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FROM GESTURE TO SYMBOL: THE RELATION
OF FORM TO MEANING IN ACQUISITION OF
PERSONAL PRONOUNS IN AMERICAN SIGN LANGUAGE

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Built up or built in? Traditional models of child language acquisition differ with respect to what is assumed about the knowledge underlying acquisition and how this knowledge changes over time. In one view (the interaction-based models), language is seen as a part of the child's general cognitive capacity (cf. Bates 1976, Bruner 1975, Piaget 1955). Linguistic structures are regarded as derivative of general cognitive structures rather than as reflecting a specific linguistic capacity; language is "built up" from the child's interaction with the environment and from her prelinguistic knowledge of relations among objects and events. Given the richness of the child's experience and the close relationship between linguistic and prelinguistic forms of knowledge, the children's own contribution is thought to be restricted to very simple and general learning mechanisms.

In another view, the child-based models (Schatz 1982), language emerges from knowledge structures specific to language; these constitute a distinct task-specific mental capacity (cf. Chomsky 1965, Gleitman 1981). Language is seen as qualitatively distinct from the child's prelinguistic knowledge of the world. Further, the child is assumed to possess an innate knowledge of the possible forms of human languages (so-called universal grammar), and her task is to infer the structure of the particular language to which she is exposed. This view emphasizes the child's contribution to the acquisition process -- through its biologically given linguistic capacity -- while minimizing, although not eliminating entirely, the role of experience.

These models of language acquisition lend themselves to testable hypotheses about the language acquisition process. The interaction-based model implies that the child's transition from prelinguistic communication to linguistic competence should be relatively smooth. That is, if linguistic structures are derived from prelinguistic forms, there should be no abrupt discontinuity in the use of these differing

forms. On the other hand, if language is a distinct formal system reflecting a particular mental capacity, not wholly built up from early communicative competence, one would predict a discontinuous transition from early prelinguistic to linguistic expression. That transition would be marked by evidence of the reorganization of knowledge regarding the function and use of linguistic forms once they become part of a formal grammatical system.

The main objective of the present study was to obtain empirical evidence bearing on these positions. The transition from prelinguistic to linguistic communication was investigated in the acquisition of pronouns in American Sign Language (ASL). Studying this issue in the context of the acquisition of a signed language provides a unique methodological advantage, in that both prelinguistic and linguistic forms are expressed in the same modality. In particular, personal pronouns in ASL (i.e. I, YOU) have the same form both as the paralinguistic pointing gestures that commonly accompany speech and as the prelinguistic pointing gestures observed in young hearing children who are not yet speaking. With a single modality and external articulators, the developmental process can be observed directly over time.

Personal pronouns belong to the class of "deictic" (or indicating) terms whose meanings change depending upon who is actually speaking at any given time in the discourse context. Thus, they have been said to have "unstable" or "shifting" referencing properties, while most other words have "stable" referencing properties (Jakobson 1957).

Three noteworthy features characterize the hearing child's acquisition of pronouns: (1) Pronouns are acquired in a particular order. Beginning around 16-18 months, the pronoun *me* enters, followed by *you* at around 22 months, and only after that the 3rd person pronouns (Charney 1978, Clark 1978). (2) During this process some children will avoid using *me* and use full proper nouns instead (e.g. "Billy do X" instead of "I do X"). (3) Around the time that *you* enters the child's lexicon, some children have been observed to engage in pronoun reversal errors; e.g. mother might say to the child, "Do you want to go to the store?" and the child reply, "Yes you want to go to store." Here the child uses *you* incorrectly to refer to herself rather than to mother. Similarly, the child may understand and produce *me* to refer to the adult rather than to herself; although symmetrical *you/me* error pairs do not necessarily co-occur in time. Initially these children

appear to regard pronouns as having fixed or stable referents (i.e. you = child, me = adult) instead of as having changing referents (Charney 1978, Chiat 1982, Clark 1978).

These findings suggest the following questions about the acquisition of pronouns in ASL: (1) How do early pointing gestures come under grammatical control? I.e. how does the child move from the early biologically given, unconstrained, and communicative use of pointing gestures to the use of pronominal pointing constrained by the grammatical conventions of the language? (2) What is the developmental relationship between prelinguistic communicative gestures and linguistic expression? (3) Specifically, is the acquisition of linguistically governed pointing facilitated by the child's knowledge of its extra-linguistic communicative functions? (4) Finally, given the seemingly transparent meaning of pronouns ME and YOU in ASL, will deaf children learn these relations at an accelerated rate and in an error-free manner?

The data. The subject was a third-generation, profoundly and congenitally deaf girl who was learning ASL as a first language from her deaf parents. She was of normal intelligence and free of other neurological and physical handicaps. Two types of data were obtained in this study: longitudinal data from 0;6 to 2;3, and experimental data from pronoun elicitation tasks at age 1;11. For the former, the child's free conversation with her parents was videotaped in 8 one-hour sessions approximately nine weeks apart. For the latter, production and comprehension of personal pronouns were evaluated using tasks adapted from Charney (1978) and Chiat (1981), who used them with hearing children. First, the child's ability to recognize and identify referents was tested with a set of pictures of common objects. Then, three pronoun tasks were administered; they involved: (1) pictures of familiar and unfamiliar people (including the experimenter, the child, and her parents); (2) an action task involving a bag filled with family possessions; and (3) a hiding-box task in which the child had to find grapes under a specified picture. During each task she was asked a series of questions to encourage her production of pronouns.

Videotapes between 0;6 and 2;3 were transcribed for adult and child signing with contextual information. Reliability checks on the transcriptions of four videotapes were done by two native deaf signers. Their judgments showed 95% agreement with my own.

Results, early period. At 0;6 the child did not point but did show the normal reaching and grasping behaviors typical of hearing children at this age. At 0;10 she pointed to things around her, at times to direct mother's attention to objects and locations (with eye gaze to adult, N = 76), and at other times to investigate objects by herself (without eye gaze, N = 20). Of particular significance was the child's communicative and unambiguous pointing gestures to herself (N = 12) and to other people (N = 7).

Middle period (1;0 to 1;6). During this period, one semantic function of the child's pointing gestures disappeared completely from her lexicon: She stopped pointing to refer communicatively to people such as mother, father, and self but continued to use pointing for general deictic referencing to objects, locations, and events around her. Several types of data were obtained to determine if the child's seemingly selective avoidance of self and other referencing resulted from a general language deficit. First, there was an increase over time in sign and combination types. Second, the child's mean length of utterance (MLU) steadily increased during the period 1;0 to 1;6, and there was an increase in the number of signs used in combination versus signs used alone. Thus, by these measures, the child's language was developing normally by standards used to assess development of language in other hearing and deaf children.

During this period when the child was not using the pronoun points, signs YOU and ME (no occurrence of these forms in the 308 utterances during this 6-month period), she did refer to herself and people around her by using full proper nouns (of ASL). She signed MOTHER, FATHER, and GIRL in linguistic contexts that would normally require pronouns.

Error period (1;10 to 1;11). At 1;10 the child began pointing to people again, but in a manner that appeared to differ from adult usage: She pointed to people occupying second-person role for the first time using the YOU sign -- but the sense of the pointing sign appeared to mean 'me'.

This interpretation is based on three kinds of evidence: (1) the formational difference between the YOU form (bent elbow, eye gaze at addressee) and general deictic pointing (straight elbow, gaze outward); (2) total absence of the ME form (though she seemed fully aware of herself and used YOU in contexts that otherwise

required the pronoun ME); and (3) contextual information, including mother's responses. Thus, in one instance the child used YOU to indicate herself while signing to her mother that she (the child) wanted to eat. Because the actual form of the child's utterance carried the meaning that the mother should eat, the latter replied that she was not hungry and would eat later. The child, appearing disturbed over the misunderstanding, dragged her food bag from across the room to her mother's feet and repeated the sign EAT.

Pronoun elicitation tasks (1;11 --). These tasks elicited 26 YOU (for 'me') production errors, and 18 comprehension contexts were isolated. The results raised questions about the precise nature of the production errors. Was the child merely imitating mother's utterances? Did the mother sign YOU to the child immediately prior to the child's errors? The answer was clearly, No. In only three instances was the child's YOU preceded by the mother's YOU. Second, were the production errors restricted to a particular grammatical class of utterances in the child's lexicon (routine or syncretic, unanalyzed forms; e.g. "Iwanna")? The constructions did not show such a pattern: Fifteen were without the WANT verb, while the 11 with the WANT verb were not in a fixed order (WANT YOU 5 times, and YOU WANT 6 times, meaning 'I want'). Finally, was the child's pronoun error susceptible to mother's correction either by molding or by other means? The possibility of physical molding of the language articulators (i.e. the hands) in a signed language might be thought to give deaf children a distinct advantage. In fact, the child's errors persisted despite mother's deliberate attempts to mold the child's YOU sign into the ME sign -- suggesting that (a) the child cannot be forced to imitate linguistic forms that she is not yet able to analyze within her emerging grammatical system, and (b) there is a resistance to environmental influence on the acquisition of certain grammatical forms, irrespective of the mode of language transmission.

The comprehension tasks revealed that the child generally understood the ME pronoun as used by adults to have multiple referents and to refer to themselves but not to her.

Correct use of personal pronouns. From 2;3 the child produced and comprehended the full set of personal pronouns spontaneously and without errors. She produced ME in self reference, YOU to refer to mother and father, and third person

possessive markers to refer to people.

Discussion. These results present two questions.

First, given the child's rich and continuing use of deictic pointing, why does a particular function of the pointing form drop out of production?

Previous studies of language acquisition in hearing children invoke the notion of the child's avoidance of certain phonological and grammatical constructions (see, e.g., Ferguson & Farwell 1975). Children will avoid the use of certain words containing sounds that they find difficult to articulate. What is unique about the "avoidance" behavior observed here is that the child avoided a particular function of pointing and not a particular linguistic form. The child is able to articulate the form; she appears to avoid the particular use because of its grammatical function. Slobin (1982) suggests that hearing children are biased towards relating one meaning (or concept) to one word-like surface form. In ASL pointing enters into the language in a number of ways: (1) as a primary phonological unit, (2) as a primary component of the anaphoric referencing system, (3) as comprising one subset of the class of morphological forms called "classifiers," (4) as personal pronouns, (5) as full deictic terms within the grammatical system of ASL, and (6) as paralinguistic gestures. Thus, pointing in ASL represents a single surface form with complex underlying grammatical functions, and it can be viewed as similar to linguistic forms in spoken languages with fusional morphological units.

On this line of reasoning, one might expect the child to avoid the use of the pointing form entirely until its various meanings and functions can be fully understood. The obvious explanation for the selective avoidance, however, is simply that pointing has such a pervasive function in the language that its use cannot be avoided entirely. But why, among the various linguistic functions of pointing, does the child specifically avoid first and second person pronominal reference pointing? In contrast to the other lexical items in this child's vocabulary, the referent of a pronoun shifts depending on the speaker. In addition, the use of pronouns is constrained by other grammatical processes (e.g. strict co-referencing rules). Finally, the child has an alternate means for communicating the same information, viz. through the use of full lexical nouns. Thus, confronted with the multifunctionality of pointing in the language, she avoids YOU and ME pointing

in favor of simpler lexical choices. In this sense the child can be said to be "avoiding" indexical pointing in favor of forms that remove any ambiguity.

The second and related question is, why does the child make pronoun errors? My proposal is that the child's YOU sign is a non-reciprocal, non-deictic, "frozen" lexical sign that stands for her and her alone. In short it is her name (as other persons address her), and not a pronoun. Further, I believe that the child did not have true pronouns in her productive lexicon at this time. This analysis shares with Clark (1978) the notion that the YOU pronoun is her name. Clark suggests that children produce these errors because they fail to take on the perspective of the adult. I propose, however, that the child had to shift to the adults' perspective to have produced the YOU (for ME) error in the first place. Further, the incorrect meaning that the child has attached to the YOU form is a problem related to learning the structure of the linguistic system, not the by-product of a general cognitive deficit.

The derivation appears to be as follows: The child's error occurs at a time when she has clearly begun to understand the symbolic relationship between a sign and its referent, when her vocabulary is growing rapidly, and when her MLU is steadily increasing. At the same time, the frequency and distribution of her deictic points have begun to decline, replaced by full lexical nouns. The child observes other people using the YOU form to refer to her. Regardless of who is signing, the referent is the same (i.e. her). Thus, drawing upon her knowledge of sign-symbol correspondences, she hypothesizes that the YOU point is a symbol referring to herself, i.e. a name sign. In effect she is applying the sign-symbol schema that works for other nouns to the YOU point. She has over-symbolized the indexical YOU point, treating it as a frozen lexical item with a stable referent, herself.

This analysis makes clear the fundamentally linguistic nature of the error. The child has grasped a basic fact about linguistic systems; i.e. the abstract relation between linguistic forms and their meaning. Rather than indexing particular objects in the world, these linguistic forms have intensional content; i.e. they denote meanings or concepts rather than particular objects. The sign SHOE, e.g., does not index a particular object but rather stands in an abstract relation to a class of objects. The child's initial hypothesis about the meaning of YOU is that it is a symbol of this type. In effect, YOU refers to herself as SHOE refers to all shoes. Unfortunately, the correct,

adult use of the sign in ASL is in fact indexical. In hypothesizing that YOU is the lexical item referring to herself, the child ignores the indexical information provided by the form of the sign. Thus, the symbolizing principle takes precedence; the result is an error when applied to indexical signs.

Rather than reflecting a general cognitive deficit related to perspective shifting, the YOU (for 'me') error derives from the over-application of an abstract linguistic principle. The error is striking, because the child ignores transparent, perceptually salient information which she used to communicate with pre-linguistically, and which she continues to use deictically. This information is ignored in favor of a symbolization process that increases the abstractness of the relationship between form and meaning.

Two facts would count as evidence against the hypothesis just offered, that the child regards YOU as her name: (1) If during the error period the child produced the YOU form to refer to someone other than herself; or (2) if she comprehended the YOU form as referring to another person when she was not the addressee but an onlooker in a conversation between two adults. Both of these points cannot be supported by the data.

The final puzzle concerns the asymmetrical nature of the child's production error. The explanation appears to be as follows: When the child signs YOU to intend 'me', it always has a single referent, the child herself. She does not sign ME, because she already has a form to represent this, the YOU sign. In addition (at this period), ME always means other people (but not their names). Since her YOU sign seems to function as a noun denoting herself, it might be expected that she would fail to use ME simply because pronouns are not part of her productive lexicon at this time.

It should be clear, then, that the child's problem is a linguistic one, related to understanding functions of pointing in the language. In mastering the use of personal pronouns the child in this study moved from interpreting pronominal pointing gesturally to interpreting them lexically to understanding them as part of a grammatical system, i.e. as pronouns. Use of pronominal pointing was not simply "built up" out of the prelinguistic pointing gestures. This is particularly surprising, given that ASL is constructed in such a way as to permit a simple transition between prelinguistic pointing gestures and producing personal pronouns. However, the idea that gestures can function as linguistic symbols is so powerful that it overrides the

transparent indexical information that pointing provides.

This child's acquisition of personal pronouns resembles that of hearing children, despite radical differences in modality that would otherwise be expected to facilitate the sign learning process compared to the learning of spoken language. Thus, this phenomenon may provide insight into universal aspects of pronoun acquisition.

The child's avoidance of the personal pronouns, together with the errors that occur as they are introduced, provide telling evidence related to theoretical questions concerning reorganization of knowledge structures in development and concerning certain discontinuities between linguistic and non-linguistic systems (Bowerman 1982). The child shifts from conceptualizing person pointing as part of the class of deictic gestures to viewing them as elements within the grammatical system of ASL. But the child's initial hypotheses concerning their function within the grammar are incorrect and must be revised. The comprehension and use of certain simple indexical pointing gestures were temporarily lost during a month or two in her second year. Thus, the disturbance in the processing of these seemingly transparent gestures provides compelling evidence for the restructuring of the child's knowledge. The cognitive and neurological basis for this reorganization is unclear, and needs to be investigated further. However, the existence of the phenomenon of reorganization cannot be doubted, and data from this study may provide evidence for current modularity theories of language acquisition (e.g. Fodor 1983).

It cannot be said that there is no relation between prelinguistic and linguistic knowledge or that language acquisition is unrelated to cognitive development. It can be said, however, that linguistic knowledge -- concerning, for example, the relationship between form and meaning -- is not merely constructed out of the prelinguistic materials at hand. In this sense, the acquisition process is discontinuous with other forms of knowledge.