

# Sign Language Typology: The Contribution of Rural Sign Languages

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## Abstract

Since the 1990s, the field of sign language typology has shown that sign languages exhibit typological variation at all relevant levels of linguistic description. These initial typological comparisons were heavily skewed toward the urban sign languages of developed countries, mostly in the Western world. This review reports on the recent contributions made by rural signing varieties, that is, sign languages that have evolved in village communities, often in developing countries, due to a high incidence of deafness. With respect to a number of structural properties, rural sign languages fit into previously established typological classifications. However, they also exhibit unique and typologically marked features that challenge received views on possible sign languages. At the same time, the shared features of geographically dispersed rural signing varieties provide a unique window into the social dynamics that may shape the structures of modern human languages.

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**Modality:** in this context, refers to the modality of signal production and perception (i.e., visual–spatial versus oral–auditory)

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## 1. INTRODUCTION: SIGN LANGUAGE TYPOLOGY

Languages may differ from each other on all levels of linguistic description, that is, with respect to their lexicon, phonology, morphology, and syntax. Think of the size of the phoneme inventory, word-formation strategies, and basic constituent order within a clause—to give just a few examples. One of the goals of language typology is to take stock of these differences, and to identify recurrent patterns, thus arriving at descriptively adequate typological classifications. In the course of this endeavor, scholars attempt to identify the design space that modern human languages populate and to describe what factors might constrain this diversity (Evans & Levinson 2009).

Ever since the advent of the discipline of sign language linguistics in the 1960s, comparative studies have consistently revealed that sign languages are fully comparable to spoken languages in all aspects of linguistic structure [e.g., Fischer 2008 (1974), Liddell 1980, Sandler & Lillo-Martin 2006]. Still, to date, sign languages (languages in the visual–spatial modality) are only rarely included in typological studies (Evans et al. 2011, Majid & Levinson 2011, Anderson 2012, and Velupillai 2012 are noteworthy exceptions). Clearly, the inclusion of sign languages in large-scale typological studies is important because it broadens the scope of linguistic generalizations and allows us to test whether typological classifications identified on the basis of spoken languages also apply to sign languages; we refer to this field as cross-modal typology.

As is expected of any human language, sign languages differ from each other at all relevant levels of linguistic description (Perniss et al. 2007). The goal of the field of sign language typology is to identify such intramodal typological patterns, which may be of two types: (a) They mirror a pattern known from the study of spoken languages—consider, for instance, basic SVO versus SOV word order or the typological distinction between head-internal and head-external relative clauses; or (b) they are modality specific in the sense that they result from the affordances of the visual–spatial modality, such as the availability of multiple articulators (which facilitates simultaneity of expression) or the potential to exploit visual iconicity. As such, sign languages, being visuospatial languages, contribute uniquely to our understanding of what constitutes the human ability for linguistic communication.

Naturally, every new sign language that is being investigated adds to our understanding of the attested variation and similarities across sign languages, and the so-called rural sign languages are the most recent addition to the field of sign language typology (Zeshan 2008). After sign language linguistics emerged as a discipline, initiated by the publication of Stokoe's [2005 (1960)] study on American Sign Language phonology, linguists focused almost entirely on a small number of Western sign languages (e.g., American Sign Language, Swedish Sign Language, and Sign Language of the Netherlands). Apart from a few studies, urban sign languages from other continents received attention only from the 1990s onward (for the history of sign language linguistics, see McBurney 2012). At present, additional sign languages are constantly being added to the research agenda. Although all of these sign languages are valuable for sign language typology, it is certainly no exaggeration to say that with the description of rural sign languages, an important piece has been added to the puzzle.

In Section 2, we introduce the group of rural sign languages and attempt to delimit them from other sign language types. In Sections 3–5, we discuss selected lexical, syntactic, and morpho-syntactic properties of rural sign languages. In all three sections, we report to what extent the rural sign languages add to our understanding of sign language typology, that is, to what extent they share properties with and/or differ from urban sign languages as a group and also to what extent they differ from each other. In Section 6, we address issues of variation within and across rural signing varieties in light of the social dynamics that lead to their emergence.

## 2. ON THE NOTION OF RURAL SIGN LANGUAGE

As described above, until recently, the field of sign language linguistics had focused entirely on urban sign languages, that is, sign languages that have emerged in urban areas of developed countries, resulting from the congregation of large groups of deaf individuals at educational and social institutions for the deaf. A key feature of urban signing communities is that, apart from professionals (i.e., interpreters and teachers) and relatives of deaf individuals, most sign language users are deaf themselves. Deaf children are generally trained to lipread the surrounding spoken language and to read and write its script. Because the vast majority of deaf people are born to hearing, nonsigning parents, a considerable proportion of these individuals start first-language acquisition late and, therefore, may never achieve native fluency in sign. Moreover, deaf community members often identify themselves as culturally Deaf, given a set of shared life experiences, including attendance at deaf boarding schools, sign language use, and participation in deaf social events (Ladd 2003, Padden & Humphries 2005). With the advent of cochlear implants, the linguistic landscape in deaf education is rapidly shifting from a bilingual approach to a preference for mainstreaming implanted children into regular education. Although the outcome of these technological advances is as yet poorly understood, in the long run they are expected to have substantial repercussions on the transmission of sign languages and Deaf culture in developed countries.

In various enclaves around the world, sign languages have also spontaneously emerged in rural communities with high incidences of (often hereditary) deafness (de Vos & Zeshan 2012). Whereas the incidence of congenital deafness in developing countries is approximately 0.1%, the incidence in rural areas of developing countries is generally estimated to be three to five times higher (UNICEF 1985, Morton 1991). The proportion of deaf community members in rural signing communities may rise to up to 3.3%, although these numbers may fluctuate over time (Kusters 2010). There are currently at least a dozen reported cases of such rural sign languages (Table 1). Apart from deaf individuals, each of these communities harbors a large number of hearing signers who have acquired the sign language through interaction with their deaf community members. Although these villages often lack educational facilities for deaf individuals, the general positive attitude toward deafness and sign language use and the comparable socioeconomic status of deaf and hearing community members signify a high degree of integration and equality in these so-called shared signing communities (Kisch 2008, Kusters 2010). Almost without exception, deaf individuals acquire rural sign languages natively in a comparatively rich environment, where not only their parents and siblings but also their extended family members, neighbors, and covillagers have learned to communicate visually by using signs (de Vos 2012b). Ironically, deaf individuals are a small minority of sign language users in these communities.

Both urban and rural signing varieties may have considerable time depth. Sign languages that have been used by deaf native signers for only two or three generations are usually regarded as emerging sign languages (Meir et al. 2010). A well-documented case of the emergence of an urban sign language is Nicaraguan Sign Language, which developed following the initiation of deaf education in Nicaragua's capital (Senghas 2003). A well-known example of the emergence of a rural sign language stems from the Al-Sayyid Bedouin community of Israel, where deaf and hearing people have cocreated a village sign language in recent decades (Sandler et al. 2005). More recently, Bauer (2014) suggested that a subset of alternate sign languages (see the sidebar titled Alternate Sign Languages) might be grouped alongside rural sign languages under the broader category of shared sign languages (Nyst 2012). Further intermediate forms of gestural communication exist in which as few as one or two deaf individuals develop a homesign system (see the

**Table 1 Overview of rural sign languages (SLs)**

SL	Location	Population	Time depth	Selected references
Adamorobe SL	Ghana	35–45 deaf signers	200 years	David et al. 1971; Nyst 2007a,b, 2008
Al-Sayyid Bedouin SL	Israel	130 deaf and approximately 700 hearing signers	Four generations	Aronoff et al. 2005, 2008; Kisch 2008, 2012; Sandler et al. 2005, 2011
Algerian Jewish SL	Originally Algeria, now France and Israel	Unknown	At least five generations	Lanesman & Meir 2012
Alipur SL	India	150 deaf signers	At least six generations	Panda 2012, Zeshan et al. 2013
Ban Khor SL	Thailand	24 deaf and approximately 400 hearing signers	First two deaf signers in the 1930s	Woodward 2003; Nonaka 2004, 2009, 2011, 2012
Chican SL (Yucatec Mayan SL)	Mexico	17 deaf and 332 hearing signers	Three generations of deaf signers	Shuman 1980, Johnson 1991, Fox Tree 2009, Escobedo Delgado 2012, Le Guen 2012, Zeshan et al. 2013
Kata Kolok	Bali, Indonesia	46 deaf and more than 1,200 hearing signers	Five generations of deaf native signers	Branson et al. 1996, 1999; Marsaja 2008; Permiss & Zeshan 2008; de Vos 2011, 2012a,b
Koinchri Sain	Jamaica	Only a few deaf, elderly monolingual signers	Unknown (moribund)	Dolman 1986, Adone et al. 2012
Inuit SL	Nunavut, Canada	47 deaf signers (spread over various villages)	Unknown	MacDougall 2001; Schuit et al. 2011; Schuit 2012, 2013
Mardin SL	Turkey	40 deaf signers and their extended family	Four generations of deafness	Dikyuvva 2012, Zeshan et al. 2013
Martha's Vineyard SL	Northeastern United States	Extinct (approximately 20 in 1800)	Approximately 250 years (1700–1945)	Groce 1985
Providence Island SL	Colombia	19 deaf signers	At least three generations	Washaugh et al. 1978; Washaugh 1979, 1980, 1986; Woodward 1978, 1982
Urubu-Kaapor SL	Brazil	7 deaf signers	Unknown	Kakumasu 1968, Brito 1983

## ALTERNATE SIGN LANGUAGES

Alternate sign languages (sometimes also referred to as secondary sign languages) are sign languages that are not (primarily) used by deaf people but rather were developed by hearing people for various purposes, such as (a) work in a noisy environment (Sawmill Sign Language of British Columbia; Meissner & Philpott 1975), (b) a vow of silence (monastic sign languages; Umiker-Sebeok & Sebeok 1987), (c) a lingua franca in an area where various different spoken languages are used (Plains Indian Sign Language of North America; Davis 2010), and (d) a means to obey certain culturally based speech taboos (Aboriginal sign languages of Australia; Kendon 1988). For an overview of the use and structure of alternate sign languages, see Pfau 2012. Occasionally, an alternate sign language may have been adopted by deaf community members as a primary means of communication, as is true, for instance, for Plains Indian Sign Language (Davis 2010) and Yolngu Sign Language (Northeast Arnhem Land, Australia; Bauer 2014).

sidebar titled Homesign) in interactions with their relatively limited hearing network (Brentari & Coppola 2012, Goldin-Meadow 2012, Haviland 2014).

Given our limited understanding of the social dynamics that lead to similar and disparate linguistic structures across these sign language types, in our typological comparisons we focus on urban and rural signing varieties, which originated as a primary means of communication among a substantial group of deaf signers and are used by at least three subsequent generations of native sign language users. Thus, we ensure optimal comparability with the urban sign languages that form the basis of our typological analyses.

### 3. THE LEXICA OF RURAL SIGN LANGUAGES

Cultural practices are often considered one of the driving forces behind lexicalization (Levinson 2000, Everett 2005). Rural sign languages present a unique perspective on this issue: Their deaf users share their culture with the wider hearing community, yet deaf and hearing villagers communicate in two autonomous languages. Moreover, from their emergence onward, rural sign languages have been in close contact with the spoken languages that surround them; thus, hearing signers could affect their structures (de Vos 2011). Below, we aim to show that the lexica of rural sign languages may in fact be quite distinct from those of the spoken languages that surround them, rendering them independent samples in typological comparisons. Section 3.1 reviews evidence that rural sign languages have complex cardinal numeral systems that exhibit typologically rare

## HOMESIGN

The term homesign refers to gestural communication systems that emerge from the interaction of a single deaf individual with his/her hearing network in the absence of any conventional sign language (Goldin-Meadow 2012). Early studies of isolated deaf children and their hearing family members have indicated that homesign systems may evolve to have language-like properties, such as a stable constituent order, that are similar across a number of cultures. It is likely that rural sign languages originated from homesign-like systems, known as intermediate communication systems, which span two generations in a single family (e.g., Haviland 2014).

**Vigesimal numeral**

**system:** a system that is (partially) based on the number 20 (base-20 system), such as French *quatre-vingts* ('eighty,' lit. 'four-twenties')

features. Section 3.2 discusses the existence of restrictive lexical sets in the domains of color and kinship that are remarkable similar across a number of rural sign languages.

### 3.1. Typologically Unusual Features in the Domain of Number

The literature on cardinal number systems in spoken languages is centered on the notion of a numeral base. A numeral base is “that numerical value to which various arithmetical operations are applied” (Comrie 2005, p. 207). In the case of additive bases, other numerals are added, as in *fourteen* (*four* + *ten*), whereas multiplicative bases are subject to multiplication, as in *forty* (*four* × *ten*) (Hanke 2010, p. 68f). Across spoken languages, such decimal numerals are the typologically most common strategy, but nondecimal systems also occur, albeit more rarely.

All urban sign languages investigated to date have been reported to employ the decimal pattern (e.g., Fischer 1996, Fuentes & Tolchinsky 2004, Fuentes et al. 2010, McKee et al. 2011, Lutalo-Kiingi 2014, Sagara 2014), although there are also some accounts of five-based numerals (Skinner 2007). However, a recent study on cardinal numbers in three rural sign languages (Alipur, Chican, and Mardin Sign Languages) identifies complex typological features in their numeral morphology, paralleling the existing variation found among spoken languages and, at the same time, adding to our understanding of numeral morphology in signed languages (Zeshan et al. 2013).

Zeshan et al. (2013) report that in Chican Sign Language all numeral strategies are additive; for instance, the sequence FIFTY TWENTY TEN means *eighty* (see the sidebar titled Notational Conventions). Mardin Sign Language deploys a multiplicative vigesimal system in which forms have become fused and have lost overt reference to the sign TWENTY (Figure 1a); the sign EIGHTY, for instance, is produced by outstretching the four fingers (Figure 1b). Mardin Sign Language also has a monomorphemic lexeme for the number 75, a phenomenon that has not previously been reported for any signed or spoken language (Figure 1c).

Another striking finding is that, in both Alipur and Mardin Sign Languages, subtractive numerals are attested. Subtraction—for instance, ‘ten minus one’ to mean *nine*—is a vanishingly rare strategy in the numeral systems of spoken languages [but see Hymes (1955, p. 30) on Athapaskan languages, Williamson (1973) on Benue-Congo, and Barriga Puente (1998) on Central Wintun and other languages of the Americas]. In these cases, it is rarely as productive as in the Alipur case, in which signers may subtract as many as ‘five’ off the base numeral. As shown by examples 1a and b, the order of the numeral base and the element of subtraction may vary in Alipur Sign Language. In example 1b, the base element HALF (meaning 50) has been topicalized, which is marked out by raised brows (rb).

## NOTATIONAL CONVENTIONS

Following standard conventions, sign language examples are glossed in English SMALL CAPS. The gloss INDEX stands for a pointing sign (usually with index finger extended) and POSS for a possessive pronoun. The convention SIGN-SIGN is used when two English words are necessary to gloss a single sign; SIGN<sup>1</sup>SIGN indicates that two signs are combined in a compound. Subscript numbers indicate points in the signing space used in pronominalization and verbal agreement (‘1’ refers to a locus close to the signer, ‘2’ to a locus close to the addressee, and ‘3’ to a locus close to a present third-person referent or locus established by means of INDEX). Lines above the glosses indicate the scope (i.e., onset and offset) of a particular nonmanual marker.



**Figure 1**

Three signs illustrating the complex numeral system of Mardin Sign Language. (a) The sign TWENTY. (b) The sign EIGHTY, which has an implicit vigesimal base. (c) The monomorphemic sign for SEVENTY-FIVE. Reprinted with permission from Zeshan et al. (2013, p. 374f). Copyright 2013, Walter de Gruyter.

(1a) TWO LESS HALF  
'48'

rb

(1b) HALF, TWO LESS  
'48'

Here, we can report only some of the most striking findings described by Zeshan et al. (2013), but these already indicate that within this particular semantic field, rural sign languages may develop structural complexities that are present neither in the urban sign language of the respective country (e.g., Turkish Sign Language or Indian Sign Language) nor in the surrounding spoken language. As such, rural sign languages constitute unique samples of linguistic diversity. On par with spoken language isolates, they may exhibit typologically rare features that, to date, have not been attested in any urban sign language. In rare cases, these typologically marked features extend our knowledge of possible numerals, such as the sign for 75 in Mardin Sign Language, but in general, they appear to fit the existing spoken language typologies. Inclusion of rural sign languages therefore increases the feasibility of a meaningful cross-modal typology, comparing linguistic features across both natural language modalities.

### 3.2. Restrictive Lexical Sets: Color and Kinship

Within certain lexical domains, it appears that rural sign languages often have a reduced lexical set compared with that of urban sign languages, and are actually among the most restrictive ever reported. In the domain of color, for instance, Kata Kolok has four lexical items designating the basic colors *white*, *black*, *red*, and *blue-green* (de Vos 2011). Similarly, Adamorobe Sign Language (Nyst 2007a), Ban Khor Sign Language (Nonaka 2004), and Providence Island Sign Language (Woodward 1989) have three-word paradigms that consist of WHITE, BLACK, and RED. The most limited set has been described for Inuit Sign Language, which has only two lexical signs: RED and BLACK (Schuit 2013), thus contradicting the implicational universal that every language that has a term for *red* also has one for *white* (Kay & Maffi 1999). Koinchri Sain, however, appears to have the most extensive set of lexical color terms ever reported for a rural sign language, yet still marking

out only five concepts: *black*, *white*, *red*, *yellow*, and *blue* (Adone et al. 2012). Interestingly, in addition to the lexical signs, each of the rural sign languages reported above allows for the use of nonlexical pointing signs to designate colors or to specify them in ongoing discourse (de Vos 2011). Inuit Sign Language has in fact adopted the pointing strategy with regard to *white*, leaving this color lexically unspecified. By contrast, signers of urban sign languages do not employ such nonlexical forms of color descriptions, and their color terminologies in general reflect the paradigms of the spoken languages that surround them.

The observation that certain lexical sets of rural sign languages can be described as a subset of the surrounding spoken languages also holds true in the case of kinship terminology. This finding may be unexpected, given that a high degree of integration of deaf individuals might be hypothesized to facilitate alignment of the lexica. Nevertheless, the kinship system of Kata Kolok is limited compared with the high and low Balinese terms, as it has designated forms only for *grandparent*, *mother*, *father*, and *offspring* (de Vos 2012a). The same is true for Inuit Sign Language. Inuktitut, the surrounding spoken language, has a highly elaborate kinship system, whereas Inuit Sign Language only has three terms, namely ELDER (to refer to parents), SIBLING, and SPOUSE. Once again, Inuit Sign Language displays a typologically unusual pattern, as it does not have separate terms for *father* and *mother*. Providence Island Sign Language, too, has been reported to only have three kinship terms, namely MOTHER, FATHER, and OFFSPRING (Woodward 1978, p. 128). Consequently, the kinship systems of these two rural sign languages appear to be among the most restrictive in the world. Note that for Yucatec Mayan Sign Language, Shuman (1980, p. 158) also reports only consanguineal terms for *mother*, *father*, and *grandfather*, but it is possible that some information is missing in his preliminary report. Finally, according to Nyst (2007a, p. 100), kinship terminology in Adamorobe Sign Language is restricted to terms for *grandparent*, *mother*, *father*, *child*, *sibling*, and *younger sibling*. As in other rural sign languages, many nonkin signs are being co-opted to express kin relations (e.g., the sign SAME for *sibling* or *cousin*).

The kinship terminologies of urban sign languages are vastly more complex and generally reflect cultural distinctions made in the culture of the wider hearing community (Wilkinson 2009). The lexical differences between urban and rural sign languages support the hypothesis that the differential social dynamics of rural versus urban signing communities may play a role in the formation of a signed lexicon. Rural sign languages emerge in comparatively small and tight-knit communities that, on the whole, may tolerate more variation at the lexical level (Washabaugh et al. 1978). Conversely, the use of urban sign languages in deaf education may in fact accelerate the calibration of concepts for signs and written words (de Vos 2011). At any rate, because rural signing communities are relatively small, they form an ideal case in which to chart the formation and dispersion of lexical signs and the social mechanisms that underlie these processes.

## 4. SYNTAX

As yet, only limited information about the syntactic properties of rural sign languages is available. In the following subsections, we summarize findings on themes that are central to linguistic typology more generally: basic constituent order (Section 4.1) and negation (Section 4.2). All in all, it seems that with regard to syntactic structure, rural sign languages show similar patterns of diversity as previously reported for urban sign languages as well as spoken languages.

### 4.1. Basic Constituent Order

One of the main typological dimensions along which the languages of the world are classified is the sequential order of the verb and its core arguments in a simple transitive sentence, such as *John*

*loves Mary*. Across spoken languages, by far the most common orders are SOV and SVO (Dryer 1992). The variation in basic constituent orders among urban sign languages mirrors this general pattern, but it is also important to note that the third most common order, VSO, has not yet been attested in any sign language. Crucially, the word order of a sign language is often different from that of the surrounding spoken/written language(s) (Kimmelman 2012, Leeson & Saeed 2012, Napoli & Sutton-Spence 2014). The current distribution of word orders in modern human languages may reflect a more general cognitive preference or a universal tendency (Dryer 1992). Recent accounts have contested this view, claiming that areal and lineage-specific tendencies may also play a role (Dunn et al. 2011). Furthermore, Goldin-Meadow et al. (2008) have suggested that SOV word order is favored in the visual modality, in particular in early stages of language emergence. Rural signing varieties are of particular interest to this debate as they emerge *de novo* and might thus reflect any modality-driven predispositions more directly.

Although to date basic constituent order has been described in detail for only a few rural signing varieties, it seems that they display similar patterns of variation. In each case, the basic order is distinct from that of the surrounding spoken language. Al-Sayyid Bedouin Sign Language, for instance, has developed a predominantly SOV constituent order, whereas both Hebrew and the locally spoken Arabic dialect have SVO word orders, and Israeli Sign Language features primarily SVO and OSV word orders (Sandler et al. 2005).

Marsaja (2008) suggests that in cases when both arguments are overtly expressed, Kata Kolok signers prefer an SVO order. However, de Vos (2012a) shows that sentences with two overt arguments are extremely rare in spontaneous discourse, and when they do occur, SVO, SOV, and OVS constituent orders are attested in equal proportions. In spoken Balinese, SOV order is ungrammatical, and SVO is the dominant word order besides OVS (see Arka 2003, 2005 for details). As for Indonesian signing varieties, they are severely underdescribed, and no sources on word order are available to date (Palfreyman, forthcoming). Contact between Kata Kolok signers and Indonesian Sign Language users, however, has been a recent development, and is therefore unlikely to have affected the word orders used by Kata Kolok signers (Marsaja 2008, de Vos 2012a).

With regard to Yucatec Mayan Sign Language, Shuman (1980, p. 168) reports an SVO pattern but also hints at the possibility of topic–comment order playing a role. This is strikingly different from the everyday language spoken in the community, Yucatec Maya, which is essentially verb initial (Bohnemeyer 2004). Although the national sign language of the area, Lengua de Señas Mexicana, also exhibits a dominant SVO word order (Quinto 1999), influence from the national sign language is unlikely, as contact with the national deaf community has been limited (Escobedo Delgado 2012).

Finally, Providence Creole English spoken on Providence Island, like many other creole languages, has a strict SVO word order (Bartens 2009). Conversely, Washabaugh (1979) shows that deaf users of Providence Island Sign Language order constituents not on the basis of their syntactic or semantic roles, but rather on the basis of topic–comment structure.

Taken together, these observations reveal that with regard to a core typological parameter such as word order, rural sign languages show variation on par with both urban signing varieties and spoken languages: SVO and SOV are the most common orders, and there also appear to be sign languages without a dominant constituent order. In other words, in this typological domain, rural sign languages do not show strikingly homogeneous or exceptional behavior. At the same time, the attested variation does not provide strong evidence for a modality-driven cognitive predisposition for SOV word order (Goldin-Meadow et al. 2008), unless one assumes that these effects are no longer apparent after only three generations of language use (as in the case of Kata Kolok, Yucatec Mayan Sign Language, and Providence Island Sign Language). Rather, the patterns suggest that basic constituent order need not fixate in the relatively early stages of language emergence and can be based on information structural units such as topic and comment.

## 4.2. Negation

All sign languages studied to date employ manual and nonmanual markers (see the sidebar titled Nonmanual Markers) to express sentential negation. Manual markers are signs that function as negative particles or adverbials (comparable to English ‘not’), whereas nonmanual markers involved are generally head movements—most commonly a side-to-side headshake—that combine simultaneously with a sign or a string of signs. Interestingly, however, the distribution and combination of these markers differ from sign language to sign language (Pfau & Quer 2002, Zeshan 2004, Quer 2012).

In many urban sign languages, manual clause negators are available, but it is common to negate a proposition by means of a headshake only. This typological pattern is referred to as a nonmanual dominant pattern, and it is illustrated by examples 2*a* and *b* from German Sign Language. If the optional manual negator NOT is used, it usually appears sentence finally (example 2*a*); if the same sentence is negated by means of a headshake (hs) only, the headshake either accompanies only the verb or spreads onto the object, as indicated by the brackets in example 2*b*. Taken together, nonmanual dominant sign languages are characterized by the facts that (*a*) a manual negative element is optional and (*b*) the headshake may spread.

(2a)  $\text{POSS}_1$  SISTER BEER LIKE  $\overline{\text{hs}}$  NOT  
‘My sister doesn’t like beer.’

(2b)  $\text{POSS}_1$  SISTER BEER LIKE  $(\text{hs})$   
‘My sister doesn’t like beer.’

In contrast, in some other sign languages, negating a proposition by means of only a nonmanual marker is impossible. Italian Sign Language, for instance, belongs to this group, which comprises what are referred to as manual dominant sign languages. In sign languages of this type, (*a*) a manual negative element is obligatory and (*b*) the headshake usually accompanies only the manual negator (example 3*a*). Consequently, example 3*b* is ungrammatical, irrespective of the scope of the headshake (Geraci 2005, p. 221).

(3a) PAOLO CONTRACT SIGN  $\overline{\text{hs}}$  NON  
‘Paolo didn’t sign the contract.’

(3b) \*PAOLO CONTRACT SIGN  $(\text{hs})$   
‘Paolo didn’t sign the contract.’

## NONMANUAL MARKERS

In sign languages, nonmanual markers—that is, facial expressions and head and body movements—fulfill functions at all levels of linguistic description (Pfau & Quer 2010). To give a few examples, mouth movements may constitute a part of the phonological description of a sign; certain configurations of the lips and cheeks may function as morphemes (e.g., adverbials); eyebrow position provides syntactic information, as it may signal sentence type (e.g., interrogative) and information structure (e.g., topic); and body leans convey information at the level of pragmatics.

Obviously, the picture we sketch here is very much simplified. The typological picture is much more complex because the two broad typological groups are not homogeneous. Within the two groups, sign languages may differ with respect to the position of the manual negator; the availability of negative concord; and at least within the nonmanual dominant group, the scope options for the headshake (Pfau 2014).

To date, the realization of sentential negation has been described in some detail for only two rural sign languages: Kata Kolok and Inuit Sign Language. The descriptions reveal that these rural sign languages do not add a new pattern to the typological picture, but interestingly, both of them display the manual dominant pattern. In both Kata Kolok (example 4a) and Inuit Sign Language (example 4b), the headshake accompanies only the manual negative sign, which occupies a clause-final position (Marsaja 2008, p. 200; Schuit 2013, p. 50). In addition, negation has been analyzed for Yolngu Sign Language, a rural yet alternate sign language, and again, the pattern identified is the manual dominant one (Bauer 2014).

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**Signing space:** three-dimensional space in front of the signer's body. Height, approximately from forehead to waist level; width/depth, approximately arm's length

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- (4a) CORPSE-ASH PUT  $\frac{hs}{NEG}$   
 'Don't put the ashes of the dead (on the ground).'
- (4b) POLAR-BEAR SEE  $\frac{hs}{NEG-1}$ , ROUND-EARS $\wedge$ LONG-NAILS $\wedge$ ANIMAL  $\frac{hs}{NEG-1}$   
 'I didn't see a polar bear, nor a grizzly bear.'

Finally, it is also important to point out that the typological classification manual dominant implies only that the manual negator is obligatory; it does not necessarily imply that the nonmanual is optional. In Italian Sign Language, for instance, a headshake is always present. Interestingly, with regard to Kata Kolok, Marsaja (2008, p. 196) states that "only a few negative constructions [...] include a small headshake, but most do not." This is certainly an interesting observation, but one has to keep in mind that it is quite possible that another nonmanual marker, namely a protruded tongue, is consistently used in negative contexts, and that Kata Kolok thus also employs a nonmanual marker—albeit a different one (de Vos 2014).

Although the distinction between manual dominant and nonmanual dominant systems is modality specific, it is important to determine to what extent the patterns reported for sign languages fit into the existing spoken language typologies (e.g., Payne 1985, Dahl 2011). Pfau (2008, 2014) suggests that Italian Sign Language and Kata Kolok employ negative particles (which are lexically specified for the headshake), whereas German Sign Language displays split negation, as the headshake accompanying the verb is independent of the negative particle. As such, the former two sign languages pattern with spoken languages such as English, whereas German Sign Language resembles French. Rural signing varieties thus contribute to the field of sign language typology by providing the opportunity to test generalizations concerning possible types of negation in signed languages. From the perspective of cross-modal typology, urban and rural sign languages alike may follow previously established spoken language typologies, even if they do so by means of constructions that are modality specific due to the simultaneous use of manual and nonmanual articulators.

## 5. MORPHOSYNTAX: USE OF SPACE

One aspect of sign languages that is clearly modality specific is the use of the signing space for grammatical purposes. All sign languages studied to date make use of this three-dimensional space for localizing and referring to referents, but recent studies have revealed that they do so in different ways, yet follow typological patterns common to spoken languages. Here, we discuss two

phenomena that involve the signing space: the expression of motion and location (Section 5.1) and the referential use of spatial loci (Section 5.2).

### 5.1. Frames of Reference

Spoken languages vary radically according to the types of spatial descriptions that are employed to describe tabletop events (Levinson 2003). Central to understanding this variation is the notion of a frame of reference (FoR): a linguistic construction specifying the angular relationship between a smaller foregrounded object (the Figure) and a larger backgrounded object (the Ground), such as the man and tree of **Figure 2a**. This spatial array could be described by a relative FoR, such as ‘The man is left of the tree,’ providing a description that is anchored in a certain viewpoint. However, the same scene could also be described within an intrinsic FoR, such as ‘The man is in front of the tree.’ As such, an intrinsic FoR description is projected from one of the features of the Ground object, in this case the tree. Finally, within an absolute FoR, descriptions adhere to cardinal directions, such as ‘The man stands east of the tree.’ Most languages have all three options available, but differ in the type of frame that is deployed predominantly in the description of tabletop arrays (e.g., English favors the relative FoR).

Most sign languages have a comparable set of lexical signs describing FoRs, just as spoken languages do. Importantly, Emmorey (2002) notes that although these signs reflect the three different frames of reference, their spatial forms need not. The sign NORTH, for instance, could be produced along any cardinal axis. Additionally, signers frequently use a simultaneous classifier construction in which the selected handshapes—so-called entity classifiers—designate the types of objects they refer to while their respective spatial relationship in the signing space reflects the spatial array in an iconic way (see the sidebar titled Sign Language Classifiers and **Figure 3**). **Figure 2b** illustrates such a constellation; as expressed in Kata Kolok, the right hand represents the man, and the left hand represents the tree. The hands are essentially spatial entities themselves, so sign-perceivers must interpret these bimanual constructions in terms of a particular FoR. The intrinsic FoR is expressed by projecting the features of the objects onto the signer’s hands. In **Figure 2b**, for example, the orientation of the hand palm represents the man facing the tree.

Research has consistently shown that urban sign language users deploy predominantly a relative FoR. That is to say, viewpoint, as marked by the sign-producer’s view of his own signs, is crucial to interpreting these constructions. Conversely, sign-perceivers need to conduct a mental



**Figure 2**

(a) Figure–Ground array. Based on a stimulus picture developed by the Cognitive Anthropology Research Group, now the Language and Cognition Department at the Max Planck Institute for Psycholinguistics (Levinson et al. 1992). (b) Simultaneous classifier construction in Kata Kolok. Modified from de Vos (2012a).

## SIGN LANGUAGE CLASSIFIERS

The elements that are commonly referred to as classifiers in the sign language literature are handshapes that surface in verbs of motion and location and that reflect certain semantic characteristics of a referent. Two types that are often distinguished are entity and handle classifiers. The former classify subjects in intransitive and locative clauses; in many urban sign languages, handshape *i* in **Figure 3** could refer to a person moving or a pen lying, whereas handshape *ii* could refer to a car moving or a book lying. The latter classify direct objects in (di)transitive clauses; handshape *iii* in **Figure 3** could refer to a flower in a giving event, whereas handshape *iv* could signal that a cup is being given.

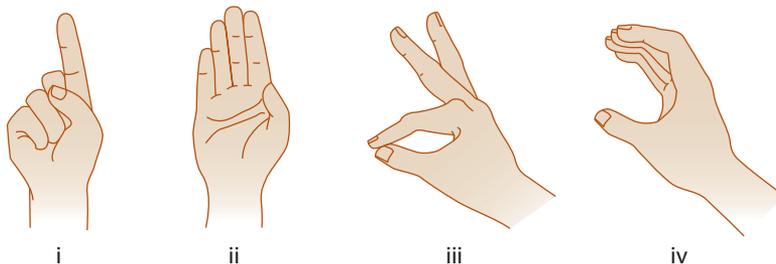
The grammatical status of classifier handshapes is a matter of debate. For extensive discussions of terminology, theoretical analysis, and typological variation, see Schembri (2003) and Zwitserlood (2012).

rotation of the classifier construction in order to interpret it correctly (e.g., Perniss 2007). It has been assumed that with regard to simultaneous classifier constructions, the affordances of the visual–spatial modality have a homogenizing effect on the variation among sign languages. More specifically, it has been hypothesized that the sign-producer’s own view on his signs highlights the relative FoR. However, concerning the emergence of Nicaraguan Sign Language, Pyers et al. (2010) report that this type of conventionalized viewpoint was not present in the initial cohort of sign languages users. Moreover, Nyst (2007a) observes that in Adamorobe Sign Language, entity classifiers are not used at all. Systematic elicitation of Kata Kolok has revealed that this rural sign language deploys predominantly an absolute FoR in the description of Figure–Ground constructions (de Vos 2012a). Thus, evidence from these rural sign languages in particular shows that sign languages may vary radically from one another even in the domain of spatial language, in which significant homogeneity might be expected.

As described below, in Kata Kolok, the preference for the absolute FoR extends into the domain of deixis, and absolute pointing signs in particular. As explained in more detail in Section 5.2, the preference for the absolute FoR in such referential expressions is mirrored by a number of other rural signing varieties.

### 5.2. The Use of Referential Loci in Pointing Signs and Verbs

In all urban sign languages investigated to date, the signing space can be employed for referential purposes by spatially modifying indexical signs or verbs. A prototypical example is visualized by



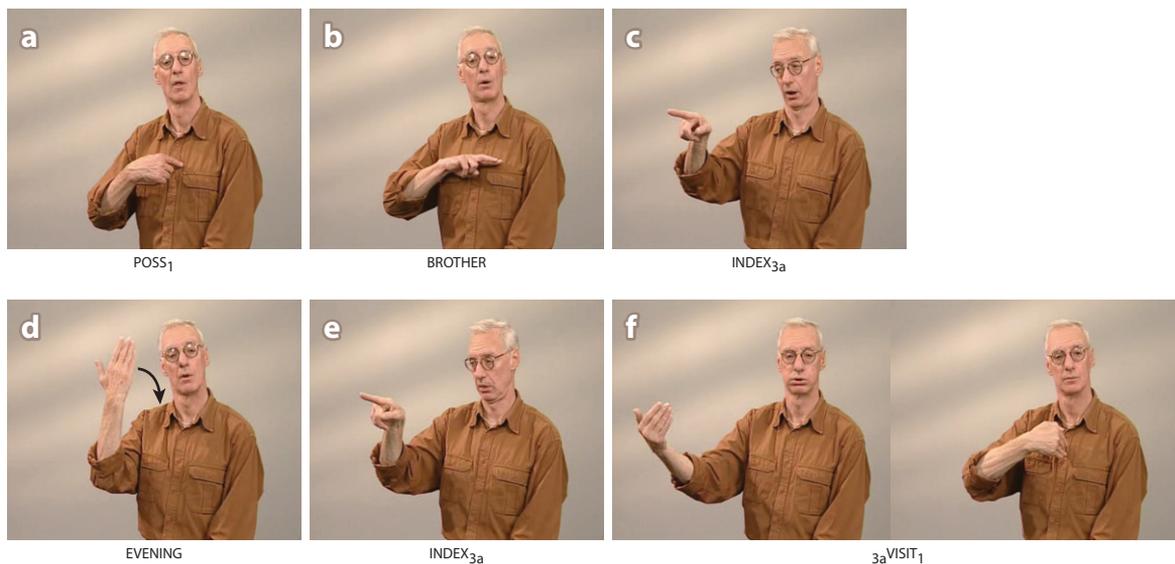
**Figure 3**

Examples of classifier handshapes, as used in various sign languages: (*i,ii*) Entity classifier handshapes. (*iii,iv*) Handle classifier handshapes (also see the sidebar titled Sign Language Classifiers).

video stills in **Figure 4**. In this example from Sign Language of the Netherlands, the signer first localizes a nonpresent referent, his brother, at an arbitrary (anaphoric) locus to his right by means of the indexical (pointing) sign  $INDEX_{3a}$ . Subsequently, the same location can be used for pronominalization; that is, the second instance of  $INDEX_{3a}$  in **Figure 4** is interpreted as ‘he.’ Interestingly, some verbs can be modulated such that they target loci in signing space—be it the locus of a present referent or a locus established by means of  $INDEX$ . In **Figure 4**, the verb  $VISIT$ , which in its citation form moves forward from in front of the signer’s body, is directed from locus  $3a$  toward the signer, thereby indicating the subject and object of the action expressed by the verb (‘he visits me’; in the figure, the beginning and end points of the verb’s movement are shown). In other words, in this example the signing space is used for three different purposes: localization, pronominalization, and spatial modification of a verb (see the sidebar titled Spatial Modification of Verbs).

Rural sign languages are interesting in this context because at least some of them do not make use of arbitrary loci in signing space and/or do not have verbs that can be spatially modified in the way described above. In the following, we keep these two phenomena separate because, as discussed below, there are sign languages that do not make use of arbitrary loci but still allow for the spatial modulation of verbs.

Kata Kolok, for instance, does not make use of arbitrary loci, neither in combination with pointing signs nor with verbs. Pointing signs exist, of course, and they are frequently used, but they target only absolute loci such as the location of a present referent or the direction of a house (in order to refer to a person living in that house). That is, the “direction of a pointing sign is motivated by shared background knowledge of individuals and associated geographic locations” (de Vos 2012a, p. 197). In example 5a, for instance, the signer refers to a person called Si (in order to talk about her father) by means of a name sign followed by a pointing sign toward Si’s garden, which is not visually accessible at the location where the communication takes place. Subsequently in the discourse, the same locus is used to refer to this individual (de Vos 2012a, p. 197).



**Figure 4**

Example from Sign Language of the Netherlands illustrating different grammatical uses of the signing space. (a–c) “My brother, . . .”; (d–f) “. . . he will visit me tonight.” Modified with permission from NGC (2002). Copyright 2002, NGC.

## SPATIAL MODIFICATION OF VERBS

What we refer to in neutral terms as spatial modification actually touches on an issue that is hotly debated in the literature. Some scholars consider the spatial modulation of a verb an instantiation of agreement and thus refer to verbs like VISIT in Figure 4 as agreeing verbs. That is, the direction of movement and/or the orientation of the hand(s) is taken to spell out agreement features. Others suggest that the phenomenon is (partially) gestural and thus should not be considered part of the grammar; they refer to verbs such as VISIT as directional or indicating verbs. We briefly mention a few complications: (a) All sign languages for which the phenomenon has been identified also have verbs that cannot undergo modulations of this type, the so-called plain verbs; (b) in VISIT, the direction of movement is from subject to object, but there are also verbs (so-called backwards verbs such as INVITE) in which the movement proceeds from object to subject (Meir 1998); and (c) some sign languages employ dedicated auxiliaries in the context of plain verbs (Sapountzaki 2012). For a recent overview and discussion, see Lillo-Martin & Meier (2011) and Mathur & Rathmann (2012).

- (5a) . . . FATHER NAME-SIGN<sub>(Si)</sub> INDEX<sub>Si</sub>'s garden  
'Si's father . . .'
- (5b) MAN INDEX<sub>3a</sub>. WOMAN INDEX<sub>3b</sub>. APPLE GIVE<sub>0</sub>.  
'There is a man here, and a woman there. Give an apple.'

With very few exceptions, verb signs in Kata Kolok are never spatially modified to target abstract or absolute loci in space (Marsaja 2008, p. 168; de Vos 2012a, p. 127). The same is true for Al-Sayyid Bedouin Sign Language, in which directionality is completely absent even in prototypical transfer predicates such as GIVE. In example 5*b*, the signer describes a video clip in which a man gives an apple to a woman. She establishes spatial loci for the two referents to her left and right by means of pointing signs, but then articulates GIVE in its citation form, with a forward movement from her body (Aronoff et al. 2005, p. 32). Example 5*b* seems to suggest that Al-Sayyid Bedouin Sign Language allows for the establishment of loci for nonpresent referents, but one has to keep in mind that the loci are semiabstract because they refer to referents that were visible on a video screen just prior to the articulation of the utterance.

This observation, however, does not imply that rural sign languages in general do not make use of abstract loci. Schuit (2013), for instance, observes that in Inuit Sign Language, verbs can be spatially modified for both absolute and abstract loci. In example 6*a*, movement of the verb PLANE-FLY-WITH-STOPS<sub>Wpg</sub> ends at a location that is in the direction of Winnipeg ('Wpg'), a city located 1,500 km away from the village where the sentence was uttered; the verb WAIT in the second clause is articulated at the same locus (Schuit 2013, p. 117). In contrast, in example 6*b*, movement of SEE proceeds toward an abstract locus, the same locus that is targeted by the pointing sign following the verb (Schuit 2013, p. 111).

- (6a) WINNIPEG INDEX<sub>1</sub> DOCTOR PLANE-FLY-WITH-STOPS<sub>Wpg</sub>  
WAIT<sub>Wpg</sub> TWO THREE MONTH<sub>++</sub>  
'I went on the medical plane to Winnipeg and stayed there for two or three months.'
- (6b) INDEX<sub>1</sub> TALK INDEX<sub>3a</sub> SEE<sub>3b</sub> INDEX<sub>3b</sub> PAY-ATTENTION  
'I told him to watch this, pay attention.'

Finally, Yolngu Sign Language appears to occupy a position between Kata Kolok and Al-Sayyid Bedouin Sign Language on the one hand and Inuit Sign Language on the other hand, as it allows for

the spatial modification of verbs, but only for absolute loci. Bauer (2014) provides an example in which the signer speaks about her uncle who lives in a settlement in the northeastern part of the island. When expressing her intention to tell him to come, she directs the verb TELL toward the geographic location of the settlement.

## 6. DISCUSSION

### 6.1. Rural Sign Languages: A Homogeneous Group?

Our review of the typological contribution of rural sign language to the field of sign language typology, and the field of cross-modal typology more generally, yields interesting results. First, it turns out that the kinship systems of rural signing varieties are among the most restrictive ever reported, and rural sign languages may have limited lexical sets in other semantic domains, too. Second, a review of the cardinal number systems of three rural sign languages reveals typologically marked constructions including vigesimal and subtractive numerals, which have not previously been reported for any sign language. Finally, it appears that rural signing varieties may recruit the signing space for linguistic purposes in notably distinct ways compared with previously reported urban sign languages. With regard to basic constituent order and negation, rural sign languages exhibit variation comparable to patterns of variation previously reported for signed and spoken languages.

Clearly, rural sign languages do not constitute a homogeneous group. All in all, a nuanced picture emerges, in which rural sign languages display considerable variability along typological dimensions as well as some common patterns. In our view, the linguistic diversity among rural signing varieties clearly shows that they should be considered independent samples on par with other signed and spoken languages in cross-modal comparisons. They exhibit typologically rare and complex features that contribute uniquely to existing typologies, as has previously been reported for spoken language isolates (Haspelmath et al. 2005, Trudgill 2011). At the same time, it can be hypothesized that the structural features that are common among rural sign languages, but are unattested in urban sign languages, may originate in the social dynamics that are shared across these communities. In Section 6.2, we review the hypotheses that are currently advocated in the literature and argue that an interdisciplinary account is needed to determine (a) the social dynamics that shape rural signing varieties and (b) how these factors may interact.

### 6.2. Social Dynamics and Language Structure

In recent years, there has been increased interest in how the social and geographical context in which a language is used may shape its structure (e.g., Kusters 2003, Wray & Grace 2007, Trudgill 2009, Lupyán & Dale 2010). Rural signing varieties are of particular interest to this discussion because they originate in relatively isolated communities in which the emergence and evolution of linguistic forms can be observed in vivo. Although it is entirely conceivable that multiple factors contribute to shaping the structures of rural sign languages (de Vos & Zeshan 2012), it is our aim here to review the most prominent hypotheses that are currently represented by the sign linguistic literature; these concern the limited time depth of a sign language, context-dependency, community size, the proportion of second-language signers, and the lack of formal education.

Perhaps the most striking differences between urban sign languages and rural sign languages relate to the way the signing space is being recruited at the level of morphosyntax. Whereas all urban sign languages investigated to date have been reported to use spatial verb inflection as a strategy to indicate who did what to whom, these forms are rarely (if at all) attested in the

spontaneous corpora of rural sign languages (Nyst 2007a, Aronoff et al. 2008, Marsaja 2008, Schuit 2013, Bauer 2014). Aronoff et al. (2008) propose that the relatively limited time depth of Al-Sayyid Bedouin Sign Language may have prevented it from accruing such spatial morphology, which suggests that all sign languages will eventually converge on a similar use of space—if they are mature enough. At present, however, it is far from clear whether this is indeed the case. On the one hand, Kata Kolok, a comparably old rural sign language, still lacks spatial morphology. On the other hand, data from Nicaraguan Sign Language suggest that an emerging urban sign language may acquire a spatial grammar over the course of only a few decades (Senghas et al. 2004).

As for Kata Kolok, de Vos (2012a) further hypothesizes that the lack of spatial modification of verbs may be related to the fact that signers maintain a high degree of shared background knowledge. As a consequence, signers prefer to structure their discourse around deictic pointing signs that make reference to real-world locations within the community; that is, they employ a context-dependent strategy. Unlike anaphoric pointing signs directed at abstract spatial loci, as found in urban sign languages (Figure 4), deictic pointing signs in Kata Kolok do not license the spatial modification of transitive verbs—in contrast to what has been described for Inuit Sign Language (example 6a) and Yolngu Sign Language. Importantly, the dominance of deictic pointing not only is attested in the domain of person reference (Washabaugh et al. 1978, de Vos 2012a), but also appears to play a role in the domains of space and time (de Vos 2012a) and the formation of the signed lexicon (de Vos 2011, Meir et al. 2012). Conversely, signers of urban sign languages more often communicate about events that are temporally and topographically displaced, and this context of language use may lead to more elaborate anaphoric (pointing) strategies.

This review also reports on the existence of restricted lexical sets in various semantic domains in rural sign languages. Washabaugh et al. (1978) suggest that the limited number of kinship terms in Providence Island Sign Language might result from the fact that signers often refer to (related) community members by proper names and deictic pointing signs. The authors argue that the sociolinguistic situation, that is, the fact that the language is used in a small and tight-knit community, favors the use of such context-dependent strategies. The same argument might explain the use of pointing signs instead of lexicalized color terms, as described, for instance, for Ban Khor Sign Language and Inuit Sign Language. De Vos (2011) suggests that signers of rural sign languages in general may tolerate more lexical variation than do urban signers because the rural communities are relatively small and signers are aware of idiosyncratic variation across the community. Indeed, Meir et al. (2012) show that lexical variation is more prevalent among signers of Al-Sayyid Bedouin Sign Language than among signers of Israeli Sign Language and American Sign Language. They additionally suggest that the congregation of deaf individuals in formal settings, such as conferences, results in communicative pressure to unify and expand the conventional lexicon. Similarly, de Vos (2011) suggests that formal deaf education may boost the calibration of a signed lexicon to that of the written language of the wider hearing community.

Sandler et al. (2011) have suggested that the fact that a phonological system has not yet crystallized in Al-Sayyid Bedouin Sign Language may be due to its limited time depth. Importantly, however, other young sign languages, such as Israeli Sign Language, seem to have developed a phonology within the same time span, suggesting that additional demographic factors such as community size may play a role (Meir et al. 2012).

With respect to the phoneme inventory of Adamorobe Sign Language, Nyst (2007a) argues that a comparatively high proportion of hearing second-language signers may have resulted in comparatively lax articulation of handshapes in this rural sign language, that is, in a phonologically less complex system. Similarly, on the basis of statistical analyses of a large set of spoken languages, Lupyán & Dale (2010) argue that usage by many second-language learners can be

expected to cause a decrease in morphosyntactic complexity (see Dale & Lupyan 2012 for simulations). Assuming that the spatial modification of verbs is a morphosyntactic operation, the lack of spatial inflection reported for many rural sign languages could be accounted for along similar lines. In this regard, however, it is important to note that, although rural sign languages often have large numbers of second-language users, the same appears to be true for many urban signing varieties, although detailed statistical evidence about the composition of signing communities is often missing (de Vos 2012a). As such, the impact of a large number of second-language learners on the structures of rural sign languages is difficult to assess at present.

Although many of the above hypotheses point in the same direction, it is hard to tease apart the relative impact of each of these factors, as they are often confounded in the signing communities that are currently described in the literature. For this reason, atypical cases, such as urban sign languages that have arisen outside the context of formal deaf education, may turn out to be particularly informative [e.g., Malinese Sign Language (V. Nyst, personal communication)]. Additionally, if community size is indeed important, we might also expect to find quantitative differences between the lexica of different urban sign languages that have comparatively large or small community sizes. Computational modeling may be crucial in determining the relative contribution of each of these factors (Roberts & de Vos 2014).

Only when considering linguistic data from a considerable number of rural sign languages can we identify the features that display a typological distribution on par with other urban sign languages and spoken languages, and determine which features may be uniquely shared among rural sign languages. Through documentation of these features and identification of the social processes and linguistic mechanisms that underlie them, rural sign languages are expected to further our understanding of the cultural processes that shape the evolution of modern human languages.

#### SUMMARY POINTS

1. Sign language typology investigates to what extent sign languages differ from each other and to what extent the attested differences mirror typological patterns previously identified for spoken languages.
2. Results obtained to date indicate that sign languages are indeed typologically distinct from each other in many respects. Some of the typological patterns reflect spoken language patterns, whereas others are modality specific.
3. Rural sign languages, namely sign languages that are used in village communities with a high incidence of (often hereditary) deafness, have only recently been added to the research agenda.
4. Cross-linguistic studies reveal that certain lexical/grammatical differences among rural sign languages mirror modality-independent typological distinctions identified for spoken languages and urban sign languages (e.g., word order), whereas others reflect modality-specific typological patterns described for urban sign languages (e.g., negation).
5. In addition, rural sign languages display certain characteristics that are typologically unusual, either from an intramodal perspective (e.g., lack of spatial morphology) or from an intra- and cross-modal perspective (e.g., numerals).
6. Some of the typologically unusual features of rural sign languages (e.g., restrictive lexical sets, the dominance of exophoric pointing) can probably be explained in terms of their social dynamics.

## FUTURE ISSUES

1. More grammatical phenomena, which have been investigated for urban sign languages, should be studied for a wider range of rural sign languages to identify typologically common or unusual features (e.g., handshape inventory, pluralization, doubling, non-manual markers).
2. What is the impact of cross-modal contact on certain structural properties of rural sign languages, for instance, in the domains of vocabulary size and word order?
3. What can we learn from acquisition patterns of deaf children growing up in rural signing communities? After all, these children have a comparatively rich linguistic input compared with those growing up in urban communities, and as such their linguistic development should be more comparable to that of hearing children learning an oral language (de Vos 2012b).
4. What can rural sign languages tell us about the processes that give rise to the emergence and evolution of languages? Rural sign languages emerge in small and relatively isolated communities in which the innovation and diffusion of forms can be inferred from synchronic variation; as such, they may provide a unique opportunity to observe such processes.
5. To what extent do rural sign languages exhibit duality of patterning, and what factors contribute to the development of sign language phonology?

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Often considered the first study on the linguistic structure of a sign language.

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Contains sociolinguistic sketches and studies on linguistic properties of many of the rural sign languages discussed here.

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## RELATED RESOURCES

- Al-Sayyid Bedouin Sign Language, University of Haifa. [http://sandlersignlab.haifa.ac.il/html/html\\_eng/al\\_sayyid.html](http://sandlersignlab.haifa.ac.il/html/html_eng/al_sayyid.html)
- Eurobabel project. “Endangered sign languages in village communities” (2009–2012), funded by the European Science Foundation (ESF). [http://www.uclan.ac.uk/research/environment/projects/endangered\\_sign\\_languages\\_village\\_communities.php](http://www.uclan.ac.uk/research/environment/projects/endangered_sign_languages_village_communities.php)
- Kata Kolok metadata, including video examples of the language. [https://corpus1.mpi.nl/ds/imdi\\_browser/?openhandle=1839/00-0000-0000-0008-CB2B-4](https://corpus1.mpi.nl/ds/imdi_browser/?openhandle=1839/00-0000-0000-0008-CB2B-4)
- Yucatec Maya Sign Language dictionary, compiled by Olivier Le Guen. [http://olivierleguen.free.fr/Vocabulario\\_LSMY/vocabulario.html](http://olivierleguen.free.fr/Vocabulario_LSMY/vocabulario.html)



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## Errata

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