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The influence of community on language structure

Evidence from two young sign languages

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By comparing two sign languages of approximately the same age but which arose and developed under different social circumstances, we are able to identify possible relationships between social factors and language structure. We argue that two structural properties of these languages are related to the size and the heterogeneity versus homogeneity of their respective communities: use of space in grammatical structure and degree of lexical and sublexical variability. A third characteristic, the tendency toward single-argument clauses appears to be a function of a different social factor: language age. Our study supports the view that language is not just a structure in the brain, nor is it strictly the domain of the individual. It is very much a socio-cultural artifact.

Keywords: community and language structure; sign languages; ISL; ABSL; variation; space; argument structure

1. Introduction

A language comes into being, develops and changes in a community of users. Human communities vary a good deal in terms of their size and in the nature of social ties within the community and with other communities. What is less well understood is how features of a community and its social practices interact with structural properties of its language. Recently, researchers have described communities sharing a language that differ in specific attributes, and examined whether differences in linguistic structure and language use in these communities can be related to these different social attributes. Trudgill (2009) suggests a relationship between certain social characteristics in English-speaking communities and certain types of linguistic structures found in these language varieties. The relevant social features are degree of contact vs. isolation with other communities,

denseness vs. looseness of social networks and community size. He hypothesizes that dialects of small, tight-knit and comparatively closed communities are more likely to give rise to irregularity and opacity and to a higher degree of redundancy in their morphological systems, for example, by having more morphological categories participating in agreement processes. While redundancy could in principle facilitate communication, redundancy in morphological inflectional systems also entails more complexity and, with additional structure, the potential for more irregularity.

Comparing what he terms Traditional Dialects of English, spoken in relatively low-contact communities in England, Scotland and Northern Ireland, with the majority General English varieties, Trudgill shows that Traditional Dialects not only retain more irregularities (e.g. they have retained irregular forms of verbs which, in the general varieties of English have become weak verbs, such as *mow-mew* and *row-rew*), but also develop new irregularities and opaque morphological structures. For example, the dialect of Norfolk developed morphological variants of the pronoun *it*: *it* is used for objective case and in tag questions, whereas *that* is used for subjective case, as in *that's raining, isn't it?* (ibid., p. 106). The same dialect also developed new irregular past tense forms for verbs that historically were weak verbs, such as *show-shew*.

Trudgill's explanation for this particular interrelation between linguistic attributes and social factors involves interplay among several factors. The first is language contact and simplification of linguistic systems. Trudgill suggests that language contact leads to simplification because in contact situations many of the language learners are adults and post-adolescents, who have passed the critical period for language acquisition (Lenneberg 1967), and are therefore more likely to encounter difficulties in learning systems which are opaque and irregular. Conversely, small isolated communities are more resistant to change because they have fewer opportunities for language contact and adult learning. Furthermore, the tight-knit social structure of such communities encourages preservation of norms (cf. Milroy & Milroy 1985), which plays an important role in resisting change. Finally, Trudgill suggests that linguistic changes that result in complexification, are likely to survive only in communities characterized by low degree of language contact and high degree of preservation of norms, that is, small isolated closed-knit communities.

Lupyan and Dale (2010) likewise develop the idea that linguistic structure is influenced by social structure. They argue that language structures adapt to the environments in which they are being learned and used, as do biological organisms that adapt to ecological niches. Linguistic niches vary with respect to the proportion of learners in a community, adults vs. children, and the size and the geographical spread of the linguistic community. Languages that are used for communication

in large groups are more likely to include adult learners, and therefore features that are difficult for adults to learn are likely to disappear over generations of language use. Morphological complexity, characteristic of languages spoken in smaller groups, in which language learners are mainly infants, increase redundancy, a feature which may facilitate language acquisition by infants, as it provides infants with multiple cues allowing them to acquire language with less reliance of extralinguistic context. From a statistical analysis of over 2,000 languages using a combination of demographic sources and the World Atlas of Language Structures, Lupyan and Dale show that morphological complexity is indeed related to demographic and socio-historical factors: languages spoken by large groups have simpler morphological structures (e.g. fewer case distinctions and less complex conjugations) than languages spoken by smaller groups, and redundancy in morphological marking (e.g. more case distinctions, and phenomena like agreement) is more characteristic of languages of smaller groups.

The influence of social structure on linguistic structures is not restricted to morphosyntax. Hay and Bauer (2007) have shown that languages with larger populations tend to have a larger phonemic inventory than those with smaller populations, regardless of language family. A larger phoneme inventory means that finer distinctions must be made in order to distinguish phonemes from one another, while the phonemes presumably would share more features among them than is the case in languages with smaller inventories. As a possible explanation, the authors cite other research suggesting that higher variability in a community, that is, greater exposure to multiple speakers, facilitates learning of more finely differentiated phoneme categories.

Their explanation is compatible with an idea put forward by Wray and Grace (2007) that characteristics of social interactions in a community contribute to the structure of the language of that community. They draw a distinction between two types of communicative contexts: esoteric (communication inside the group) and exoteric (communication outside the group), and suggest that these two contexts give rise to typologically distinct linguistic structures. They argue that languages used in esoteric contexts tend to become increasingly complex, with highly unusual sound combinations, highly specific lexical items, many morphophonemic alternations as well as irregular morphological paradigms leading to suppletion (p. 550). Languages used in exoteric contexts, by contrast, are characterized in general by rule-based regularity and semantic transparency (p. 551). Wray and Grace attribute these morphological differences to sociolinguistic and psycholinguistic factors having to do with the language learners in the two conditions and the homogeneity vs. heterogeneity of the community.

In esoteric contexts, the community is typically homogeneous; members of the community share a culture and environment, and intimate knowledge of

the community members. Such a language is learned by children born into the community. Wray and Grace argue that “languages that are under the control of the child’s learning style appear not only to retain existing irregular features, but to become increasingly complex” (p. 550). In contrast, exoteric communication is conducted with strangers, among people coming from different social and cultural backgrounds, and therefore the communicators cannot rely on shared background to aid the interpretation of the linguistic message. Such a language is characterized by features learnable by adults, such as transparency, regularity and compositionality (p. 551). Wray and Grace further suggest that the relative regularity and compositionality of many of the more familiar languages today is the result of the exoteric contexts in which most modern languages are used, rather than being a defining characteristic of human language *per se*.

Wray and Grace’s claims echo those made earlier by Joos (1962), in a book called “Five Clocks”. In it, he develops the idea that formality of style depends on social circumstances. The better people know each other, the less formal and less explicit their language has to be. Informal and intimate registers are characterized by ellipsis and phonological reduction, because the interlocutors can rely on their shared background to construct the intended meaning.

A related distinction is made by Bernstein (1971) between two types of language codes used by speakers in different social circumstances: restricted and elaborated. The restricted code is used in circumstances where the speakers share a great deal of their knowledge and assumptions. The code is economical in that it can convey a vast amount of meaning with few words, since speakers can rely on shared connotations that the verbal message evokes. The elaborated code is used between people who do not have shared background and world knowledge. In such circumstances, the linguistic message has to be explicit, as speakers cannot rely on their interlocutors to share a common context. Restricted codes can be found in close-knit groups such as families, extended families and group of friends, much like the esoteric contexts of Wray and Grace and Joos’s informal and intimate register.¹

In discussing adherence to linguistic norms in different communities, Le Page and Tabouret-Keller (1985), refer to “focused” and “diffused” forms of language: focused forms characterize communities with multiplex ties of kin, exclusion of outsiders and a confined territory. Such communities are more likely to maintain their vernacular in spite of pressure from the outside to conform to the standard variety. Once such close-knit networks break, so that members of the community have more interaction with people outside their community, the language variety begins to show influence of the standard variety.

While these hypotheses do not all make precisely the same predictions, it is possible to tie together the evolutionary perspective presented by Wray and Grace

and the sociolinguistic perspectives of Joos, Bernstein, Trudgill and Le Page and Tabouret-Keller. All agree that smaller close-knit communities are more likely to use a focused form of the language characteristic of esoteric communication contexts. If the community maintains its close-knit character for a few generations,² certain linguistic features are likely to emerge.³ Once such a community starts interacting with 'strangers', the language becomes more diffused and different linguistic features develop.

Natural languages used by a community of users come not only in the spoken modality, but also in the signed modality. Sign languages that develop naturally in deaf communities offer insights into many areas of linguistic investigation, including the interrelation between properties of the community and properties of the language. In order for a sign language to emerge and develop, there must be a group of deaf people who interact regularly over an extended period. However, the social circumstances of most deaf people differ greatly from those of hearing people. Deaf people are always a minority in the hearing community surrounding them. Deaf people in a community may have limited contact with other signers as a result of not having opportunity to interact with them (such as those who attend a different school for the deaf). Furthermore, the degree of integration of a group of deaf people into the hearing society can vary greatly. In some communities, deaf people are integrated into the wider community, while in other cases they are stigmatized and marginalized.

Previous studies of sign languages that have developed in small rural communities in various countries argue for a relation between types of interactions of deaf people and characteristics of their sign languages. Washabaugh (1986) studied a sign language that emerged in rural communities on Providence Island (Colombia) in the Western Caribbean as the result of the appearance of deaf people in those communities. The number of deaf people was small at the time of his research- twenty out of 3,000 inhabitants, even though deafness had existed in these communities for at least three generations. Washabaugh reported that deaf people from different villages did not interact with each other on a daily basis because of geographic separation and social stratification, so that many of the interactions of deaf people on the island were with hearing people in their own village. He describes hearing people on the island as having a paternalistic attitude towards deaf people, who were regarded as simple-minded and were not encouraged to socialize or work outside of the family. Despite the fact that the language was at least three generations old, Washabaugh finds little evidence of consistent word order or any other syntactic structures. Consequently, the language is very much context-dependent, and sentences out of context are often misinterpreted. In a task in which participants were asked to describe in signs 8 puppet actions, their addressees interpreted the description correctly less than

50% of the time (*ibid.*, p. 65). Washabaugh concludes that the social position and geographic distribution of deaf people and their language in the community led to underdevelopment of grammatical structure.

Ragir (2002) extends Washabaugh's descriptions and insights to a comparison of six "indigenous sign languages". Five of the six languages she refers to emerged in small, rural, and mostly closed communities. In addition to Providence Island, she reviews what has been reported about the sign languages of Martha's Vineyard (USA), Grand Cayman Island (Jamaica), Nohya (Yucatan, Guatemala) and Enga (New Guinea). The sixth is Nicaraguan Sign Language, which developed in a school for the deaf in Managua and is used in a larger urban area. Her claim is that the degree of social interaction and integration plays a role in the development of a linguistic system. In three of the communities in her study, deaf people were marginalized and had restricted access to social interactions. As a result, she argues, "the indigenous sign systems remained static and context-dependent for many generations" (*ibid.* p. 275). In contrast, the three sign languages that developed in communities in which deaf members were socially integrated are described as containing "well-developed context-independent lexicons and grammars" (*ibid.* p. 275).

In this article we do not evaluate the degree of integration of deaf people in the larger community and its relation to language structure. Instead, we examine the whether there may be a relationship between the size of a sign language community and the denseness of social ties among signers on types of linguistic structures and processes. We compare two types of sign languages: village sign languages and deaf community sign languages (Meir et al. 2010a). These two types develop under very different social conditions. Village sign languages arise in small, relatively closed communities with a high incidence of hereditary deafness. In such communities the deaf members do not form a separate community, but are rather part of the general close-knit village community. Deaf community sign languages develop when deaf people from different places get together over a long period of time, often in schools for the deaf. In communities of this kind, some hereditary deafness may be present, but deafness also arises through childhood illness and disease. In the latter case, there are likely to be more deaf children who have no signing relatives, either hearing or deaf.

These two types of communities match the distinction made by Wray and Grace between esoteric and exoteric language contexts: village sign languages arise in communities characterized by a mode of communication typical of esoteric contexts, since all signers, both deaf and hearing, are members of a relatively small and closed community. They are all of the same ethnic background, many are genetically related, they share the same physical space and they share cultural and religious beliefs. Deaf community sign languages, on the other hand, arise in

exoteric contexts, in which languages users may come from very different backgrounds in terms of ethnicity, country of origin, place of residence, or education. However, these languages differ from their spoken counterparts in an important way: their age. All known sign languages are much younger than spoken languages; they emerge only when a group of deaf people can socialize and communicate on a regular basis. Such circumstances have arisen in numerous places over the last two or three centuries.

In some cases, we are fortunate enough to study very young languages, almost from their inception. The two languages that will be compared in this article, Israeli Sign Language (ISL) and Al-Sayyid Bedouin Sign Language (ABSL) fall into this category. Each emerged about 75–80 years ago; they have only three or four generations of users and so are very young as far as languages in general go. They give us the opportunity to study a three-fold interaction: characteristics of the community, language age, and linguistic structures.⁴

We will suggest that, as has been proposed for spoken languages, intimate shared knowledge in the community or the lack of it can result in different linguistic structures. In the case of ABSL and ISL, we look into a specific kind of shared knowledge – knowledge of shared physical space. Sharing physical space gives rise to specific grammatical structures in ABSL, while the lack of it enhances the development of different structures in ISL. Furthermore, we argue that linguistic communities characterized by esoteric communication contexts may not only develop more irregularities, as has been argued for by Trudgill and by Wray & Grace, but are also able to sustain more linguistic variability for a longer period of time.

The last claim might be somewhat counter-intuitive; it seems reasonable to expect smaller language groups to show more uniformity than larger ones, because the regular contact of many community members with each other should make language users more similar to each other, and should enhance spread linguistic innovations and forms faster than in larger, less tightly-knit communities. Moreover, in such small close-knit communities there might be pressure from within to adhere to specific uses of language, as such uses indicate social solidarity (as suggested by Le Page & Tabouret-Keller 1985). But our findings indicate the contrary, at least with respect to lexical and sub-lexical aspects of the languages. We find variability in vocabulary items themselves and in how different signers produce them. These findings may have implications for an evolutionary perspective of human language, which we discuss in the conclusion. We suggest that variability may be the result of two different forces, depending on the age of the language: in older languages, variability may increase as the community spreads over larger geographical areas, and sub-communities are formed. In young languages, variability may be the starting point, before uniformity-inducing factors come into play.

We start with a description of the two types of languages, village sign languages and deaf community sign languages, and the social contexts in which they are used (Section 2). We then introduce the two particular languages representative of each of these language types, which are the focus of the study in this article: ISL and ABSL (Section 3). After describing our methodology in Section 4, we introduce linguistic phenomena that differ between the two languages, which, we argue, stem from the different characteristics of their respective communities: grammatical use of space (Sections 5.1–5.3) and lexical and sublexical variation (Section 5.4). We also show that the shared newness of the languages may lead to the development of certain structures that are similar in the two (Section 6). Specifically, new languages show a tendency for one-argument clauses, especially when the encoded events have human arguments, as the sign productions of older signers of both ISL and ABSL indicate. We conclude by discussing possible implications of our findings for an evolutionary perspective on languages in general.

2. Two types – village sign language and deaf community sign language⁵

Village sign languages develop within small communities whose members include congenitally deaf people. Often, there is a proportionately high incidence of hereditary deafness in such villages. In Al-Sayyid, the percentage of deaf people is 3.5% – more than 40 times the usual incidence elsewhere.⁶ The communities within which village sign languages arise are typically socially separated from the larger population in the country by reason of ethnicity or geography. Because of this separation, the deaf people born into such communities may not attend school, especially if the local schools, populated largely by the hearing people in the same communities, have no special provisions for deaf children. Furthermore, because of geographic location or ethnic separation, they do not have access to the national deaf educational system nor do they participate in the wider deaf community, if there is one.⁷ Therefore, these deaf individuals are not exposed to any existing sign language in the region. In such contexts, the birth of even a small group of deaf children in the community may give rise to a sign language that develops without contact with other sign languages. These languages emerge from the need to communicate within families, and they are characteristically used by both deaf and hearing members of the community.

The creation of such a system is vividly described by the hearing son of a first generation deaf person from the Al-Sayyid village, who described to us how the Al-Sayyid Bedouin Sign Language (ABSL) arose: “The parents needed to communicate with the deaf children born into the family. They wanted to transmit information about everyday activities and interactions, as well as values and

traditions important for the community. They used whatever communication system worked. Since the children were deaf, they used gestures. Some of the gestures were already being used in the community, others were invented by the children and still others by their parents.”

Since the language is used by both deaf and hearing members of the community, there is no deaf community per se, but rather a signing community, which is much larger than the number of deaf people in the community.⁸ The transmission of the language is within and between families, and both deaf and hearing members play a role as linguistic models and as acquirers. In village sign languages, many children, both hearing and deaf, interact in sign language from very early in life.

Village sign languages are less rare than might be expected. The first thorough description of a community with such a language is Groce’s (1985) book *Everyone Here Spoke Sign Language*, which traced the history of a community that had used a sign language for communication among its hearing and deaf residents for several generations. Subsequently, other village sign languages have been documented and studied: Providence Island, Colombia (Washabaugh 1986), Amami Island, Japan (Osugi, Supalla & Webb 1999), Al-Sayyid Beouin Sign Language, Israel (Kisch 2000; Sandler et al. 2005), Desa Kolok, Bali (Marsaja 2008; de Vos 2011), Bhan Khor, Thailand (Nonaka 2007), Adamorobe, Ghana (Nyst 2007) and Algerian Jewish Sign Language, Algeria and Israel (Lanesman & Meir 2012). Reports on additional village signing communities keep accumulating, bringing promise for more comparative studies.

These communities differ along several variables which are expected to influence the resulting linguistic system: size of community, age of the language, distribution of deaf people in the community, social status of deaf people, exposure to other sign languages, and presence or absence of interference from the spoken language (Meir et al. 2010a). But all the languages share the way in which they came into existence and a degree of intimacy among the members of the community that does not characterize the other type of sign languages, deaf community sign languages. The social networks in these villages can be described as dense and multiplex, as most people in these communities know each other, and people are related to each other in more than one way (Milroy 1980). Importantly, the dense and multiplex networks are characteristic of all members of these communities, deaf and hearing. As pointed out above, deaf people do not form a separate community within the village, but are rather part of the wider village community.⁹ In the village setting, people share a common culture and social environment at a very intimate level from the beginning. Their shared context, expectations, and knowledge make it easier for them to communicate than is the case for people with diverse backgrounds. This degree of familiarity may

allow them to be less explicit verbally than people who do not have as much in common, yet at the same time to communicate effectively across a range of topics, provided the context is shared.

The second type of new sign language, *deaf community sign languages*, arises when unrelated signers of different backgrounds come together in one place. Typically the establishment of a school for deaf children draws together in one location deaf children from a larger region, but other institutions such as deaf associations and clubs can also provide opportunities for sustained contact among deaf people. In the latter cases, language learning takes place in large measure between peers and unrelated adults. The history of major European and North American sign languages is directly linked to the building of deaf schools in the eighteenth and nineteenth century and the social clubs that formed in communities around them (Padden & Humphries 1990, 2005; Woll et al. 2001).

The deaf people who come together under situations like these have varied language backgrounds. Some may already have learned an existing sign language. Others may have grown up using sign communication only within the family, that is, homesign. In some rare cases, almost none of the members of the new language community know an existing sign language beyond their home signs, and the sign language that emerges can be regarded as new (the sign language that emerged in Nicaragua may be an example of such case. See e.g. Senghas 1995, 2003).

The social context of deaf community sign languages vary. Some are several centuries old (e.g. British Sign Language, French Sign Language, and American Sign Language), others only a few decades old, e.g. Nicaraguan Sign Language, whose origin can be traced at least to the founding of the school for the deaf in Managua in 1977. Some have communities in the hundreds of thousands, distributed over a large geographical area; ASL, for example, has a community of 200–300,000, and is used throughout the United States and most of Canada. Other communities are much smaller. Yet a key characteristic of deaf community sign languages, as opposed to village sign languages, is that most of the signers are unrelated to one another and come from different regions or cultural backgrounds. The individual members of these communities, then, have external social ties that are not shared by other members, and therefore the social networks among members in deaf community sign languages can be characterized as relatively low in density. Also, the community of the emerging language consists largely of deaf people, who come together because of their common experience of deafness, and continue to stay together in the presence of institutions like deaf schools, clubs and associations. In other words, in contrast to the villages described above, these are deaf communities as well as signing communities; the language emerges simultaneously with the community.

3. Israeli Sign Language and Al-Sayyid Bedouin Sign Language

We present here a contrastive study of two sign languages from the same region of the world: Israeli Sign Language (ISL) and Al-Sayyid Bedouin Sign Language (ABSL). Though they are of the same age approximately, they are of contrasting socio-linguistic types, giving us a good basis for observing language structures across the two types of sign language under discussion. ISL emerged with the initial crystallization of the deaf community in Israel in the 1930s; ABSL emerged with the birth of deaf children in the Al-Sayyid community, in the 1930s as well. The communities of both languages also share the same wider geographical region, the present-day State of Israel. However, the two communities differ greatly in their social characteristics. All ABSL users are members of the Al-Sayyid tribe. The members of Al-Sayyid form a relatively small closed community whose members, deaf and hearing, all live in one small geographical area. Though some of the women may come from outside and marry into the village, once they are married they spend most of their time at Al-Sayyid. The ISL community, on the other hand, is spread throughout the country, with more than ten deaf clubs in different cities. The members of this community come from varied backgrounds, as will be described below.

3.1 The history of ISL

ISL emerged in the 1930s, with the formation of the deaf community in Israel. Apparently there were some small signing groups in some towns in the region before that, but little is known about them. In the first two decades of its existence (1930s–1950s), ISL developed in two different environments simultaneously: the emerging deaf community (whose base was mainly in Tel-Aviv) and the then-newly-established schools for the deaf, first in Jerusalem and then in other cities as well (Meir & Sandler 2008). The members of the first and to a large extent also the second generation of the deaf community came from different backgrounds, in terms of both their country of origin and their language. A few were born in Israel, but the majority were immigrants who came to Israel initially from Europe (Germany, Austria, France, Hungary, Poland), and later on from North Africa and the Middle East. Some of these immigrants brought with them the sign language of their respective countries. Others had no signing at all,¹⁰ or had some kind of a homesign (gestural communication system developed and used among the members of one family, see e.g. Goldin-Meadow 2003). Deaf people started to form a social group that met regularly. In 1944 these social ties were formalized by establishing an association for the deaf in Israel, and creating deaf clubs around the country.

The other environment for the development of the language was the schools for the deaf. The first school was founded in Jerusalem in 1932, followed by the founding of schools in Tel Aviv and Haifa in the 1940s (Plaut 2007). The children who attended these schools in those early days had no sign language, and the educational approach in the schools was strictly oral: children were required to lip-read and speak, and signing was forbidden in the classrooms. However, the schools served as a fixed locale for deaf children to meet and interact regularly and over extended periods. When left to themselves, the children developed a gestural communication system that evolved over the years, as it was used by the different cohorts attending these schools.

Over the years, these two paths, the deaf community and the school for the deaf, have come together. Graduates of the deaf schools became part of the deaf community, and members of the deaf community have become more involved in the schools, both as teachers and as parents of deaf schoolchildren. Hence the communication systems that evolved in the community and in the educational systems merged, forming a new language, Israeli Sign Language. Today the community numbers about 10,000 members. The language is quite unified across the country, though (just as with spoken languages) there is some regional lexical variation; i.e. some signs are typical of the Tel-Aviv area, while others may be used in Haifa, Be'er Sheva or Jerusalem. The country of origin of the signers also may have some effect on the lexicon. Some specific signs are used within families of Moroccan, Algerian, Egyptian or German origin. This latter type of variation is more pervasive among older signers.

The educational system, which opposed the use of signing at first, changed its approach in the 1970s, as it became evident that deaf children were not advancing academically as desired. Contacts with deaf communities and educational systems for the deaf in other countries resulted in the introduction of signing into the schools. However, the teachers did not use ISL *per se*, but rather a contrived communication system that involves both speech and signing simultaneously, called Signed Hebrew.¹¹ This situation persists today: ISL is quite rarely used by educators, whose signing is by and large restricted to Signed Hebrew. The importance of the educational system with respect to ISL is that it serves as a locale for deaf children to meet and interact. The language is used much more in out-of-class situations than in the classroom.

The emergence and development of ISL are characterized, then, by heterogeneity. Members of the first two generations came from different ethnic and linguistic backgrounds. They met and continue to meet in schools, in the deaf clubs and in social gatherings, but they do not share a restricted geographical area or single social background.

3.2 The history of ABSL

The Al-Sayyid people reside in the village of Al-Sayyid, near Be'er Sheva in the Negev region in southern Israel. In 2010 they numbered 3,258 people.¹² Like other Arab groups in the Negev, they are referred to as Bedouins. The Bedouins are divided into 'tribes', descent groups, which constitute their major social network. Some of the Bedouin groups were formerly nomads or semi-nomads, while other groups, the Al-Sayyid among them, are descendents of *fellahi:n* (farmers). Distinctions between the groups are very salient, and they determine social interactions and marriage patterns. About 70% of marriages are within the kin-group,¹³ and marriages outside the descent group are restricted, as there are very clear constraints as to which groups can marry into which (Ben-David 2004; Kisch 2007). Groups that reside in close vicinity do not necessarily interact with each other.

Al-Sayyid Bedouin Sign Language (ABSL) arose in this small community as a result of a high incidence of nonsyndromic recessive deafness (Scott et al. 1995). The first Al-Sayyid man migrated to present-day southern Israel from Egypt about 200 years ago, and took a wife. Four generations afterwards, in the 1920s and 1930s, four deaf siblings were born into the community (Kisch 2008). In the next two generations, deafness appeared in a number of other families resulting in what today is estimated at about 130 deaf adults, teenagers and children. The sign language that arose in the village is different in vocabulary from the sign languages of the region, ISL and Jordanian Sign Language (Al-Fityani & Padden 2010).¹⁴ It differs in word order from ISL and the surrounding spoken languages, the local Arabic dialect and Hebrew (Sandler et al. 2005). ABSL is used widely throughout the community by both deaf and hearing members (Kisch 2000, 2004), and is seen as alternative language of the village in addition to spoken Arabic. The prevalent use of ABSL in the village has led to widespread exposure to the language by deaf children and many of their hearing siblings and relatives from birth or a very young age.¹⁵

The Al-Sayyid community is socially and culturally homogeneous. Its users share the same small geographical area. They all belong to one large extended family, with common history and common beliefs and cultural practices as well as a common family name. Marriage is to a large extent within the village, and first-cousin marriages are very common. This results in multiplex of close kinship ties, as the spouse is often a first cousin, the parents-in-law are also aunt and uncle, and the spouses have the same grandparents. Many of the people in the village know each other and know of each other, and most deaf people know the other deaf people in the village. Moreover, most hearing people in the village know deaf people and are exposed to fluent communication in sign language. Signing is not

stigmatized and deaf people do not form a distinct social group. Kinship relations are characterized by dense social-kin networks (Kisch 2007, 2008).

Although deafness is not uncommon in other Bedouin villages, the deaf people in Al-Sayyid, especially those over 40 years old who did not benefit from schooling, do not maintain regular contact with deaf people outside their community (Kisch 2008:303). In that, they do not differ from the hearing members of Al-Sayyid, for whom the community is the main framework of social interaction.

Contacts between ISL and ABSL users are also very recent, despite the geographical proximity (the Al-Sayyid village is about 20 km from Be'er Sheva, the largest city in southern Israel). While older ABSL signers may recognize individual ISL signs, they do not understand conversational ISL, and ISL signers do not understand ABSL conversations. The two languages are mutually unintelligible.

Younger people have had exposure to ISL, or at least to ISL signs. Their linguistic environment is more complex. Around the 1980s, deaf children from Al-Sayyid began to attend a school for deaf children in Be'er Sheva (Kisch 2008), where they met deaf children who used ISL and were exposed to some versions of Signed Hebrew used by their teachers. Teen-aged boys began to attend a boarding school near Tel-Aviv, where communication is mainly in ISL signs, and in ISL proper with the two deaf teachers in that school. In 1997 deaf classes opened in schools in the Arab towns of Tel Sheva and Segev Shalom (Plaut 2007), and a few years ago in a school in the village of Al-Sayyid as well. The teachers in these schools have varying degrees of mastery of ISL signs, which they use together with spoken Arabic. Taken together, this linguistic context means that, with few exceptions, deaf children of the Al-Sayyid community have often been exposed to ISL signs but typically have not had sustained exposure to ISL as a language in their formative years. Nevertheless, as a result of the introduction of ISL signs in the school system and from more association with ISL signers, young Al-Sayyid deaf people, unlike their elders in the community, seem to communicate easily with ISL signers.

Because ABSL and ISL developed under very different social circumstances but are almost of the same age, they provide us with an opportunity to probe the following question: Do the social characteristics of the community have an impact on the nature of the emerging language?

On the basis of the study reported here, we find that certain structural properties of the two languages differ in such a way that they may in fact be related to the social circumstances of their respective communities. These properties include different ways of using space for linguistic expression, as well as different degrees of lexical and sublexical variability across the community. A third property is shared by older signers of both communities, namely, the tendency to use one-argument

clauses. This property, we argue, stems from the newness of a language, and characterizes the older generations of both ISL and ABSL.

4. Methodology

The results reported below are drawn from research studies that took place between 2004 and 2010 on the emergence and development of grammatical structure in ISL and ABSL. For the purpose of comparing across generations, signers were divided into three age groups in each language. Following Labov's Apparent Time construct (Labov 1994, 2001), our investigation of language use across different aged speakers is a synchronic measure of ongoing language change. That is, studying the language of signers of different age groups in these young languages may shed light on the development of linguistic structure almost from the beginning. In ISL, some of the signers of the first generation are still among us, which makes it possible to observe the oldest signers of the language. In ABSL, the signers of the first generation are all deceased, and the oldest signers we have been able to work with are in their 40s. As a result, the division into age groups in the two languages does not match. The oldest ISL group consists of people of the first generation of signers, and the age span of each group is about 15–20 years. The oldest ABSL signers are people in their 30s and 40s, and consequently the age span of the signers in each of the younger groups is 7–10 years.

In addition to belonging to different age groups, we selected ISL subjects who varied in terms of their country of birth: Algeria (5 participants), Egypt (1 participant), Morocco (7 participants), Germany (2 participants), Belgium (1 participant), South Africa (1 participants) and Israel (16 participants). They also vary in terms of the age they acquired the sign language. Some are native signers, that is, born to deaf parents, and some are not, as specified below. The ABSL signers come from 12 different nuclear families in the village. While we cannot be sure that the participants represent all different subgroups in the two communities, we believe that they give a fair representation of the socio-linguistic variation in them.

ISL: *Group 1*: Thirteen signers (all deaf, seven men and six women) aged 65 years and older.¹⁶ People from this age group were not exposed to one unified linguistic system as a group, but rather they created it through interaction with each other. Members of this group came from a variety of linguistic backgrounds. As the language was too young when they were children, there are no native ISL signers among them, that is, deaf people whose parents were deaf and used the language as the main means of communication with their children. But seven of the eleven signers had deaf siblings or other family members. Therefore, some have used a sign language or some sort of a signing system from an early age.

Group 2: Ten signers (nine deaf and one hearing, four men and six women) aged 45–65. Members of this group can be considered second-generation signers, since they had linguistic models when they joined the deaf community. Those who were born in Israel or immigrated to Israel at an early age had at least several years of schooling with other deaf children. Although the educational ideology was strictly oral until the 1970s and the teachers in the schools did not use signing (Plaut 2007), the daily interaction with other deaf children over a long period gave most members of this age group the opportunity to use signing from childhood. Three of the signers in this group have deaf siblings, and two are native signers. The other five were exposed to ISL in their teens, and can be considered late learners.

Group 3: Eight signers (four men and four women) aged 25–44. All members of this age group had formal schooling and learned Hebrew, and so can be considered bilingual. Six of the eight are native ISL signers.

ABSL: Group 1: Nine second-generation signers (8 deaf, 1 hearing, 6 men and 3 women), ages 28–45. Six are monolingual ABSL signers; two went to a school for the deaf in Be'er Sheva, where they learned some Hebrew and interacted with ISL signers. Four members of this group had a deaf father. They all have deaf siblings, and had adult models of sign language, including deaf relatives such as aunts, uncles and cousins.

Group 2: Seven third-generation signers (3 men and 4 women, one of whom is hearing), ages 17–24. All deaf participants went to a school for the deaf in Be'er Sheva, were taught in Hebrew and were exposed to ISL signs. Three have a deaf mother as well as deaf siblings, and another has one deaf sibling. All of the younger adults interact with deaf signers of the second generation.

Group 3: Thirteen children (5 boys and 8 girls, one of whom is hearing), ages 5–15. All deaf signers study in a special class for the deaf in an Arabic speaking school in Tel-Sheva, where they are taught Arabic, and are exposed to some ISL signs used by their hearing teachers. Five children have a deaf parent, and all have deaf siblings.

Several tasks were designed in order to study different grammatical aspects of the languages. The studies of use of space (Sections 5.1–5.3 below) and the expression of argument structure (Section 6) are based on signed productions describing a set of 30 short video clips, designed to elicit simple de-contextualized sentences (Aronoff et al. 2004; Sandler et al. 2005). Each clip depicts a single action carried out by either a human or an inanimate entity by itself or involving another entity. The events presented in the clips vary with respect to the number of arguments (intransitive, transitive and ditransitive) and animacy. In addition, data from personal narratives and videotaped conversations of signers of both languages provided corroborative evidence. The study of sublexical and lexical variation was based on the responses to a picture-naming task, consisting of pictures of

15 everyday items. Lexical items, including compounds, were elicited by a picture-naming task and a translation task (the details of these tasks are described in detail in Meir et al. 2010b).

5. Linguistic differences between ISL and ABSL related to properties of the communities

5.1 Use of space in ABSL

An important characteristic of sign languages is that signs – which convey the lexical content of sign languages – are produced in visible space. In sign language discourse, motion of the hands in three-dimensional space, and incorporation of the space around the signer as part of the communicative act can become systematic in a language community.

Space is integrated into the signed message in various ways. In the sign linguistic literature, two broad uses of space have been identified. These are often referred to as topographical use of space vs. grammatical or metaphorical use of space (Emmorey 1995, 2003). In the former, signers use the signing space to represent or to refer to real-world locations or spatial relations. In the latter, the movement of the hands in space encodes grammatical notions such as transitivity relations. In both uses, however, the signing space is used as a representational device, for representing real-world spatial relations or grammatical relations. Another possibility for using space is to refer to actual locations and entities in the signing situation by pointing to them. This could be referred to as a deictic use of space, and is seen in pointing gestures of spoken conversations as well (McNeill 1992 and much subsequent work).¹⁷ The possibility to refer by pointing is based on the knowledge shared by the interlocutors by virtue of the fact that they are both in the same ‘here and now’. In sign languages, such deixis can take different forms, which become conventionalized in a language community. When comparing ABSL and ISL, we find that the two languages use space differently, and have developed linguistic structures that stem from the different uses of space. We will suggest in what follows that these differences stem from characteristics of the communities.

5.1.1 *Identifying people by the location of their houses*

Though people have name signs in ABSL, signers often identify people by pointing to the location of their houses. For example, one signer, when referring to her sister, signed the sister’s name sign and then pointed to the real-world location of her house. Another signer, when referring to a person named Abdullah,

signed his name sign, and then pointed to the real-world location of his house. When referring to her brother, she points at a different direction, the location of her brother's house (see Figure 1a–b below). This device is commonly used in narratives and in conversations.

5.1.2 *Identifying places in a discourse by pointing to their real world locations*

When talking about places in the vicinity, ABSL signers often point to their real-world location. For example, in a narrative about childbirth, three major places were consistently referred to: the hospital, the mother-child clinic and home. Whenever the signer referred to one of these three places, he would point to the direction of the real-world location of that place. Another signer, when referring to a school in the Bedouin town Segev Shalom, pointed to the real-world location of that town, as illustrated in Figure 1d.

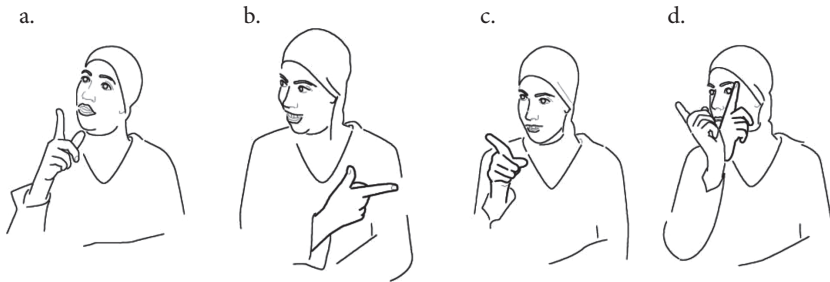


Figure 1. Pointing to real-world locations to refer to people and places: Pronominal signs in the discourse of a young second generation signer, referring to (a) Abdullah (a person's name) (b) the signer's brother, (c) the addressee, and (d) Segev Shalom (a place)

5.1.3 *Compound place names involving pointing signs*

ABSL uses compounding for creating new lexical items (Aronoff et al. 2008; Meir et al. 2010b). Among the different compounds attested in the language, one group of compounds stood out as having very clear function and structure. These are compounds that identify cities and countries. In these compounds, the first member is a sign referring (usually by metonymy) to a property of the place, and the second member is a pointing sign, which we gloss as THERE.¹⁸ Some examples are: PRAY^THERE 'Jerusalem' (shown in Figure 2), LONG-BEARD^THERE 'Lebanon,' HEAD-MEDALLION^THERE 'Jordan,' HEAD-SCARF^THERE 'Palestinian Authority' and WIDE-HAT^THERE 'America.' These signs are characterized by a fluid transitional movement, and a consistent order: the pointing sign is final. The pointing is always toward the real-world location of the city or country. Thus the direction of the pointing with respect to the signer's own body may change, if the signer changes his/her position. Pointing in a different direction

is considered an error, and is corrected, as has happened quite often to us when trying to converse about a certain city or country.



Figure 2. A compound place name a pointing sign: PRAY^THERE 'Jerusalem'


All the above devices employ pointing signs directed at real world locations. While the first two can be regarded as pragmatic in nature, in the sense that signers employ the physical setting in which the conversation takes place to convey certain pieces of information, the third device is grammatical. The compound place names are conventionalized and lexicalized (Aronoff et al. 2008), and can be regarded as a *grammatical* mechanism in the language that is based on the mental map of the village and its vicinity shared by ABSL signers. The meaning of the compounds is not compositional, and they have a conventionalized structure: the pointing sign follows the content sign and has a specific rotation movement that is not always present in other pointing signs. These compounds show that a device that starts off as pragmatic in nature may enter the lexicon and grammar of the language as is well-known in grammaticalization processes in general.

These devices were documented in narratives and conversations. We did not find them in signers' descriptions of the set of short video-clips that were designed to elicit de-contextualized sentences, described in Section 4 above. This is not surprising; these video clips do not contain people or places from the village or the vicinity. Therefore there is no need to use devices that make use of real-world locations. As we show below, the responses of ISL signers to these clips are very different in their use of space.

5.2 Use of space in ISL

In addition to pointing to real-world objects and locations present in the signing situation as in ABSL, ISL makes use of the signing space to represent spatial relations among entities, as a pragmatic device to contrast two different discourse topics, and as a grammatical device for reference tracking (Meir & Sandler 2008).

5.2.1 *Representing spatial relations*

ISL uses a complex system for representing static or dynamic spatial relations. Similar systems are found in other sign languages as well and are referred to as ‘classifier constructions’ (Emmorey (ed.) 2003; Zwitserlood 2012). In such a construction, the handshape assumed by the hand/s represents a type of object, and the location and movement of the hand/s in the signing space represent spatial relations among objects as well as the motion of entities in space (Aronoff et al. 2003; Meir & Sandler 2008). In order to convey a message such as ‘the cup is next to the piece of paper’, the signer’s right hand can assume a shape representing a cylindrical cup, while the left hand represents the flat sheet of paper (Figure 2a). Placing the right hand next to the left hand will express the relation ‘next to’ or ‘near’. Another example is a sentence meaning ‘The car rode under the bridge’. To convey this content, the signer uses one hand to represent the bridge, while the other hand, with a  handshape representing the car, moves under it (see Figure 2b).

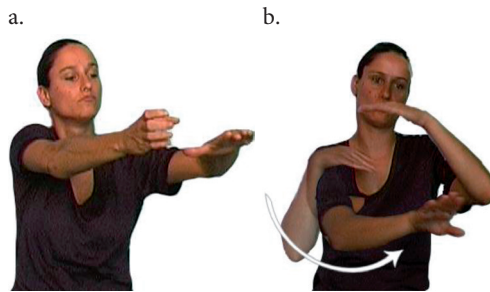


Figure 3. Representing spatial relations by hands: (a) ‘The cup is next to a piece of paper.’ (b) ‘The car rode under the bridge’

5.2.2 *A pragmatic device of marking contrast*

The two hands in space can also be used to express a contrast or a comparison between objects.¹⁹ We found an example of this in a particular passage in which an ISL signer was comparing two types of bacteria – harmful and helpful. In this passage, the signer signed the helpful bacteria on the right side, and the harmful bacteria on the left. Subsequently, every sign or sentence related to the ‘good’ bacteria was signed on the right, while every expression related to the ‘bad’ bacteria was signed on the left. The use of the two sides made possible a convenient visual demonstration of comparison and contrast.²⁰

5.2.3 *A reference-tracking device*

ISL, like other sign languages, uses the signing space as a reference-tracking device. This use of space is often referred to as grammatical use of space, since the pointing signs and some verbs employed to establish the identity of referents and

to track these referents throughout a discourse are analogous to pronouns and agreement affixes in spoken languages. This device is based on establishing an association between nominals in a clause and discrete locations in space, called 'R(eferential)-loci'. This association is achieved by signing a noun and then pointing to, or directing the gaze towards, a specific point in space. The R-loci are used for anaphoric and pronominal reference for the nominals associated with them, and are therefore regarded as the visual manifestation of the pronominal features of the nominals in question (see e.g. Klima & Bellugi 1979; Lillo-Martin & Klima 1990; Meier 1990; Janis 1992; Neidle et al. 2000). By establishing R-loci and subsequently pointing back to them, signers can refer to 3rd person referents without the aid of pointing to real world locations of these referents or their homes. The signer creates a spatial scene in the signing space, and therefore is not dependent on real-world locations.

In addition to pronouns, verbs that inflect for agreement (the so-called 'agreement verbs', Padden 1988) also make use of the system of R-loci: their beginning and end points, as well as the direction faced by the palm (or fingertips), are determined by the R-loci of their grammatical arguments. The direction of the movement of the verb is determined by the spatial thematic role of the arguments (movement is from source to goal), and the palm faces the syntactic object (Meir 1998, 2002).²¹ Figures 3a–c show three forms of the agreement verb SHOW. The form meaning 'I show you (something)' has a path that moves from the signer to the addressee, while in the form 'you show me' the direction of the path is reversed. A verb form meaning 's/he showed you (something)' moves from a location associated with the 3rd person participant to a location in space in the direction of the addressee.

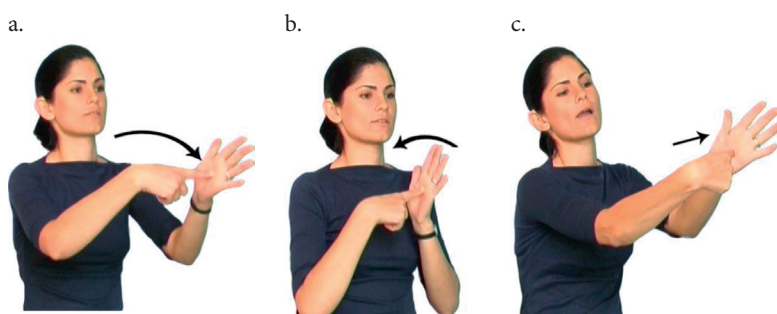


Figure 4. Inflected forms of the verb SHOW: (a) 'I show you'; (b) 'you show me'; (c) 's/he showed you'

Not all verbs in a given sign language inflect for agreement; agreement inflection is restricted to verbs denoting transfer (whether concrete or abstract) (Meir 2002), and in some sign languages also some verbs with two animate arguments.

In order to elicit verb agreement forms in ISL, signers were asked to describe to another ISL signer a set of 30 thirty short video clips, mentioned in Section 4 above. For the purpose of studying agreement forms, we analyzed the responses to those clips that denote a transfer event (GIVE, TAKE, THROW, FEED, SHOW) and verbs with two animate arguments (LOOK, PULL, PUSH, TAP). The analysis of the responses shows that signers of the youngest group used agreeing forms in 72.5% of their responses. In order to illustrate the use of space and verb agreement in these responses, consider the following description of a clip in which a girl and a woman are sitting at a table, and the girl feeds the woman (with yogurt):

- (1) TABLE, FEMALE SIT_a, FEMALE CHILD SIT_b, FEMALE THERE_b, FEED_a
 ('There's a table. A woman is sitting here (on the right-hand side), a girl is sitting here (on the left-hand side). The female here (on the left) is feeding the one on the right.')

The signer signs the sign for 'table' in the center of the signing space. He then signs the sign FEMALE, and uses a special form of a sign meaning 'sit at a place', signing it at the right side of the signing space. By doing this he localizes the mother at a point in space to his right. In a similar way, he localizes the girl by "sitting" her at the left side of the signing space. He then points again to the locus on his left (the locus associated with the girl), and sign the verb FEED with a path movement the moves from locus *b* (the girl) to locus *a* (the mother), thus indicating that the girl is feeding the mother.

As mentioned above, signers of the younger group establish R-loci and direct verbs to or from these loci in 72.5% of their responses. However, signers in the two older groups used agreeing forms of transfer verbs in less than 40% of their responses (Meir 2012). Signers of the oldest group often conveyed such messages by using two clauses to describe the event (e.g. MOTHER SIT; GIRL FEED). We discuss this strategy in Section 6 below. Some signers of the second age group use this strategy as well, and others rely mainly on word order (e.g. FEMALE FEED MOTHER). But they use the mechanism of establishing R-loci in about only a third of their responses. These results indicate that the mechanism of verb agreement has become almost doubly wide-spread in use, and that third generation signers use this mechanism in the majority of their responses. But this mechanism was much rarer at the earlier stages of the language; its spread among ISL signers evolved over time. We return to this point below.

ISL signers may use the signing space to talk not only about people or entities, but about locations as well. When talking about a location, such as a store, a hospital, a city or a country, ISL users often use a similar mechanism to that used to establish R-loci. They sign the noun for the location, and then point to a specific point in space, to establish this location in the signing space. In contrast to ABSL,

this location does not correspond to the real-world location of the place, and as such is termed “relative space” in contrast to “geographic space”.

By localizing places and referents in the signing space, the signer creates a scene that is shared by the interlocutors for a particular conversation. All these devices use the signing space in a particular way: rather than employing real-world space to refer to entities and locations, the signer *creates* a spatial scenario in the signing space, and then uses this spatial scene to introduce entities and then describe the spatial relations between them or refer to the grammatical roles they play. Therefore it is not surprising that we find these devices used by signers to describe the content of decontextualized clips; they provide the signer with very useful grammatical means to refer to event that are not related to the ‘here and now’.

5.3 Discussion

Both ISL signers and ABSL signers use space in the service of communication. But they do it in different ways. ABSL signers share a physical location, their village. The whole village can be seen from the road, and there are vantage points from which its geographical relation to other villages and towns can also be viewed. Real-world locations in and around the village are part of the knowledge shared by members of this community. People can rely on the fact that everyone in the village knows where people’s houses are, the location of major institutions in the vicinity with respect to the village, and where other cities and neighboring countries are located with relation to the village. This rich shared knowledge finds its way into the grammatical structure of the sign language that developed in the place, for example, in the compound place names as exemplified in Figure 1. This is somewhat reminiscent of the use of deictic terms rooted in local landscape, such as ‘upstream/downstream/across the river’, ‘uphill/downhill’ opposition etc. (Levinson 2003 and references there). As pointed by Hurford (2011:466), the use of such terms makes sense in a community whose speakers share the same geographical location, and would not be functional in a language whose speakers inhabit different geographical locations.

ISL signers, in contrast, do not share a common mental map. People come from different places and live in different places. Their encounters are not restricted to a specific location (clubs, people’s houses, etc.). Real-world locations are not constant for all users of the language. ISL signers often live in built-up metropolitan areas, where visual access to the geographical locale and its relation to other places is obscured. What is shared is the location in which the current encounter takes place. By localizing discourse locations and referents in the signing space, the interlocutors create a shared space for the occasion, which is used to identify and refer back to discourse referents. In ABSL space is already established, and

therefore can be employed from the start of any conversation. In ISL, space is not taken as always established. It is not assumed to be part of the shared knowledge, and, therefore, it is created anew for each encounter.

This explanation does not imply that space is never part of the shared knowledge of any two ISL signers. For example, two people working in the same building can refer to other people by pointing at the direction of their offices. They can do this precisely because they share a physical space that is part of their shared knowledge. However, this knowledge is not shared by other ISL users; it is not part of the shared background of the entire community. The point is that since there is no one specific physical space that is shared by all members of the community, the language could not develop a *linguistic mechanism* that is based on sharing a specific space, such as the compound place-names of ABSL.

When describing clips denoting transfer events to other signers, ABSL signers very rarely localized referents in the signing space and directed verbs to these loci. In a set of responses of the older group of signers, out of 110 occurrences of signs denoting acts of transfer, in only 12 cases did the signers modulate the direction of the path movement of the sign to indicate the agent and the recipient (Padden et al. 2010). In 98 responses (89%), the verb was signed as moving outward from the signer's body or towards the signer's body,²² rather than between two R-loci established in space, as is shown in Figure 5.



Figure 5. Signing the verbal sign GIVE on the back-front axis, not incorporating spatial locations into the sign

Preliminary results from another village sign language that emerged in the Arab town of Kafr Qasem in Israel show a very similar pattern of use of space. Deafness in the town goes back to at least 1910 (Meyad Sarsur, p.c. 2011), so Kafr Qasem Sign Language (KQSL) might be about a generation older than ABSL.

Signers of Kafr Qasem Sign Language (KQSL) refer to other people by pointing to the location of their houses. They also refer to locations in the town by pointing to their real-world location. But when asked to describe the same set of clips, they do not localize referents and do not modulate the movement of the verb accordingly. Of 77 responses produced by six KQSL signers (ages 38–67), only two verb forms may be analyzed as indicating agreement (Kastner, Meir and Sandler in preparation). Similar tendencies to those found in ABSL and KQSL were found by deVos (2012) in her detailed analysis of pointing signs and use of space in Kata-Kolok, a village sign language that developed in a village in Bali. DeVos found that Kata Kolok is characterized by absolute pointing, that is pointing to objects, entities and locations which are visible in the discourse, or whose geographical location is given (Levinson 2003). She states that “absolute pointing is not unique to Kata Kolok signers, but occurs in other cultures, and other sign languages, too. The main difference between the use of absolute pointing in Kata Kolok and in other sign languages seems to be that this is the dominant strategy in Kata Kolok, whose users prefer it even when the referents or locations are invisible.” (ibid. 188–189). As for referring to people, the most common way is by pointing at a geographical location frequented by the person referred to, such as the person’s home, workplace or farmland (ibid., 212–213). Creating spatial maps which are specific to a given discourse, and using such maps for referent tracking as in ISL has hardly been attested in her data (p. 194).

A unique and interesting use of pointing signs found in Kata Kolok is the ‘celestial timeline’, that is, pointing to the sky in order to indicate time by directing the points towards the location of the sun at that time of the day (de Vos 2012: 412). Since the location of the sun varies little from day to day in a tropical latitude, the association between these locations and the time they indicate is shared by the village people and is taken advantage of for communicative purposes.



In ABSL, pointing upwards to the sky means ‘noon’. But ABSL does not use the celestial timeline as described in Kata Kolok. This is not surprising considering the fact that the local latitude is 31° and the sun’s location at different times is not constant. However, it seems that three unrelated village sign language are characterized by similar patterns of use of space, in which pointing is by and large towards geographical locations, and creating spatial maps within a discourse is very rare. We hypothesize that the grammatical use of space we find in ISL and many other deaf community sign languages, such as ASL and BSL (see Meir 2002 for a list of sign languages that use this mechanism of verb agreement) may require greater interaction with interlocutors that do not reside in a specific area, and therefore do not share a mental map of specific geographical locations. Although we know of no attempts to demonstrate a correlation between the absolute use of space and community size or cohesion, all the languages for which the absolute use of space

is said to predominate over relative spatial markers (left and right) belong to small communities (Levinson 2003).

Interestingly, even under conditions such as those under which ISL arose, the use of space for referent-tracking takes time to develop, suggesting that it is not the physical and social context alone which contribute to using space as a grammatical device. First generation ISL signers did not use space in this manner consistently. Some signers localize referents, locations or structures, but they do it sporadically, and these locations in space are not often systematically incorporated into the structure of verbs. That is, some signers localize referents in space, but the verb form is signed with respect to the signer's body and not towards the locations associated with the referents. It is only in the third generation of ISL that we find a widespread use of a grammatical mechanism for localizing referents and locations, and for incorporating these locations for the purpose of verb agreement (Meir 2010; Padden et al. 2010b). The gradual emergence of the system indicates that, although properties of the community may channel the language in specific directions, the processes contributing to the crystallization of such systems require time to manifest themselves grammatically. Grammatical markers, especially those of inflectional morphology, take time to develop.²³ This holds both for sign languages (Aronoff et al. 2004, 2005) and for spoken languages (see McWhorter 1998 on creoles).²⁴

5.4 Sublexical and lexical variation and sociolinguistic differences

Both ISL and ABSL have conventionalized lexicons. ISL has sublexical structure as well; like other established sign languages, it has a phonology (see Meir & Sandler 2008 for ISL; Sandler & Lillo-Martin 2006; Brentari 2012; Sandler 2012). To say that there is a phonological level of structure means that there are discrete and meaningless formational elements that work together in a system. The existence of minimal pairs, meaningful words distinguished by such elements drawn from a finite list, is strong evidence for a system of this kind. In spoken languages, distinctions between words are made by sounds that are divided at the highest level into the categories of consonants and vowels. In sign languages, the major categories of phonological organization are hand configuration, location, and movement (Stokoe 1960), each with its own hierarchy of features. Figures 6–8 illustrate minimal pairs along these parameters in ISL.

For PROFIT, the hand configuration is , and for RESTRAINT, it is . All other aspects of the two signs are the same. The signs SEND and SCOLD have the same hand configurations and movements, but are distinguished by location: near the signer's torso for SEND, and near the face for SCOLD. The signs ESCAPE, BETRAY are distinguished by the shape of the path movement, straight for ESCAPE, and arced for BETRAY.

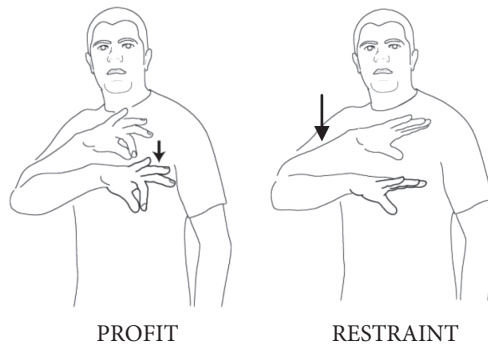


Figure 6. ISL minimal pair distinguished by hand configuration features: PROFIT, RESTRAINT

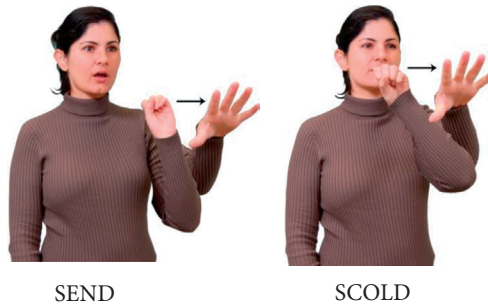


Figure 7. ISL minimal pair distinguished by location features: SEND, SCOLD

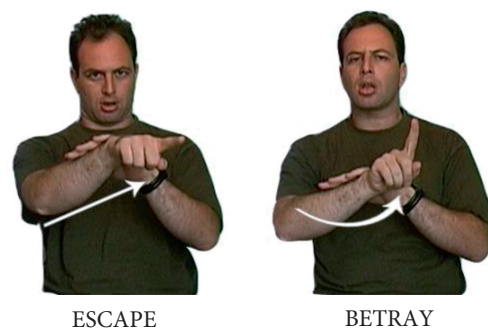


Figure 8. ISL minimal pair distinguished by movement features, ESCAPE, BETRAY

However, in ABSL we have yet to find clear-cut cases of minimal pairs, parallel to the ISL examples presented here. We have encountered one or two minimal or near minimal pairs, but the differences between them are easily explained by iconic rather than formally contrastive detail. In addition, we noticed that different

individuals often adopt different phonetic forms for the same ABSL signs – they vary widely in sublexical components, in use of hand configuration, location and movement. An example of such variation is given in Figure 9. The figure shows two variants for the ABSL sign DOG. The variants, produced by two different signers have different locations and different movements. Specifically, token 9a is produced in the space in front of the signer's chest and has a combination of a path movement (i.e. the hand moves from one location to another) and a handshape change – from open to closed. Token 9b is produced in front of the mouth, has a different handshape change – a clawing movement of the fingers and doesn't have a path movement.

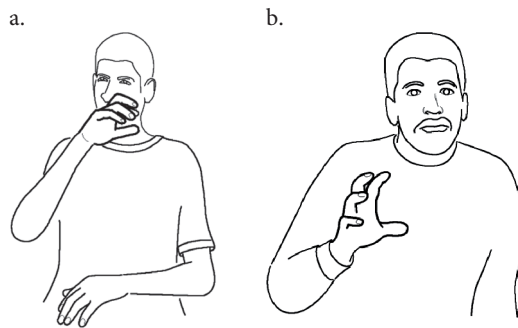


Figure 9. Mouth and chest are not contrastive places of articulation in ABSL variants of DOG (a, b)

5.4.1 *A comparative study of sublexical variation in three sign languages*

Our initial impression was that the amount of variation in such potentially contrastive features was unusually large (Aronoff et al. 2008). That impression led us to develop a comparative study in which the amount of sublexical variation in ABSL was measured and compared with the amount of variation found in two other sign languages, ISL and ASL (Israel 2009; Israel & Sandler 2010, Sandler et al. 2011). Since ASL is older and has a longer history of grammatical innovation and change across generations of signers, the level of variation in this language could serve as a reference point against which to compare the amount of variation in ABSL and ISL.

Israel and Sandler collected 15 signs produced in isolation by ten signers in each language, and coded them according to detailed sublexical features of the three major phonological parameters. For each lexical item (a sign), and each feature (e.g. the location, the type of movement, etc.) the amount of variation across signers within each language was quantified using two measures. The first measure indicated for each sign the greatest proportion of tokens produced with the same feature value across participants (e.g. 80%, if 8 out of the 10 signers produced

the same sign at the same body location). The second measure indicated for each sign how many different values were produced per feature in the group of tokens (e.g. 2, if a given sign had tokens with the thumb *extended* as well as tokens with the thumb *adducted* to the palm). Each of these two measures was averaged over different signs for each phonological feature to provide a global measure of the amount of variation for that feature (see Israel 2009 for an in-depth description of the complete methodology).

The results indicated differences among the three languages. As we had suspected, ABSL had the greatest amount of cross-signer variation, followed by ISL and then ASL. Although the data set used for the quantification of variation was relatively small, and therefore statistical significance for the cross-linguistic differences was not established for most of the features coded by Israel²⁵, the ABSL > ISL > ASL pattern was found across subcategories of phonological features as well as at the global level (the entire sign), and hence was fairly robust.

This robustness is supported by differences in the degree of social homogeneity associated with the groups of signers studied. The group of ABSL participants consists of signers from the same extended family, with six out of the ten belonging to the same immediate family. The ISL group was less socially homogenous: four of the signers were members of the same immediate family, and among the rest two pairs were siblings. The ASL group was the least socially homogeneous; only two signers were siblings. We assume that groups of greater social homogeneity within a language community produce less variability at the sublexical level, so that this highly homogenous group of ABSL participants exhibits lower variability than in the larger ABSL community. On the other hand, due to its lower social homogeneity, the group of ASL signers represents the larger ASL community more faithfully, including the amount of sublexical variability. Thus, ABSL is likely to have even greater sublexical variability than recorded by Israel, hence the robustness of the gross quantitative differences across the languages.

5.4.2 *Lexical variation*

Variation is not found only at the sublexical level. One of the first of many surprises confronting us in investigating the vocabulary of ABSL was the variation in lexical signs, even those representing everyday concepts. For example, three different signs for CAT were documented, shown in Figure 10. Other everyday concepts that have more than one corresponding sign include 'morning', 'tomato', 'onion', 'horse', 'fish', 'red', and 'black'. In addition, many of the lexical items for everyday concepts are compounds, and we found great variation in the production of compounds (Meir et al. 2010b). Most compounds had at least three variants, and some had many more (some compounds had six variants in a group of 8 signers).

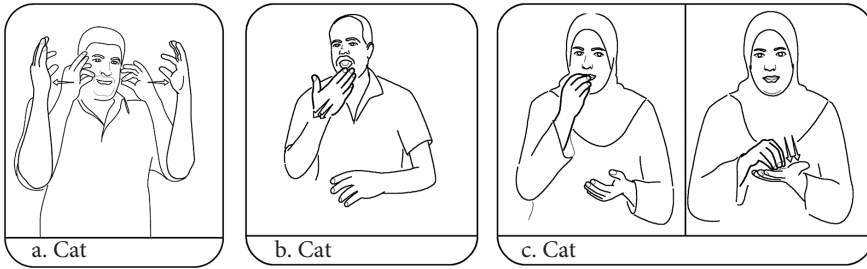


Figure 10. Three lexical variants of the sign CAT in ABSL

It is clear that these signs, like many signs in ABSL and in other sign languages, have iconic origins. This may in part explain the tolerance for alternate signs: the meaning is retrievable from the form. However, iconicity is not likely to be the whole story, as the selection of particular iconic properties to represent concepts is to some extent arbitrary. While we have not systematically compared the amount of lexical variation across sign languages, our experience with more established sign languages indicates noticeably less lexical variation, especially for everyday concepts, than we have found in ABSL.

5.4.3 Discussion: Variation within the community

Linking language age with the amount of variation is related to the observation that it takes time for users of a new language to develop a conventionalized lexicon of symbolic items. If the process of conventionalization at the sublexical level is gradual, then, within a given language, we should expect to find increasing formational consistency across tokens over time. Accordingly, if age were the only factor that is different across languages, older languages would show cross-signer consistency. However, this is not the case, because languages emerge in very different settings, and age is not the only factor that may explain cross-linguistic differences in the amount of variation.

ABSL and ISL are of the same age (each having arisen about 75 years ago), yet the lexical and sublexical variation in the former is greater. One fundamental difference in the histories of these two languages that may be related to differences in the extent of variation is their linguistic origin. Unlike the first ABSL signers, who most likely created most if not all of the language within the community, some of ISL's first signers who had immigrated to Israel from Europe and North Africa had already used sign languages in their countries of origin (Meir & Sandler 2008). That experience must have developed in those ISL signers automaticity in sign production, intuition about what constitutes a well-formed sign, and awareness of the formal differences between their own signs and signs produced by other members of the new community. In contrast, the four deaf

children who created the first ABSL signs did not have a model against which to compare the new signs that they invented. It is possible, then, that the first signers of ISL were more finely tuned for processing the new linguistic input, because some of them had already had linguistic experience with signs. Therefore the starting point for ISL was different from the linguistic tabula rasa from which ABSL emerged.

The fundamental import of conventionalization is that it facilitates communication by establishing fixed symbols for physical and psychological referents that can be used in a variety of contexts by a large number of individuals. Even when a language is used within a very small community of individuals with much shared information, a lexicon of conventionalized forms is indispensable. Still, it is possible that in such settings (as within the close-knit Al-Sayyid community) the amount of social and psychological information that is shared by the different members is so great that it reduces to some extent the pressure towards convergence, and this may lead both to variability in lexical items mentioned briefly in Section 5.4.2 and to looser phonetic specifications for those that are shared, described in Section 5.4.1.²⁶ According to this hypothesis, community size may be yet another social factor influencing the amount of variation in a language. In a larger community, signers are more likely to meet strangers, or signers who are not known to them. In such cases, conventionalization becomes essential for communication about a shared set of concepts, objects and events. Unfamiliar signers need to stay within a narrower margin of variation in order to be immediately intelligible to strangers. Another important factor in conventionalization is the frequency of usage and of exposure to the same forms, a factor that stabilizes phonological categories, according to Hay and Bauer. Because of the sheer size and social structure of the community, ISL signers interact with a greater range of individuals and see multiple examples of the same sign across many more signers than ABSL signers do, both of which contribute to stabilization of form.

Finally, it is possible that the use of a language in formal settings has an impact on conventionalization by encouraging standard uses of both vocabulary and articulation on which different users converge. Both ISL and ASL are used in conferences and meetings of Deaf associations, and for both dictionaries have been published. ASL is also used in universities such as Gallaudet University in Washington D.C. and in specific departments in other universities as well. Within the ASL community there are influential individuals such as teachers, academics and interpreters whose form of sign language is held in esteem, and it is likely that these language models have some effect on convergence across individual language users. Though the ISL community of users lacks a socio-cultural center similar to Gallaudet University for ASL, it is used in gatherings of the Deaf Association

clubs and events and there is an interpreters' training program for ISL. Within the Al-Sayyid community, there is little pressure toward formal standardization, as the language is perceived as belonging to the family and not the public sphere. The language is not used in school instruction, and is not regarded by the teachers as appropriate for use in school. Until very recently, the language had no name beyond "our signs," the term that still prevails in the village.

6. New languages: A tendency towards one-argument clauses

The ISL and ABSL communities differ from each other in the way they came to be, in the size of the community, the nature of the language users and language learners and the degree of intimacy and background knowledge shared by the members. These differences give rise to different grammatical structures in the two languages, and different degree of variation within the community. However, the two languages also share an important feature: their young age. Both are only about 75 years old. Are there certain features that characterize young languages? The place to look is the linguistic structures of the older signers of each community, since their language use presumably represents earlier stages of the language (Labov 1994, 2001).

Indeed, when analyzing the sign productions of older signers in both ISL and ABSL (first generation signers in ISL and second generation signers in ABSL)²⁷, we noticed an interesting similarity: signers in both groups tended to use one-argument clauses, even when referring to an event that involved two arguments. This tendency was especially strong when the two arguments were human. Of the set of 30 short video clips that we used as elicitation material, 18 showed a transitive event, an event with two or three participants. An analysis of the signers' responses shows that out of all the responses describing a transitive event, in 22% of the ISL responses, and in 27% of the ABSL responses, the event was 'broken' into two clauses, each with one animate argument. When looking only at those transitive events with two animate arguments, the percentage is higher: 33% in ISL, and 47% in ABSL (Padden et al. 2010a; Meir 2010).

Here are some illustrative responses by ABSL and ISL signers:

- (2) The clip: A girl is feeding a woman
 - a. ABSL:
 - i. WOMAN SIT, EAT PLATE; CHILD FOOD FEED-SELF
FEED-OTHER
 - ii. WOMAN CHAIR SIT; GIRL SPOON FEED-OTHER FEED-SELF

- b. ISL:
 - i. MOTHER SIT; FEMALE CHILD FEED-OTHER FEED-SELF
 - ii. FEMALE MOTHER SIT; FEMALE CHILD FEED-SELF
FEED-OTHER
 - iii. MOTHER SIT; FEMALE SMALL FEED-OTHER FEED-SELF
- (3) The clip: A woman is giving a shirt to a man
 - a. ABSL
 - i. MAN TAKE; WOMAN GIVE
 - ii. MAN BE-LOCATED (=stand); WOMAN SHIRT GIVE,
MAN TAKE
 - iii. WOMAN ONE GIVE SHIRT; MAN TAKE
 - b. ISL
 - i. MAN STAND; FEMALE GIVE
 - ii. MAN I TAKE; FEMALE GIVE
 - iii. MALE STAND; FEMALE SHIRT RED GIVE
- (4) The clip: A man is throwing a ball to a woman
 - a. ABSL:
 - i. MAN THROW; CHILD CATCH
 - ii. GIRL BE-LOCATED (=stand); MAN BALL THROW
 - b. ISL:
 - i. MALE THROW; FEMALE CATCH
 - ii. FEMALE CHILD LOCATED THERE; I DAD BALL THROW

Expressing a transitive event by two intransitive clauses is cumbersome. Why do signers use it? Notice that the older signers show this tendency more than the younger signers. Assuming, following Labov, that synchronic differences between different age groups in a language community reflect diachronic developments in the language, a comparison between signers of different age groups in ISL and in ABSL enables us to trace the development of argument structure devices from very early stages of the two languages. In the initial stages, the two languages apparently do not have any grammatical mechanism to mark grammatical roles. Signers rely on the context to disambiguate the message. Yet our task required signers not only to mark ‘who is doing what to whom’ but also to distinguish who (the agent of the event) from whom (the patient), and since the clips showed events out of context, signers could not rely on the context to disambiguate their responses. Given the lack of conventionalized grammatical markers or shared context, signers needed to devise a strategy to mark the semantic roles of the referents. When there is only one argument in a clause,

the association of arguments to syntactic roles is trivial; there is only one syntactic position, and only one referent to fill this position (as in *a man is asleep*). The need to distinguish between arguments arises only when there are two possible referents that could fill a certain syntactic role, as in *a girl pushes a man*, where both the girl and the man can be the 'pusher'. Therefore, one way of avoiding the need to develop a mechanism for marking argument structure is by having only one-argument clauses.

The same tendency towards one-argument clauses has been remarked independently for another new sign language, Nicaraguan Sign Language. This sign language emerged about 30 years ago, when the first school for the deaf was founded in Managua. The first group of deaf children brought to the school came from hearing families, and were not exposed to signing deaf adults. However, as they began to communicate with each other, a signing system started to emerge. The use of this system by subsequent cohorts of children who acquired it from their older peers brought changes and developments into the language. Ann Senghas and her colleagues, who have been studying the language since its inception, report that the first cohort of children showed a strong tendency towards one-argument clauses if both arguments participating in an event are human. In fact, in their data they did not find **any** response consisting of two human nouns and a verb (Senghas et al. 1997: 554). Typical responses were: MAN PUSH WOMAN FALL, MAN PUSH WOMAN GET-PUSHED when describing a clip showing a man pushing a woman, and MAN CUP GIVE WOMAN RECEIVE for an event in which a man is giving a cup to a woman. In the second cohort different word orders appeared, some of which had the two verbs adjacent to each other (e.g. MAN WOMAN PUSH FALL, or MAN PUSH FALL WOMAN). However, even in the second cohort no responses consisted of two human nouns and one verb.

Three young languages, then, show a strong preference for one-argument clauses in their initial stages. Givón (1979) argues that the tendency towards one-to-one ratio of verbs and arguments is typical of the 'pragmatic mode' of communication, which characterizes pidgins and creoles *inter alia*. His claim supports our argument that this tendency is indeed related to language age, irrespective of modality. Dubois (1987, 2003) has identified a set of constraints on the distribution of expression of arguments in discourse, which he terms *preferred argument structure*. The first of these is what he calls the *One Lexical Argument Constraint*: Avoid more than one lexical core argument. That is, sentences in discourse tend to have only one core argument expressed as a lexical NP; other core arguments are expressed as pronouns, as inflectional affixes or are left unexpressed. Clearly, the older ISL and ABSL signers are obeying this constraint to a fault. In short, there are a number of good reasons why older users of both ISL and ABSL show a preference for one-argument clauses. The constraint is less stringently obeyed

in younger users because they have developed the resources that permit them to express more than one argument per clause when the context calls for it.

7. Conclusions

This article adds to a growing body of research that suggests that at least some aspects of grammatical structure are determined by the social structure and patterns of interaction of the community using the language. The various studies mentioned in Section 1, as well as our own studies reported on in this article, support the view that language is not just a structure in the brain, nor is it strictly the domain of the individual. It is very much a social-cultural artifact as well.²⁸

Previous studies (described in Section 1) have emphasized the following factors as central in their impact on language structure: the size of the community, its geographical spread, the degree of language contact and denseness vs. looseness of social networks within the community. These factors indirectly determine aspects of the structure of a language. For example, they determine whether children or adults constitute a more significant fraction of the language learners, and this in turn can influence properties of the developing language. Children and adults have different learning strategies, and languages adapt to the particular characteristics of each type of learner, resulting in typologically distinct linguistic structures.

The present article contributes in specific ways to our understanding of the relation between language structure and social factors. First, the languages under study are sign languages. In addition to being produced and perceived in a different physical modality, sign languages have another important characteristic: they are young, some of them only several decades old. Therefore early stages of certain sign languages are available for linguistic study (unlike most pidgins and creoles, whose early stages took place a few centuries ago). Their age, together with some specific social features, have an effect on the languages that emerge.

The difference in use of space in ISL and ABSL illustrates how shared knowledge or the lack of it (in this case about the physical space) may lead to different grammatical structures. Sign languages, because they are produced in space, use space as a formational resource for creating the lexicons and grammars. But they may do so in different ways. For ABSL signers, knowledge of the real-world locations of people's homes and other places in and around the village, is shared by the language users, and this shared knowledge works itself into the use and structure of the language. ISL signers, as a group, do not reside in the same physical space and therefore do not possess shared knowledge in this domain. In order to employ space in the service of grammar, they have to rely on the space they do share, the signing space in each encounter. The grammatical means that has evolved is that

of establishing associations between referents and loci in the signing space, which can then be used for anaphoric expressions in the pronominal and verbal system.

An important finding of our study is that young sign languages in small close-knit communities may show greater variation than sign languages that emerge in larger and older communities. From an evolutionary point of view, this might suggest that early human languages arose in circumstances of great variability. Modern sociolinguistics has taught us that variation is the norm rather than the exception in linguistic communities. However, variation is usually associated with and attributed to expansion in size, to geographical area and to social stratification of the linguistic community. Our research suggests that variability might exist in very early stages of a language, when its community is still small and restricted to a specific geographical area. Therefore variation is not only the result of growth and expansion; it might also be present at the starting point. Conventionalization and greater uniformity develop under certain pressures, as, for example, in exoteric communication settings like those of ISL and ASL, or when linguistic norms develop, as a result of cultural focusing which results from a variety of conditions, such as lack of social mobility, multiplex ties of kin, exclusion of outsiders and a confined territory (Le Page 1979). However, conventionalization and uniformity may not be there from the beginning. Indeed, it is hard to conceive of how a language could begin from nothing, as ABSL did, except under conditions of great variation; there is no model from which to work, no set of signs given in advance. Every sign must arise through negotiation among the members of the community and such negotiation is only possible because of the small size of the community (in this instance, initially four in number).

If this approach is on the right track, an evolutionary scenario suggests itself. Assuming that early human communities were small, numbering only a few tens (Dunbar 1992, 1993), early linguistic communication was probably quite varied within a community. As the community expands and the degree of shared knowledge between its members diminishes, there is pressure towards greater conventionalization and uniformity. As the language community continues to expand, a different type of variation is introduced – variation across geographical areas and social strata. The two types of variation are different, though; in the early stages, variation is between individuals, sometimes between families (Sandler et al. 2011). In later stages, variation is found between various subcommunities within the larger community. This latter type of variation can then provide the members of a community with means to express different social identities in different social circumstances by adopting linguistic features that characterize different social groups ('acts of identity', Le Page & Tabouret-Keller 1985). But in order for variation to become a means for expressing social identity, linguistic norms have to emerge, and these, as far as we can tell, take time to develop, and are therefore not

there at the early stages of a language. Languages that do not start off in a tight-knit closed community, but rather in communities consisting of ‘strangers’ with no shared background, cannot sustain this initial type of variation. The pressure to conventionalize is much stronger, since the lack of it together with the lack of shared background can easily result in a communication breakdown.

The approach laid out here assumes that the social conditions under which a language develops interact with its linguistic structure. Sign languages are crucial for constructing and assessing such approaches. Because of their young age, the social conditions and histories of their communities can often be known with some certainty and their linguistic development is observable from very early on. Furthermore, new sign languages develop under two distinct settings: within small communities or villages where transmission is within and between families as in ABSL, and in contact situations where unrelated signers of different backgrounds are brought together in locations such as cities or schools, exemplified here by ISL. Sign languages have often been seen as offering a natural laboratory for the study of universal properties of human language, for example, in grammatical structure, language acquisition, and brain representation. The issues explored here and demonstrated by comparing two sign languages, ISL and ABSL, show us that young sign languages in particular offer us an additional natural laboratory. In this laboratory, we can study the emergence and development of linguistic structure and its interaction with the composition and character of the language community.

Notes

1. Bernstein has been broadly criticized for the social and educational policy conclusions that he draws from this distinction, but that does not vitiate the validity of the distinction, which mirrors that made by many other scholars, as we have shown.
2. The literature does not discuss how many generations are needed for these characteristics to develop. In this article we focus on two young languages, about 75–80 years old. As the differences between the two language discussed here indicate, certain characteristics develop quite early in the life of a language.
3. Hurford (2011) presents a similar conclusion, based on several studies, some of which appear in this section as well. Hurford also suggests an inverse relation between complex morphology and complex syntax that we do not explore: “Small community languages tend to have more complex morphology and simpler syntax, especially after a long history of relative isolation. Languages of large communities where people often talk to strangers tend to have simpler morphology and more complex syntax.” (p. 469).
4. Sign language communities differ from spoken language communities in another respect: many of the language users are non-native or L2 users. In case of deaf community sign languages, most of the deaf members are born to hearing families, and therefore do

not acquire the sign language from birth. They are often characterized as 'late learners', and their linguistic abilities in some areas of language structure fall behind those of native signers (see Mayberry 2010 for a detailed and thorough survey of the effect of age of acquisition on linguistic abilities). In case of village sign languages, many of the hearing signers (those that are not children of deaf parents) are L2 users, since they acquire the spoken language of the village as their L1. The fact that many of the language users are non-native may have an effect on linguistic structure. Trudgill (2001), for example, suggests that second language learners cause simplification of the linguistic system. We do not discuss this issue here since it is not clear to us how to compare the non-native usage of sign language in each of these types of communities.

5. This distinction is discussed in more detail in Meir et al. (2010a).
6. For example, in the United States the incidence of congenital deafness is about 0.07% (Marazita et al. 1993).
7. These circumstances may and do change over time. Village communities rarely stay socially isolated for more than a few generations. Once deaf people from the village form regular contacts with other deaf communities in the country, major changes take place in the social and linguistic texture of the village community which, ultimately can lead to the disappearance of the language, as has happened to the sign language of Martha's Vinyard (Groce 1985).
8. Kisch (2008) refers to these communities as 'shared signing communities', a term that emphasizes the fact that signing is shared by both hearing and deaf members of the community.
9. In time, signers from villages may start to participate in larger deaf communities, typically through schooling, more occurrences of deaf people marrying deaf or increased social mobility, and we can begin to see changes in the village sign languages as a result. Such changes may eventually lead to the emergence of a deaf sub-community within the village community (see e.g. Kisch 2007 regarding changes in the Al-Sayyid community).
10. Deaf children born to hearing families who do not use any sign communication system may grow up with no exposure to any sign language at all, especially if the family adheres to strict oral communication (Mayberry 2010).
11. Signed Hebrew is a communication system in which the addressor speaks Hebrew, and accompanies the spoken language with signs from the ISL lexicon. The signs follow the word order of Hebrew, and usually lack any grammatical morphemes and structures of ISL (Meir & Sandler 2008). Crucially, the system described in Section 5.2.3 is not present in the signing of most people using Signed Hebrew.
12. Data from *The Negev Bedouin Statistical Data Book*, no. 3, 2010, BGU Print unit. Table B/9, p. 44.
13. Data from *The Negev Bedouin Statistical Data Book*, no. 3, 2010, BGU Print unit. Table B/17, p. 51.
14. Kisch, who conducted a detailed anthropological study of the community, reports that people in the community, when watching ISL or Jordanian Sign Language on television, would often comment "This is not at all like our signs." (2008:289).

15. Since many of the ABSL users are hearing, whose mother tongue is Arabic, Al-Sayyid is a bilingual-bimodal community (we thank an anonymous reviewer for this point). ABSL is regarded throughout Al-Sayyid as the second language of the village. Hearing members of Al-Sayyid vary widely in their competence in ABSL. Those who have grown up in a household with one or more deaf members are fluent bilingual native signers of ABSL. Those who have less regular contact with ABSL or who come into contact late in life (for example, the hearing spouses of deaf people) have L2 command of ABSL at varying levels. Bilingual communities show the effects of language contact in many ways, including code-switching, calquing, and the use of structures from one language in the other. We have not yet, however, found such effects between Arabic and ABSL. Word order in ABSL is different from that of Arabic (Sandler et al. 2005). In places where we had expected to find calquing, such as the names of days of the week or religious holidays, we found less than we had expected. For example, some of the days of the week are numbered, WEEK+ONE for 'Sunday' WEEK+SEVEN for 'Saturday'; but the word for 'Friday' is SIX+PRAY (Meir et al. 2012). One second-generation deaf signer signs Id-Al-Fitr 'feast of fast-breaking' as HONOR-GOD+SHEEP+SLAUGHTER. In general, ABSL compound signs tend to be comprised of words for more concrete concepts than the corresponding Arabic words. Further research is needed to investigate whether and how this special type of bilingualism in a small and relatively close-knit community affects the linguistic structures of ABSL.

16. The oldest subject is 91 years old, the first member of the Association of the Deaf in Israel.

17. Although it is now well established that speakers of all spoken languages augment the linguistic signal with manual gestures in space, this co-speech gesture is not linguistically organized (McNeill 1992; Kendon 2004).

18. As is customary in the sign linguistics literature, signs are represented by upper-case glosses, consisting of English words which are the closest translations of these signs.

19. See Liddell (2007) for an exploration of the functions of the nondominant hand in ASL and Crasborn (2011) for an overview of the phonological roles played by this dual articulator in sign languages generally.

20. Using the two hands to mark a contrast between good vs. bad is found in speech-accompanying gestures as well. On the use of dominant vs. nondominant hand in gesture for good vs. bad, see, e.g. Casasanto, D., and Jasmin, K. (2010).

21. This description of the mechanism of sign language verb agreement is oversimplified. For a fuller description and analysis, see Meir (2002).

22. The direction of the movement in these verbal signs (from the signer outwards or towards the signer) is determined by the semantics of the verbs. In verbs where the external argument is the thematic source, as in GIVE and SEND, the movement of the verb is outwards. In verbs where the external argument is the thematic goal (as in TAKE and GRAB), the movement is towards the signer. On the relationship between thematic structure and the direction of movement, see Meir (2002) and Meir et al. (2007).

23. In Nicaraguan Sign Language, systematic use of space is not present in signers from the first cohort, those who had no sign language input in their childhood before entering the school for the deaf. The second cohort, who entered the school later and had the signing of

the first cohort as input, developed demonstrably systematic use of space, both in production and in comprehension (Senghas 2003). The criteria and methodology of this and other NSL studies differ from those used in the work reported here, and the results cannot be compared directly. However, it is clear from all studies that sign communication is not born with systematic use of space for reference in discourse. Rather, this must develop through use.

24. For a discussion of the different rates of development for different aspects of grammar in ABSL see Sandler et al. forthcoming.

25. In the individual features studied by Israel, statistical significance was only found for differences in the amount of variation in thumb position. However, when a difference for any feature was counted as a difference between two tokens, statistical significance for variation was reached across the three sign languages (see Israel 2009 for the complete methodology).

26. This is somewhat reminiscent of Joos's (1962) "Five clocks" discussed in Section 1, and Hay and Bauer's (2007) study on the relationship between Phoneme inventory size and population size.

27. As we mentioned above, all four first generation signers of ABSL had died by the time we began our research.

28. The other view, that language is primarily 'in the brain', has been advocated by Chomsky in numerous publications, e.g. Chomsky (2006): "If so, it appears that language evolved, and is designed, primarily as an instrument of thought, with externalization a secondary process."

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