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ABSTRACT

Videotapes of a deaf child of deaf parents were used to study the developmental stages and underlying processes involved in the child's acquisition of negation from age 28 months to age 41 months. The S was videotaped in spontaneous interaction with her mother or the experimenter for approximately 1 hour each month, and the films were transcribed into an English gloss notation by a team of deaf adults. Use of the negative headshake, a linguistic component of sign language, was the primary focus of study. Results revealed that the S acquired negation through stages comparable to those involved in hearing children's language acquisition. Findings suggested that the deaf are fully capable of learning to understand and use negation, and that a deaf child of deaf parents should not be considered to be communicating in a primitive or gestural manner if he negates sentences by using only a headshake. (LS)

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EARLY STAGES IN THE ACQUISITION OF NEGATION BY A DEAF CHILD OF DEAF PARENTS

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RESEARCH, DEVELOPMENT AND DEMONSTRATION CENTER
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The University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children has been established to concentrate on intervention strategies and materials which develop and improve language and communication skills in young handicapped children.

The long term objective of the Center is to improve the language and communication abilities of handicapped children by means of identification of linguistically and potentially linguistically handicapped children, development and evaluation of intervention strategies with young handicapped children and dissemination of findings and products of benefit to young handicapped children.

Early Stages in the Acquisition of Negation by a Deaf Child of Deaf Parents

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Introduction

Negation is a process which occurs in all languages. A statement and its negation may be loosely defined as two related statements such that it is logically impossible for both to be true or for both to be false. For example, the statements

1 a) The coffee is good.

b) The coffee is not good.

cannot both be true or both be false. If the statements are applicable to the situation at all, then one must be true and the other false. Although logically either statement could be regarded as the negation of the other, linguists ordinarily refer to the one containing the "negative word" - here, not - as the negation of the other. 1b), therefore, is the negation of 1a).

Sentence 2b), however, is not the negation of 2a):

2 a) The coffee is good.

b) The coffee is bad.

It is impossible for 2a) and b) to both be true, but they could both be false: the coffee could be neither good nor bad, but mediocre.

In a negation, the content words are ordinarily unchanged. In the simplest cases, such as 1a) and b), negation is accomplished by the addition of a single function word (in English, not). Sometimes a negation involves the substitution of one function word, such as a pronoun or quantifier:

3 a) Somebody is home.

b) Nobody is home.

4 a) I have some.

b) I have none.

Sometimes other function words must be added or changed to make the negative sentence grammatical:

5 a) I have a book.

b) I do not have a book. (or: I don't have a book.)

6 a) I have some money.

b) I don't have any money.

In none of these cases have content words been changed.

The examples have been from English, but negation in other languages follows similar grammatical principles. Content words remain essentially unchanged although their order may be affected. Function words and affixes, however, may be added, deleted, or substituted. Such changes are regular and predictable within a given language and can generally be described by a small number of basic grammatical rules.

Questions and imperatives, as well as statements, can be negated by the same basic processes:

7 a) Is John sick?

b) Isn't John sick?

8 a) Go away!

b) Don't go away!

The "negative words" (not, none, etc.) involved in negations such as those cited above are sometimes referred to as negative operators. Their presence in a sentence operates on it to reverse its meaning.

In addition to negative operators, most languages have negative interjections, such as English no. Negative interjections differ from negative operators in that they do not operate on a sentence to change its meaning. For example, in response to the question Is it a dog?,

either of these responses is possible if the animal is, in fact, a cat:

9) No, it's not a dog.

10) No, it's a cat.

The no in 9) and 10) is a response to the preceding question and does not significantly alter the meaning of the sentence that follows.

Negative interjections may occur alone (No!), as reinforcers of the negativity of an already negative utterance (No, don't touch that!), or as responses to situations rather than questions (No, give me the other one). In some languages, a negative interjection may have the same form as some negative operator. Thus, although in English the most basic negative is not, not no -- witness the unacceptability of *John is no sick -- no, as a determiner, can function as a negative operator:

11 a) I have some books.

b) I have no books.

Although the forms of negative operators and interjections are not always distinct, their functions are: a negative operator reverses the meaning of a sentence; a negative interjection's meaning is independent of, or supplementary to, the sentence it accompanies.

Negation in child language is a fruitful area for investigation for several reasons. First, as stated above, it is a universal process. Although its grammar varies from language to language, all languages have some means of negating. Second, any type of sentence can be negated. Therefore, studying negation can yield information about many aspects of the child's language. Third, because negations are expressed in some form even by very young children, and increase in complexity as the child grows older, a developmental progression can readily be observed.

Statement of the Problem

Until recently, the study of human language was limited to spoken languages. This was generally true even of studies of language usage by the deaf. Although deaf individuals' abilities to use and to comprehend the language of their community, in spoken or written form, were assessed and described, their sign language communication among themselves was given relatively little attention.

In recent years, however, the sign language of the deaf in North American (American Sign Language, or ASL) has been made the object of serious linguistic study.

ASL is produced with the hands (aided by the face and body) rather than the vocal apparatus, and perceived visually rather than auditorily; its form is therefore unlike that of spoken languages. However, studies by Stokoe (1970), Bellugi (1972), and others have demonstrated that despite the difference in outward form, ASL is organized in patterns comparable to those of spoken languages.

Since most deaf children have hearing parents, deaf children ordinarily do not learn sign language until after they have entered school. The deaf child of deaf parents, however, learns sign language very early, through normal interactions with his parents, just as hearing children acquire their first language. Studies of the sign language acquisition of deaf children of deaf parents, (Boyes, 1973; Fischer, 1973; Lacy, 1972; McIntyre, 1974), suggest that the processes involved are much like those which occur in hearing children learning a spoken language.

In this paper, the acquisition of negation by a deaf child of deaf parents is described. The aim is to identify developmental stages and, if possible, to infer underlying processes. These stages and processes may then be compared with those suggested for hearing children acquiring spoken languages.

Review of the Literature

Most studies of the acquisition of negation have been concerned with children acquiring English. A brief description of sentential negation in adult English, based on that presented by Klima (1964) and summarized by Klima and Bellugi-Klima (1966), provides useful background information for these studies.

Negative operators in adult English include the negative particle not and its contraction n't; pronouns none, nobody, nothing; the determiner no; and adverbs never, nowhere. Not generally appears in conjunction with auxiliary verbs, either immediately following or contracted with the auxiliary: will not / won't; have not / haven't, etc. If some form of be, used as auxiliary or as copular verb, comes first in the verb phrase, not follows or is contracted with it: is not / isn't, etc.

The negative particle is not normally attached to main verbs, except for be as a copula (He isn't coming) and sometimes have (He hasn't enough money). Instead, in the absence of have, be, or an auxiliary, the dummy auxiliary do is inserted, and the particle attaches to it, generally in contracted form (didn't, doesn't, don't).

Negative imperatives consist of auxiliary do + negative particle, followed by optional you, and finally the main verb:

Don't (you) touch that again.

Generally, English allows only one negative operator per main verb.

A. The Acquisition of Negation

Bellugi's 1967 dissertation remains the single largest work on the acquisition of syntactic negation in English. Her data came from a longitudinal study of the language acquisition of three children. The study began when the children were starting to combine words into multi-word utterances (between ages one-and-one-half and two years) and continued for one year with one child and for two and one-half years with the other two.

Bellugi divided the acquisition of negation into six periods, determined by linguistic development, not age. Children reached comparable levels of development at different ages. For Period A, the subjects ranged in age from 19 to 29 months. This period was characterized by negative utterances in which the negative element, generally no or not, did not occur internal to the sentence and associated with the auxiliary, as it does in adult English. Instead, the negative element preceded, or occasionally followed, a rudimentary sentence or phrase:

No a flag

No the sun shining

Seal no (Bellugi, 1967, pp. 37-38)

Bellugi considered such sentences to be composed of a negative element attached to a "nucleus". She did not compare the length or structural complexity of negative and affirmative utterances.

Not only did the children at this stage fail to produce sentence-

internal negatives, but Bellugi found little evidence that they even understood such forms in adult speech. In fact, parents may expect children to fail to comprehend such negations. Bellugi observed that the children's mothers tended to reinforce negative sentences by preceding them with the interjection no:

No, that's not Adam's (Bellugi, 1967, p. 42)

This no does not negate the utterance which follows. It is a semi-independent part of the utterance and serves merely to reinforce the subsequent not.

In adult English, as previously noted, the sentence-initial interjection no can serve another function. It can refer back to a prior utterance, not the utterance of which it is a part:

Green

No, that's blue

In these utterances, as in the children's Period A negations, the initial no is the only negative element. However, Bellugi points out a crucial difference between these superficially similar adult and child forms. The children did not produce utterances in which initial no referred back to a previous utterance. Rather, initial no invariably operated on the utterance in which it occurred. Thus

No the sun shining

did not mean "No, the sun is shining," in response to a prior "It's cloudy." It meant "The sun isn't shining." No, which is not generally a negative operator in adult English but is frequently used as a reinforcing interjection, was often used by the children as a negative operator.

In Period B, the negative element occurred internally to the sentence, between subject and verb. New negative forms had developed; can't and don't occurred as well as no and not. The children (aged 23-36 months) appeared to "associate particular negative words with particular verbs from the contexts in which they frequently hear them" (Bellugi, 1967, p. 68). Positive auxiliaries rarely occurred and the children did not seem to have learned the system underlying their use. Thus can't and don't were probably functioning as unanalyzed, unitary negative morphemes for the children.

With the development of sentence-internal negation, initial 'no' with prior reference began to appear:

Mother: That's your valentine

Eve: No, Becky valentine (Bellugi, 1967, p. 74)

Bellugi found evidence that, at this stage, the children had begun to comprehend the parents' use of sentence-internal negation.

Period C involved the appearance of a wide variety of auxiliary + negative and copula + negative combinations. The children, who at this time ranged in age from 26 to 44 months, appeared to have grasped many of the crucial aspects of the English auxiliary system. Use of no as an utterance negator decreased markedly. Period C also included further evidence that the children comprehended adult sentence-internal negatives, including those involving negative words and constructions the children themselves did not yet use.

Periods D, E, and F, which are less pertinent to the present paper, covered the period from 42 to 45 months of age for one child and from 50 to 58 months for the other. Major developments during these periods were some and any (I have some vs. I don't have any),

negative pronouns and determiners, tag questions, and word negation by means of the prefix un-.

Menyuk's (1969) analysis of the development of negation is somewhat similar to Bellugi's. She considered early sentences involving initial no or not to consist of a negative element attached to an otherwise affirmative utterance. According to Menyuk, when the child's grammar specifies that a sentence is composed of subject and a predicate, the negative element occurs between these two parts. Later, when the child learns to use auxiliaries, the negative is attached to the auxiliary. Menyuk did not discuss initial 'no' as an interjection, either referring to a prior utterance or reinforcing the negativity of the utterance which follows.

Bloom's data (Bloom, 1970) come from a longitudinal study of three children during a developmental period roughly corresponding to Bellugi's Period A and B. Bloom, like Bellugi and Menyuk, observed that young children frequently used initial 'no' as a negative operator. Her interpretation differs from Bellugi's in that she did not consider the negative element to be simply attached to an affirmative sentence or "nucleus." Instead, she considered it to be part of the internal structure of the sentence, coming between subject and predicate:

$$S \rightarrow \text{Nom (Neg)} \left\{ \begin{matrix} NP \\ VP \end{matrix} \right\} \quad \text{(Bloom, 1970, p. 157)}$$

Bloom claimed that Nom (the sentence subject) never actually occurred in a negative utterance. Affirmative subject-and-predicate sentences occurred, but adding a negative element to such a structure made it too complex for the child at this stage, so the subject (Nom) was deleted through what Bloom called the "reduction transformation"

(Bloom, 1970). At a slightly later stage, negative utterances which included sentence subjects appeared, and the negative element followed the subject; apparently, the reduction transformation was no longer used regularly. At this stage, initial 'no' was always an interjection, referring back to a previous utterance. This use of the initial 'no,' termed anaphoric by Bloom, was rare in the earlier period. Both Bloom and Bellugi found that anaphoric 'no' emerged later than initial negative-operator 'no'.

Discussion of the reduction transformation itself, and of such problems as how Bloom determined that the noun that followed a 'no' was not a sentence subject, go beyond the scope of this paper. What is significant here is a crucial difference between Bloom's and Bellugi's data. Bellugi found sentences such as

'No the sun shining', and

'No I see truck' (Brown and Bellugi, 1964, p. 35)

in which the 'no' negated a following utterance with expressed subject. Bloom found no such utterances.

Perhaps this discrepancy reflects individual differences in children, although it seems strange that all three of Bellugi's subjects would function in one way and all three of Bloom's in another. Other factors may have been the somewhat subjective nature of the analysis and the size of the samples. Also, with longitudinal studies such as these, in which observations are made at regular intervals, there is always the possibility that crucial changes occurred between observations.

Despite these differences, however, Bloom's and Bellugi's

findings are similar in other significant respects. First, both found that 'no' was routinely used as a negative operator in early negations. Second, both found that initial 'no' appeared as a negative operator before it appeared as an anaphoric interjection.

Bloom also discussed the syntax of negation as it related to a semantic categorization. She divided the children's negative utterances into three semantic categories: nonexistence, rejection, and denial. With nonexistence, "the referent was not manifest in the context, where there was an expectation of its existence, and was correspondingly negated in the linguistic expression" (no pocket) (Bloom, 1970, p. 173). Utterances classified as rejection negations were those in which "the referent actually existed or was imminent within the contextual space of the speech event and was rejected or opposed by the child" (no dirty soap) (Bloom, 1970, p. 173). Denial negations "asserted that an actual...predication was not the case. The negated referent was ... manifest symbolically in a previous utterance; no truck denied the expressed identity of the car as a truck" (Bloom, 1970, p. 173). Bloom divided her data into two phases: Phase 1, "characterized by the earliest meaningful and productive use of a negative element in syntactic contexts" (Bloom 1970, p. 197); and Phase 2, marked by syntactic differentiation of the different semantic types. Bloom concluded that syntactic expressions of non-existence, rejection, and denial appeared in that order. As each new semantic category emerged, it took on the syntactic form the preceding category had formerly had. Thus, expressions of non-existence appeared before rejections or denials. When rejections began to appear, they

took on the syntactic form of the earlier expressions of non-existence, and a new and more sophisticated grammatical form developed for non-existence. This analysis by semantic categories is difficult to interpret or to apply to other data because Bloom does not give explicit, objective criteria for categorizing utterances.

Slobin (1965) reported that young children acquiring Russian negate utterances by placing a negative word at the beginning of the utterance. The negative element is 'nyet', which, like English 'no', is an independent negative interjection and not a negative operator in adult Russian. Young Russian-speaking children, then, like English-speaking children, construct negations using an interjection as a syntactic negative operator.

McNeill and McNeill (1968) have described the acquisition of negation in Japanese in terms of semantic categories. In Japanese, according to the McNeills, there are four different words which can be used to negate sentences. The McNeills do not clearly describe the syntactic differences among the four forms, although their article suggests that differences do exist. The inadequacy of their syntactic description, coupled with an absence of illustrative sentences in Japanese, makes the entire article difficult to interpret.

The McNeills claim that the four negative operators are semantically distinct. One of them is used to indicate the non-existence of objects or events; another, to indicate "internal desire, or the lack of it" (McNeill and McNeill, 1973, p. 621). Two more are used to convey the falsity of some idea already proposed or in mind: one

if a simple declaration of falsity is being made, the other if an alternative is entailed as well. The following English sentences cited by the McNeills illustrate these semantic classes:

Non-existence: There's not an apple here.

Internal desire: No, I don't want an apple.

Falsity (non-entailment): That's not an apple.

Falsity (entailment): No, I didn't have an apple; I had a pear.

The McNeills suggest that these four kinds of negative may be described in terms of three contrasts: Existence - Truth (the non-existence of some thing versus the non-truth of some sentence), External - Internal, and Entailment - Non-entailment. This can be expressed in terms of binary features:

	Non-existence: Nai (adj)	Falsity (non-entailment): Nai (aux)	Internal desire: Iya	Falsity (entailment) Iiya
Existence	+	-	+	-
Entailment	-	-	-	+
External	+	+	-	+

Thus, nai (adj) has the feature matrix [+existence, - entailment, + external].

The McNeills state that the other possible feature combination such as [+existence, +entailment, - external], are not represented in Japanese. They do not explain this observation. For instance, the falsity of a proposition can be asserted in two ways, using nai (aux) or iiya, depending on whether or not some true proposition is entailed. There is no such pair of negatives for -external. Iya is the only

-external negative, and it is also -entailment. This would mean that in Japanese one cannot say the equivalent of "I don't want an apple; I want a pear". This is implausible.

The McNeills analyzed a Japanese child's acquisition of these four negatives. They concluded that she first responded only to non-existence as negative, later learning the semantic distinctions Existence - Truth, Internal - External, and Entailment - Non-entailment, in that order. This conclusion must be regarded skeptically, however. First, the analysis of the acquisition of negation depends heavily on the analysis of negation in adult Japanese, which, as indicated above, is not entirely clear. Second, two of the negative operators cited are phonologically identical. The McNeills do not explain how they determined that these were in fact two different words in adult Japanese, much less which of these forms the child was using or what led them to believe the child was using them as two distinct forms.

The semantic categories the McNeills describe for Japanese seem roughly comparable to Bloom's categories. Nai (adj) would correspond to non-existence, iya to rejection, and nai (aux) and iiya to denial. However, the two developmental sequences cannot be directly compared. First, as previously mentioned, neither Bloom nor the McNeills explicitly indicated how they categorized a child's utterances. Second, and more important, is that the McNeills and Bloom were looking at different things. Bloom describes the order

of emergence of different semantic types of negation. The McNeills, however, studied the order in which the child learned to contrast different semantic types lexically and grammatically. For example, in the earliest period the McNeills describe, their subject had not yet learned to contrast internal with external negations by using the proper forms, but she already seemed to be expressing both types of negation.

B. The Use of Negation by the Deaf

In general, studies of the linguistic capabilities of the deaf have been concerned with their reading comprehension and written usage of English, since pencil-and-paper tasks are easier to present to deaf pupils and to analyze than are oral ones.

These studies have been done with older children, since younger ones lack the necessary reading and writing skills. Children's performances have been assessed primarily in test situations. Until recently, there were no systematic longitudinal studies of language acquisition by deaf children.

Schmitt's study (1969) of deaf children's comprehension and use of English negatives in a variety of paper-and-pencil tasks indicated that even the oldest students tested (age 17) did not have complete command of negation in English. Although the subjects generally responded correctly to the negative sentences on the Comprehension subtests, certain subjects consistently responded to negative sentences as if the negative operator (not) were not present. They interpreted the negative sentences as corresponding positives. On production

tasks, although even the youngest deaf students tested (age 8) generally used negatives in contexts which called for them, 8 and 11-year-olds, and even some 14- and 17-year-olds, had difficulty in constructing grammatically correct negative sentences. Incorrect verb forms were frequently used. Sentences in the past tense, in which negation requires the addition of the dummy auxiliary do and the attachment of tense marking to it rather than to the main verb (John walked becomes John did not walk), were more difficult than sentences involving the present progressive (is not walking) or future (will not walk).

Negative sentences were included in the receptive language scale in Moores, Weiss, and Goodwin's "Evaluation of Programs for Hearing Impaired Children" (1974). On this test, the subjects (6- and 7-year old deaf children) were required to select the picture corresponding to the sentence which had been presented. Sentences were presented in a variety of modalities and modality combinations (Printed Word, Sound, Sound and Speechreading, Sound and Speechreading and Fingerspelling, Sound and Speechreading and Signs) to children in programs representing a variety of pedagogical approaches. Signs were used in English word order. Regardless of program or mode of communication, the subjects performed much as Schmitt's did: they "tended to ignore the negative cues and select the picture representing the opposite meaning more frequently than the correct response" (Moores, Weiss, and Goodwin, 1974, p. 67).

Loew (1972) attempted to assess deaf children's use of English negation, using Bloom's semantic categorization. The subjects were eight seven-year-old deaf children. All attended an oral school

program; none made substantial use of signs or fingerspelling. None had been formally taught English sentence patterns for negation. The subjects were shown pictures designed to elicit negations of Bloom's three types: non-existence, rejection, and denial. Their oral responses were then analyzed. Negative responses were made to stimuli of all three types. However, the children did not use clearly differentiated grammatical forms for the different semantic categories. Instead, the most common negative construction was No either preceding or following a word or phrase (no want to read, book no). These utterances were similar to those reported for normal-hearing children at much younger ages. The predominance of utterances of this type was most marked for non-existence of objects and for denials. Full adult expressions of these would involve few content words (nouns, verbs other than 'be', etc.): There isn't any book there, That's not an apple. Adult expressions of rejection and non-occurrence (non-existence) of action (The boy doesn't want the apple, The boy can't walk) involve more content words. For these cases, the subjects were somewhat more likely to use sentence-internal negation (Boy can't walk; Boy no want apple).

In general, the subjects used internal negatives only when it was appropriate to use contentives for both subject and verb. These two contentives provided an internal position for the negative word. The most direct determiner of the sophistication of the negatives produced, then, seemed to be grammatical (proportion of content words involved in a complete expression of the negation), not semantic. The subjects used negation in contexts which called for it, but their

ability to form grammatically correct English negative sentences was severely hampered by their limited mastery of English function words.

Lacy (1972) conducted the first longitudinal investigation of the acquisition of American Sign Language negation by a deaf child of deaf parents. He found that the earliest negatives used by this child - her age during the period of observation is not indicated - were NO[1] and NEG (the negative headshake). NEG was by far the more frequent of the two. NEG could occur either in linear order with manual signs or simultaneously with a sign or sign sequence. It was used as a negative operator in both types of occurrences. When it was simultaneous with other signs, it sometimes reinforced the negativity of an utterance containing NO. Lacy does not mention its occurrence as an anaphoric negative. NO wasused both anaphorically and as a negative operator. Like the English no of Bellugi's subjects (Bellugi, 1967), it did not occur in a sentence-internal position. ASL no, like English no and Russian nyet, is an interjection. Lacy's subject, like children learning spoken languages, used a negative interjection as a negative operator. At a later stage, this subject abandoned the use of NO as a negative operator and began to use such negative operators as NOT and CAN'T, frequently in utterance - internal position. CAN'T (a suppletive negative variant of CAN, not a contraction, in ASL) was

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[1]Signs are presented in English gloss, in capitals. The English word chosen as the gloss for a particular sign is only a symbol for the sign. It does not imply either semantic or grammatical equivalence.

acquired before CAN. These developments seem to be approximately parallel to those of Bellugi's subjects in Stage II.

Procedure

Alice is one of nine children filmed reguarly as part of a longitudinal study of the sign language acquisition of deaf children of deaf parents. (For details of that study, refer to Hoffmeister, Moores and Best, 1974). Both her parents, who are divorced, are deaf. Alice lives with her mother, who attended an oral elementary day school and later a state residential school for the deaf. The father is employed as a printer. Alice is an only child. She has a severe to profound bilateral sensori-neural hearing loss, with an aided threshold in the severe range.

Alice was enrolled in an oral-aural preschool program at the age of thirteen months and later entered oral-aural public school classes for the hearing impaired. Communication in the home is through sign language or sign plus speech.

Alice was twenty-five months old at the beginning of filming. She was videotaped in her home for approximately one hour each month, in spontaneous interaction with her mother or occasionally with one of the experimenters. Books and toys were used as props to arouse interest and elicit language.

The films were transcribed in an English gloss notation by a team of deaf adults. Each transcriptionwas checked for accuracy three times before the transcript is analyzed.

The present paper is based on transcriptions of tapes I through IX, covering the period from age twenty-five months through age forty-

one months. (Intervals between filming sessions were occasionally longer than one month, due to vacations and illnesses.) Table 1 shows Alice's age at the time of each filming.

Insert Table 1 about here

Negation in sign language takes a variety of forms. The present paper deals primarily with Alice's use of the negative headshake, glossed NO^N. This sign is not the closest equivalent to English no. It was chosen for analysis because it is extremely common in adult sign language and is the first negative sign to appear in children's language. It should be noted that the headshake, while generally regarded as gestural and non-linguistic in spoken language systems, is clearly linguistic in sign language.

Sign language utterances are presented in English gloss. Notation used in transcription is explained in Table 2.

Insert Table 2 about here

Although it is possible for two manual signs to be performed simultaneously (one with each hand), such sign combinations are the exception rather than the rule. NO^N, however, being performed with the head rather than the hands, can readily be performed either sequentially or simultaneously with manual signs.

For the present paper, if a NO^N began before the start of manual signing in an utterance, the NO^N was considered to have preceded the manual signing and was transcribed as follows: NO^N X. This convention was followed even if the NO^N continued during the

Table 1

Alice's Age at Each Filming Session

Tape No.	I	II	III	IV	V	VI	VII	VIII	IX
Age in mos.	25	26	27	28	32	37	37	39	41

Table 2

Notation used in English Gloss Transcription of ASL

- -	Utterance boundaries
YES^{N}	Affirmative nod
$\frac{X}{Y}$	Signs X and Y occurred simultaneously
PT.	Pointing action
(X)	Identification of a pointing action's referent
X-Y	A single sign for which two English words were needed for an adequate gloss

manual signing. Such continuation was common, particularly in the children's signing.

If a NO^N began simultaneously with the start of manual signing, it was transcribed as follows:

$$- \quad \underset{NO^N}{\underline{NOT\ MAD\ NO}} \quad SMILE \quad -$$

This should be interpreted: No^N began simultaneously with NOT and continued during MAD NO. NO^N ceased before SMILE began.

A negative which does not act on the utterance within which it occurs will be called an <u>independent</u> negative. Independent negatives include:

a) Anaphoric negatives
("No, that's a dog.")

b) Certain other negatives which do not interact semantically with the rest of the utterance.
One example is Alice's
$- No^N \quad Yes^N \quad No^N \quad Yes^N -$

Independent negatives are so defined to distinguish them from negations in which the negative element acts on and negates all or part of the remainder of the utterance ("That's not a dog," "Don't stop that.").

<u>Results</u>

The function of NO^N in the sign language of deaf adults has not yet been described. Therefore, Alice's mother's use of NO^N (in conversations with her daughter, during filming sessions) was analyzed. This analysis provides insight into the nature of the model to which Alice was exposed.

The following generalizations seem to describe nearly all of the appearances of NO^N in Alice's mother's utterances:

1) NO^N occurred frequently as a single-sign utterance, an interjection.

2) In multiple sign utterances, NO^N most frequently occurred in initial position. In these instances, NO^N was virtually always anaphoric. In two utterances, however, initial NO^N was the negative operator in a negative imperative.[2] The only initial NO^N's which could not be conclusively labeled as anaphoric either were questionable transcriptions or occurred in utterances whose meaning could not be determined.

3) NO^N occasionally occurred in utterance-final position. In most such utterances, the NO^N appeared to be independent, sometimes perhaps functioning as a tag question. In a few cases, the final NO^N was a negative operator, negating the entire preceding portion of the utterance.[2]

4) Sequential NO^N's occurring in positions other than initial or final were rare. In these cases, either the NO^N was one of a series of independent signs (YES^N NO^N pt. (you) not turn), or the utterance appeared to contain two sentences, in one of which the No^N occupied initial or final position.

5) No^N frequently occurred simultaneously with other negatives: NOT, DON'T, NEVER, NOTHING, NONE, NO, CAN'T, and DON'T-KNOW. In these cases, the addition of No^N did not significantly alter meaning. Rather, it seemed to reinforce the negativity of the sign it accompanied.

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[2] Other deaf individuals have suggested that these constructions, while not frequent in ordinary signed conversation, are often used by adults signing to children.

In these utterances, No^N sometimes occurred only during performance of the other negative:

$$- \quad \frac{\text{NOT}}{\text{NO}^N} \quad \text{TABLE} \quad -$$

In other instances, it extended throughout the entire phrase:

$$- \quad \frac{\text{GIRL NOT LIKE BED}}{\text{NO}^N} \quad -$$

$$- \quad \frac{\text{NOT MAD NO}}{\text{NO}^N} \quad \text{SMILE}$$

[(she's) not mad, (she's) smiling]

A large proportion of the utterances which included the other negatives listed above were accompanied by NO^N. In this use, NO^N could perhaps be considered suprasegmental.

6) NO^N frequently occurred simultaneously with $WHAT^L$. $WHAT^L$ is a common question indicator, performed by holding both hands open, palms up, in front of the body, with a slight side-to-side motion. However, it has a number of other uses, some of which border on the gestural. For instance, it frequently accompanies facial expressions indicating such emotions as pity, confusion, or surprise. It also occurs along with shrugged shoulders ("don't know").

In nearly all cases, the combination of NO^N and $WHAT^L$ seemed to function as neither a negative nor a question. Instead, it was apparently a unitary interjection, roughly translatable as "don't know" "can't," or "I give up." $\frac{\text{WHAT}^L}{\text{NO}^N}$, in certain cases, may have been a question tag.

Both NO^N and $WHAT^L$ individually were observed to function in this manner.

7) In a few instances, NO^N occurred simultaneously with non-negative signs other than $WHAT^L$. In these cases, the NO^N generally seemed to operate on and negate the signs with which it co-occurred. For example, -

PT. (CAMERA) $\frac{\text{SEE}}{NO^N}$ - clearly meant that the camera couldn't "see" Alice, who was sliding out of her chair.

However, in two utterances, NO^N occurred simultaneously with non-negatives without negating them. Rather, it appeared to be intended as a negative comment on a situation being described. For instance, - $\frac{\text{HIGH BIG FOR PT. (GIRL)}}{NO^N}$ - did not mean that the chair was not high. Instead, NO^N seemed to express dismay that the chair was too high. (According to deaf informants involved in this project, the two functions of NO^N simultaneous with a non-negative -- negation and negative comment - are differentiated by facial expression. Utterances such as those cited above, therefore, are not ambiguous.) Here again, NO^N could be considered suprasegmental.

NO^N, like English no, can be an interjection (occurring in isolation or as an anaphoric or sentence-initial reinforcing negative), or occasionally a tag question (You're coming, no?) However, it also used in ways that English no is not. English no, except when used as a quantifier, cannot be a negative operator; NO^N - initial, final, or simultaneous - can. Also, NO^N can be used simultaneously with an utterance, not to negate it, but to reinforce or comment on it (see 5 and 7 above). In these cases, it may be suprasegmental, functioning rather like an intonation contour in a spoken language. English no does not function in this manner.

Other common negative words in the mother's language were two interjections, NO and NO^L. NO is used much like the English interjection no. It usually occurs either in isolation or as an utterance - initial anaphoric or reinforcing negative. NO^L is formed by shaking the hand, palm out, or the index finger from side to side. It is used much like NO, but only in situations calling for a prohibition or reprimand, such as

- NO^L PUT-BACK -

meaning 'No, put it back!'

Among the most common negative operators other than NO^N were NOT and CAN'T. Both are quite close in meaning and use to their English counterparts. NOT normally precedes verbs, or sometimes nouns, adjectives or adverbs in copular-type sentences:

- $\frac{\text{NOT}}{NO^N}$ TABLE -

after Alice has incorrectly called something a table, means 'That's not a table.' CAN'T is the negative counterpart of CAN, although the two are unrelated in form. CAN'T is used before verbs.

Table 3 shows the number of negative utterances of various types which were recorded during each filming session.

Insert Table 3 about here

In Session I, Alice used no negatives except isolated NO^N 's. Session II contained her first multiple-sign negative, a two-sign utterance using initial, anaphoric NO^N. In Session III, Alice produced

Table 3A

Typology of Alice's Negative Utterances

Stage	Session	INDEPENDENT NEGATIVES									
		NO^N alone	NO^N initial	NO^N non-initial	$\overline{NO^N \quad WHAT^L}$	NO alone	NO in utterance	NO^L alone	NO^L in utterance	NOT alone	DON'T-KNOW alone
1	I	3									
	II	3	1								
	III				1						
	IV		1								
2	V	19	4			2	1				
	VI	2	2	2					1		
	VII	4	3		1			1		1	
3	VIII	9	5		2	1	2				
	IX	7	3	3		1	2				1

Since negatives other than NO^N were frequently accompanied by simultaneous NO^N, with no resultant change in meaning, this table groups together NO and $\frac{NO}{NO^N}$, CAN'T and $\frac{CAN'T}{NO^N}$, etc.

Table 3B

Typology of Alice's Negative Utterances

Stage	Session	NO^N initial	NO^N final	NO^N simult.	NO^N medial	NOT	CAN'T	NONE
1	I							
	II							
	III	1						
	IV							
2	V		1					
	VI							
	VII		1	1				
	VIII		1	3		1	1	1?
	IX			1	1		3	

? indicates an utterance which is difficult to interpret and therefore cannot be definitely classified as a negative operation.

no anaphoric NO^N's. However, she used the interjection $\frac{NO^N}{WHAT^L}$ for the first time and also produced her first recorded utterance involving a negative operator:

$$- NO^N \text{ SEE } -$$

Session IV included no negatives except a single initial anaphoric NO^N.

There was a four-month gap between Sessions IV and V, due to a summer vacation. Session V showed a marked increase in the variety of Alice's negative utterances. Her first negative sign other than NO^N - NO - appeared at this time. It appeared as an interjection, both in isolation and accompanied by a simultaneous NO^N. In one utterance,

$$- \text{ GRASS } \frac{NO}{NO^N} -$$

it occurred in final position. This utterance is uninterpretable, however, so NO's function in it cannot be ascertained. Session V also included an utterance involving final NO^N as an negative operator:

$$- \text{ CHAIR PT. (SLIDE) } NO^N -$$

meaning 'That (slide) is not a chair.'

Session VI contained only independent negatives, including Alice's first recorded use of NO^L. Session VII included another use of utterance - final NO^N as negative operator and also Alice's first recorded use of simultaneous NO^N as a negative operator:

$$- \frac{\text{MOTHER THROW PT. (PUMPKIN)}}{NO^N} -$$

meaning 'Mother didn't throw out that pumpkin' (She threw out a different one). Session VII also included Alice's first recorded use of NOT. NOT was accompanied by simultaneous NO^N but was not attached to a larger utterance and therefore is difficult to interpret.

Session VIII shows a tremendous variety of negative utterances. Utterances were negated using final NO^N, simultaneous NO^N, NOT, and CAN'T. NOT and CAN'T were appropriately positioned. NO was beginning to be used as an anaphoric negative. NONE made its first, though uninterpretable, appearance at this time.

In Session IX, Alice continued to use simultaneous NO^N, and CAN'T, as negative operators. She also produced one negative utterance using NO^N in medial, preverbal position:

\- PT. (GIRL) NO^N TALK -

meaning 'She doesn't talk.' DON'T-KNOW (a two-morpheme sign, composed of KNOW with a negating suffix) appeared, as a single-sign utterance.

Discussion

Discussion will be limited primarily to Alice's use of negative operators. An independent negative is sometimes an answer to a question, sometimes an expression of frustration or dislike or disagreement. Its referent, particularly in child language, is often difficult to ascertain. The relationship of a negative operator to the utterance it negates is both grammatically more interesting and easier to study.

Alice's use of negative operators may be divided into three periods. The first period included very little use of utterance negation. Only one utterance, in Session III, used a negative operator. In

- NO^N SEE -

NO^N clearly negated SEE; a hat had been pulled over Alice's face, and she definitely could not see. Initial NO^N as a negative operator does not seem to be part of the adult model, except as an imperative, which this utterance is not. Alice's one actual negation in this period is indistinguishable in form from her sentences involving anaphoric negatives. She may, at this time, have been innovatively using initial NO^N as an utterance negator much as hearing children use NO in their early language. This possibility is supported by Lacy's observation (Lacy 1972) that his subject used initial NO^N (transcribed as NEG) as a negative operator.

Period II includes sessions V - VII. In this period, Alice ceased using initial NO^N as a negative operator and began to use final NO^N instead. This construction, although used in the adult model, is not frequent. It may, however, be the simplest form of utterance negation for a child to learn, since it involves the most common negative (NO^N) in linear order rather than in simultaneity. Perhaps Alice had advanced from using an innovative form of her own to using the adult form which was easiest for her to master.

Also in stage 2, Alice began to use other negative signs - NO, NOT, and $NO^{\sim}$. These signs were often accompanied by simultaneous NO^N. NO^N seems to be the first negative sign learned. Perhaps,

once its occurrence in a variety of situations calling for negatives has been mastered, learning to attach it to other more specific negative signs as they are learned is a relatively minor task.

At the end of this stage, Alice made her first recorded use of NO^N simultaneous with an affirmative utterance as negative operator.

Stage III (Session VIII and IX) marked the clear emergence of simultaneous NO^N as negative operator and of NOT and CAN'T. In session VIII, simultaneous NO^N predominated:

$$- \underset{NO^N}{\text{PT. (HOUSE) HOME}} -$$

'Nobody's home.'

$$- \underset{NO^N}{\text{CATCH PT. (BIRD)}} -$$

'Didn't catch the bird.'

In Session IX, however, this construction was used less. This may be mere accident. However, it was at about this time that Alice's sentences seemed to take on a moderately consistent AGENT - ACTION - OBJECT order. It is possible that once she learned the basic order of the major elements of a sentence, she could reduce her dependence on simultaneous NO^N and make more use of NOT and CAN'T, which have fairly fixed positions relative to the major sentence constituents. Thus in Session VIII Alice produced:

$$- \underset{NO^N}{\text{PT. (GOAT) CAN'T WALK-UP}} -$$

'The goat can't walk up,'

in which CAN'T is correctly positioned between subject and verb. The NO^N serves to reinforce CAN'T's negativity.

The utterance

- PT. (GIRL) NO^N TALK -

from Session IX is interesting in this regard. It seems that Alice, having learned to put NOT and CAN'T in an internal pre-verbal position, now tried to use NO^N the same way. This utterance should not be over-analyzed, however, since Alice's signing was so rapid that it was impossible to ascertain whether the NO^N actually came between subject and verb or occurred simultaneously with them.

This progression shows some interesting parallels with the acquisition of negation by hearing children. First, Alice used NO^N as an all-purpose negative operator, much as hearing children used no and nyet. NO^N, like no and nyet, is commonly used to reinforce the negativity of a negative utterance, just as are no and nyet. Unlike no and nyet, NO^N is often itself a negative operator. The significant fact is that children learning all three languages extrapolated the constant item from a wide range of negative utterances and used that item as their negative operator. It is interesting that Alice, unlike Lacy's subject, never used NO as a negative operator. This may be a genuine difference between the two children, or it may be a result of the limited size of Alice's language samples.

Another interesting parallel is that negatives began to be used in internal sentence positions only at a later stage. At first, the negative operator - in English, Russian, and ASL - was simply tacked onto an otherwise affirmative utterance. This fact is, of

course, closely related to the fact that all three adult languages commonly place the negative operator in pre-verbal position. ASL, however, has an intermediate stage. Children learning English and Russian can put the negative element either at one end or the other of an utterance, or they can put it in a medial position. In ASL, there is a third option: simultaneity. Alice moves from using NO^{N}, the most basic negative, in linear order, to using it simultaneously, to using other signs having more specific meanings and more fixed sequential positions in their appropriate positions. It will be interesting to see whether this progression -- from simplified sequential to simultaneous to exact sequential - occurs in other aspects of the acquisition of ASL also.

In ASL, as in English, CAN'T is apparently learned as an unanalyzed whole, since CAN'T is used before CAN (which has not yet emerged by Alice's Session IX). This is particularly plausible in ASL because CAN and CAN'T are formationally unrelated.

One distinct difference between the ASL and English data is that both Bloom and Bellugi reported negative operators appearing before anaphoric negatives. The reverse is quite definitely the case with Alice. There are several possible explanations for this. One is that criteria for determining utterance boundaries in child language are not well established. Perhaps utterances recorded as two-sign anaphoric negatives were analogous to items recorded as two separate single-word utterances for hearing children. It is also possible that the preponderance of anaphoric negatives in the early sessions was a result of the filming situation. When Alice had

not yet become comfortable with the taping procedure, one common ploy used to elicit conversation was to deliberately identify something incorrectly. This tactic almost asked for an anaphoric response:

MOTHER: - PT. (DOG) CAT -

ALICE: - NO^{N} DOG -

Perhaps further research will reveal whether this in fact reflects a difference in the languages or in the communication situations the child routinely experiences or whether it is the result of individual differences among children, filming procedure, or notation.

Other comparisons with other acquisition studies are more difficult to make. The relevance of Bloom's reduction transformation to these data, for example, cannot be determined. Alice produced so few negative operations - fifteen in all, in nine sessions, and rarely more than two or three per session - that it is impossible to realistically compare the structure of her affirmative and negative constructions. Since Bloom's book did not provide criteria for a semantic categorization of utterances, her semantic framework cannot readily be applied.

Another difference between Alice and the children in other studies is the rate of language acquisition. Alice, in Sessions VIII and IX, seems to be entering Bellugi's Period B - yet she is over three years old, whereas Bellugi's subjects were 23 - 36 months old at this point. Perhaps this is a matter of individual differences. Perhaps it indicates that hearing, for children who can use it, is more efficient than sight for language acquisition. Or possibly the difference is that hearing children acquiring language are exposed to speech, not

only from their parents, but in school, on the street, on radio, on TV. Alice does not receive such exposure to ASL.

There is a marked contrast between Alice's use of negation and deaf students' performances on tests involving English negation. Alice was learning a language naturally, from her mother. Tests of English negation test students in a language which they have learned rather late and under unusual circumstances. Deaf students' poor mastery of English negation reflects, not their inability to learn negation per se, but the difficulty of teaching English to those who cannot hear it.

Summary

A deaf child of deaf parents has been shown to have acquired negation through stages comparable to those involved in hearing children's language acquisition. She progressed from the early, over-generalized use of a single form to the later use of a wider variety of more grammatically sophisticated forms. Certain differences were noted which result from the differences between ASL and spoken languages.

Her growing ability to use negation in simple but grammatically correct sentences in her native language by age three stands in marked contrast to the difficulty many deaf persons experience in using English negative forms. This suggests, first, that the deaf are fully capable of learning to understand and use negation; their difficulties are with specific rules of English. Second, a deaf child of deaf parents should not be considered to be communicating in a primtive or gestural manner if he negates sentences by using

only a headshake. He must, of course, learn the English rules as well. But the use of the negative headshake in ASL negation is highly structured. A child's use of this gesture, if he has been learning ASL in the home, is systematic and may be linguistically quite sophisticated.

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