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## Making Language Around the Globe *A Crosslinguistic Study of Homesign in the United States, China, and Turkey*

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At the present state of our knowledge, it is premature to attribute a particular organization of grammaticizable notions to the child at the beginning of language acquisition (pace Slobin, 1985). It would seem more plausible to endow the child with sufficient flexibility to discern and master the particular organization of the exposure language.

**Dan I. Slobin (1997b, p. 296)**

**B**ut what happens when a child is not exposed to a conventional language?  
In 1985, Dan Slobin encouraged the field of language acquisition to take advantage of the fact that the world's languages constitute a range of "experiments of nature." Different types of languages pose different types of acquisition problems for the language-learning child. By observing children who are exposed to languages that vary systematically along one or more dimensions, we can get some sense of which aspects of languages, if any, present stumbling blocks to the language-learner. Moreover, to the extent that we see children *change* the input they receive, we get insight into the role children themselves play in shaping the language they learn—as Dan so eloquently put it, the child as "language-maker" (Slobin, 1985a).

Dan encouraged the field by pointing out the kinds of questions that can only be addressed by crosslinguistic studies (Slobin, 1985b) and by publishing the first two volumes of *The crosslinguistic study of language acquisition*. The encouragement was wildly successful. Language acquisition researchers, who up until this point had been narrowly focused on English, began expanding their horizons and their languages. There are now five volumes in Dan's influential crosslinguistic series exploring acquisition in 28 different languages.

Our work takes Dan's call to extend the range of environments within which we observe language-learning one step farther. What would happen if a child were not exposed to any language model whatsoever? Would such a child develop a communication system and, if so, which properties of language would the system contain? Put more simply—would such a child be able to make her own language?

The children we study are deaf with hearing losses so extensive that they cannot naturally acquire oral language, and born to hearing parents who have not yet exposed them to a conventional manual language. Under such inopportune circumstances, these deaf children might be expected not to communicate. Yet they do. Despite their impoverished language-learning conditions, American deaf children of hearing parents develop gestural communication systems, called "homesigns," that contain many of the properties of language (Goldin-Meadow, 2003a). Moreover, Chinese deaf children of hearing parents develop gesture systems similar to their American counterparts, suggesting that the deaf children's gesture systems are resilient, not only to the absence of a conventional language model, but also to some aspects of cultural variation. The purpose of this paper is to extend the range of environments within which we observe gesture creation one step further to include a deaf child developing a homesign system in Turkey.

## THE DEVELOPMENT OF HOMESIGN SYSTEMS: WHY TURKEY?

The deaf children in our studies are inventing their homesign gesture systems without benefit of a conventional language model, but they do not create these systems in a vacuum. They are exposed to the gestures that their hearing parents produce as they talk to their children, and those gestures differ from culture to culture (McNeill, 1992). Does the crosslinguistic variation in gesture have an impact on the gesture systems the deaf children create?

In previous work, we chose a Chinese culture as a second culture in which to explore the homesign gesture systems of deaf children in large part because the patterns of parent-child interaction in Chinese cultures differ greatly from those in American cultures (e.g., Chen & Uttal, 1988; Wu, 1985). For example, Chinese parents favor practices that result in more control over their interactions with their children than American parents (Lin & Fu, 1990). In addition, Chinese parents produce many more gestures when they speak to their children (hearing or deaf) than do American parents (Goldin-Meadow & Saltzman, 2000). Despite these differences, the Chinese deaf children in our studies invented homesign systems that were similar to the American deaf children's homesign systems in sentence-level structure (Goldin-Meadow & Mylander, 1998), word-level morphological structure (Goldin-Meadow, Mylander, & Franklin, 2005), narrative structure (Phillips, Goldin-Meadow & Miller, 2001), generic expressions (Goldin-Meadow, Gelman, & Mylander, 2005), and descriptions of motion events (Zheng & Goldin-Meadow, 2002).

Although the gestures Mandarin-speakers produce differ in quantity from those produced by English-speakers, they do not differ—at least from the deaf child's point of view—in quality. McNeill and Duncan (2000; see also McNeill, this volume) note that a primary difference between the gestures that accompany Mandarin vs. English resides in the timing of gesture in relation to speech. For example, action gestures (a downward blow) typically co-occur with the predicate in an English sentence ("the old lady *hit* him with a big stick"), but tend to occur out of synchrony with the predicate in a comparable Mandarin sentence ("old lady hold *big stick* him hit-down"). McNeill and Duncan suggest that this difference reflects the fact that English is a subject-prominent language, whereas Mandarin is a topic-prominent language. Interestingly, while this difference is an important one in understanding the relation between gesture and speech in these two languages and may be

crucial to children who can hear, it is a difference that is *invisible* to the deaf child. Chinese and American deaf children would both see the downward blow, but would know nothing about where the gesture fell with respect to speech. From the deaf child's vantage point, the gesture models provided by hearing individuals in Chinese and American worlds do not differ.

In contrast to the gestures that accompany Mandarin, the gestures that accompany Turkish can look very different from those that accompany English, at least with respect to the expression of intransitive motion events (Kita & Özyürek, 2003; Özyürek & Kita, 1999; Özyürek et al., 2007). Turkish is a verb-framed language whereas English and Mandarin are satellite-framed languages (Talmy, 1985). This distinction depends primarily on the way in which the path of a motion is packaged. In a satellite-framed language, both path and manner can be encoded within a verbal clause; manner is encoded in the verb itself (*flew*) and path is coded as an adjunct to the verb, a satellite (e.g., *down* in the sentence "the bird flew down"). In a verb-framed language, path is bundled into the verb while manner is introduced constructionally outside the verb, in a gerund, a separate phrase, or clause (e.g., if English were a verb-framed language, the comparable sentence would be "the bird exits flying"). One effect of this typological difference is that manner can, depending upon pragmatic context (Allen et al., 2005; Papafragou & Gleitman, 2006), be omitted from sentences in verb-framed languages (Slobin, 1996). Importantly, these crosslinguistic differences have been shown to influence how manner and path are expressed in gesture. For example, Turkish speakers produce more manner-*only* gestures (e.g., fingers wiggling in place to represent feet alternating while walking) and path-*only* gestures (e.g., index finger crossing space to represent the trajectory of the walk) than English speakers, who produce more gestures containing *both* manner and path (fingers wiggling as the hand crosses space; Kita & Özyürek, 2003; Özyürek & Kita, 1999; Özyürek et al., 2007). These gestural patterns can be traced to the typological difference between English and Turkish—manner and path are expressed in two clauses in Turkish but in one clause in English.

Our goal here is to explore whether the different gestures that hearing speakers produce make a difference to a deaf child generating a homesign gesture system. We therefore examined the gestures produced by a deaf child of hearing parents growing up in Istanbul, and compared them to the gestures produced by the American and Chinese deaf children in our previous studies. If deaf children in all three cultures develop homesign systems with the same structure despite differences in the gestures they see, we will have increasingly compelling evidence for biases that children themselves bring to the language-making task. If, however, the gestures developed by the Turkish deaf child differ from those developed by the American and Chinese deaf children, we can begin to deduce how children's construction of a language-like gesture system is influenced by the models they see.

## DEAFNESS AND LANGUAGE LEARNING

Deaf children born to deaf parents and exposed from birth to a conventional sign language such as American Sign Language acquire that language naturally; that is, these children progress through stages in acquiring sign language similar to those of hearing children acquiring a spoken language (Newport & Meier, 1985). However, 90% of deaf children are not born to deaf parents who could provide early exposure to a conventional sign language. Rather, they are born to hearing parents who rarely know conventional sign language and, quite naturally, expose their children to speech (Hoffmeister & Wilbur, 1980).

Unfortunately, it is extremely uncommon for deaf children with severe to profound hearing losses to acquire the spoken language of their hearing parents naturally; that is, without intensive and specialized instruction. Even with instruction, deaf children's acquisition of speech is markedly delayed when compared either to the acquisition of speech by hearing children of hearing parents, or to the acquisition of sign by deaf children of deaf parents. By age 5 or 6, and despite intensive early training programs, the average profoundly deaf child has a very reduced oral linguistic capacity (Conrad, 1979; Mayberry, 1992; Meadow, 1968).

Moreover, although many hearing parents of deaf children send their children to schools in which a manually coded system of a spoken language (e.g., Signed English) is taught, other hearing parents send

their deaf children to “oral” schools in which sign systems are neither taught nor encouraged; thus, these deaf children are not likely to receive input in a conventional sign system, either at home or at school.

We observed a Turkish deaf child twice, at ages 3;4 and 3;6 (years;months), and compared the gestures he produced to those produced by four deaf children in America (1 in Philadelphia, 3 in Chicago) and four in Taiwan, Republic of China (Taipei), each observed twice between ages 3;8 and 4;11 (Goldin-Meadow & Mylander, 1998). All of the children were videotaped at home for approximately two hours per session interacting with their hearing mothers (and any other family members present) with a standard set of toys. The children were congenitally deaf with no recognized cognitive deficits. Cause of deafness was unknown. Each child had at least a 70 to 90 dB hearing loss in both ears, and even with hearing aids, none was able to acquire speech naturally. At the time of videotaping, none of the children could do more than produce an occasional spoken word in a highly constrained context, and none had been exposed to a conventional sign system.

### SENTENCE-LEVEL STRUCTURE IN THE HOMESIGN SYSTEMS

We used the coding system described in Goldin-Meadow and Mylander (1984) and found that, like his counterparts in the United States and China, the Turkish child used three types of gestural lexical items: (1) Deictics were typically pointing gestures that maintained a constant kinesic form in all contexts. These deictics were used to single out objects, people, places, and the like. (2) Characterizing gestures were stylized pantomimes whose iconic forms varied with the intended meaning of each gesture (e.g., a fist pounded in the air as though hammering). (3) Markers were typically conventional head or hand gestures (e.g., head-shake, nod, two-handed “flip”) that were used as modulators (e.g., to negate, affirm, doubt).

The Turkish deaf child, like the American and Chinese deaf children, concatenated his gestural lexical items into strings expressing the propositions or semantic relations typically found in child language. In previous work, we have found that homesigners’ gesture strings share structural properties with the sentences produced by young children learning language from conventional language models and, in this sense, warrant the linguistic term “sentence.” We focus here on two structural properties of these sentences: (1) patterned production and deletion of semantic elements in the surface structure of a sentence; and (2) patterned ordering of those elements within the sentence.

#### *Gesture Production and Deletion Regularities*

Production probability patterns describe the likelihood that a particular argument or predicate will be produced in a gesture sentence (e.g., when describing a mouse eating cheese, a gesture for the actor, mouse, is less likely to be produced than a gesture for the patient, cheese). In previous work, we have found that both American and Chinese homesigners produce gestures for transitive actors, patients, and intransitive actors at different rates (Feldman, Goldin-Meadow & Gleitman, 1978; Goldin-Meadow & Mylander, 1998). Gestures were produced significantly more often for patients (the cheese when describing a mouse eating cheese) and for intransitive actors (the mouse when describing a mouse moving to its hole) than for transitive actors (the mouse in a sentence describing a mouse eating cheese).<sup>1</sup> As can be seen in Figure 2.1, the Turkish child displayed this same pattern in his homesigns.

<sup>1</sup> We used context and the form of act gestures to decide whether a gesture sentence was transitive or intransitive. If, for example, the child was gesturing about his mother pushing a truck across the floor, his gesture sentence would be considered transitive if he produced a push gesture (a C-hand representing the mother’s hand on the truck moving it across space) and intransitive if he produced a go gesture (a flat palm representing the truck moving across space). Note that if the child produced a pointing gesture at the truck along with the push gesture, the point would be classified as a patient (i.e., truck push). In contrast, if he produced a pointing gesture at the truck with the go gesture, the point would be classified as an intransitive actor (i.e., truck go). These decisions were made without regard for the order in which the gestures were produced; that is, the pointing gesture would be classified as a patient whether the child produced it before (truck push) or after (push truck) the push gesture.

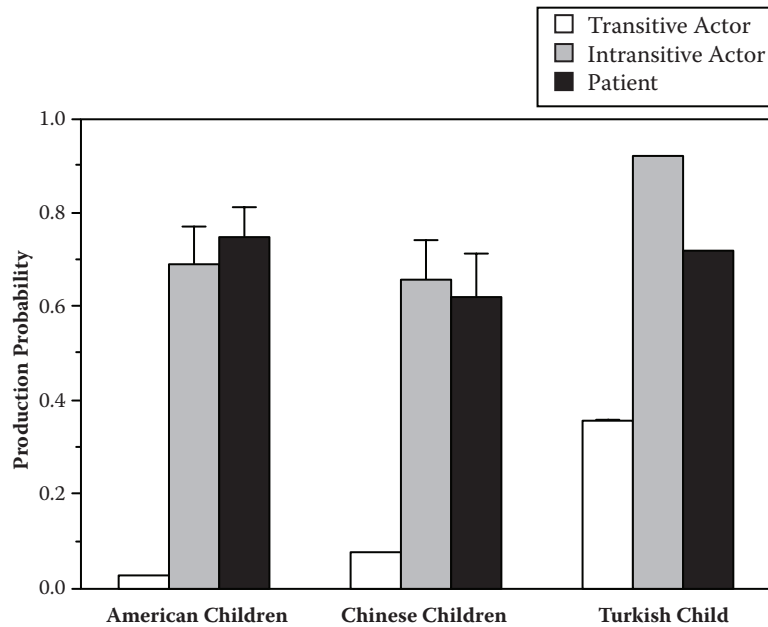


Figure 2.1 Production probability of transitive actors, intransitive actors, and patients in two-gesture sentences. The bars indicate standard errors for the American and Chinese children.

Interestingly, the particular structural pattern found in the deaf children's gesture sentences in all three cultures is an analog of a structural case-marking pattern found in natural human languages—*ergative* languages, in which patients and intransitive actors are marked in the same way and both different from transitive actors (cf. Dixon, 1979; Silverstein, 1976). In the deaf child's case, marking is by production/deletion. Gestures for the intransitive actor (the moving-mouse), tended to be produced as often as gestures for the patient (the eaten-cheese), and more often than gestures for the transitive actor (the eating-mouse). The bars for the American and Chinese deaf children represent mean scores for four children. The bars for the Turkish deaf child represent only his data. Although the Turkish child produced gestures for actors (both transitive and intransitive) more often than the American and Chinese children, in all cultures, intransitive actors resembled patients more closely than they resembled transitive actors—the hallmark of the ergative pattern. It is also worth pointing out that none of the languages spoken in these deaf children's worlds (English, Mandarin, or Turkish) is ergative in structure.

### *Gesture Order Regularities*

Gesture order patterns describe where a particular argument or predicate tends to appear in a gesture sentence. The American and Chinese deaf children produced gestures for intransitive actors before gestures for acts (*mouse-go*) and also produced gestures for patients before gestures for acts (*cheese-eat*). They thus placed intransitive actors in the same position as patients (the children did not produce enough transitive actors to determine a consistent order pattern for this semantic element). As can be seen in Figure 2.2, the Turkish deaf child also produced gestures for patients and intransitive actors before gestures for acts.

Deaf children who are exposed to conventional sign languages, not surprisingly, learn the ordering patterns of those languages—for example, SVO (subject–verb–object) in American Sign Language (Hoffmeister, 1978), SOV in the Sign Language of the Netherlands (Coerts, 2000). It is striking that the homesigners in our studies not only used consistent order in their gesture sentences,

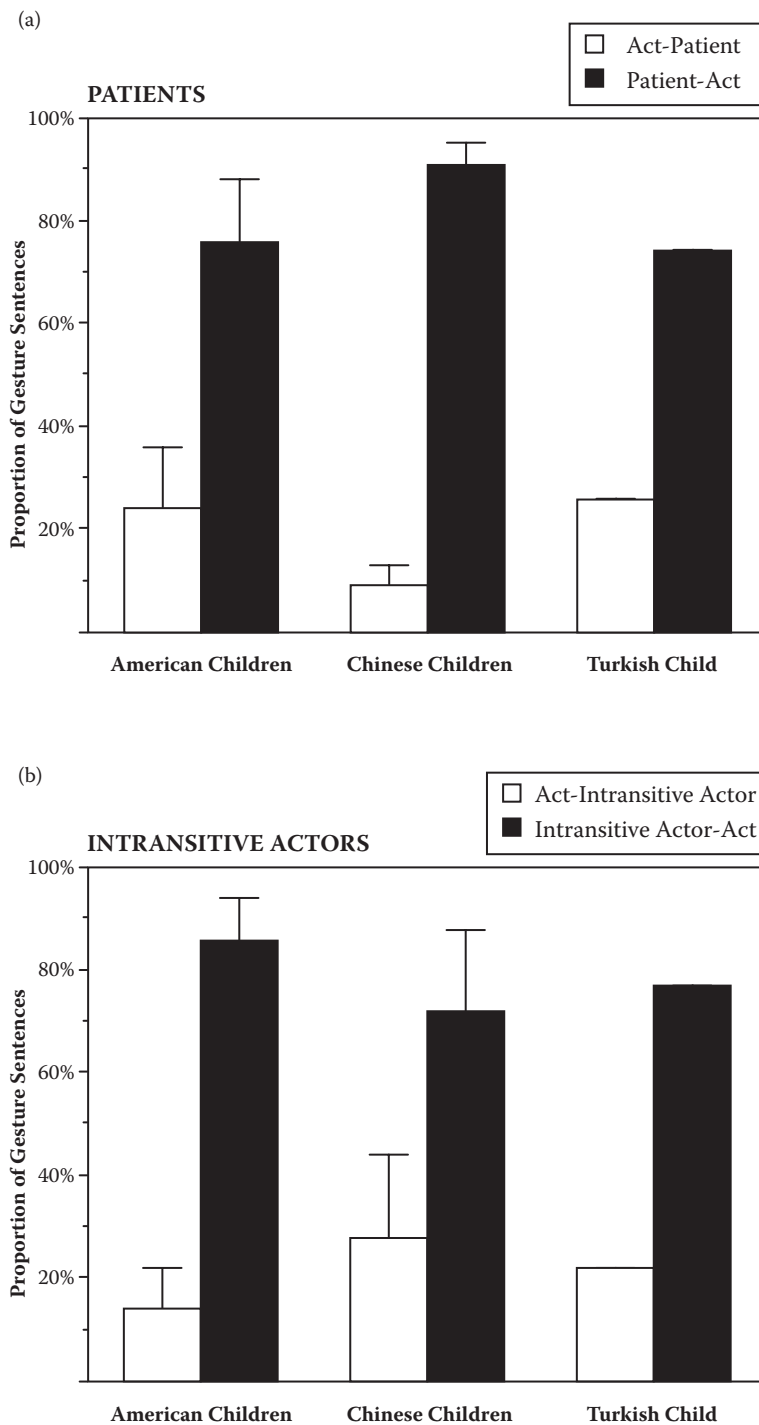


Figure 2.2 Position of patients (a) and intransitive actors (b) in two-gesture sentences containing acts. The bars indicate standard errors for the American and Chinese children.

but they all used an O-first (or patient-first) order—an order that is consistent with the patient-focus found in the children's production regularities.<sup>2,3</sup>

Thus, deaf children from three different cultures produce gesture sentences that are not haphazardly generated. Gestures are produced and positioned in sentences as a function of the semantic role they represent and, in this sense, display a simple syntax. Interestingly, the particular syntactic patterns found in the homesign systems in all three cultures were the same.

## EXPRESSING PATH AND MANNER IN MOTION EVENTS

The differences manifested in the gestures that accompany speech in English- and Mandarin-speakers vs. Turkish-speakers have to do with the way manner and path are packaged in the verb, not how semantic elements are expressed and marked in a sentence. We therefore might expect our Turkish deaf child to differ from our American and Chinese deaf children, not in his sentence-level gesture structures, but in the gestures he produces to convey manner and path in motion events.

Following Zheng and Goldin-Meadow (2002), we isolated all of the gestures the Turkish child produced to convey crossing-space motions (motions in which a person or object moves or is moved to another location) and examined how many discourse units conveying a motion event contained gestures for the path and or manner of the motion. Contrary to our expectations that the homesigners' gestures would be influenced by the gestures produced by hearing speakers in their worlds, we found that the Turkish homesigner produced gestures for paths and motions at the same rate as the American and Chinese homesigners. Children from all three cultures produced path gestures in twice as many discourse units as manner gestures (Figure 2.3).

Although the production/deletion, ordering, and manner/path patterns we have found are suggestive, before reaching any firm conclusions we must first observe more deaf children in Turkey to determine how representative the child in our study is (there is, indeed, variation across individual homesigners within a culture, particularly in terms of morphological structure, Goldin-Meadow, Mylander, & Franklin, 2007). We also need to examine the gestures that the hearing parents of these particular deaf children produce. It is possible that these parents do not use gesture when they talk to their deaf children in the same ways as parents do when talking to their hearing children (although see Goldin-Meadow & Saltzman, 2000, for evidence that the gestural differences between hearing parents of deaf vs. hearing children are minimal, compared to the differences between hearing parents of Chinese vs. American children). Our future work will examine these possibilities.

## LANGUAGE-MAKING SKILLS THAT DO NOT REQUIRE A LANGUAGE MODEL

Children who are exposed to conventional language models apply whatever language-learning skills they have to the linguistic inputs they receive, and the product is a linguistic system. There is no reason to believe that deaf children who are *not* exposed to a conventional language model have a

<sup>2</sup> Most of the gestures that the children used to convey patient arguments were pointing gestures (e.g., point at grape). However, the children did, on occasion, use a characterizing iconic gesture to refer to patients (e.g., an eat gesture used to refer to the grape) and when they did, they placed these iconic gestures in the same sentence-initial positions that their patient-points occupied (Goldin-Meadow, Butcher, Mylander, & Dodge, 1994).

<sup>3</sup> Importantly, the deaf children's ordering patterns are not reducible to the discourse status of the semantic elements—if we reanalyze the sentences in terms of whether an element is “new” or “old” to the discourse, we find that most of the children's gesture sentences are “old-old” or “new-new,” and that the “old-new” sentences are approximately as frequent as “new-old” sentences. In other words, “new” elements do not consistently occupy the initial position in the deaf children's gesture sentences, nor do “old” elements (Goldin-Meadow & Mylander, 1984, p. 51).

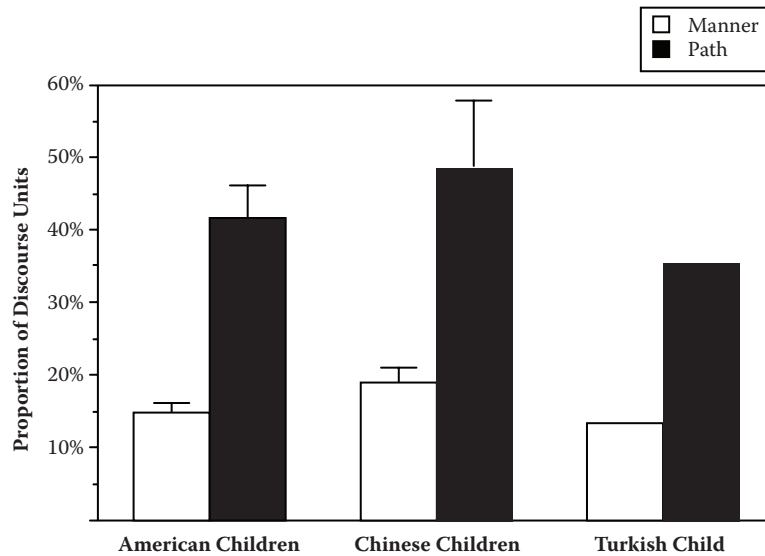


Figure 2.3—Proportion of discourse units expressing motion events that contain manner and path gestures. The bars indicate standard errors for the American, Chinese, and Turkish children.

different set of language-learning skills. However, they apply these skills to a very different input. Despite this radical difference in input, their product is also a set of linguistic properties. What kind of language-learning skills can create such a product in the absence of linguistically structured input? The deaf children’s homesign systems offer hints as to what these skills might be, skills that might more aptly be called *language-making* than *language-learning*. The data we have described here suggest a number of such skills: the ability to segment ideas into word-like units, to combine those units into sentences, and to organize the sentences around an ergative pattern.

One of the most striking aspects of the deaf children’s gestures is that it is not mime. The children could easily (and effectively) convey information by producing continuous and unsegmentable movements in mime-like fashion. For example, a child could elaborately pantomime a scene in which she is given a jar, twists off the lid, and blows a bubble in order to request the jar and comment on what she’ll do when she gets it. But the deaf children don’t behave like mimes. They produce discrete gestures concatenated into sentences—their gestures resemble beads on a string rather than one continuous strand. The basic process underlying the deaf children’s gesture system appears to be *segmentation*.

Once segmented into smaller units, those newly segmented units need to be related to one another within a larger *combination*. At the sentence level, the children’s solution to the combination problem is to construct sequences. But just stringing elements together is not enough. Imagine that a mime for the bubble-blowing scene is segmented into many discrete gestures. Although the gestures may adequately refer to the elements in the scene, they do not convey how those elements relate to one another. This relation, which is conveyed iconically in a mime, must be conveyed through other processes in sequences of discrete elements. One such process marks the elements in a sequence according to thematic role using deletion and order, devices that are found in all natural languages and in the deaf children’s homesigns. These processes are necessary to tell who is doing what to whom.

We have also shown here that the homesign systems in three cultures can be described in terms of an *ergative* pattern. Unlike segmentation and combination, ergative constructions are not universal. In fact, ergative languages are not particularly frequent in the world’s languages. Why then would children arrive at these constructions in the absence of linguistic input? Although it may be counterintuitive to speakers of English (which is not an ergative language), the ergative pattern may be a default organization for a language-learning child—in other words, it may require input to structure language in any other way. Indeed,



Zheng and Goldin-Meadow (2002) found that hearing children acquiring Mandarin, a language that allows deletion, not only delete a great deal but they delete according to an ergative pattern (and, as mentioned earlier, Mandarin is *not* an ergative language). Thus, the ergative structuring that we see in the deaf children crops up in hearing children when their language does not rule it out. Ergative structure is also found in very young English-learners who can only produce two words at a time (Goldin-Meadow & Mylander, 1984, p. 62–64) and in children learning Korean, which is also not an ergative language (Choi, 1999; Clancy, 1993). Taken together, these data bear on what we might describe as the initial grammatical state – the state that children are in when they come to language-learning.

The way the deaf children instantiate an ergative pattern in their gesture systems is to omit gestures for transitive actors, which are typically subjects in conventional languages. Conventional languages vary according to whether they permit deletion of subjects (i.e., null subjects). Italian does (it's a null-subject language), English does not. Children need input to determine whether or not the language they are learning is a null-subject language.

The question we address here is whether children come to language-learning with a default bias to either omit or produce subjects. Hyams (1986) hypothesized that children start out with a grammar that licenses null subjects and need input from a conventional language to teach them whether subjects must be expressed in that language. Data from the deaf children's gesture systems—in particular, the fact that the children omit gestures for transitive actors, which tend to be subjects<sup>4</sup>—support Hyams' (1986) view that children come to language-learning with a default bias to omit subjects.

In some domains, however, children may come to the language-learning situation *without* a bias or default—and the deaf children can provide useful data here as well. For example, children exposed to conventional language models discover relatively early that they are learning either a right-branching (English) or a left-branching (Japanese) language (Lust & Wakayama, 1979). Discovering the branching direction of the language they are learning has ramifications throughout the children's linguistic system. Do children have a bias toward right- vs. left-branching systems before being exposed to linguistic input? No—at least according to the data on complex sentences in the deaf children's home-signs (Goldin-Meadow, 1987). The deaf children show no bias of any sort, suggesting that the initial grammatical state may be neutral on this dimension.

These constructions—obligatoriness of explicit subjects, and dominant branching organization (left vs. right)—are places where Slobin (1997a, p. 3) has hypothesized that children learn a general format or “solution” from the syntax of the language model to which they are exposed. Our findings suggest that a language model is indeed essential to obligatorily produce subjects and to have a branching direction, thus providing empirical support for Slobin's claim. However, our findings go one step further—they make it clear that these two cases are not identical. In one case (branching direction), the child does not appear to come to the language-learning situation with a bias. In the other case (obligatoriness of subjects), the child does—a bias to omit subjects (or at least agents).

## PRIVILEGED FORMS AND MEANINGS

One of the original goals of Slobin's crosslinguistic enterprise was to identify commonalities in the early stages of language-learning that children across the globe display despite differences in the languages to which they are exposed—a set of privileged forms and meanings that crop up in children's language even if there is no explicit model for them in the language the children are learning. These privileged forms and meanings constitute a set of hypotheses as to how children might be expected to communicate in the absence of usable linguistic input, and the data we have described here provide support for those hypotheses.

<sup>4</sup> Note that, in the deaf children's gesture systems, transitive actors really are omitted, or more accurately not lexicalized, as opposed to never being there in the first place—otherwise we would not be able to explain the systematic actor production probability patterns we find in relation to underlying predicate frames (see Goldin-Meadow, 1985, 2003a).

Take, for example, consistent word order, which appears to be a privileged form in early child language (Goldin-Meadow, 2003a, pp. 26–27). Children look for ordering relations across words within a sentence, learning them easily if their language relies on word order to convey who-does-what-to-whom and imposing ordering regularities if their language does not display them. In line with these findings, we find that deaf children, exposed to no usable language whatsoever, impose ordering regularities on their homemade gesture systems. Word order does indeed seem to be a privileged form for language-learners.

In addition to privileged forms, we can also identify privileged meanings on the basis of the crosslinguistic literature. A focus on *results* seems to be a privileged meaning for language-learners (Goldin-Meadow, 2003a, p. 25–26) and, here again, the deaf children’s homesign gesture systems provide confirming evidence. Ergative patterns can be thought of as focusing on results, a tendency to see objects as affected by actions rather than as initiators of action. In the sentence “you go to the corner,” the intransitive actor “you,” has a double meaning. On the one hand, “you” refers to the goer, the actor, the initiator of the going action. On the other hand, “you” refers to the gone, the patient, the affectee of the going action. At the end of the action, “you” both “have gone” and “are gone,” and the decision to emphasize one aspect of the actor’s condition over the other is arbitrary. By treating intransitive actors like patients in terms of production probability (Figure 2.1) and order (Figure 2.2), the deaf children are highlighting the affectee properties of the intransitive actor over the initiator properties. Focusing on patients may be a default bias children bring to language-learning. When not exposed to a usable conventional language model, children display a patient bias in their self-generated communication systems. This bias is, of course, abandoned when a hearing child is exposed to a language model whose syntactic structures do not match the bias (e.g., Zheng & Goldin-Meadow, 2002).<sup>5</sup>

If a patient-focus is such a natural way of taking in a scene, why don’t most of the world’s languages design their structures to take advantage of what would appear to be an easily processed format. Slobin (1977) has outlined a number of pressures that language faces—pressures to be clear, processible, quick and easy, and expressive. Importantly, Slobin points out that these pressures do not necessarily all push language in the same direction. Thus, for example, the pressure to be semantically clear may come into conflict with pressures to be processed quickly or to be rhetorically expressive. The need to be clear may pressure languages to adopt structures that reinforce the patient-bias. However, at the same time, the need to be quick and expressive may pressure languages toward structures that do not have a patient focus. If the bias toward patients is as fundamental as our homesign data suggest, there may be a cognitive cost to overriding it—for example, there may be greater cognitive costs involved in processing sentences that do not organize around the patient than sentences that do. This would be an intriguing direction for future research (Goldin-Meadow, 2003b).

<sup>5</sup> It may be easier to guess actors than patients from context. If so, the bias to express patients found in the deaf children’s gestures could stem from the child’s tendency to express elements that are less predictable. However, we have found little support for the idea that predictability in context drives the deaf children’s patterns of production and deletion. For example, in our analyses of underlying predicate frames, we examined production probability separately for first person actors (i.e., the child him or herself), second person actors (the communication partner), and third person actors. If predictability in context is the key, first and second person actors should tend to be omitted regardless of underlying predicate frame because their identity can be easily guessed in context (both persons are on the scene); and third person actors should be gestured quite often regardless of underlying predicate frame because they are less easily guessed from context. We found, however, that production probability patterns for first person, second person, and third person actors do not differ (Goldin-Meadow, 1985, p. 237). In other words, the structural patterns seen in the deaf children’s gestures do not seem to reflect how likely a semantic element is to be inferred from context.

## WHAT HOMESIGN CAN TELL US ABOUT HOW ALL CHILDREN LEARN LANGUAGE

The particular thoughts the deaf children convey in their gestures have not been influenced by a conventional language model. These thoughts come as close as we can currently envision to revealing the expressible and grammaticizable notions that children bring to the language-learning situation—thought before language. But data from the deaf children can address a second question about how children learn language, one that is central to the crosslinguistic study of language-learning that Slobin encouraged in 1985. Do young hearing children speak like native language users because they are exposed to different language models, or because they are growing up in different cultures? To the extent that the language model is, on its own, responsible for crosslinguistic differences at the earliest stages of language development, deaf children developing their gesture systems across different cultures *should not* reflect these differences—precisely because they do not have access to their culture’s language model. On the other hand, to the extent that the culture within which the language model is embedded may also be responsible for the early crosslinguistic differences we see in language development, the deaf children *should* display the same differences as their hearing counterparts—since they too live in that culture (see, for example, Phillips et al., 2001). The deaf children’s homesigns can, in this sense, serve as a baseline against which to evaluate the effects of a conventional language model (see Zheng & Goldin-Meadow, 2002, for an example of this line of work).

Slobin (1997b, p. 276) has suggested that certain grammatical forms and constructions may be more accessible than others to children.<sup>6</sup> However, it is not a simple matter to determine which notions are more, or less, accessible. Indeed, Slobin has made it clear that accessibility hierarchies cannot be discovered by surveying the array of languages that are spoken across the globe by adults. We need to look at children. If a child gives grammatical expression to a notion early in development, that notion is a good candidate for being high on the accessibility hierarchy. However, the age at which a construction appears in a child’s language is affected by many factors, not the least of which is the language model to which the child is exposed.

We suggest that deaf children inventing their own gesture systems offer the most straightforward data on this question. If a deaf child is able to produce a grammatical construction without any guidance from a language model, that grammatical construction must be very high on the accessibility hierarchy—what we have called a resilient property of language. Thus, the constructions we have identified in the deaf children’s homesign systems are likely to be highly accessible to all language-making children, serving as, what Slobin so aptly called the conceptual starting points for grammatical notions.

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<sup>6</sup> Recently, Slobin (1996, 2003) has become convinced that language plays an important role in shaping how we think when we talk. Note, however, that the deaf children we study are creating their gesture systems without usable input from a conventional language model. Their homesign systems thus provide the best evidence that children can express language-like notions in language-like ways without a language model. But data from the deaf children could also provide evidence that language shapes thought. To the extent that the deaf children fail to express ideas that can be expressed in natural language, not only will we have evidence that a conventional language model is essential for expressing certain ideas, but we will also have pointers as to what those ideas might be (Goldin-Meadow, 2003b).

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