

From Here and Now to There and Then: The Development of Displaced Reference in Homesign and English

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An essential function of human language is the ability to refer to information that is spatially and temporally displaced from the location of the speaker and the listener, that is, *displaced reference*. This article describes the development of this function in 4 deaf children who were not exposed to a usable conventional language model and communicated via idiosyncratic gesture systems, called homesign, and in 18 hearing children who were acquiring English as a native language. Although the deaf children referred to the nonpresent much less frequently and at later ages than the hearing children, both groups followed a similar developmental path, adding increasingly abstract categories of displaced reference to their repertoires in the same sequence. Caregivers in both groups infrequently initiated displaced reference, except with respect to communication about past events. Despite the absence of a shared linguistic code, the deaf children succeeded in evoking the nonpresent by generating novel gestures, by modifying the context of conventional gestures, and by pragmatic means. The findings indicate that a conventional language model is not essential for children to be able to extend their communication beyond the here and now.

INTRODUCTION

Language functions as an important tool in everyday life due to its ability to fulfill a wide variety of essential communicative functions. Among the most important of these is the ability to refer to objects and events that are not currently perceptible to either the speaker or the listener, that is, the ability to engage in "displaced reference" (see Hockett, 1960). Displacement allows us to describe lost possessions, to pass on our childhood memories, and to proclaim our future aspirations. We can also tell someone what to do, create wild stories based on pure imagination, or write about abstract topics (like the development of displaced reference). If humans were to communicate only about what is immediately in front of them, it is not at all clear that a complex and productive linguistic system would even be necessary.

How then do children come to master this important function of language? In general, previous work placed much of the responsibility for the earliest interactions about displaced topics on parents who engage their children in talk about the nonpresent (Bruner, Roy, & Ratner, 1982; Eisenberg, 1985; Moerk, 1975; Wanska & Bedrosian, 1986; Zukow, Reilly, & Greenfield, 1982). Bruner et al. (pp. 97-98) describe how parents often tempt their child with an object in the early stages of requesting. The child responds with reaching and, eventually, with formal requesting. Once the child has learned to request non-visible objects, around 14 months, parent elicitation of requests suddenly drops off. In a similar vein,

Lewis (1934) reports that early child references to the nonpresent are often responses to adults' questions, and Sachs (1983) finds that parent-elicited reference to the past and future precedes spontaneous talk about the past and future by 3-6 months. Eisenberg (1985) characterizes a number of stages of parental participation in children's earliest descriptions of past experiences, noting that caregivers can even guide children through accounts of events the children themselves do not remember. Together, these results suggest that most children learn to communicate about displaced topics primarily by following their parents' cues (but see Bowerman, 1981, and Weist, 1989).

The question we address here is somewhat different. Given that parental input appears *sufficient* to influence when and how displaced talk develops in children, we next consider whether having a model for talk about the nonpresent is *necessary* for the child to be able to communicate about the nonpresent. In other words, is it essential for children to be exposed to a conventional language containing devices that allow communication about the nonpresent in order for those children to be able to communicate about things and events that are not immediately perceptible? This possibility is difficult to explore under typical language-learning circumstances precisely because most young children are surrounded by models of displaced talk in the communications of

their parents and other members of their community, and these models appear to be a remarkably powerful influence on the young language-learner.

There are, however, children who are *not* exposed to a usable model of a conventional language yet communicate nonetheless. These children, profoundly deaf from birth and unable to acquire spoken language, are born to hearing parents who have chosen not to expose them to a signed language. Despite their lack of a conventional language model, the children use gestures, called *homesign*, to communicate. The gestures that deaf children produce under these circumstances display many of the structural characteristics of conventional languages (Goldin-Meadow & Mylander, 1990a). For example, the children have stable gesture vocabularies with distinct forms for nouns and verbs (Goldin-Meadow, Butcher, Mylander, & Dodge, 1994), they map gesture-internal structure onto meaning systematically (Goldin-Meadow, Mylander, & Butcher, 1995), and they combine gestures into productive sentences exhibiting simple grammatical structure (Goldin-Meadow & Feldman, 1977) and recursion (Goldin-Meadow, 1982, 1987). Moreover, Goldin-Meadow and Mylander (1984, 1990b) have determined that the specific structures, both morphological and syntactic, found in the homesigning children's gestures are *not* consistently present in the spontaneous gestures of their hearing parents. Thus, homesign develops in the absence of a language model and, as such, provides us with the rare opportunity to observe linguistic development with a minimum of linguistic input.

Recently, in a case study of a single child, Butcher, Mylander, and Goldin-Meadow (1991) investigated whether displaced reference is possible in homesign. They found that the child was able to use his pointing gestures to refer to objects that were not present, despite the fact that the child's hearing mother rarely used gesture in this way. The child pointed to an object or location present in the room to indicate another, nonpresent object. For example, he requested a left-hand-mitten puzzle piece from the experimenter by pointing to the right-hand-mitten puzzle piece that he had already inserted into the puzzle (Butcher et al., 1991, p. 328). Similarly, he pointed to the corner of the living room where his family sets up the Christmas tree each year to refer to the absent tree that would be placed there in a few weeks time (p. 328). These findings suggest that a conventional language model is not essential for a child to communicate about at least some aspects of the nonpresent.

In this study, we build upon the Butcher et al. (1991) findings, providing a more comprehensive de-

scription of the development of displaced reference in homesign. Butcher et al. focused only on the ability to refer to nonpresent objects and did so in a single deaf child. We explore the ability to communicate many types of information not perceptible in the environment, including events that are spatially and temporally displaced—and we do so in four deaf children. For comparison purposes, we also describe parallel developments in a group of 18 hearing children acquiring English. In addition, we consider the role of the parents of both groups of children in eliciting communication about the nonpresent, focusing in particular on whether the role of the caregiver differs for different types of displaced reference. This question is particularly germane to the unusual circumstances of our deaf children in which parent and child do not share a common linguistic code. Finally, we investigate how the deaf children are able to introduce nonpresent topics given that their communication system is based primarily upon pointing and iconic gestures.

METHOD

Participants

The data were collected in part in previous studies (see Butcher & Goldin-Meadow, in press; Butcher et al., 1991; Goldin-Meadow, 1979; Goldin-Meadow & Mylander, 1984; and Goldin-Meadow & Morford, 1985) and in part for the present study. The homesigning participants included four deaf children of hearing parents (referred to here as Abe, David, Marvin, and Kathy) who were followed longitudinally for 2 years starting at the ages of 2;3, 2;10, 2;11, and 3;1.¹ These children were all profoundly deaf (>90 dB bilateral hearing loss across the speech range). Their parents chose to rear them according to an educational method that discourages the use of manual communication. They had few opportunities to be exposed to American Sign Language (ASL) or any manual code of a spoken language. We were convinced that the children had not had significant exposure to ASL because we could find no evidence of even the most common ASL signs in their gesture repertoires. In addition, none of these children had made significant progress in acquiring spoken language; they

1. Due to the difficulty of detecting deafness prior to the age that displaced reference is first observed (1;0 to 2;0), the deaf participants are older than would be optimal for an investigation of displaced reference. However, despite the deaf children's ages, we did observe the first productions of some types of displaced communication in all four of the children.

Table 1 Number of Participants by Age (Years, Months) and Hearing Status

Age	Hearing Status	
	Deaf	Hearing
1,2 to 1,6	0	4
1,7 to 1,11	0	4
2,0 to 2,4	1	4
2,5 to 2,9	1	4
2,10 to 3,2	3	4
3,3 to 3,7	4	4
3,8 to 4,0	4	0
4,1 to 4,5	2	0
4,6 to 4,10	3	0
4,11 to 5,3	4	0

could produce only a few spoken words or holophrases and did not combine words productively. None of the children exhibited any abnormalities in cognitive development. All four children came from working-class families with native English-speaking parents.

The hearing English-speaking comparison group data were collected in a cross-sectional study designed to capture the onset and acquisition of the types of displaced reference reported in the literature. Participants included four children, two girls and two boys, at six points in development (ages 1,4, 1,9, 2,2, 2,7, 3,0, and 3,5). These ages were chosen to span the reported onset of reference to nonvisible objects (1,4 to 1,5), to immediate past and future (1,8 to 1,10), to remote past and future (1,10 to 2,5), and to hypothetical reference (2,7 to 3,3). Where possible, the hearing children were followed longitudinally, but most children appear in the data at only one age. Thus, a total of 18 hearing children, eight girls and 10 boys, participated in the study. All the hearing children learned English from birth from native English-speaking parents and showed no delay in language development. None of the children exhibited any abnormalities in cognitive development. The socioeconomic status of the hearing children's families ranged from working class to professional. Table 1 provides an overview of the ages and hearing status of all participants.

Procedure

The children were videotaped for 1–2 hr while engaged in free play with their mothers and/or an experimenter (see Goldin-Meadow & Mylander, 1984, for a detailed description of the procedure).

Data Transcription

The speech and symbolic gestures produced by the children were transcribed from the videotapes.² Transcriptions included information about the speaker, the form of the gestures, any speech or vocalizations, whether gesture and speech co-occurred, whether gesture and speech were spontaneous or imitated, who initiated the interaction, and contextual information (see Goldin-Meadow & Mylander, 1984, pp. 15–32, for a detailed description of gesture coding and how meaning is assigned to gestures).

Consecutive utterances with the same communicative goal were grouped into topics. For example, if a child wanted mother to open the Play-Doh, all consecutive requests were considered part of this single topic. If the child then called attention to the Play-Doh or asked mother to make something with the Play-Doh, this was considered a new topic. Topics were selected as the unit of analysis instead of utterances for calculating the frequency and initiation of displaced reference because the deaf children had to repeat themselves more often than the hearing children due to communication breakdown. We did not want to risk inflating the results by including these repetitions. Utterances were the unit of analysis only for investigating linguistic devices for marking displaced reference.

The deaf children's communications were composed almost entirely of gesture (94%, $n = 2,713$ utterances). When they did speak, they often imitated their caretakers (51%, $n = 162$ utterances). Spoken imitations, as well as all gesture imitations, were not included in the analyses. The hearing children depended primarily on speech to communicate (96%, $n = 2,109$ utterances). Only a small proportion of the hearing children's communications were made up of gesture alone (4%, $n = 2,109$ utterances), and only once did a hearing child refer to the nonpresent with a gesture in the absence of speech (0.2%, $n = 639$).³

Data Coding

All of the spoken and gestured utterances produced during a portion of each taping session (30 min

2. The hearing children produced many more communications than the deaf children. We therefore coded an hour of interaction for the deaf children, but only a half hour of interaction for the hearing children. As a result, all data are reported in proportions.

3. The hearing child was looking at a picture of a pig whose hat had been blown off by the wind. The child was asked, "Where does the hat go?" He responded by pointing to the head of the pig. This response was coded as an example of reference to a nonpresent characteristic of an object (in particular, reference to the typical location of the hat).

for the deaf, 10 for the hearing) were transcribed; this enabled us to analyze the relation between communication about nonpresent topics and communication about all topics. For the remainder of the session (another 30 min for the deaf, and another 20 for the hearing, see n. 2 above), we transcribed only those spoken and gestured utterances that referred to the nonpresent. The displaced communication from the entire session was used to investigate patterns of topic initiation and linguistic devices. A total of 4,603 utterances (displaced and nondisplaced) were transcribed from the videotapes. After repetitions and ambiguous utterances were removed, the database for the homesigning children included 2,417 utterances (1,788 topics), and the database for the hearing children included 1,722 utterances (1,324 topics).

Coding Displaced Communication

It is important to point out that the single term "displaced reference" is used to describe a range of communicative behaviors that differ enormously in the demands placed on the child—from requesting a bottle (ca. 14 months, Bruner et al., 1982) to remarking that the baseball game wouldn't have been cancelled if it hadn't rained yesterday (ca. 36 months or later, Kuczaj & Daly, 1979). The breadth of behaviors considered to constitute displaced reference makes it a topic that is difficult to study within a single experimental paradigm. This may be the reason that most studies of displaced reference investigate the development of a domain of reference that is narrowly defined, such as requesting (Bruner et al., 1982), hypothetical reference (Cromer, 1974; Kuczaj & Daly, 1979), or talk about the past (e.g., Eisenberg, 1985; Fivush, 1991). There are a few studies that describe displaced reference more generally (Lewis, 1934; Lucariello & Nelson, 1987; Sachs, 1983). However, even these studies tend to focus primarily on reference to the past and future. This tendency to focus on a subdomain of displaced reference rests on the assumption that the chosen domain is a category of reference that is distinct, not only in the mind of the scientist but also in the mind of the child. We felt it premature to make such an assumption for our population and have avoided doing so by including all of the child's communications that did not refer to perceptible information in the immediate environment.

The following definition of displaced reference, based in part on Hockett's (1960) description of the design features of language, was used: Any utterance that directs the interlocutor's attention to some information that is not perceptible in the environment

of the communicators is displaced. We further classified utterances according to whether the displacement was spatial, temporal, or both and whether the displacement was proximal or distal (see Morford, 1993, for a full explanation of displacement categories). These finer categories cohered into three broad categories of displacement that could be distinguished developmentally in both gestural and spoken communication (as described in the "Results" section).

Reliability

One of the authors (JM) transcribed and coded all of the data with the exception of a portion of the homesign sessions that had previously been transcribed. A second coder independently analyzed a subset of the homesigning children's and the hearing children's data. Interrater agreement for dividing the data into utterances was .80 ($n = 94$) for the homesigning children and .88 ($n = 304$) for the hearing children. Cohen's kappa coefficients (Cohen, 1960) were calculated for all other coding decisions to determine the level of agreement after chance agreement had been excluded. The reported kappas differed significantly ($p < .01$) from the expected values for all coding decisions. The proportion agreement and the kappa for each decision are as follows: for grouping the utterances into topics for the homesigning children (.94, .82) and for the hearing children (.91, .84); for distinguishing between communication that was displaced and communication that was not displaced for the homesigning children (.88, .76) and for the hearing children (.83, .63); for determining who had initiated displaced reference for the homesigning children (.91, .65) and for the hearing children (.91, .81).

RESULTS

We begin by comparing the proportion of all communication in the deaf and hearing children that is displaced and describing its development in terms of three categories of displacement. Next, we describe the initiation patterns for communication about the nonpresent in each group. Finally, we review the devices used by the deaf children to mark displacement in their communication.

Figure 1 provides a comparison of the use of displaced reference by the deaf homesigners and the hearing English speakers. The figure presents the proportion of all topics that included at least one utterance referring to the nonpresent. Although both groups of participants increased their communica-

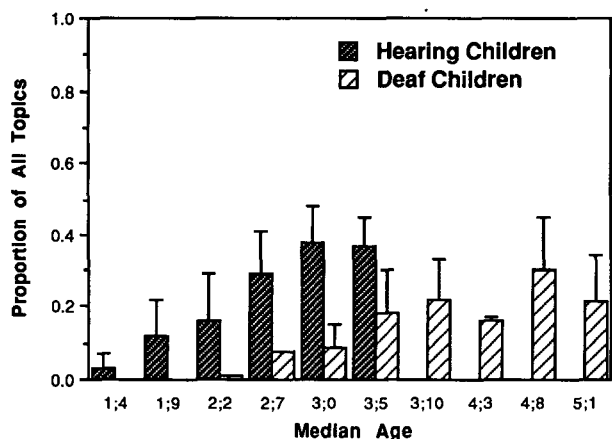


Figure 1 Mean proportion of all topics that were displaced produced by the hearing and deaf children at each observation session. The ages marked on the figure represent the median age for each of the 4-month observation periods.

tion about nonpresent topics over time, there are striking differences. First and foremost, at the four ages where there are data for both groups of participants (2;2, 2;7, 3;0, 3;5), a much *smaller proportion* of communication refers to the nonpresent for the homesigning children than for the hearing children. This finding indicates that although the homesigners were able to refer to the nonpresent, they did so much less often than did the hearing children. Second, the data in Figure 1 suggest that there is a *delay in the onset* of displaced reference in the homesigning children. We return to this point later.

In terms of analyses within each individual child, all four homesigners referred to the nonpresent with their gestures, and all four increased the frequency of their displaced communication over development. However, there was considerable individual variation in the use of displaced reference across the four children. Abe referred to the nonpresent in none of his communication at age 2;2, and in only 14% of his communication by age 5. Kathy and Marvin produced displaced reference somewhat more, starting at 0% and 9%, respectively, at age 3;0 and increasing to 18% and 33% between the ages of 4;8 and 5;1. David was the only homesigner who used displaced reference proportionally as often as the hearing children. He referred to the nonpresent in 11% of his communications at around age 3;0 and increased that percentage to between 37% and 43% after the age of 3;11.

We turn next to an analysis of the *types* of displaced reference that the children displayed in their communications. Displaced utterances were grouped

according to the type of displacement (e.g., spatial or temporal, proximal or distal). Combinations of these features allowed us to distinguish three broad categories of displaced reference based on characteristics independent of the linguistic form of the utterance (see Morford & Goldin-Meadow, in press, for more detailed information on and examples of the coding categories). Figure 2 presents the proportion of topics containing displaced communication that the deaf (right graph) and hearing (left graph) children produced, divided into (1) references to nonpresent objects, actions, attributes, or locations (dark bars), (2) references to proximal events (hatched bars), and (3) references to distal and nonactual events (white bars). In the next sections, we examine the onset and amount of communication devoted to each of these three categories of displacement.

Reference to Nonpresent Objects, Actions, Attributes, or Locations

In their earliest references to the nonpresent, both the deaf and hearing children referred to nonpresent objects, actions, attributes, or locations. In these utterances, the children demonstrated the ability to refer to what they knew about an object or action—and were not limited to what was currently visible. For example, a hearing child once said, "This is for looking with," when her mother handed her a toy mirror, thus referring to an action that is typically done with the object, despite the fact that the foil covering on the toy mirror did not actually allow the child to see her reflection. One of the deaf children (Marvin) made this type of reference while looking at a picture of a football. He gestured, "Index [picture of football]—Index [rubber ball]—KICK" (see Appendix for a description of the homesign notation system); he had thus commented on a characteristic action (which was not taking place in the situation) of the two objects.

In order not to inflate our estimates of the children's abilities, we were conservative in crediting children with this first type of displaced reference. It was not sufficient for the utterance merely to refer to the absence of the object, action, or characteristic. Rather, the child's gesture or speech had to reflect knowledge that the child had about the nonpresent object, action, or characteristic. For example, when David was searching for a toy crown and produced a shrug with upturned hands (WHERE), the gesture was not considered an instance of displaced reference because the gesture, although indicating that he did have an object in mind, did not provide information

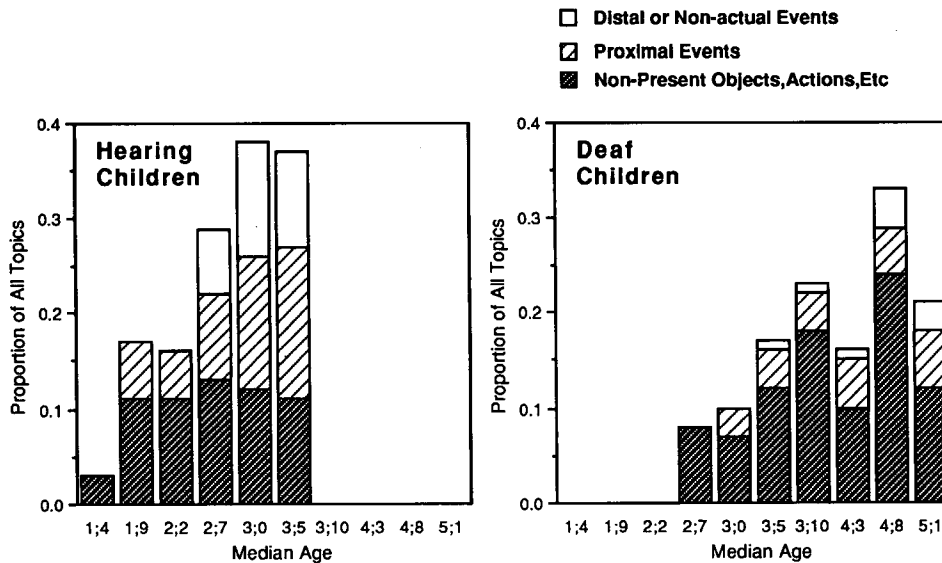


Figure 2 The proportion of all displaced topics that the hearing and deaf children produced at each observation session, categorized according to type of reference: (1) reference to nonpresent objects, actions, attributes, or locations; (2) reference to proximal events; or (3) reference to distal or nonactual events. The ages marked on the figure represent the median age for each of the 4-month observation periods.

specifying the missing object. In contrast, when he patted the top of his head (thus indicating the habitual location of the nonpresent object) along with the WHERE gesture, the gestured utterance was classified as an instance of displaced reference. Note that the criteria we have established for this first type of displaced reference include utterances referring to objects that are present in the room as long as the utterance refers to a nonpresent characteristic of the present object (e.g., when Marvin was looking at Dumbo the elephant whose large ears give him the ability to fly, he pointed to his ear and gestured FLAP; this gestured utterance was considered displaced because it referred to a flying action that was not currently taking place and thus was nonpresent). In general, to produce an instance of this first type of displaced reference, the child must attempt to communicate information which in some way goes beyond what is perceptible in the present context.

The hearing children first referred to nonpresent objects, actions, attributes, or locations at 1;4, the earliest age we observed them (see the dark bars in Figure 2; the ages indicated on the graphs represent the median age of the children included in each observation period, see Table 1). The deaf children first referred to nonpresent objects, actions, attributes, or locations at age 2;7, more than a year after the hearing children were doing so. They then steadily increased their use of this type of displaced reference and, by

age 3;5, were using it proportionally as often as the hearing children.

Reference to Proximal Events

Both groups of children also referred to events that took place prior to or after the communicative act but still during the observation session, that is, they referred to proximal events. For example, after blowing a large bubble, one of the deaf children (Abe) pointed at the bubble jar and used two open palms, with his fingers spread, to indicate an expanding bubble (EXPAND). As a comparable example in speech, a hearing child said, "See, I flipped over," immediately after doing a flip on the couch. Particularly for the homesigners, referring to their own actions was an important development in contrast to previous communication strategies (e.g., waving a hand so that caregivers would watch them engage in an action or showing the outcome of their actions to a caregiver, such as a picture or a broken toy). This second type of displaced reference differs from the first in that the child describes an entire, specific event rather than a piece of an event—that is, an entire event rather than an isolated object, action, or property. Nevertheless, the event described, although not actually occurring at the moment the utterance is produced, is still very much tied to the present context. Reference to proxi-

mal events might thus serve as a transitional step in developing the ability to refer to more distant events.

The hearing children first referred to proximal events (the hatched bars in Figure 2) at 1;9, but the deaf children did not begin until 3;0.⁴ Again, there is an increase in the use of this type of displaced reference over time. However, the increase was much slower for the deaf children than for the hearing children. Even by 5;1, the deaf children referred to proximal events only half as often as the hearing children referred to proximal events at 3;0.

Reference to Distal or Nonactual Events

In this final type of displaced communication, the child referred to an event in the past, an event in the future, a potential event, or a fantasy event. An example of this type of reference occurred when a hearing child said, "And after three, I'm going to be four," when the experimenter asked how old she was. One of the deaf children (David) used this type of reference to indicate that, in preparation for setting up the cardboard chimney for Christmas, the family was going to move a chair downstairs. He gestured, "Index [chair]—MOVE AWAY—MOVE AWAY. Index [chair]—Index [downstairs]. CHIMNEY. MOVE AWAY [chair/table]—MOVE HERE [cardboard chimney]." Examples of reference to distal and nonactual events provide particularly striking evidence of the homesigners' ability to think and communicate about the nonpresent. However, they were relatively rare in comparison to the first two categories of displaced reference.

The hearing children began referring to distal and nonactual events (the white bars in Figure 2) at 2;7. The deaf children began at 3;5, again, over a year later than their hearing counterparts. As in reference to proximal events, although the deaf children increased their references to distal and nonactual events over development, the increase was much less substantial than in the hearing children. Moreover, only David ever made reference to future and hypothetical events along with his references to past and fantasy. Interestingly, David was also the child who referred to displaced topics proportionally as often as the hearing children. Two deaf children, Marvin and Kathy, referred only to past and fantasy events, and these children were intermediate in their fre-

quency of displaced reference. Abe, who referred to only one type of distal event (the past), communicated about displaced topics the least of all four deaf children.

In sum, there were important differences between the groups in the developmental onset and relative amount of each type of displaced reference. The deaf children were considerably older than the hearing children when they began referring to each of the three categories of displaced reference. Moreover, the even distribution across the three different types of displaced reference evident relatively early in the hearing children was not found in the deaf children at any point in our observations. Once the hearing children began making all three types of displaced reference (i.e., from age 2;7 on; see the left graph of Figure 2), they used all three types equally often. In other words, in addition to being capable of making reference to distal and nonactual events, or to the immediate past and future, the hearing children did in fact refer to these topics as often as they referred to nonpresent objects and actions. In contrast, even after the deaf children began making all three types of displaced reference (i.e., from age 3;5 on; see the right graph of Figure 2), most of their communication about the nonpresent continued to be references to nonpresent objects, actions, attributes, or locations. Thus, one of the primary differences between the two groups is that, when children engage in communication about the nonpresent with their caretakers, children acquiring a conventional language discuss a broad range of displaced topics, including categories of reference that are truly distant from the here and now. In contrast, children who are not acquiring a conventional language, although capable of truly displaced reference, communicate primarily about topics that are only slightly removed from the present. These findings suggest that the farther the intended message is from the present, the more important a shared lexicon becomes.

Developmental Consistency Within and Across Children

Despite the differences in the onset and frequency of displaced reference, the path of development for the two groups of children was remarkably similar. Note in Figure 2 that, for both the deaf and hearing children, the onset of reference to nonpresent objects, actions, attributes, or locations preceded the onset of reference to proximal events which, in turn, preceded the onset of reference to distal or nonactual events (i.e., for both groups, the black bars appeared at an

4. Two of the four deaf children referred to nonpresent objects, actions, attributes, or locations in their first taping sessions (at age 2;10 and 2;11), and one of those two referred to proximal events in his first taping session (at age 2;10). We therefore cannot be certain that we observed the first production of these types of displaced reference in these two deaf children.

earlier age than the hatched bars which, in turn, appeared at an earlier age than the white bars).

This phenomenon appears to be particularly robust, as each individual child in the deaf sample, as well as the grouped data in the hearing sample, conformed to this developmental pattern. Among the deaf children, Kathy first referred to nonpresent objects, actions, attributes, or locations at age 3,4, to proximal events at 3,6, and to distal and nonactual events at 4,0. Comparable onset ages were 2,5, 2,10, and 3,7 for Abe, and 2,11, 3,1, and 3,9 for Marvin. David referred both to nonpresent objects, actions, attributes, or locations and to proximal events in his first session at 2,10 but did not begin to refer to distal or nonactual events until 3,3. Although we did not have longitudinal observations on most of the hearing children, we could calculate how many of the 24 cross-sectional observation sessions were consistent with this particular developmental pattern. In fact, we found that all 24 sessions conformed to the pattern. In three sessions, the children produced none of the three forms of displaced reference. In two sessions, the children referred to nonpresent objects, actions, attributes, or locations but to no other events. In seven sessions, the children referred to proximal events and to nonpresent objects, actions, attributes, or locations but did not refer to distal or nonactual events. Finally, in the remaining 12 sessions, the children produced all three types of displaced reference. In none of the 24 observation sessions did a child refer to distal or nonactual events without also referring to the other two types of displaced events, and in none of the sessions did a child refer to proximal events without also referring to nonpresent objects, actions, attributes, or locations. Thus, there were no individual violations of the developmental pattern evident in the grouped data in Figure 2, analyzed either by child or by session.

It is particularly striking that the two groups of children began referring to proximal events after they first referred to nonpresent objects, actions, attributes, or locations. Previous studies of reference to proximal events have suggested that children do not distinguish these events temporally from the present in their earliest communicative acts (Antinucci & Miller, 1976; Bloom, Lifter, & Havitz, 1980; Bronckart & Sinclair, 1973; but see also Weist, 1989, who argues that children acquiring Slavic languages encode temporal deixis as early as 1,6 to 2,0). However, this type of communication does demonstrate an ability to communicate about actions independently from partaking in those actions. The onset data presented in Figure 2 suggest that acquiring this ability is a developmental step for the child. Moreover, this devel-

opmental step appears to be one that the child can take even if not exposed to a conventional language model.

Who Initiates Displaced Reference—Caregiver or Child?

The second analysis investigates whether caregivers elicited most of the displaced communication observed in the deaf and hearing children. Perhaps some of the differences between the deaf and hearing children noted thus far can be accounted for by differences in caregiver behavior. As noted above, many studies have found that caregivers play an important role in scaffolding early talk for their children, particularly about the past (Eisenberg, 1985; Fivush & Fromhoff, 1988; Miller & Sperry, 1988; Stoel-Gammon & Cabral, 1977).

We suspected that the caregivers of the deaf children might not play an active role in initiating displaced communication because they typically addressed their children in speech and their children had little access to information in the auditory modality. Topic initiation was only coded for caregiver-child interactions in which the child participated. Thus, for both the deaf and hearing children, when the caregivers introduced displaced topics through speech to which their children did not respond, these topics were not included in the corpus. In essence, the data are coded from the perspective of the child. Rather than reflecting all attempts by caregivers to communicate with their children, the analysis reflects the actual communication that takes place between children and their caregivers.

At times, the caregivers did succeed in introducing displaced topics to their deaf children through combining their speech with a variety of contextual and pragmatic cues, such as showing the child a picture or reenacting a well-known behavioral routine. For example, Marvin's mother held up a picture of a policeman, and Marvin responded by pointing in the direction of the home of a friend whose father was a policeman. In a second example, David's mother introduced a fantasy topic one day while David was playing with a toy school bus. As David manipulated the Fisher-Price people onto the bus, his mother got his attention and started asking, "Where's David?" She then waved and said "Good-bye," just as she did when he left on the school bus each morning. David proceeded to set up a scene with the toys that represented his home, his school, and his friends' homes, narrating his play in gesture as he proceeded. When his mother tried to intervene in the play a second time, David shook his head and gestured to her, "In-

Table 2 Proportion of Displaced Topics Initiated by the Adult Caregivers Interacting with the Deaf or Hearing Children

Type of Displacement	Caregivers of Deaf Children	Caregivers of Hearing Children
Nonpresent objects, actions, attributes, or locations	.08	.29
Proximal events	.07	.15
Distal or nonactual events	.11	.40
Past	(.18)	(.62)
Future	(.00)	(.33)
Potential	(.00)	(.35)
Fantasy	(.25)	(.38)
Mean across categories	.09	.28

Note: The number in each cell represents the average proportion of each type of displaced communication that the adult caregivers initiated when interacting with the deaf children or the hearing children. All four dyads contributed to each of the three proportions for the deaf children; 14 dyads contributed to the proportion for nonpresent objects, actions, attributes, or locations; 13 contributed to the proportion for proximal events; and 10 contributed to the proportion for distal or nonactual events in the hearing children. The proportion of reference to distal or nonactual events is broken down into four subcategories: past, future, potential, and fantasy.

dex [toys]—SMALL—Index [Mother]—BIG—Index [self]—BIG," conveying the idea that she and he were too big to participate in the play themselves, but he found a Mickey Mouse doll to represent her and then pointed back and forth to her and to the doll. As he continued his play, he indicated in gesture that the doll representing his mother was waving goodbye to the toy children on the bus. These examples illustrate how the deaf children's caregivers could introduce displaced topics without depending on speech.

Although we expected that the caregivers of the homesigning children might initiate less displaced communication than their children, we were surprised to find that this pattern held for both groups. On average, the caregivers of the deaf children initiated only 9% and the caregivers of the hearing children initiated only 28% of the communication about the nonpresent in which their children participated (see Table 2, mean across categories).

The caregivers of the hearing children initiated displaced communication most often when talking about distal and nonactual events, peaking when they talked about the past. Indeed, they initiated talk about the past more than half of the time (62%, see Table 2), a result that replicates previous findings in the literature (Eisenberg, 1985; Stoel-Gammon & Cabral, 1977). It is frequently assumed that caregiver initiation patterns with respect to talk about the past reflect the caregiver's role in displaced talk more generally—that is, that parents are the primary initiators not only of talk about the past but of all talk about the nonpresent. However, our findings call this as-

sumption into question. Reference to the past appears to be somewhat unique in that it is one of the few types of displaced reference that parents initiate more often than their children.

Turning to the caregivers of the deaf children, we found that, even for the subcategory of reference to past events, these caregivers initiated communication much more rarely than their children (18%, see Table 2). Although this is well above the general level of initiation by these caregivers (9%), it is also strikingly different from—and lower than—the initiation level of the caregivers of the hearing children.⁵ The low rate at which the caregivers of the deaf children initiated communication about the past and other distal and nonactual events may not have been sufficient to sustain continued communication about such events in their deaf children. This pattern of initiation explains, in part, the lower relative frequency of communication about distal and nonactual events observed in the communication of the deaf children despite their demonstrated ability to refer to the distant nonpresent.

Devices for Evoking the Nonpresent

If it is children, and not adults, who initiate communication about the nonpresent most often, it is important to consider how they are able to evoke the

5. Deaf caregivers of deaf children exhibit similar "scaffolding" behaviors as have been documented in hearing caregivers of hearing children, for example, by simplifying their language when addressing their children and by regulating attentional control (Kantor, 1982).

nonpresent in the minds of their interlocutors. The hearing children were obviously acquiring linguistic devices from their caregivers and from other language models; thus, once acquired, these conventional linguistic devices could be used by the hearing children to mark temporal and spatial displacement. The question of interest was how the deaf children managed to evoke in their communication partners the message they intended to convey when that message was displaced. To address this question, we first determined whether an utterance included an explicit marker of temporal or spatial displacement. To do so, the transcription of an utterance was read out of context. If the utterance could only be interpreted as referring to the nonpresent, we searched for the explicit gestural marker within the utterance that was used to signal displacement (e.g., a marker for the past). All utterances that did not contain explicit markers were then classified as exploiting pragmatic or implicit means to refer to the nonpresent. These utterances were analyzed in context to determine the device(s) that had permitted the utterance to be interpreted as a reference to the nonpresent.

We turn first to the generation of explicit markers of displacement, which represent the strongest evidence of linguistic invention by the homesigning children. Two of the four homesigners generated explicit displacement markers that were novel gestures, and all four homesigners appropriated conventional gestures from their caregivers but modified the gestures' meanings so that they functioned as displacement markers.

Explicit Devices

Novel gestures. Two of the homesigners generated novel gestures that they used in references to the nonpresent. These gestures are considered novel because the caregivers were never observed to use them.⁶ Moreover, the two displacement markers and their meanings were each unique, suggesting that they were independently generated by the two children (who, in fact, lived in different cities and did not know one another). The evidence for one of the two gestures is very limited. Marvin produced a gesture that clearly referred to the past, but we observed it only once during our taping sessions. This gesture occurred while he was looking at flashcards with his mother. When he saw a picture of a poodle, he showed it to his mother with a look of excitement and recognition. His mother responded, "That's right. We

used to have a gray poodle, huh?" Marvin then pointed over his shoulder behind himself, pointed to the picture, and finally pointed to the floor in front of himself repeatedly. The point over his shoulder was apparently in reference to the past.

The evidence for the second novel displacement marker is stronger. David produced a gesture eight times to refer to both remote future and remote past events, such as needing to repair a toy (Future) and having visited Santa (Past). The gesture was made by holding the hand vertically near the chest, palm out, and making an arcing motion away from the body. David's caregivers glossed this gesture as AWAY, as though it referred to spatially remote occurrences. In fact, the events David described with this gesture were all both spatially and temporally displaced. There are no examples of this gesture in reference to objects that were spatially displaced but not temporally displaced; thus we believe that the gesture refers to a combination of spatial and temporal displacement but not to spatial displacement alone.

Conventional gestures. In addition to the two novel gestures, the deaf children used two other explicit displacement markers that they appropriated from conventional gestures used in U.S. American culture. (1) Three of the four homesigners (Abe, David, Kathy) modified a conventional gesture that is typically used in the United States to express doubt or uncertainty. The gesture is made by holding both hands out to the sides and then flipping the hands from palm down to palm up; the hand movements are often accompanied by a shrug of the shoulders. In addition to using the gesture for its conventional meaning, the deaf children also used the gesture to signal nonvisible objects. When used in this context, the gesture conveys the meaning WHERE. (2) Three of the four homesigning children (David, Marvin, Kathy) used a second conventional gesture which we glossed as WAIT. This gesture is formed by holding up the index finger and is often used in the United States to request a brief delay or time-out. In addition to using the gesture for this conventional meaning, the deaf children also used the gesture to identify their intentions, that is, to signal the immediate future.

Not surprisingly because the WHERE and WAIT gestures are commonly used in the United States, the caregivers of the deaf children also used these two gestures and did so during the first taping sessions we have on record. To investigate whether the children had learned to use these two gestures to signal displaced reference from their caregivers, we compared the instances in which the children used the gestures to the instances in which the caregivers used the gestures.

6. Of course, the homesigners generated many other novel gestures. We focus on these two in particular because they were used to mark a temporal relation.

Focusing first on the WHERE gesture, we found that the children's caregivers never used this gesture to request nonvisible objects. In the sample of interactions coded for this analysis, the three caregivers (whose children used the WHERE gesture) produced the WHERE gesture 41, 48, and 23 times; not once did any of the three caregivers use the gesture to refer to nonvisible objects. They did use the gesture to express doubt and uncertainty but not in terms of nonvisible objects. For example, one caregiver produced a WHERE gesture while asking the child how many books were in a pile. The caregivers typically produced the WHERE gesture in isolation, that is, not combined with other gestures; each of the three caregivers combined the WHERE gesture with a point only once (e.g., one caregiver combined the WHERE gesture with a point to an orange card to request that the child identify the orange objects in the room) and they never combined it with iconic gestures.

In contrast, the deaf children did use the WHERE gesture to request nonvisible objects and did so by combining the gesture with both pointing and iconic gestures. Abe used the gesture to signal nonvisible objects four times (out of the 90 times he used the gesture in this sample), David used the WHERE gesture to signal nonvisible objects 11 times (out of 173), and Kathy used it to signal nonvisible objects nine times (out of 39). For example, Kathy was looking at flashcards and saw a picture of a fish. Later, when looking at a book, she saw another picture of a fish, which prompted her to combine a point to the picture in the book with the WHERE gesture to request that the experimenter help her find the original flashcard with the fish. In another example, Kathy combined an iconic gesture for MICROPHONE with the WHERE gesture to request that the cameraperson find and give her the microphone.

Turning next to the WAIT gesture, we found that the children's caregivers did not use this gesture to signal immediate future, even though their children did. In the sample of interactions coded for this analysis, the three caregivers (whose children used the WAIT gesture) produced the WAIT gesture 20, 8, and 13 times; not once did any of the three caregivers use the gesture to refer to the immediate future. Rather, the caregivers used the gesture to get the child's attention before demonstrating how the child should say a word, or how the child should perform an action. The speech that most often accompanied this gesture was "watch" for two of the caregivers and "wait" for the third caregiver. For example, one caregiver produced the WAIT gesture in combination with a point to a dog that she wanted the child to look at. Another caregiver produced the gesture in combination with an iconic gesture meaning STOP to

halt the child's actions. However, the caregivers did not use the WAIT gesture, either in combination or in isolation, to refer to actions they were about to perform.

In contrast, the deaf children did, at times, use the WAIT gesture, either alone or in combination with other gestures (often points at themselves and points at the objects they intended to manipulate or places they intended to go to) to signal an action that the child was about to take. Kathy used the WAIT gesture to signal the immediate future 12 times (out of the 41 times she used the gesture in this sample), David used the gesture to signal the immediate future once (out of 15), and Marvin used it to signal the immediate future three times (out of 27). For example, Marvin gestured WAIT and then pointed at the toy-bag to indicate that he was going to go retrieve a new toy. Again, we find that, although the homesigners used the same gesture form as their caregivers, they modified the use of the gesture to express information about the nonpresent.

Three of the four deaf children arrived at the same meanings for the WHERE and WAIT gestures, meanings that were different from those used by their caregivers. The fact that three children independently developed similar means of marking reference to the nonpresent is strong evidence that the deaf children's gestures originated in the conventional gestures used by their hearing parents and the hearing culture at large—given similar starting points, the deaf children arrived at similar markers for signaling the nonpresent (and did so despite the fact that their caregivers did not use these gestures to signal the nonpresent). However, note that even though all four of the deaf children were exposed to these conventional gestures, in each case, only three of the four modified the gesture for an alternative use (in each case, the fourth child used the gesture but did not use it to signal the nonpresent). Thus, the presence of a conventional gesture in a deaf child's environment is no guarantee that the child will appropriate that gesture and use it to mark displaced reference. However, if the child does appropriate the gesture, its derived meaning is likely to be constrained by the semantic starting point given it by the culture at large; as a result, the derived meaning is likely to be similar across all children.

The explicit devices described here were used in only a small proportion of the topics referring to the nonpresent (5%, $n = 556$). We now turn to the question of how the homesigners were able to refer to the nonpresent if they did not make use of an explicit marker. There were five strategies used for this purpose, each of which exploited pragmatic means to evoke the nonpresent: labeling, indicating multiple

constituents, nonliteral pointing, nonliteral inflection, and juxtaposition.

Implicit Devices

Labeling. In most cases in which the homesigners wished to communicate about the nonpresent, they simply produced a descriptive gesture to label an action, an object, an attribute, an agent, or an event outcome that was not presently located or occurring in the room. This was possible to the extent that the homesigners were able to provide labels for these entities. For example, Marvin was able to request an object that was not in the room by gesturing DRINK and pointing to the kitchen, and David was able to explain why his mother brought the dog inside when the milkman arrived by pointing at the dog, pointing outside, and then gesturing BARK. Note that in order for this strategy to be effective, the child's label had to be transparent enough for the conversational partner to understand its significance. All four of the deaf children used labeling to refer to the nonpresent and did so on an average of 74% of the occasions that they used implicit strategies to refer to the nonpresent (52% for Abe, 83% for David, 65% for Kathy, and 78% for Marvin).

Indicating multiple constituents. In a few cases, the children identified an event that was not occurring in their environment, not by labeling a piece of the event with an iconic gesture, but by pointing to at least two (present) constituents of the event (including the agent, the patient, and/or the location). For example, to comment on the fact that she had blown some bubbles, Kathy pointed to several bubbles and then proudly pointed to herself repeatedly. All four of the deaf children indicated multiple constituents to refer to the nonpresent and did so on an average of 7% of the occasions that they used implicit strategies to refer to the nonpresent (10% for Abe, 2% for David, 8% for Kathy, and 6% for Marvin).⁷

Nonliteral pointing. An alternative implicit strategy that the deaf children used to convey nonpresent objects was nonliteral pointing (see Butcher et al., 1991). The points used by the homesigners did not always refer to the object or locus at the end of their point. Rather, the child often intended to refer to an associated object, agent, or location. Specifically, the children pointed (1) to present objects to refer to perceptually similar objects, (2) to present locations to refer to an agent or object associated with that location,

and (3) to present locations where an event was about to occur or where an event had already occurred. In addition, the children often pointed to pictures to refer to a real object. All four of the deaf children used nonliteral points to refer to the nonpresent and did so on an average of 20% of the occasions that they used implicit strategies to refer to the nonpresent (19% for Abe, 19% for David, 25% for Kathy, and 17% for Marvin).

Nonliteral inflection. A related implicit strategy involved inflecting iconic gestures toward present objects that represented nonpresent objects. Verb inflection in conventional signed languages (Padden, 1983) and in homesign (Goldin-Meadow et al., 1994) is performed by transposing the sign or gesture from its typical location (often neutral signing space directly in front of the signer) to another location. For example, in homesign, a TWIST gesture can be combined with a point to a jar, or, alternatively, the TWIST gesture can be produced over or near the jar to communicate a request that the jar be opened. Inflection was sometimes used by the homesigners to refer to performing an activity, not on the object near which the gesture was performed, but on a similar and nonpresent object. For example, Marvin inflected the gesture EAT (he produced the gesture near a picture of gumdrops) to indicate that he likes to eat real gumdrops, and Abe inflected the gesture HOT (he produced the gesture near an unlit candle) to indicate that, when lit, candles can be hot (see also Butcher et al., 1991). All four of the deaf children used nonliteral inflection to refer to the nonpresent and did so on an average of 3% of the occasions that they used implicit strategies to refer to the nonpresent (6% for Abe, 2% for David, 3% for Kathy, and 2% for Marvin).

Juxtaposition. The final implicit strategy observed in the homesigners' communication, juxtaposition, was used only by David to refer to potential events. To show the contingency of two events, David juxtaposed two situations in which a single element had been altered or negated. For example, to express the idea that you could not see a toy if you did not remove a part of the packaging, he gestured looking at the toy with the packaging (and squinted his eyes to show that he could not see) and then looking at the toy without the packaging (opening his eyes wide to show that he was able to see). In this way, he could demonstrate the contingency between the presence of the packaging and the ability to see the toy. As mentioned above, only David used juxtaposition to refer to the nonpresent, and he did so on 2% of the occasions that he used implicit strategies to refer to the nonpresent.

In sum, we have identified four explicit devices for marking displaced reference, including two novel

7. At times, the children used more than one implicit device within a single displaced utterance; as a result, the percentages across the five types of implicit devices sum to more than 100% for each of the four children.

gestures and two gestures appropriated from the conventional gestures used by the hearing caregivers and modified in meaning. We have also identified five implicit devices for marking displaced reference, including labeling nonpresent entities, indicating multiple constituents of a nonpresent event, nonliteral points, nonliteral inflection, and juxtaposition. Note that our findings are not exhaustive because there may be patterns in the data that we have not yet discovered, and there may be systematic uses of other parts of the body that we have not coded. For example, facial expression and eye gaze play a very important role in ASL and may well be used to signal meaning in the homesigners' gestures as well. However, the devices we have described provide a basis for understanding how it is possible for individuals who do not share a historically evolved linguistic code to introduce displaced topics in their communication.

DISCUSSION

The population we study provides a rare opportunity to observe the extent to which a child can develop an effective communication system when the environment does not provide a linguistic model. In this article, we have described how children approach the task of referring to nonpresent objects and events when the linguistic input they receive is inadequate to provide a model for that purpose. We find that deaf children who communicate via homesign make displaced reference in one of three ways: (1) by generating their own novel markers for the nonpresent, (2) by modifying the context in which conventional gestures (e.g., shrugging, holding up a finger to mean "wait") are used, and (3) by exploiting pragmatic devices to evoke the nonpresent in the minds of their conversational partners.

This study provides evidence that children are able to refer to the nonpresent despite degraded linguistic input. Furthermore, there are striking parallels in the development of displaced reference in children who have, and children who do not have, a language model. In particular, despite variation in the onset and frequency of reference to the nonpresent, we found that the ability to refer to the nonpresent emerged gradually rather than all at once for both groups of children. The patterns in the data led us to define three broad categories of displaced reference, each category more abstract than the previous and appearing at a later point in development. (1) The earliest type of displaced reference involves communication about nonpresent objects, actions, attributes, or locations. In this type of communication, children

express knowledge that they possess about objects that is not perceptible to them. (2) The second type of displaced reference to emerge is reference to proximal events. In this type of reference, children either anticipate what will happen next in a situation and express that anticipation verbally or gesturally before the event occurs (particularly in reference to their own intended actions), or they refer to events that have just occurred, most often commenting on the outcomes of their own actions. Thus, with this type of communication, we can observe the child's emerging ability to plan and assess his or her own behavior through language. (3) The third type of displaced reference to emerge is reference to remote past and future, hypothetical and fantasy events. This type of communication constitutes what is typically understood by the term "displacement." Because the developmental progression of these three types of displaced reference was evident in the deaf children as well as the hearing children, we can hypothesize that the types of displaced reference themselves, and the order in which each type appears in development, are not driven by linguistic input and may well be driven by conceptual development.

A surprising finding is that both the deaf and hearing children actually initiated more of their communication about the nonpresent than their caregivers. We suspect that this phenomenon has gone unnoticed in previous research primarily because most studies of parental input to displaced talk in early childhood concern a subdomain of displaced reference—reference to the past—rather than including all communication that refers to the nonpresent. Conclusions from these limited studies have been generalized to the entire domain but, as we find in the current study, such generalization was perhaps premature. It is ironic, although perhaps not surprising, that the category of displaced reference that has been of most interest to adult scientists is precisely the domain of reference that adult caregivers of hearing children initiate most. We find, as others have, that parents place a priority on sharing past experiences and that they encourage this ability in their children. However, this parental drive to initiate communication is not as strong for other types of displaced reference. Thus, one of the primary tasks for future studies of displaced reference is to provide a more comprehensive analysis of how children and parents approach displaced communication when it concerns topics other than past experience.

In addition to the similarities in the two groups' development, we also find differences, both at the level of the group and at the level of the individual. The developmental differences between the home-

signers and the hearing children as groups demonstrate that even though caregivers are not initiating most communication about displaced topics, their input may influence the time course and rate of the development of displaced talk. Children acquiring English communicate about nonpresent topics approximately 1 year earlier, and at much higher frequencies, than children who use homesign. Moreover, the distribution of communication across the three categories of displaced reference indicates that the topics of communication are vastly different for children who share a language with their caregivers and for those who do not. The further a topic of communication is removed from the present, the less likely it is that a homesigner will engage frequently in that type of communication. By contrast, the hearing children engage in the three types of displaced reference with equal frequency, essentially extending the limits of their environment through language. Thus, we find that access to a conventional language model, and sharing that model, not only facilitates the onset of displaced reference but also increases the likelihood of its use in children once they begin referring to the nonpresent.

Some of the deaf children and their families appeared better able to compensate for the absence of a shared linguistic code than others. The process of referring to displaced events is negotiated and depends both on the child generating appropriate gestural symbols and on the caregiver decoding the child's gestures appropriately. When the process breaks down, it appears to break down predictably. Certain domains of displaced reference are more difficult to communicate than others and appear to be relatively fragile in these circumstances. We found that the homesigner who communicated about displaced topics the least referred only to the past and never to fantasy, hypothetical, or future events. Two homesigners were intermediate in the amount of displaced reference they produced and referred to fantasy as well as past events but did not refer to either hypothetical or future events. Only one homesigner referred to displaced topics as often as the children acquiring English; the same homesigner was the only one who referred to all four types of distal events—hypothetical and future, as well as fantasy and past. Thus, not having a language model appears to have a large and predictable impact on reference to distal and nonactual events—affecting hypothetical and future events more than fantasy, and fantasy more than past.

Several possible explanations could account for the rarity of reference to fantasy, hypothetical, and future events. Central to any explanation is the fact

that these domains of reference all entail events that have not yet happened and might never happen. Referring to these events requires more explicit information to evoke the intended event in the interlocutor's mind. It is possible that all children will produce reference to nonpresent known experience without a linguistic model, but that finding a way to refer to nonactual experience is more fragile with respect to the role of input (cf. Goldin-Meadow, 1982). One of the roles of language input may be to facilitate the child's understanding that symbols can stand for anything—not just real objects and real experiences. Further, input may be necessary for introducing ideas about the nonactual, because this is precisely the domain where children cannot draw upon their own experience.

In sum, we find that children can communicate about a wide range of nonpresent topics whether or not they have a conventional language model for doing so. In the rare event that children must generate their own symbols, they develop the ability to communicate about that which they know, but cannot perceive, in much the same way as children acquiring a conventional language. Both groups add increasingly abstract categories of displaced reference to their repertoires in the same sequence. Both groups introduce displaced topics more often than their caregivers. However, if present, a conventional language model does play an important role in the development of this language function, particularly in facilitating communication about the past and about other distal or nonactual events. Finding ready-made linguistic symbols that are part of a shared system in one's environment, instead of having to generate them oneself, appears to accelerate the developmental time course and augment the frequency of displaced communication. Thus, ready-made symbols enhance the process of making displaced reference. Nevertheless, our findings make it clear that conventional symbols of this sort are not essential for children to be able to extend their communication beyond the here and now.

ACKNOWLEDGMENTS

This research was supported by a National Science Foundation Graduate Fellowship, a grant from the Spencer Foundation, a McGill University Graduate Faculty Research grant, and a grant from the Charles Cusson Foundation to J. Morford, and by grant no. BNS 8810769 from the National Science Foundation, grant no. RO1 NS26232 from the National Institutes of Health, and a grant from the March of Dimes to S. Goldin-Meadow. We thank Martha Alibali, Boaz

Keysar, Susan Levine, Brian MacWhinney, Rachel Mayberry, and David McNeill for helpful comments on previous drafts of the manuscript, as well as Inge-Marie Eigsti and Charlene Chamberlain for help in coding the data. We are particularly grateful to the families who participated in the study.

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APPENDIX

NOTATIONAL CONVENTIONS

The following notational conventions are used to represent homesign gestures:

1. Characterizing gestures and markers are represented with English glosses in capital letters. Examples: WHERE, KNOCK DOWN

2. Pointing gestures are represented by the word "Index" followed by the name of the locus of the point in brackets. Examples: Index [self], Index [picture of balloon]

3. Characterizing gestures inflected for agent, object, or place are represented by an English gloss followed by the inflected agent, object, or place in brackets. Examples: KNOCK DOWN [tower], MOVE AWAY [chair]

4. Multiple gestures in a gesture string are separated by a dash. Examples: BLOW—Index [Mother], Index [picture of apple]—EAT

5. Multiple gesture strings are separated by periods, question marks, and exclamation points depending on the child's affect. Example: BLOW—Index [Mother]. POP—Index [self].

REFERENCES

- Antinucci, F., & Miller, R. (1976). How children talk about what happened. *Journal of Child Language*, 3, 167–189.
- Bloom, L., Lifter, K., & Havitz, J. (1980). Semantics of verbs and the development of verb inflection in child language. *Language*, 56, 386–412.
- Bowerman, M. (1981). *Notes for the Nijmegen workshop*. Max Planck Institute, the Netherlands.
- Bronckart, J. P., & Sinclair, H. (1973). Time, tense and aspect. *Cognition*, 2, 107–130.
- Bruner, J., Roy, C., & Ratner, N. (1982). The beginnings of request. In K. E. Nelson (Ed.), *Children's language* (Vol. 3). Hillsdale, NJ: Erlbaum.
- Butcher, C., & Goldin-Meadow, S. (in press). Gesture and the transition from one- to two-word speech: When hand and mouth come together. In A. Kendon, D. McNeill, & S. Wilcox (Eds.), *Gesture: An emerging field of study*. New York: Cambridge University Press.
- Butcher, C., Mylander, C., & Goldin-Meadow, S. (1991). Displaced communication in a self-styled gesture system: Pointing at the non-present. *Cognitive Development*, 6, 315–342.
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37–46.
- Cromer, R. F. (1974). The development of language and cognition: The cognitive hypothesis. In B. Foss (Ed.), *New perspectives in language development*. Harmondsworth: Penguin.
- Eisenberg, A. (1985). Learning to describe past experiences in conversation. *Discourse Processes*, 8, 177–204.
- Fivush, R. (1991). The social construction of personal narratives. *Merrill-Palmer Quarterly*, 37, 59–82.
- Fivush, R., & Fromhoff, F. (1988). Style and structure in mother-child conversations about the past. *Discourse Processes*, 11, 337–355.
- Goldin-Meadow, S. (1979). Structure in a manual communication system developed without a conventional language model: Language without a helping hand. In H. Whitaker & H. A. Whitaker (Eds.), *Studies in neurolinguistics* (Vol. 4). New York: Academic Press.
- Goldin-Meadow, S. (1982). The resilience of recursion: A study of a communication system developed without a conventional language model. In E. Wanner & L. Gleitman (Eds.), *Language acquisition: The state of the art*. New York: Cambridge University Press.
- Goldin-Meadow, S. (1987). Underlying redundancy and its reduction in a language developed without a language model: Constraints imposed by conventional linguistic input. In B. Lust (Ed.), *Studies in the acquisition of anaphora* (Vol. 2). Boston: Reidel.
- Goldin-Meadow, S., Butcher, C., Mylander, C., & Dodge, M. (1994). Nouns and verbs in a self-styled gesture system: What's in a name? *Cognitive Psychology*, 27, 259–319.
- Goldin-Meadow, S., & Feldman, H. (1977). The development of language-like communication without a language model. *Science*, 197, 401–403.
- Goldin-Meadow, S., & Morford, M. (1985). Gesture in early child language: Studies of deaf and hearing children. *Merrill-Palmer Quarterly*, 31, 145–176.
- Goldin-Meadow, S., & Mylander, C. (1984). Gestural communication in deaf children: The effects and non-effects of parental input on early language development (pp. 1–121). *Monographs of the Society for Research in Child Development*, 49(3–4, Serial No. 204).
- Goldin-Meadow, S., & Mylander, C. (1990a). Beyond the input given: The child's role in the acquisition of language. *Language*, 66, 323–355.
- Goldin-Meadow, S., & Mylander, C. (1990b). The role of parental input in the development of a morphological system. *Journal of Child Language*, 17, 527–563.
- Goldin-Meadow, S., Mylander, C., & Butcher, C. (1995). The resilience of combinatorial structure at the word level: Morphology in self-styled gesture systems. *Cognition*, 56, 195–262.
- Hockett, C. (1960). The origin of speech. *Scientific American*, 203, 88–96.
- Kantor, R. (1982). Communicative interaction: Mother

- modification and child acquisition of American Sign Language. *Sign Language Studies*, 36, 233–282.
- Kuczaj, S., & Daly, M. (1979). The development of hypothetical reference in the speech of young children. *Journal of Child Language*, 6, 563–579.
- Lewis, M. (1934). The beginning of reference to past and future in a child's speech. *British Journal of Educational Psychology*, 7, 39–55.
- Lucariello, J., & Nelson, K. (1987). Remembering and planning talk between mothers and children. *Discourse Processes*, 10, 219–235.
- Miller, P., & Sperry, L. (1988). Early talk about the past: The origins of conversational stories or personal past experience. *Journal of Child Language*, 15, 293–315.
- Moerk, E. L. (1975). Verbal interactions between children and their mothers during the preschool years. *Developmental Psychology*, 11, 788–794.
- Morford, J. P. (1993). *Creating the language of thought: The development of displaced reference in child-generated language*. Unpublished doctoral dissertation, University of Chicago.
- Morford, J. P., & Goldin-Meadow, S. (in press). Time and again: Displaced reference in the communication of linguistic isolates. In G. Gyori & I. Hegedus (Eds.), *Language and languages: Their origins and evolution* (Bochum publications in evolutionary cultural semiotics 39). Bochum: Universitätsverlag Brockmeyer.
- Padden, C. (1983). *Interaction in morphology and syntax in American Sign Language*. Unpublished doctoral dissertation, University of California at San Diego.
- Sachs, J. (1983). Talking about the there and then: The emergence of displaced reference in parent-child discourse. In K. E. Nelson (Ed.), *Children's language* (Vol. 4). Hillsdale, NJ: Erlbaum.
- Stoel-Gammon, C., & Cabral, L. (1977). Learning how to tell it like it is: The development of the reportative function in children's speech. *Psychological Research in Child Language Development*, 13, 64–71.
- Wanska, S., & Bedrosian, J. (1986). Topic and communicative intent in mother-child discourse. *Journal of Child Language*, 13, 523–535.
- Weist, R. (1989). Time concepts in language and thought: Filling the Piagetian void from two to five years. In I. Levin & D. Zakay (Eds.), *Time and human cognition: A life-span perspective*. Amsterdam: Elsevier.
- Zukow, P. G., Reilly, J., & Greenfield, P. M. (1982). Making the absent present: Facilitating the transition from sensorimotor to linguistic communication. In K. E. Nelson (Ed.), *Children's language* (Vol. 3). Hillsdale, NJ: Erlbaum.

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