have more experience of naming tasks, and they also understand how to interpret complex pictures or drawings with movement lines that portray actions as in a cartoon, because these materials are more common at school (Cole, 1996).

Whether you work with the sign language of a village or of a large deaf community, it helps to collect responses across different signers, then to return to the same signer at different points in time to collect the same vocabulary. Paradigmatic responses can be compared to syntagmatic ones to probe variation across generations and groups of signers in a small community. In very small communities, sign variation may appear across families; such sociolects are called “family-lects” (Israel and Sandler, 2012). Families may vary in their signs for the same object. In large national sign languages, sign variation can be related to region, ethnicity, class, generation or age, and gender (Lucas, 2001). Some anthropologists and linguists have used network analyses to track which members of a small community have regular or less frequent contact with one another (Nonaka, 2007) as a way of establishing vocabulary use and conventionalization in the community.

A database of signs from multiple members of a sign language community can be a first step in developing a phonology of that language. Signs can be coded according to features and by phonotactics – for example constraints on one- or two-handed forms (Morgan and Mayberry, 2012), or assimilation across sign segments in a sign and in compounds. There are now large and detailed dictionaries available online (e.g. the *Online Dictionary of New Zealand Sign Language* at <http://nzsl.vuw.ac.nz>), with illustrations and videos that make it possible to compare lexical variants within sign languages.

Lexicon Studies

One way to explore signs across grammatical categories is to compile pictures of objects that share features and to ask signers to identify them. Linguists have used versions of the Swadesh List, developed by the linguist Morris Swadesh for use with spoken languages. The list is intended as an early “snapshot” of the lexicon of a language (Swadesh, 1950), in preparation for further study. On the basis of what is learned, the linguist can follow up with studies of kinship signs, noun classification, lexical categories, classifier structures, verb classification, as well as inflectional and derivational forms. The Swadesh list includes common objects, actions, colors, and some abstract concepts that one would expect to find in most human communities. James Woodward modified this list for his own comparative studies of sign languages, to avoid eliciting pointing such as for body parts (e.g., ear, eye, nose, mouth) or for personal pronouns (Woodward, 1993). The remaining items on his list include vocabulary relating to color, natural objects, food, animals, number, and intransitive verbs (eat, sleep, walk).

For elicitations, pictures of clothing, animals, or colors can be taken by using local objects; these pictures are then quickly loaded into the laptop for easy presentation on slides (Figure 9.1a–c). Familiar objects in local cultural contexts are more appealing to consultants. Be aware, however, that there are likely constraints and issues of privacy in a small community: you may not be able to show photographs of young women from one family to members (especially young men) of a different family. Instead, generic photographs can be selected from the Internet. Remember, too, that there are cultural issues even for such pictures; for example, animals that are household pets in one culture may not be pets in another; or there is clothing that is judged inappropriate in traditional communities. Before asking members of a community to participate in video actions for testing, be sure there are no privacy risks to the individual who is shown in the video.

Consultants can be asked to provide sign translations of written words across grammatical classes (e.g., nouns, verbs, adjectives), but their responses may not reveal differences between related forms. The difference between the noun “toothbrush” and the verbal counterpart, “brush one’s teeth,” may be difficult to see or nonexistent (Tkachman and Sandler, 2013). As a strategy for eliciting nouns and related verbs in American Sign Language (ASL), Supalla and Newport (1978) used videos of objects (“toothbrush”), followed by videos of actions featuring those objects (“brushing your teeth with a toothbrush”). They then used videos of unusual



Figure 9.1a–c Examples of photographs of local objects for vocabulary elicitation. Photos courtesy of Rabia Ergin.

actions typically not associated with the object, such as “putting a toothbrush in a cup,” to see if the noun in a sentence with a different action would be signed in a distinctive way. They also tested consultants at different times, to see whether signers reliably reproduced forms the same way each time.

Brentari and Padden (2001) discuss a distinction between native vocabulary in sign languages, which includes basic signs and their related forms, and non-native vocabulary which includes borrowed forms such as fingerspelling, initialized signs, and signs from other sign languages. Fingerspelled words are pervasive in some sign languages and play an important role in their lexicons (Padden, 2006; Sutton-Spence, 2006). Wrongly judged as falling outside of lexicon studies, fingerspelled words are broadly used in languages like ASL, British Sign Language (BSL), and Swedish Sign Language. They become embedded in the lexical structure of signs and can be used with signs in compounds – as in the ASL sign BLACK+M-A-I-L, “blackmail”

(Padden, 1998), or in the BSL signs for major cities like G-W, “Glasgow.” Foreign borrowings can reveal processes of lexicalization or nativization; thus, for the sign GLASGOW, the handshape of the -W- has been partially assimilated to that of -G-. Borrowed vocabulary in a sign language can be found in brand names, towns and cities, commercial entities, and signs for new technologies. Pictures of new technologies, maps, and commercial advertisements can be used to see what resources sign languages use for these concepts.

For classifier structures, including size and shape specifiers, a common approach is to use pictures or illustrations of objects in various arrangements. Zwitserlood (2003) used illustrations of objects in common classificatory schemata as a way of mapping classifier types for Sign Language of the Netherlands (NGT). She added illustrations of nonexistent entities to explore productive strategies for using classifier handshapes (Figure 9.2).

Brentari, Coppola, Mazzoni, and Goldin-Meadow (2012) compared pantomimic gestures of hearing non-signers and classifiers used by signers, focusing on (1) their use of “handling handshapes” in order to depict an agent moving an object, or (2) their use of “object handshapes” in order to describe the shape or dimension of objects without reference to an agent. They used pictures of an object (or objects) on a flat surface, then they presented the same objects in a video that showed a human hand touching or manipulating them in the picture (Figure 9.3a–b). They video-recorded gesturers’ and signers’ responses and coded for types of handshapes and movements.

Davidson (2011) asked English speakers and ASL signers to judge the meaning of spoken and ASL sentences containing quantifiers such as “some” and “all.” Her question was whether the word or the sign meaning “some” is understood to mean a quality applying to some objects in a set, but not to all of them. These pragmatic evaluations by language users are called “scalar implicatures.” After consulting with ASL signers, Davidson developed an experiment that compared speakers and signers by using Pyscope software on a laptop. First the program showed, on the left side of the screen, a photograph with an array of objects; then a video window appeared

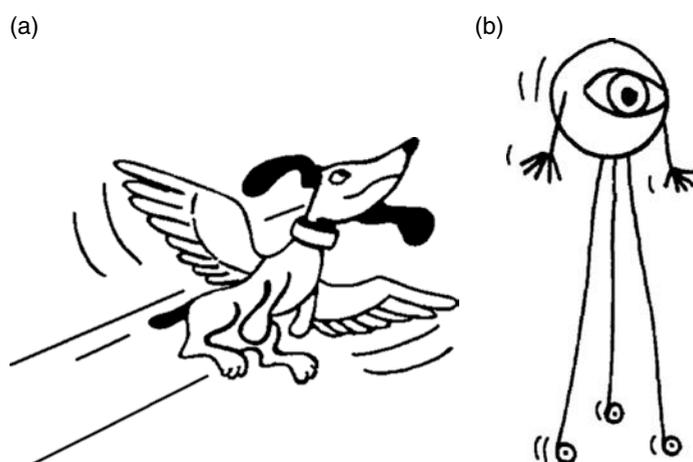


Figure 9.2a–b Illustrations of nonexistent or alien entities for elicitation of classifier structures. Zwitserlood, 2003, with permission of Inge Zwitserlood.

with a model speaking (for English speakers) or signing (for ASL signers) a sentence with the concept “some” or “all.” Participants were asked to evaluate the acceptability of the sentence by touching either a key with a smiling face sticker or a key with a frowning face sticker (Figure 9.4). Using a task that requires a key-press for judging a signed sentence allows ASL signers to rate acceptability in ASL without influence from written English.

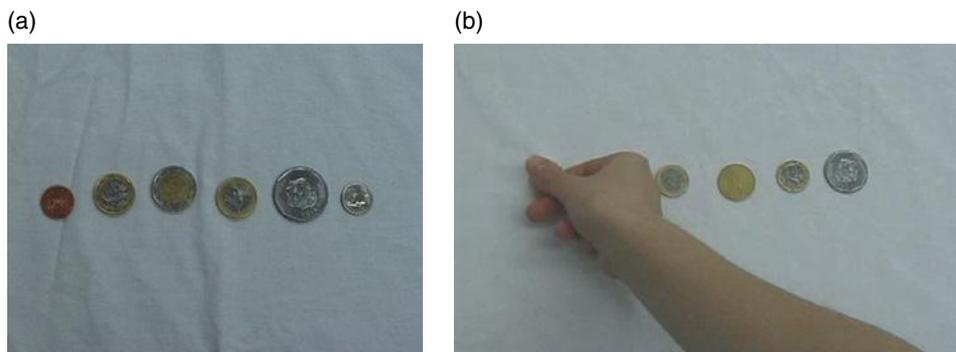


Figure 9.3a–b Photograph (left) and frame of video (right) for eliciting classifier structures for objects and agents handling objects. Courtesy of Diane Brentari.

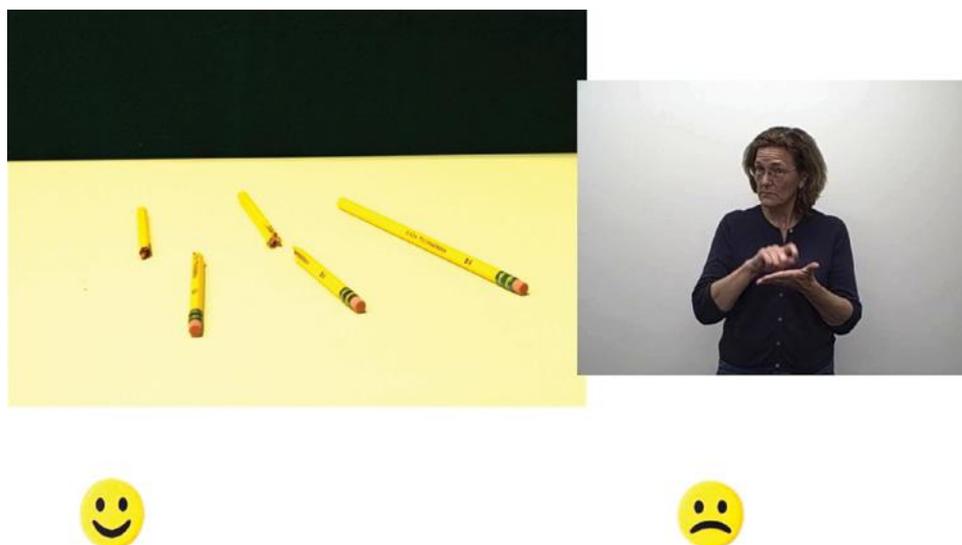


Figure 9.4 Screenshot of an ASL experimental trial eliciting judgments of quantifiers. Signers are asked to judge whether the signer’s description matches (smiling face) or does not match (frowning face) the picture. From Davidson, 2011 with permission of Kathryn Davidson.

Verb Classification and Grammatical Roles

Some studies of sign language word order and grammatical roles use video clips to elicit basic sentence structure with intransitive and transitive actions (Sandler, Meir, Padden, and Aronoff, 2005; Senghas, Coppola, Newport, and Supalla, 1997). Signers are asked to describe an action in a video clip to another signer, who is then asked to repeat the description or to identify a picture that corresponds to the action. Paired communicative tasks are ideal for evaluating if signers in a cohort or in a community can understand each other and can reliably identify the subject or object in a sentence.



Figure 9.5a–c Response sheet for addressees in paired communication tasks: “The woman gives the man a shirt.” From Shai Davidi and Sign Language Research Lab, University of Haifa, Israel.

Sandler, Aronoff, Meir, and Padden (2011) asked signers to describe an action in a video clip to another signer, who then had to identify one out of three pictures. For example, in a video showing a woman giving a man a shirt, the signer first observes a partner describing the video, then sees on the screen three pictures: a correct picture; the man showing the woman a picture (different action); and the man giving the woman a shirt (different subject) (Figure 9.5a–c). Signers' responses to these videos have been used to demonstrate argument structure in sign languages (Meir, 2010a; Padden, Meir, Sandler, and Aronoff, 2010), how the body marks a lexical subject (Meir, Padden, Aronoff, and Sandler, 2007), and how the competing iconicities of person and subject are resolved in a sign language (Meir, Padden, Sandler, and Aronoff, 2013).

Senghas (2003) studied spatial modulations and directional verb forms in Nicaraguan Sign Language (NSL). Signers view a video with three actors seated adjacently to each other. One actor turns to the side and taps the person next to her on the shoulder. The signer is then asked to provide a sign description of what happened to a second signer, who has to choose from an array of pictures featuring different actions. Different combinations of interactions between the three actors were designed to elicit various possibilities of marking grammatical roles and of representing them in space. Sign forms across cohorts of NSL signers were coded for the use of spatial modulation.

Sentence Types and Discourse Structure

Elicitation guided by using video clips, described earlier, is a good starting point for the analysis of sentence types in a sign language. Video clips can be designed to probe different kinds of sentences: with intransitive and transitive verbs, with one object and two objects (ditransitive), with inanimate and animate objects. They can elicit verbs involving path and motion and verbs involving transfer from one human to another. For example, signers may represent verbs of transfer by using separate sentences instead of one: instead of “the woman gave the man a shirt,” the signer produces two sentences: “the woman gave a shirt and the man took it.” Photographs of models with different characteristics can assist in examining the use of descriptive adjectives in a sentence. Generally, sentences used for face-to-face interaction differ from the types represented in written language (Miller, 2006) – which is another reason why signed translation from written sentences can be misleading for linguistic analysis. For more complex structures, signed narratives can have examples of direct or quoted speech, conditionals or topic structures, and they can provide data beyond what can be found in guided elicitations.

To elicit narratives, signers can be asked to describe picture books (Morford, 2003) or to view a cartoon (Brentari, Nadolske, and Wolford, 2012; Senghas and Coppola, 2001) featuring complex actions performed by an animated character.

Senghas (2010) used pictures of figures in spatial arrangements relative to each other to explore how signers position referents in signing space; these pictures were drawn from available materials developed by Levinson et al. (1992) (Figure 9.6a–c). Two signers had the same set of pictures, which showed a figure facing a tree or

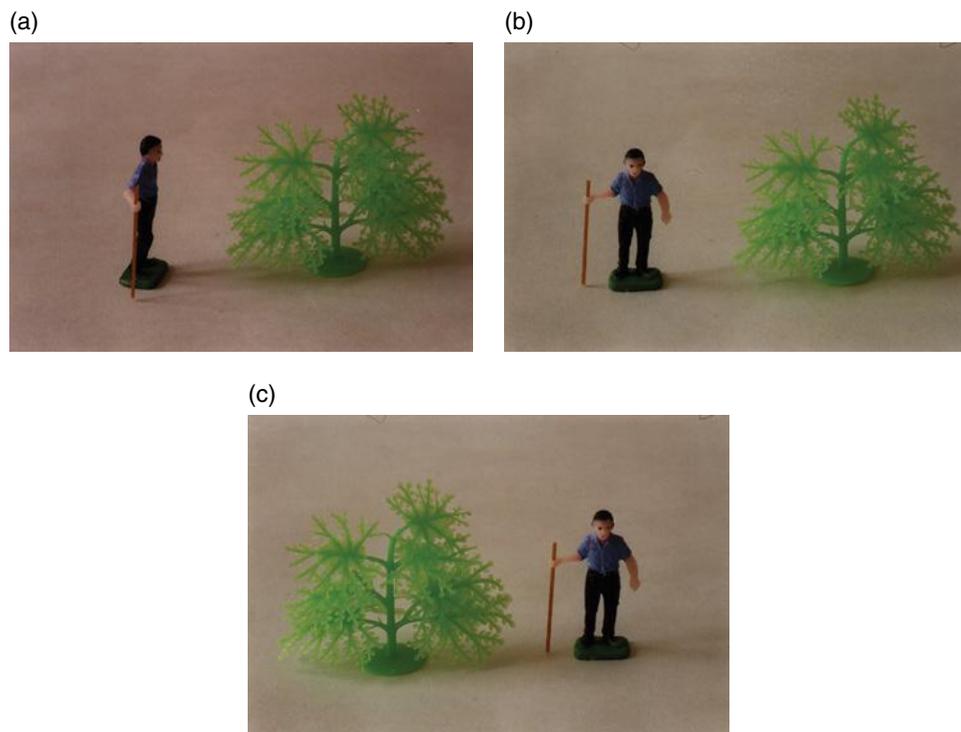


Figure 9.6a–c Photographs of figures in various spatial arrangements (Levinson et al. 1992). From <http://fieldmanuals.mpi.nl/volumes/1992/man-tree-space-games>

standing next to it on either the left or the right. One signer on the other side of a screen between the two described one picture to another signer, who then selected a picture that corresponded to the description. This elicitation evaluates whether signers provided a spatial description from their own point of view – that is, whether the figure was to the left of the signer, in which case it was called “unrotated,” or to the left of the addressee, in which case it was to the right of the signer and was called “rotated.” Senghas and her colleagues have used multiple measures, including photographs and video clips of actors performing actions, to evaluate spatial modulation across cohorts of signers.

When analyzing complex structures, it is crucial to be able to view both the grammatical structure and the prosody in sign language sentences. Cues to sentence boundaries, including the difference between coordinate and complex structures (which have embedded dependent clauses), are often found not entirely on the hands, but on the face and in movements of the head and body. Often, though not always, the eyes blink at a clause boundary, the head moves forward or tilts, and the body may also shift position. At points where these cues are aligned together, they can signal a shift to a new sentence or clause (Sandler, 2011). The body can mark a new subject of a clause with a body shift to the side (though not all sign languages have body shift) (Meir et al., 2007). The body is also the locus for predicates referring to bodily functions and emotions, which are called plain verbs (Meir, 2010b; Taub, 2001) and can be themselves used as a location and a map of the body itself,

for instance to do surgery or to do other things involving the body (such as putting clothes on).

Any study of sentences and narratives needs to make sure that sign language data are visually accessible through clear lighting and sharp focus of the face and body of the signer. A frequent mistake is to try to video-record the entire body instead of the signer's face and upper torso. Using split-screen technology where both signers in a conversation are simultaneously aligned together allows for the comparison of both production and comprehension. It also makes it possible to observe live sign language forms and structures, with interruptions, clarifications, and repetitions that are characteristic of normal online conversations. These data can be used for comparisons with elicited material, both to confirm and to clarify claims made with the help of more focused data.

As sign language studies expand to explore the continua of visual-gestural forms between gesture and conventionalized sign languages, research methods can be adapted to this purpose. Pictures and videos of the type used to elicit word order and lexical categories in established and in small sign languages can also be used with other populations. Research materials can anticipate flexibility – a feature that allows them to be used with signers and non-signers, with signers of established and signers of small sign languages, *and* with hearing non-signers who speak different languages and belong to different cultures. Some examples of this work have adapted materials to the study of word order in signers of new sign languages (Sandler et al., 2005; Senghas et al., 1997) or to the study of cognitive ordering strategies in hearing non-signers (Gibson et al., 2011; Goldin-Meadow et al., 2008; Hall et al., 2013; Langus and Nespors, 2010; Meir, et al., 2010). Cartoons have been used to compare face and body movements during speech in hearing speakers to prosody in signers' descriptions of the same cartoon (Brentari et al., 2012).

Coding Strategies

Coding strategies for sign language material are closely tied to what is possible to do with annotation systems and technologies. Developed at the Max Planck Institute at Nijmegen, ELAN has emerged as a popular annotation software for many sign language research teams (Crasborn and Sloetjes, 2008). In addition to being available for free download, ELAN has enormous flexibility and functionality for almost any purpose in sign language transcription. Annotation sequences are linked to individual video frames, permitting varying degrees of detail for notation – from individual features to signs, sentences, and discourse frames. Sequences can be matched with as many tiers or levels as is needed for simultaneous analysis – for example, a tier for coding handshapes in two-handed signs, another tier for glosses of individual signs, and yet another for a translation of the sign sentence. The use of body shift, eye blinks, and eye gaze can be represented on additional tiers, all tiers being synchronized to individual video frames.

After a narrative has been translated by using a tier tied to the video segment, a clip can be pulled out and the translation tier can be converted into subtitles for use during academic presentations. Any series of coded video segments can be retrieved, listed, and stored for playback as examples of signing featuring – say, all the sentences

with transitive clauses, or all the sentences with handling handshapes. Coded data can be exported to Excel for purposes of basic statistical analysis as well as to make graphs for visible display of the data. As studies of human language acknowledge the vital role of gesture and of the visible body in communication, there will be even more development of technologies like the lightweight and high-definition video camera or of annotation software like ELAN, which can code both audible and visible material.

To summarize, here are the major considerations in research methods for sign language grammar:

- 1 The social and cultural contexts of signers' communities should guide the design of materials for language study. This presupposes identifying networks of contact in smaller communities and institutions of social interaction in larger communities. This information can be used to evaluate the history of a sign language, including influence from other sign languages.
- 2 In many parts of the world, signers have little or no access to schooling. Research methods need to be selected and designed to accommodate signers' cultural and literacy experiences. Researchers need to be mindful of signers' work lives and to use methods that do not demand large amounts of their time. An ambitious research agenda can be divided up into smaller encounters over time, at the signers' convenience.
- 3 Elicitation methods can use pictures, illustrations, and video clips of various types to prompt the use of various types of structures. Communicative tasks, where signers are paired with each other, show language as it is used interactively. The linguist learns not only the vocabulary and the grammar of the language, but also how signers correct, repeat, clarify, and use language in conversational contexts.

Note

- 1 The standard lowercase form *deaf* is used in this chapter to refer to signers in different communicative contexts.

Keywords

elicitation methods in sign languages; field research in sign languages; new sign languages

See Also

Chapter 7

Suggested Readings

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