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## CHAPTER 4

## Getting to the Point

## How a Simple Gesture Became a Linguistic Element in Nicaraguan Signing

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## INTRODUCTION

If you have ever watched people communicating in a sign language you didn't know, you most likely remember seeing many unfamiliar signs—too many to follow the conversation. But sprinkled among them you also may have noticed some familiar movements, including nods, facial expressions, and even local hand gestures. They probably looked a lot like the gestures that hearing people make when they are talking. In the hands of Deaf people, many such gesticulations are, in fact, signs. As signs, they have a different meaning from the identical gesture and can be combined with other signs in a way that a gesture cannot.

Why is this the case? First, it seems pretty clear that many signs originally came from gestures, which were the raw materials that deaf people used when they first created sign languages. Then, as the gestures became coordinated with each other to form a language, their meanings and their linguistic functions changed.

For basic vocabulary, the historical path is the most obvious. If there is a local gesture that means 'drink,' it can easily be adapted into a sign that means 'drink.' A gesture commonly used by beggars to ask for money can become a sign for 'beg.' Gestures can be reshaped into linguistic elements, too (Casey 2003; Newport and Supalla 2000; Wilcox 2004), and here the gap between the gesture and the sign is greater. However, it is often still possible to trace the link from a modern sign back to its gesture. A sign in Jordanian Sign Language that marks events as not yet completed likely originated as a common Jordanian gesture that means 'wait a second' (Hendriks 2004). A future marker in American Sign Language (ASL) probably started out as a French gesture that means 'go' (Janzen and Shaffer 2002). Even facial expressions can

become linguistic elements. Conditional expressions in ASL, as in "If I were president . . ." are linguistically marked by a raising of the eyebrows; this linguistic element probably originated in a similar, brow-raising facial gesture that English speakers make when they produce conditional expressions (Pyers and Emmorey 2008).

Sign languages aren't the only languages that change over time and develop new linguistic elements. All languages do. It's not unusual for old words to be reshaped into new linguistic elements (Hopper and Traugott 1993; Traugott and Heine 1991). For example, the word *will* in English used to mean 'want.' It can still have that meaning, but today it more often marks future tense. So, in modern English, *Ritchie will run* says nothing about whether Ritchie wants to run; it tells us only that the running will take place in the future. What is unusual in the case of sign languages is that they use the visual-manual modality, as gestures do. As a result, sign languages have more than old words at their disposal—they can use gestures, too, even those like facial expressions that were never produced alone (that is, without speech) (Janzen and Shaffer 2002; Pfau and Steinbach 2006; Rathmann and Mathur 2008; Wilcox 2004).

How, exactly, do gestures become linguistic elements? There are likely to be several steps in the process, with every step taking a form further from its gestural roots. Because changes happen as languages are passed down from one generation to the next, we propose that children are responsible. The skills that children have for learning language may be the creative force behind language change as well. By capturing the precise steps in the process, we can learn about the nature of that creative ability.

In this chapter we take a single, humble gesture—the point—and follow its transformation into a linguistic element. This basic gesture often accompanies speech to indicate real-world locations and objects that surround a speaker. As it is taken up by signers and transformed into a sign, we see an increase in its use to identify the participants in events rather than locations or real-world objects. With this shift, points take on new linguistic functions, including indicating the subject of a verb and serving as a pronoun.

To catch the very earliest stages of such a transformation, we turned to a young language—Nicaraguan Sign Language (NSL). Because NSL is only thirty years old, the pioneering generation that created it, those who really got their hands dirty sculpting gestures into signs, are around today and are able to show us what the earliest Nicaraguan signing looked like.

#### FROM NICARAGUAN HOMESIGNS TO NICARAGUAN SIGN LANGUAGE

The Nicaraguan Deaf community and its language have existed only since the late 1970s (Keel and Iwata 1989; Keel, Senghas, and Coppola 1999; Polich

2005; Richard Senghas 2003). Before that time, deaf Nicaraguans had few opportunities to meet each other. Most deaf people stayed at home most of the time, where they came into contact only with neighbors and family members who were not deaf. The few day schools and clinics available for deaf children served very small numbers of children for short periods, with no contact outside school hours (Polich 2005). As a result, deaf children had minimal contact with each other and no contact with deaf individuals older than themselves. It is quite clear, when you meet deaf adults who grew up before the 1970s, that the conditions then were insufficient for a sign language to develop. Very few of those in their late forties and older socialize with other deaf people, and they do not have a sign language even today.

Deaf children in this situation often develop homesigns to communicate with the hearing people around them (Goldin-Meadow 2003; Morford 1996). Homesigns are systems of gestural communication that are typically used only with family members and close neighbors. Homesign systems developed by young children in places as different as the United States and Taiwan have been found to include certain common, fundamental language characteristics, including a basic vocabulary, consistent word order frames that allow recursion (Goldin-Meadow 1982), and the ability to discuss referents displaced in space and time from the here and now (Morford 1993).

When homesigners continue to use their systems into adulthood, their signing becomes more complex. An examination of the homesign systems used by three different Nicaraguan adults found that each had developed a way to indicate the grammatical subject of a sentence (Coppola and Newport 2005). However, homesign lexicons, sentence patterns, and use of the signing space, while internally consistent, are idiosyncratic and vary widely from one deaf homesigner to another (Coppola 2002; Coppola and So 2005). The fact that homesigners are not part of a larger signing community and are therefore unable to pass their system along to new learners seems to limit the complexity of homesign systems.

For a sign language to develop beyond homesigns requires a community in contact, both among peers and across generations. For deaf Nicaraguans, the critical change occurred with the rapid expansion of special education programs in the late 1970s. A new center for special education opened in 1977, with classes in deaf education offered from preschool through grade six. Initially, approximately fifty deaf students enrolled, increasing to one hundred within the first few years (Polich 2005). Although language instruction aimed to teach students to lip-read and to speak Spanish (with little success), the children spontaneously used gestures to communicate with each other, and they did so with enthusiasm whenever they had the chance—on the buses, during recess, even behind the teachers' backs in class. These interactions served as the starting point of a new sign language and a new social community. What started as a hodgepodge of different homesign systems must have

begun to reshape itself at this time, eventually converging into a single, common system. In 1981 a vocational center for adolescents with disabilities opened, and many of the alumni of the primary school program enrolled. In 1983 the two centers were serving more than four hundred deaf students altogether (Polich 2005).

Every year since then, a new wave of children has entered school (typically at the preschool level) and learned to sign by socializing naturally with the older children there. Graduates of these programs have maintained social contact into adulthood, establishing social and athletic programs for deaf adults, celebrating major holidays together, even marrying other deaf people and starting new families together. Today members of the community range in age from birth to forty-five and number more than a thousand. They communicate in Nicaraguan Sign Language (NSL), the language that emerged from their social contact, and most of them have used it as their primary (indeed, only) language throughout their lives.

Because children entered this group steadily throughout the 1980s and 1990s, the community today provides a snapshot of a continuum of language experience. Recall that those who arrived in its earliest years encountered a fledgling system of signing, while those who arrived more recently encountered a richer, more developed language. This social situation has led to an unusual language community in which the richest, most fluent signers are the youngest members. It provides us with a rare opportunity to track the historical development of a new language by comparing different age cohorts of signers, progressing forward in time from older to younger signers.

To capture different periods in the emergence of the language, we have found it convenient to group members of the community into cohorts based on the period in which they first arrived. Those children who arrived in the late 1970s and early 1980s (now adults) form the first cohort, those who arrived in the mid- to late 1980s (now adolescents) form the second cohort, and those who arrived in the 1990s (now children) form the third cohort. In the study that we describe here, we compared signed stories narrated in NSL by four deaf signers from each of these three cohorts. All of them are fluent signers who have been using NSL as their primary language all of their lives—since they were five or younger.

To go one level deeper in the fossil record, we compared these NSL signers to four deaf homesigners who never entered the programs in Managua. As adults, these homesigners have had at most sporadic contact with signers of NSL; none of them has a regular communication partner who signs NSL, none uses NSL vocabulary (aside from those signs that share forms with common Nicaraguan gestures), and none has even rudimentary knowledge of NSL grammar. The homesigners ranged from twenty to thirty years of age at the time their narratives were elicited. They give us a view of the communication systems of deaf Nicaraguans before NSL developed.

To collect comparable language samples from all of the participants, we showed them each an animated cartoon titled “Canary Row,” involving the familiar characters Sylvester the cat and Tweety Bird. This cartoon has been used extensively in previous research on sign languages and gesture. (For a full description see McNeill 1992.) Participants watched the cartoon a few times on a monitor and then told the story to someone else. The NSL signers told the story to a peer from the same cohort, and the homesigners told the story to a communication partner familiar with their homesign system. All of the narratives were videotaped for later analysis.

## FOLLOWING A FORM

For many reasons, pointing gestures are good candidates to be taken up and integrated into a new sign language. People use points all the time. They have been found in the gestures that accompany speech (Kendon 2004; Kita and Özyürek 2003; McNeill 1992; and many others), in mature sign languages (Sandler and Lillo-Martin 2006), and in homesign (Coppola 2002; Fusellier-Souza 2006; Goldin-Meadow and Mylander 1984; Morford 1996). Points are generally made with an extended finger or an open hand directed away from the body, though you can also point with other parts of the body, such as by jutting an elbow or pursing the lips in the direction of the intended referent (Kegl 2002; Kita 2003). Both hearing children (Bates et al. 1979) and deaf children (Bellugi and Klima 1982; Hoffmeister 1978) start producing points at a very young age, along with their very first utterances.

Points are so pervasive that it is easy to overlook their complexity and the mental machinery required to interpret them. Even the most basic use of a point—to direct someone’s attention to an object in the immediate environment—requires that both communication partners understand that the person who produces the point intends to refer to something. Try producing a point for your cat, and you will find the cat is more likely to sniff your finger than follow its trajectory across the room. Most of the time, when people point, they are speaking at the same time, and the timing and movement of the point are coordinated with their speech (McNeill 1992, 2005). To understand such pointing, a listener must coordinate it with the spoken words and the greater context of the conversation. Among other uses, such cospeech points often provide information about the location or identity of a referent, as in points that accompany expressions like *over there* or *that tablecloth*. Even if you can’t hear the speech, you can often infer the intended places and objects in the world to which such points refer. For this reason, it is perhaps unsurprising that points can be used in sign languages for the same function. Researchers have proposed that pointing entered the grammar of sign languages as a marker of location (Pfau and Steinbach 2006) though their use

in mature sign languages has expanded to include many other functions, to which we now turn.

## POINTING IN SIGN LANGUAGES

Pointing movements accomplish a range of tasks in sign languages around the world. They indicate the participants of events and their roles by linking verbs to nouns to make it clear who does what to whom (Engberg-Pedersen 1993; McBurney 2002; Meier 1990; Padden 1988; and others). They can serve as determiners by combining with nouns to indicate that a referent is either a specific one that has been mentioned before, a generic one, or a new referent (Bahan et al. 1995; Zimmer and Patschke 1990). They are also used to describe the locations of objects and events (Emmorey 2002; Padden 1988; Shepard-Kegl 1985). (Some recent accounts propose that these uses of points are not linguistic and should be considered a gestural component of the language (Liddell 1995; Liddell and Metzger 1998).)

Of course, points in sign languages can be used to draw attention to things in the immediate environment, just as in co-speech gesture (Liddell 1996). However, when the referent is not in the immediate here and now, the use is a more abstract one. The particular use depends partly on the form of the point. Within each particular sign language, different types of points can carry out different functions. For example, in ASL, a point with the index finger can show the subject or object of a verb, like *he* or *him*, while an open palm shows possession, like *his* or *yours*.

Sign languages make extensive use of the three-dimensional space in front of the signer in an integrated system that includes much more than just pointing. In many sign languages, locations in the signing space can become associated with particular referents (Klima and Bellugi 1979; Meier 2002; Meir 1998; Padden 1988; Supalla 1982). The signer can then incorporate a location into other signs in order to refer to its referent and to link other signs with it. For example, a signer might associate a man with a location on the right and later produce the sign PAY toward the right, indicating that the man was paid. In this way, signers can use locations in the signing space to link characters to their roles in certain events, or objects with their traits. Locations in the signing space can also be associated with particular places, or with points along a timeline (Frishberg and Gough 2000; Taub 2001). All mature sign languages that have been documented take advantage of the signing space for these kinds of functions, though the specific uses differ from language to language. Any use of pointing must be compatible with the other devices of a language. When they have been used to assign meaning to certain locations in the signing space, points to those locations can then take on meaning themselves.

Some of the uses of pointing that are common to sign languages have been documented in homesigns as well. Deaf homesigning children in many countries, including the United States, Taiwan, Nicaragua, and Spain, all use a point to refer to objects and locations (Goldin-Meadow 2003). Two elderly Japanese sisters who are homesigners were also found to use points for these functions and to indicate nonpresent persons and objects. They also used points as prosodic markers for phrases and clauses (Torigoe 2000). Previous work with four adult homesigners in Nicaragua found that each had developed a way to indicate nonpresent participants and their roles in simple events; these devices included points to the chest to indicate the agent of an event, points to other people who were present, points to fingers to represent participants in events, and points to empty spatial locations to indicate both locations and persons (Coppola and So 2005).

## PICKING OUT THE POINTS IN NICARAGUAN NARRATIVES

We decided to follow a single element, the point, as it developed from a gesture to a linguistic form. To accomplish this, we systematically compared the points produced by participants situated at four different moments along a continuum of language emergence: adult homesigners who never acquired a conventional sign language, as well as NSL signers who acquired the language at three successive periods during its emergence, that is, first-, second-, and third-cohort signers. How do the form and the function of pointing change as we progress along this continuum?

We reviewed the narratives that we had videotaped from each signer and picked out every instance of a point made with a finger, hand, or even an outward movement of the arm. We set aside those few instances (ten altogether) that were directed toward some aspect of the immediate real-world environment, such as a nearby object or the communication partner. The remaining points were the focus of our analyses. Some of them were directed at a part of the signer's body (typically the chest), and the large majority pointed to an empty space.

We then determined the meaning and function of the point within the narrative. To do this, we looked at the context of the narrative to see what the point referred to. We categorized the points into two types: those that referred to locations (such as 'overhead' or 'to the left') and those that referred to persons or objects (such as Tweety Bird or the cage). We refer to these functions as locative and nominal uses.<sup>1</sup>

Note that both of these types of use entail a displacement of the referent from the real world and real objects. This kind of displacement is a fundamental symbolic characteristic of language that allows reference to entities and locations that are not part of the here and now (Hockett 1966). As the points

took on this symbolic function, we also examined whether they combined with other signs to form phrases. The ability to combine and recombine elements is another fundamental characteristic of language. It enables the creation of new expressions with even a limited set of symbols. These were the kinds of changes we set out to capture as pointing gestures became integrated into the emerging grammar of NSL.

### FROM LOCATIVE TO NOMINAL POINTS

As we counted up the locative and nominal uses of points, we wanted to be sure to take into account the variation in signing rate and the length of the narratives of the signers in our different groups. To do this, we computed how often each kind of point appeared per one thousand signs for each signer. Specifically, we first counted the locative and nominal points produced by each participant in the eight stories that make up the Canary Row narrative. These were our numerators. We then calculated the signing rate of each participant for the fifth story. We used this calculation to estimate the number of signs produced in the entire narrative. By using this second figure in the denominator, we effectively controlled for variation in the signing rate and length of narratives. We then multiplied this proportion by one thousand. This adjusted amount is reported in the following results. (However, we see a similar pattern of results when we plot the raw number of points instead.)

We found many locative uses of points in the narratives. An example is given in figure 4.1, in which a homesigner points above his own head to refer to a location above the head of the cat in the story. Note that his eye gaze follows the point. This use of eye gaze with a locative is highly typical for all four groups, and may even be obligatory.

We also found several nominal uses of points. An example is shown in figure 4.2, in which a first-cohort signer points to her left to refer to Tweety Bird. The nominal points are quite different in appearance from the locative points. They are signed more quickly and with a smaller movement or no movement at all. Eye gaze, in these cases, does not follow the point. In figure 4.2 the signer closes her eyes as she points to the left.

The most striking difference between the locative and nominal points is how often they are produced. We discovered that this frequency depends on language group. Specifically, the nominal uses—and not the locative—increase dramatically across the continuum of groups. This development can be seen in figure 4.3. For each group, the first bar represents the locative points, that is, the points used to refer to locations. As you look across the groups, you can see that these points are frequently produced by all of the groups and at a relatively constant rate. A linear regression analysis did not detect any change across the groups.



Figure 4.1. Example of a locative point. A homesigner points above his own head to refer to the location above the cat. Note that his eye gaze follows the point.

The second bar for each group refers to the nominal points, that is, the points that refer to characters and things. As you look across the groups, you can see that each one uses this type of point more than the last, from the homesigners through the three cohorts of NSL signers. A linear regression analysis revealed a significant increase across the groups:  $F(1,14) = 10.2, p = 0.006$ .

### COMBINING POINTS WITH VERBS TO FORM COMPLEX EXPRESSIONS

The fact that nominal points are being used with greater frequency in more recent versions of NSL suggests that they are being used differently from before. To examine this question more closely, we counted how often points

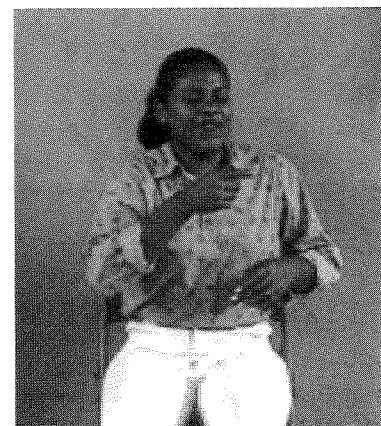


Figure 4.2. Example of a nominal point. A first-cohort signer points to her left to refer to the bird, which has been previously associated with that locus. Note that the movement is constrained within the signing space, and that her eye gaze does not follow the point.

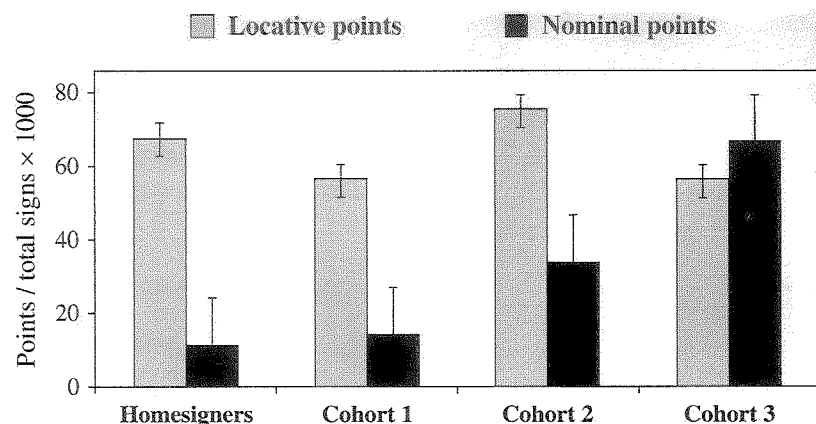


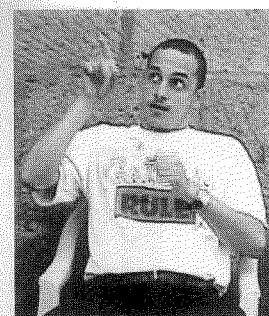
Figure 4.3. Points with locative and nominal uses. In contrast to locative points, which do not differ systematically across groups, nominal points increase across the language continuum, reflecting the emergence of a new function for these forms.

were combined with another sign to form a phrase. We then computed, for each group, how frequently the points combined with a noun, as in POINT + BOOKCASE (figure 4.4), or a verb, as in POINT + TALK (figure 4.5). (We defined *verbs* here to include all verbal elements, including plain verbs, classifier constructions, and constructed action sequences.) When we considered how often nominal points were combined with verbs, a very clear pattern emerged. As you can see in figure 4.6, this combination increases dramatically across the continuum. A linear regression analysis again revealed a significant increase across the groups:  $F(1,14) = 5.9, p = 0.03$ .

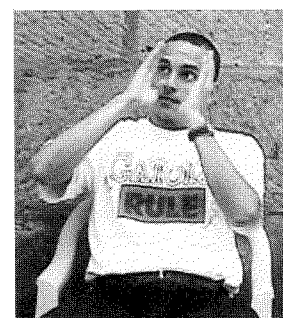
No such pattern emerged when we counted up how often nominal points were combined with nouns. There was also no such pattern for locative points in combination with either nouns or verbs. Apparently something is special about the combination of nominal points with verbs. They appear to reflect a change in function, in which points are increasingly being used in a pronoun-like way to indicate the subjects and objects that need to be associated with verbs. In this way, signers can show who is doing what to whom without repeating nouns or the names of characters. For a long time, homesigners and signers have been combining nouns with verbs to form basic sentences. The pattern of change shown here suggests that nominal points replace many of the nouns in these sentences.

#### GESTURE IN, GRAMMAR OUT

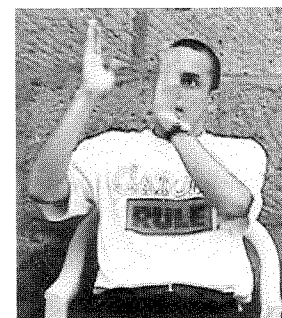
As we look at the development of signing in Nicaragua from its origins in homesigns through three age cohorts of NSL signers, we see a shift in the use of the



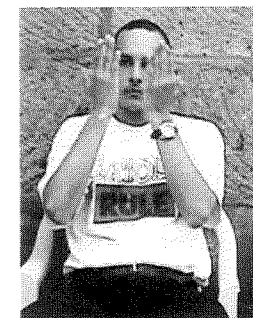
point-loc



bookcase-a

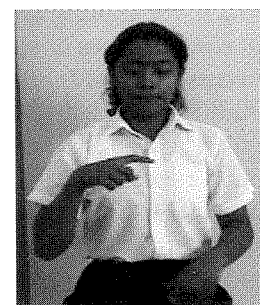


bookcase-b

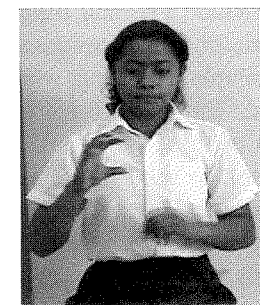


bookcase-c

Figure 4.4. An example of a locative point combined with a noun, produced by a first-cohort signer. He produces a point to the upper right, followed by a three-part sign for BOOKCASE, meaning, "There is a bookcase up off to the right side."



point-nom



talk-a



talk-b

Figure 4.5. An example of a nominal point combined with a verb, produced by a third-cohort signer. She produces a point to her left, followed by the sign TALK, meaning, "He (Sylvester the cat) talks."

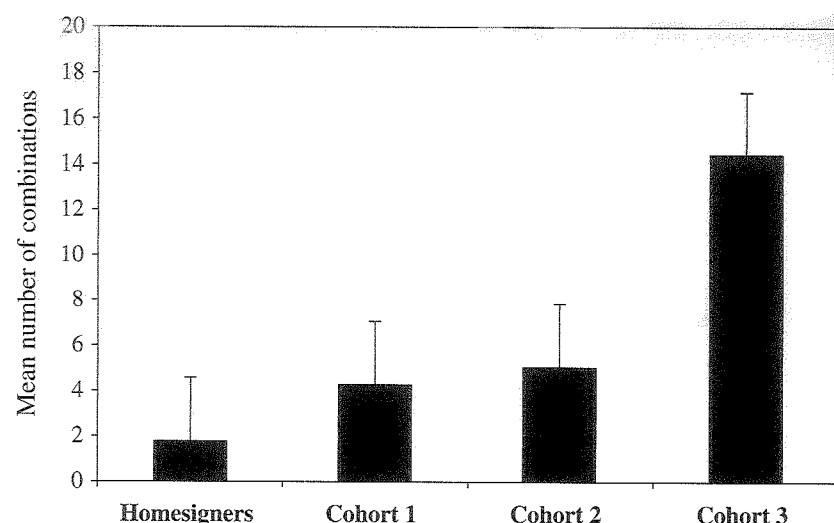


Figure 4.6. Combinations of nominal points with verbs. The number of combinations of nominal points with verbs increases across the language continuum, reflecting the integration of this new function for pointing into the syntax.

manual point. What started out with a mostly universal, concrete, locative meaning that is close to its gestural roots has taken on a more symbolic, abstract, and displaced nominal (and possibly pronominal) function. Over the same period, pointing signs have become reduced phonetically and lost some or all of their movement across space. Throughout this process, they are being integrated into the linguistic system of NSL and becoming part of its grammar. The new points participate in constructions that give them a more categorical, languagelike, less context-bound flavor than the co-speech forms that are their origin.

Other changes in NSL include a similar repurposing of the signing space. For example, in earlier work, one of us proposed that concrete uses of space (such as describing where people are sitting) were a precursor to more abstract uses (such as indicating that signs are coreferent) (Ann Senghas 2003). The interesting change in both of these cases is that signing space loses spatial meaning. In the case of pointing, the locative piece must be separated from a holistic package that includes the immediate physical context (the here and now), leaving its form and a bit of associated semiotic content. Once the point has been segmented in this way, it can be combined with other linguistic elements to form phrases and sentences. (See Senghas, Kita, and Özyürek [2004] for a description of this segmentation process in the domain of path and manner of movement.)

Researchers who study how space is used by sign languages often argue about whether these uses are part of a linguistic system or are gestural (and

by implication, less linguistically integrated). One thing is clear to us: The use of pointing and space that we have found here differs strikingly from that of gestures that accompany speech. Indeed, the more these uses develop, the less they show the spatial meaning associated with typical pointing gestures. Apparently, a crucial step in the transformation of pointing gestures into forms that can be used as abstract, recombinable linguistic elements seems to be the loss of their locative content. This is why, as we move along the continuum from the earliest to the most developed form of NSL, we find more and more points to locations that refer not to locations but to entities.

Because we know the history of NSL, we can deduce who is responsible for these changes: children, waves of new children and more children, learning and relearning the language, transforming it into something different from what it was. This same process most likely is responsible for historical changes in all languages as they are passed from one generation to the next, each generation tweaking the system before passing it on. In this extreme case, where much of the system was still very close to its holistic and unanalyzed gestural roots, the process of learning results in more than tweaks—it leads to the creation of linguistic structure. As children learned their language, they also created it.

By focusing our attention on pointing, we have captured a small part of this creative process. Over a period of only thirty years, a holistic, spatial gesture used to draw attention to real-world objects and their locations has been transformed into an abstract point at empty air, referring to some nonpresent referent at some nonpresent time. With its new status, it can combine with other elements and draw meaning from the structure of the sentence. This new use is more abstract, more displaced from the here and now, and more linguistic in function. This is the transformative power of human language acquisition.

#### Note

1. All of the data were coded by the second author; a subset of the data was coded by the first author to ensure reliability of the coding categories. Inter-coder reliability for locative versus nominal reference was 0.95.

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