

METHODOLOGY AND ANALYSIS OF SIGN LANGUAGES:  
FROM DATA TO THEORY (AND BACK))

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PRESENTATION

Hesperia generously gives its space in this volume to sign language research to bring to light part of the current linguistic research on Deaf peoples sign languages.

Sign languages have been incorporated into linguistic research rather recently: Tervoort (1953) in the Netherlands and—more importantly, due to its greater impact—Stokoe (1960 [2005]) in the United States of America are usually regarded as the starting point of sign language studies in contemporary linguistics. Since then, plenty of sign languages, such as that used in the USA and the English-speaking territory of Canada (American Sign Language, ASL) and others in Europe and other parts of the world, have been fully or partially described (Engberg-Pedersen, 1993; Herrero Blanco, 2009; Johnston & Schembri, 2007; Leeson & Saeed, 2012; Liddell, 2003; Sutton-Spence & Woll, 1999). Thus, there is not only specialized research, but also dissemination works and very conscientious introductions (Baker, Bogaerde, Pfau, & Schermer, 2016; Brentari, 2010; Pfau, Steinbach, & Woll, 2012).

The more salient characteristic of sign languages is that they are transmitted through gestures of the hands, face, and other parts of the body, and are perceived through the eyes. They are, therefore, visual-gestural modality languages, while spoken languages are audio-oral—that is, they are perceived by the ear and produced using the voice. By using gestures, they occur in a three-dimensional space, and that allows their grammar to take

full advantage of the conditions offered by the three dimensions of space, in addition to the fourth dimension of time, which is equally used in signed and spoken languages. In addition, the simultaneous use of several articulators (both hands, eyebrows, gaze, and head and torso movements) allows for a large amount of information to be transmitted at the same time. In other words, they have a greater “bandwidth” (Meier, 2002). Another outstanding feature of these languages is iconicity, since the gestural medium offers many more opportunities than sound to manipulate potentially linguistic forms for conveying our conceptualization of objects and situations (Cuxac, 2000).

In the 1980s, Deuchar (1987) already established three stages in the sign language linguistic research that preceded her. According to the author, a first stage, between 1960 and 1975, had focused on demonstrating that they were natural languages, comparable from a structural point of view to spoken languages and therefore worthy of being recognized and studied with the methods and techniques of linguistic research. In a second moment, at the end of the 1970s, research focused on the specific character of sign languages in order to solve some peculiarities—namely, the aforementioned prevalence of iconicity in signs—from a theoretical point of view. The 80s saw a shift toward a study that sought greater congruence in regard to oral languages, with a growing interest in common issues with oral languages, such as the sequential—while simultaneous—nature of verbalizations, or their similarities with languages lacking a written tradition (in particular, an interest developed in the possible similarities between sign and creole languages since they share the same proto-grammatical status (Herrero, 2000)).

Since the 80s, the studies on the sign languages of Deaf people have achieved great linguistic and thematic diversity. Not only has the number of described sign languages greatly expanded, but their study has been ap-

proached from different points of view and interests, including language development and education (Marschark & Clark, 1993; Marschark & Spencer, 2003; Marschark, Tang & Knoors, 2014), sociolinguistics (Lucas, 2001; Schembri & Lucas, 2015) and neurolinguistics (Corina, 1998; Malaia & Wilbur, 2010).

Today, the diversity of sign languages and linguistic typology deserve great attention. On the one hand, there is an interest in describing sign languages from different geographical, social, and typological contexts. A good example is the selection made in Jepsen, De Clerck, Lutalo-Kiingi, & McGregor (2015). On the other hand, there have been some studies that attempt to discover patterns or trends for specific dimensions of semantic and grammatical analysis (Napoli & Sutton-Spence, 2014; Zeshan, 2006). The plurality of approaches and methodological perspectives, both formalistic and functional-cognitive, is equally remarkable. Sign languages have specifically been a challenge in generative linguistics' program to make Universal Grammar explicit: as languages in another modality, they had to weave together their grammatical peculiarities to show that language is a unique and homogeneous ability, related to the fact of having a brain and a central nervous system and with certain characteristics common to the species (Meier, Cormier, & Quinto-Pozos, 2002; Sandler & Lillo-Martin, 2006). As an example of more empirical visions, oriented from a functionalist conception, one can cite the works based on linguistic corpus of de Beuzeville, Johnston, & Schembri (2009); Hansen & Hessmann (2015); Hodge (2013); Meurant (2015).

This volume does not intend to account for all this enormous diversity, but rather to illustrate some problems involved in the study of sign languages from a cognitive and functional point of view, focusing on the difficulties of adapting a model or set of linguistic categories to the objective of describing and explaining the grammatical and discursive phenomena

of languages that use space and vision. In some cases, the challenge is to use concepts and analytic strategies that have been born to describe spoken languages—which are different in some crucial aspects of grammar—and to do so in a way that does not distort their special characteristics. Other analyses focus on peculiar categories of sign languages, and in this case the difficulty will lie in the very process of describing them and representing them with the means at hand.

The paper by Martínez, Siyavoshi, and Wilcox presents a reflection on three crucial questions in sign languages, from the framework of Cognitive Grammar, specifically in the Langacker tradition (1987, 1991, 2001, among other works) using data from Argentine Sign Language (LSA). The first problem they study is that of the function—typical of pointing constructions—of establishing a nominal grounding; that is, of selecting a discourse entity as an object of interest shared by both interlocutors. The most common form in sign languages is the pointing gesture, but it can be signaled through other hand configurations, gaze, or body posture. The Place indicated is described as a symbolic structure, where a correspondence is established between the location and an entity of the discourse, a “thing,” in terms of Cognitive Grammar. This Place can serve to recover that referential entity in successive mentions in the signed discourse. In sign languages, entities that are established in this way constitute discourse objects ready to be used interactively.

The second issue addressed by Martínez, Siyavoshi, and Wilcox’s paper is the “control cycle,” a cognitive model that explains notions related to the modality. In this case, the selected means of expression in sign languages is facial expression (or ‘affect display’), and the authors look at two specific movements of the facial muscles: on the one hand, the furrowed eyebrows and, on the other, a specific shape that the lips take, when the corners descend to form an inverted U (or a horseshoe). The authors explain

the relationship between “effective control” and eyebrow movement, and the connection between epistemic modality and the horseshoe-shaped lip gesture. Finally, the third and last of the problems discussed in this contribution has to do with the role of gestures in language models, confronting two positions: one according to which gesture and language are part of the same thing, and another that would juxtapose gesture and language as separate objects of knowledge.

The next contribution, by Sallandre and Garcia, focuses on the difficulties of analyzing two types of highly productive constructions in sign languages, which, in the authors’ opinion, have not generally received an adequate explanation from either the generativist perspective or cognitive-functional models such as that of Liddell (2003). The first of these is what they call “transfer units” (also called “classifier constructions” or “descriptive verbs,” among other denominations), which are characterized by (say the authors, translated into English): “unconventional complex multilinear constructions involving displacement, location, manipulation and/or visual-geometric description of nominal referents.” The second type of discourse units that Sallandre and Garcia select as problematic are the sequences of “role shift” or “constructed action,” through which (again, translating the authors) the signer “moves in turn in the role of different characters of the statement, conveying the information through their point of view.”

Both issues are approached from the semiological model (Cuxac, 2000), which considers that these highly iconic forms of signed discourse are crucial in sign languages, and thus points to them as the center of interest for analysis, while meaning generators, able not only to transmit but also to show iconically. From the description of concrete examples containing the constructions referred to above (transfer units and role shifts), the authors discuss the difficulties involved in their annotation— on a video edi-

ting program—through a system of glosses based on words from a spoken language.

The following paper, by Reis, applies the “Referencing” theory (teoria da Referenciação) to Brazilian Sign Language (LIBRAS). The aim is to identify and describe the resources used in this language for making discourse objects available to the interlocutor. These discourse objects are created and resumed dynamically. More specifically, the research focuses on the procedures to build the “direct anaphora.” The Referencing theory does not assume the referred entities to exist independently of the discourse: they are rather formed and resumed within it, according to the interaction’s interests. The ultimate objective of the research relates to translation goals, thus the intended method consists of an analysis seeking to find equivalences between the referential procedures identified in Portuguese language and their possible equivalents in LIBRAS.

The author starts off from the direct anaphors conveyed in Brazilian Portuguese through pronominal forms and lexical procedures (through repetitions, synonymy, hyperonymy, generic nouns, or nominal descriptions, among others). Her methodology consists of developing a parallel corpus of instances in Portuguese and their translations in LIBRAS in search of the repertoire of manual and non-manual resources—in some cases, of great complexity—which serve the same function in Brazilian Sign Language.

The fourth contribution, presents a first approach to a dependency system applied to Spanish Sign Language (LSE). Dependency syntax assumes that the syntactic structure basically consists of asymmetric relations between words, so that one is regent or principal and the other dependent or subordinate (Hudson, 1984; Mel’čuk, 1988; Tesnière, 1959). The adaptations of the model for natural language processing have led to the compilation of a corpus of syntactic structures (treebanks)—a project of international scope—named Universal Dependencies. It offers dependency trees for about

ninety languages, including a single sign language: Swedish Sign Language (STS).

The García-Miguel and Cabeza text describes the applied annotation system and analyzes the difficulties involved in applying a dependency analysis designed to be used in computational environments to LSE. The starting point is an LSE corpus previously annotated for grammatical categories and the argument structure of clauses, among other matters. This annotation serves as the basis for the coding of dependencies. The greatest difficulty for the application of the dependency system lies in the simultaneous aspects of the signed communication, since certain aspects of the grammatical relationships are expressed through the simultaneous action of both hands, or through locations in space that are pointed to at the same time as the signs are performed.

The volume is rounded out by two collaborations that open discussion up to two other important challenges, with great impact on the lives of Deaf sign language users. First, the contribution of Tilves et al. presents a part of the topic of research aimed at automatic recognition of sign languages. The ultimate goal of these works is automatic translation, that is, to process a discourse delivered in a sign language in such a way that it is recognized by a machine that, in turn, provides an equivalent in voice or text. The authors outline the main difficulties that this objective entails and review the research carried out, focusing on the importance of obtaining databases that include reliable samples of the variation in use by different language users.

Nogueira's review, in turn, stresses the value of the book published in 2018 by Ghesquière and Meurant, entitled *École et surdit : une exp rience d'enseignement bilingue et inclusif*. The book reports on a bilingual (sign language/spoken language) teaching project that takes place in the city of Namur, in Belgium, in collaboration with the university of the same city.

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