7 Syntactic and Semantic Development of Early Sentence Negation

The children's use of negative sentences provided a particularly fruitful opportunity to study the correlation of linguistic expression with semantic intent. Negation was usually signaled in the children's utterances by a linguistic marker (such as "no," "no more," "not"), and there was corresponding nonlinguistic evidence of negation in the immediate context of the speech events that contained the utterance. It was possible to observe the relationship between the syntax and semantics of negation to obtain important insight into the question of the relative development of language and cognition.

The syntax of negation in adult English has been described at length in the traditional grammar of Jespersen (1917; 1961, pp. 426–467), and in generative transformational terms by Klima (1964). Of greater significance to this study is the extensive description of the syntactic development of negation in children's language by Bellugi (1967). She described the sequence of developmental changes in the syntactic form of three children's negative sentences from the age of approximately two years, over a period of from one to about two and one-half years—until the structure of the children's sentences approached the adult model. Bellugi provided a formal linguistic description of the acquisition of negation but did not inquire into the inherent semantics and syntax of negation that underlie the formal account.

The rule that Bellugi proposed for the earliest negative sentences in the first phase of development, Period A, placed the negative element

outside the sentence. As pointed out in the previous chapter, this rule appears to imply that there are no constraints on sentence complexity or sentence length with the operation of negation—if the choice of negation simply adds an element to an otherwise affirmative utterance. But in the texts of Kathryn, Eric, and Gia, the negative utterances were among the least syntactically complex, and there was strong evidence that the inclusion of the negative element constrained length and complexity of surface form. Also, specification of the negative particle outside the sentence is inconsistent with sentence negation in the adult model of English. Negation is an inherent semantic fact of English sentences and is marked by the attachment of the negative particle to the verbal auxiliary *within* the sentence.

The term *cognitive clutter* was used by Slobin (1966) to describe the child's early development of negation in the light of the Bellugi account. Slobin (p. 91) went on to say that the child "develops negation systems of unwieldy complexity—systems that are presumably too complicated to deal with and must be abandoned or seriously modified." But is this indeed the case? It appeared that the question of the semantic and cognitive aspects of negation was worth pursuing in an effort to describe the underlying syntax of early sentence negation.

The previous discussion of the texts and the grammars proposed for Kathryn, Eric, and Gia dealt with the earliest stage—approximately the same level that was described as Period A in the Bellugi presentation. Bellugi described a second stage, Period B, as one in which the negative element occurs after the sentence-subject and has different forms, including "no," "not," "don't," and "can't." The data to be presented here—from the observations of Kathryn I to III, Eric II to VI, and Gia IV to VI—coincided with the Periods A and B that Bellugi described for the three children she studied.

7.1. Semantic Categories of Negation

In identifying negative sentences, utterances were considered negative if (1) they contained a negative element, such as "no," "no more," "not," or "don't," that signaled negative intent, or (2) they were produced with clearly negative intent (as evidenced, for example, by the child shaking his head, pushing an object away, or refusing to follow a direction) although a negative element was not expressed.

Semantic interpretation of negative sentences was inferred from observation of the status of the referent in the context in which the utterance occurred, or the child's relation to the referent in terms of

behavior. For example, 12 of the 15 utterances with "no more" (including 4 instances of "no more" in isolation) at Eric II shared the same semantic feature: the *nonexistence* of the referent in the context of the speech event. When Eric said "no more noise," the noise had stopped; when he said "no more cleaner," the cleaner was gone; when he said "no more juice," he had finished his juice. Thus, the linguistic and contextual features shared by these 12 utterances were the expression of a negative element ("no more") and the *nonexistence* of the referent. The semantic interpretation of 2 of the 15 utterances could not be determined, and 1 utterance had a different interpretation.

At the same time, Eric II, there were 76 occurrences of "no" in the text as a single word, and it was possible to interpret the use of "no" in 41 instances. In only 3 instances did "no" signal *nonexistence* of a referent unequivocally. However, in 33 instances where "no" occurred, the referent did exist in the context. The interpretation of these utterances as negative was based on Eric's behavior as he indicated *rejection*—by pushing away or turning away from an object or otherwise opposing the occurrence of an event. Five occurrences of "no" were interpreted differently.

Clearly, Eric used the negative syntactic operator "no more" to signal *nonexistence* and the single word "no" to signal *rejection.* Most of Eric's first negative sentences, at Time II, referred to the *nonexistence* of objects and included the negative marker "no more." However, at the same time, he expressed *rejection* of something that existed in the context, and he did so by using the isolated negative element "no."

But whereas the expression of *nonexistence* and *rejection* was distinguished formally at Eric II, the same categories were not distinguished formally at Kathryn I:

(1) K:I (Kathryn not finding a pocket in Mommy's skirt, which had no pocket) no pocket.

(2) K:I (Kathryn pushing away a sliver of worn soap in the bathtub, wanting to be washed with new pink soap) no dirty soap.

The same form signalled *nonexistence*, "no pocket," and *rejection*, "no dirty soap." Furthermore, at Kathryn II, a third semantic category, *denial*, was distinguished on the basis of function, and the form of expression of *denial* was not structurally different from "no pocket" and "no dirty soap":

(3) K:II (Kathryn, Mommy, and Lois looking for the truck)

Where's the truck?

(Mommy picking up the car, giving it to Kathryn)

Here it is. There's the truck. no truck.

Thus, there appeared to be three semantic categories of negation that characterized the children's earliest negative sentences in terms of function: *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 (examples included (1) "no pocket" and sentences with "no more" at Eric II); *rejection*—the referent actually existed or was imminent within the contextual space of the speech event and was rejected or opposed by the child, as in "no dirty soap"; *denial*—the negative utterance asserted that an actual (or supposed) predication was not the case. The negated referent was not actually manifest in the context as it was in *rejection*, but it was manifest symbolically in a previous utterance; "no truck" denied the expressed identity of the car as a truck.

In a paper that discussed the acquisition of negation by one child learning Japanese as a first language, McNeill and McNeill (1967) raised the issue of the semantic interpretation of negation in Japanese. They reported that the facts of negation in Japanese are accounted for by four different forms of the negative element organized on the basis of three dimensions or contrasts. These forms are not syntactically different—each occurs in sentence-final position, after the predicate phrase. However, the shape of the negative element varies according to semantic function. The three semantic dimensions described were "Existence-Truth, Internal-External, and Entailment-Non-Entailment." From the descriptions provided, these three dimensions appear to correspond generally to the semantic categories of negation proposed for Kathryn, Eric, and Gia: *nonexistence*, *rejection* and *denial.* Although the data presented by McNeill and McNeill were incomplete, they reported that the three negation contrasts in Japanese were acquired by their subject in the order given above.

Negation in the adult model of English can also be organized in terms of the three semantic categories identified in the children's

speech; certainly the adult grammar allows expression of the contrastive notions—existence-nonexistence, acceptance-rejection, and affirmation-denial. But whereas in Japanese the semantic categories are neatly signaled by morphological markers, the linguistic expression in English is less efficient. Indeed, the thorough account of the syntax of English negation by Klima (1964) presented only the syntactic mechanics for negation generally and ignored the semantic issues: "the analysis ... offers ... no interpretation of notions like *negative* that appear as designations of grammatical symbols" (p. 247).

There were semantic differences in the early negative sentences of Kathryn, Eric, and Gia, as exemplified by the inherent differences among "no pocket," "no dirty soap," and "no truck." It appeared reasonable to approach the inquiry into the children's acquisition of negation by determining whether the three semantic categories of negation—*nonexistence*, *rejection*, and *denial*—were differentiated in the course of development in terms of (1) sequence of development and (2) structural differences in linguistic expression.

In the children's texts already described (Kathryn I, Gia I and II, and Eric I, II, and III), the syntactic operation of negation was accounted for in the proposed grammars if negative sentences were used productively. The account of the development of the syntax of negation in the later texts is essentially a taxonomic description; utterances have been classified as to semantic category, and the syntactic structure is described. Rules of grammar for the subsystem of negation were not proposed because grammars were not constructed for these later texts.

7.2. Phase 1 in the Development of Negation

The first phase in the development of the syntax of negation was characterized by the earliest meaningful and productive use of a negative element in syntactic contexts. This occurred in the texts of Eric II, Kathryn I, and Gia IV.

7.2.1. Eric I to III

In the first text collected, Time I, mean length of utterance was 1.10, and Eric produced "no" as a single-word utterance 13 times. In four instances, the utterance occurred in apparent response to a yes-no question—for example, "Does it fit?"—but the use of "no" was inappropriate in one instance and indeterminate in the other three. There were four spontaneous occurrences of "no"—not in response

to a yes-no question—that were indeterminate; it was not clear from the context or behavior whether or not negation was intended. There were five spontaneous occurrences of "no" that were appropriate, and all occurred at different times but in the same context: Eric was unable to fit the vacuum cleaner pipe and hose together.

The following paradigmatic sequence also occurred:

(4) E:I (Eric closed the lid of his toy chest) [all gone. / no more. / make all gone.]

This occurrence of "no more" was the only instance of "no more" in the text. "All gone" occurred elsewhere four time—once after Eric dropped his lollipop stick into the radiator grille and the investigator commented "It's gone." This occurrence took place just before the "all gone, no more, make all gone" sequence, with ten intervening adult utterances and three intervening utterances by Eric. The three other instances of "all gone" were indeterminate.

There was limited evidence, therefore, for postulating the rudimentary beginning of the linguistic expression of negation at Eric I—the sequence in (4) was semantically appropriate, and there were five occurrences of "no" as a single word in an appropriate context signaling negation. But the data were too meager at Time I to determine with conviction if Eric knew the 'meaning' of "no." There were many more yes-no questions to which he did not respond with "no," and the word "yes" never occurred. All that could be said at Time I was that the form "no" occurred as a single word and that its interpretation was indeterminate more often than not.

There were 76 occurrences of the single word "no" in the subsequent Eric II text. These instances of "no" have been categorized—where there was sufficient evidence to permit unequivocal classification—as expressions of *nonexistence*, *rejection*, or *denial* and are presented in Table 7.1, along with the functional distribution of "no" at Time III. As at Time I, the word "yes" or its equivalent did not occur at Eric II or III. Comparing the distribution of "no" in the Eric II and III texts, it could be seen that, aside from the indeterminate utterances, "no" was used most frequently to express *rejection*. At the same time, "no more" occurred in isolation and signaled *nonexistence* four times at Eric II and eight times at Eric III; "no more" was not used to express *rejection*. Thus, it appeared that variation in the form of nonsyntactic expressions of negation ("no" and "no more" occurring in isolation)

Table 7.1. Functional Distribution of "no," Eric II and III

	Nonexistence	Rejection	Denial	Indeterminate
Eric II	2 (1)	30 (3)	(5)	20 (15)
Eric III	2	11 (11)	0	14 (4)

Note: Numbers in parentheses refer to utterances that occurred after a prior question or comment from the receiver. It should be emphasized that utterances were interpreted (and classified as to semantic category) only when the contextual and behavioral evidence was clear. Nearly half the occurrences of "no" could not be interpreted; these occurred often while Eric played alone—for example, when stacking the blocks or connecting the train. At such times there was not an evident correspondence between utterance and referent, and what Eric said ("no") did not appear to relate to what he was doing. There were also instances that could not be interpreted because of insufficient information at the time of transcription.

corresponded to variation in function—"no" signaled *rejection*, and "no more" signaled *nonexistence* at Eric II and at Eric III.

The text at Time III was two and one-half hours longer than at Time II, but as can be observed, the number of instances of "no" as a single word decreased from 76 occurrences at Time II to 42 at Time III. Corresponding to the marked decline in the use of "no" as a single word, there was an increase in the number of interpretable syntactic expressions of negation—from 11 sentences at Time II to 35 sentences at Time III—while at the same time mean length of utterance increased from 1.19 to 1.42 morphemes. It appeared that the use of "no" as a single word decreased at Time III with the use of "no" in syntactic expression of negation.

Syntactic Negation at Eric II. The negative sentences that occurred at Eric II have been categorized and are presented in Table 7.2. At this time, Eric used syntactic negation to express *nonexistence* most often—in 9 of the 11 speech events. In order to express *rejection* he used "no" as a single word—in 33 of the 41 interpretable instances of "no." Syntactic expression of *rejection* was marginal and there was no syntactic expression of *denial.*

The grammar proposed for Eric II in Chapter V provided for a class of pivot forms, which included "no more," and the phrase structure rule which accounted for the negative sentences was:

S → (Pivot) (N).

There are two utterances with unique structure in Table 7.2, "ə don't want baby," and "no 'chine," which were sentences not generated by

Table 7.2. Categorization of Negative Utterances, Eric II

Nonexistence		Rejection	Indeterminate
no more noise	(4)	ə don't want baby	no more noise
no more light	(2)	no more noise	
no more juice			
no more cleaner			
no 'chine			
no more	(4)	no (33)	no (35)
no	(3)		no more

Note: Numbers in parentheses refer to the number of times the utterance occurred in the text, discounting immediate repetitions.

the Eric II grammar. The forms "don't" and "want" did not occur elsewhere in the text at Time II and "don't" did not occur subsequently at Time III. Eric said "ə don't want baby" as he dropped a doll which he had been holding.

The utterance "no more noise" occurred five times in appropriate contexts and in one context in which interpretation was indeterminate:

(5) E:II (Eric and Lois had put the wire man on Eric's peg bench; Eric started to whimper) Mommy. Mommy. Mommy.

O.K. Show Mommy.

(Eric began to cry; Lois stood up)

Let's go find Mommy in the kitchen. no.

No?

(Eric refusing to leave) [no more. / > no more noise.]

It was not possible to understand what Eric wanted, but he appeared to be using his negation repertoire—"no," "no more," and "no more noise"—to express negation of something. This anomalous occurrence of "no more noise" may have been the most readily available syntactic construction for expressing a negative notion that Eric was unable

to express otherwise. That is, "no more noise"—the most frequent syntactic construction—may have been generalized as a negative 'whole' comparable to "no" and "no more."

Whereas "ə don't want baby" was not related structurally to any other utterances at either Eric II or Eric III, the utterance "no 'chine," anticipated a developmental change that did occur subsequently, at Time III.

Syntactic Negation at Eric III. Table 7.3 presents the categorized distribution of the negative sentences that occurred at Eric III. There was a substantial increase in the number of negative sentences; syntactic negation expressed *nonexistence* most productively—in 30 of the 35 negative sentences that occurred. Thus, although the number of sentences increased substantially, the functional distribution was essentially the same as at Eric II—Eric was able to express *nonexistence* syntactically, but *rejection* was signaled most often by isolated "no."

Table 7.3. Categorization of Negative Utterances, Eric III

Nonexistence		Rejection	Denial
no more noise	(13)	no train	no more birdie
no more light	(2)	no more dumpcar	no more blocks
no more car	(2)	ə want any shoes	
no more seal			
no more airplane		no (22)	
no more round			
no more apple			
no more dumpcar			
ə no more			
no go in			
no goes			
no ready go			
no fit			
no it won't fit			
ə find it			
/jə/ find it			
no more	(8)		
no	(2)		

Note: Numbers in parentheses refer to the number of times the utterance occurred in the text, discounting immediate repetitions.

However, two developments occurred that distinguished the data at Eric III from the earlier data at Eric II. First, Eric began to express both *rejection* and *denial* syntactically, although occurrence of sentences with these functions was marginal. In addition, there was a differentiation in the form of the negative element in syntactic contexts. Whereas "no 'chine" at Eric II was the only instance of "no" as a negative operator, this form became productive at Eric III. Further, the two forms of the negative element—"no more" and "no"—were in complementary distribution. "No more" occurred in syntactic contexts with noun forms where the noun referent was negated directly—for example, "no more airplane," "no more noise," "no more apple." Moreover, "no more" was used in contexts where negation signaled *nonexistence* of objects that had occurred previously—the negation of recurrence.

In contrast, the form "no" occurred as a negative operator in syntactic contexts before predicate structures. Thus, the negative element had the form "no" in contexts before verbs—for example, "no go in," "no goes," "no ready go" (referring to sliding the wheels)—and also before nouns that had the grammatical function predicate-object. For example, the sentence "no train" was produced as Eric took the wire man off the train as it was being pushed. Earlier, at Time II, the sentence "no 'chine" occurred after Eric had been told that he couldn't play with the tape recorder. When his mother subsequently entered the room, Eric pointed to the tape recorder saying "no 'chine." The referents of the forms "'chine" and "train" were not negated directly, but they were negated with respect to their function as predicate-objects. Thus, the negative particle "no" appeared only in predicative constructions, in complementary distribution with "no more," which appeared in immediate constituent structure with nouns.

The negative sentences were accounted for in the Eric III grammar as follows:

E:III phrase structure:

1. $S_1 \rightarrow \text{Pivot} \begin{Bmatrix} NP \\ VP \end{Bmatrix}$, where Pivot includes "no"

4. NP → (Q)N, where Q is the quantifier "more"

Feature rule:

iv. no + NP → no + Q + N

The utterances "no train," "no 'chine," and also "no more dumpcar" (Eric emptying a peg from the dumpcar) were among the few

utterances that occurred that involved reduction with deletion of the intervening negated constituent that did not occur in performance.

Again, as in Eric II, "no more noise" occurred more frequently than any other negative sentence. On one occasion "no more noise" occurred when the bridge collapsed; one occurrence of the sentence was anomalous—as beads were being retrieved for the slide. There was one unique 'stereotype' structure: "ə want any shoes." In addition, there were two sentences—"ə find it" and "/jə/ find it"—that appeared to occur with negative intent although the negative element was not expressed; Eric produced both sentences when he was unable to find a block he had been looking for.

In summary, negation was a meaningful cognitive-semantic concept for Eric at Time II and at Time III. The mechanism for the linguistic expression of negation had emerged as a productive syntactic operation, although its function was limited, for the most part, to expression of *nonexistence*, with "no more" used as syntactic operator. Whereas earlier Eric had used two different forms of the negative element in isolation, contrastively, to signal two different semantic functions ("no more" signaled *nonexistence* and "no" signaled *rejection*), when he first began to express *rejection* and *denial* syntactically he used the same, first-learned syntactic operator, "no more," so that semantic differences were not differentiated structurally.

Thus, although Eric had learned something about the different semantic categories of negation, the development of syntactic expression was limited, at first, to syntactic constructions that expressed only one—*nonexistence*—at the same time that the other categories were expressed by isolated "no." Syntactic expression of *rejection* and *denial* began to emerge toward the end of the first phase, but the introduction of the syntactic expression of *rejection* and *denial* was not accompanied by developmental advance in the form of their linguistic expression. Rather, the differentiation of structure that represented the developmental difference between linguistic expression of negation at Time II and Time III was the syntactic occurrence of "no" and "no more" in complementary distribution in the syntactic expression of the category *nonexistence*—the first semantic category expressed syntactically.

7.2.2. Gia I to IV

The grammars that were presented in Chapter 4 for the first two texts collected from Gia did not provide for the derivation of negative sentences. It was pointed out that negation did not appear to have been

learned yet as a concept that could be expressed syntactically in the first two texts, Gia I and II.

The absence of the syntactic process of negation in the Gia grammars may be attributed, as discussed in Chapter 4, to the fact that the syntactic operator "more," signaling recurrence, was fully productive in both noun and predicate constructions. It is possible that this operated somehow to preclude the development of a similarly functioning syntactic operator to signal a contrastive notion (negation) at the same time.

However, there was provision for the syntactic expression of both negation and recurrence in the Kathryn and Eric grammars. But Eric's strategy for learning language was oriented toward the acquisition of simultaneous syntactic operators. That is, Eric's approach to the acquisition of syntax involved learning different markers with different semantic functions that did not differ from one another syntactically—"more" and "no more" occurred in the same syntactic contexts.

In contrast, Gia did not differentiate a class of pivotal syntactic operators in her approach to learning language. Gia learned grammar in terms of the concatenation of categories with grammatical sentence functions, and she differentiated classes of forms on the basis of their categorial function. It was plausible that she was able to learn only one syntactic operator, "more," because such function forms differed grammatically from category forms. Learning an additional class of function forms (which might include "more" and "no" or "no more") would have increased the complexity of her grammatical system, and such an increase in complexity might well have exceeded her cognitive limits at this stage.

However, it was pointed out that Gia and Kathryn were more similar to each other in the acquisition of syntax than they were to Eric. How, then, could the mechanism for expression of both negation and recurrence be explained in Kathryn's grammar? "More," in Kathryn's lexicon, was a member of an adjective form class; a similar class of adjectives did not exist in Gia's lexicon. The form "more" did not operate syntactically in the Kathryn I grammar, as did the negative element "no" or the operator "more" in the Gia grammars. That is, "more" was an attributive constituent in constructions with nouns only at Kathryn I and did not occur in predicate constructions, as did "no" in the Kathryn I grammar and "more" in the Gia grammars.

An explanation for the absence of syntactic expression of negation in the early texts obtained from Gia was problematical. It may be the case that there is an element of 'choice' in what is learned—that

children choose to learn certain structures and concepts (perhaps on the basis of such notions as 'need' or 'frequency of exposure')—and that the number of structures that can be learned or *practiced* at any one time is necessarily limited. Thus, having 'chosen' to learn "more" as a syntactic operator, it might have been the case that Gia was unable to attend to syntactic expression of negation at the same time.

There was no evidence that could be used to decide the relative 'need' for sentence negation in the experience of the three children. There was no apparent reason why Eric and Kathryn would need to express negation more than Gia would. Also, the data did not reveal the extent of exposure to negative sentences in the speech the children heard.

At Time III, Gia produced fewer syntactic constructions with a negative element than at Time II and only one utterance expressed negation unequivocally:

(6) G:III (Lois had freed Gia after she had gotten stuck climbing onto a chair) [no more stuck. / no more.]

Although Gia produced other sentences that contained a negative element, and the negative element "no more" occurred in isolation at Time III, these utterances were not contrastive—they did not necessarily signal negation. For example, Gia said "no more" as she was stacking blocks, and there was no evidence for an interpretation of negation. She produced the utterance "/nɑt/" while eating lunch and shaking her head negatively; her mother interpreted this at the time as "not hot." The following occurred several minutes later:

(7) G:III (Gia eating lunch at 1:00 P.M.; Mommy and Lois in kitchen with her)

morning. morning.

Good morning.

> no morning.

Gia might have referred to the fact that the time was early afternoon and not morning, but it was also possible that the appropriateness of the reference was fortuitous or otherwise associated with Gia's eating lunch rather than breakfast. "No morning" was not considered interpretable. These four utterances were the only constructions with a negative element that occurred at Time III. It appeared that Gia had not yet learned syntactic expression of negation at the time of the first three observations.

Gia used "no" as a single word to express negation in the first three texts; the functional distribution of occurrence of "no" is presented in Table 7.4. Generally, Gia used isolated "no" to signal *rejection* most often. However, at Time II there was frequent use of "no" to signal *denial* in response to questions. This high incidence of "no" signaling denial was due to an effort to 'test' the reliability of Gia's responses to yes-no questions by asking specific questions about the identity of familiar objects. For example, a clown was held up and Gia was asked "Is this a cookie?" Gia's response "no" was classed as a *denial*. The reason for attempting to test the reliability of yes-no responses had to do with the fact that "yes" was a far more frequent utterance than "no" in the second and third texts: 13 occurrences of "yes" at Time I, 145 at Time II, and 137 at Time III.

Table 7.4. Functional Distribution of "no," Gia I to III

	Nonexistence	Rejection	Denial	Indeterminate
Gia I	2 (1)	9 (1)	0	3
Gia II	2 (1)	8 (2)	(9)	2
Gia III	(1)	2 (5)	0	4 (3)

Note: Numbers in parentheses refer to utterances that occurred after a prior question or comment from the receiver.

Gia tended to respond "yes" to almost all yes-no questions. She also responded "yes" to repetitions of her utterances that were presented with rising intonation contour—a question form that attempted to verify what she had said—for example:

(8) G:II (Gia had picked up the train and it came apart)

----train. more.

(giving the train to Lois)

more.

What?

more train.

More train?

> yes.

In similar situations, Eric would produce a subsequent utterance or, less often, repeat his previous utterance—for example:

(9) E:II (Eric watching a cloud of dust on the building lot across the street)

hot. hot.

Hot?

> hot. hot.

Occasionally, Gia said "yes" as a direction—for example, giving the investigator the train to fix, saying "yes." The "yes" responses to questions were sometimes inappropriate; that is, in 14 of the 145 "yes" responses that occurred at Gia II, the context of speech events appeared to call for expression of negation instead. For the most part, "yes" responses had an almost 'automatic' aspect; presentation of an utterance with a rising intonation contour triggered a "yes" response. However, it was usually the case that there was not a meaningful choice available, that "yes" was the only appropriate response, as, for example, when Gia's utterance was repeated to her for verification. But in those situations where Gia was given a choice—for example, "Do you want to read this book?"—Gia responded "yes," whether or not she subsequently complied. In the same situation, Eric simply complied—without expressing agreement—or said "no."

Syntactic Negation at Gia IV. Gia produced six negative utterances at Time IV; these are presented in Table 7.5.

Table 7.5. Categorization of Negative Utterances, Gia IV

Nonexistence	Rejection	Denial	Indeterminate
no more pictures no open it (2)	no more		not here
no open the wallet	no (15)	no (4)	no (4)

Note: Numbers in parentheses refer to the number of times the utterance occurred, discounting immediate repetitions.

It was not clear at the time what was meant by "not here," but the five other utterances were interpretable and signaled negation. The data at Time IV were no less meager than data obtained in the earlier sessions, but interpretation of these few sentences was unequivocally expression of negation for all but one utterance ("not here").

The functional distribution of "no" in isolation included 15 instances of *rejection*, 4 instances of *denial*, 4 utterances that were indeterminate, and no instances of "no" expressing nonexistence.

In summary, negation was not expressed syntactically in the first three texts collected from Gia. She did use "no" as a single-word utterance, expressing rejection most often, but the occurrence of "no" as a single-word utterance was far less frequent than the occurrence of

"yes" at Time II and Time III. In the fourth text, it was possible to draw the tentative conclusion that Gia was able to use syntactic expression of negation, but the structure was only marginally productive. Although not tested, there was evidence that Gia understood negative sentences—she generally attended to negative directions; but evidence of a similar competence in linguistic expression was slight.

Even though the numbers of utterances were small, four of the five negative sentences (including "no more" as a 'sentence') in Table 7.5 signaled *nonexistence*, so that the order of emergence of linguistic expression of the three semantic categories of negation appeared, tentatively, to match the order observed in Eric's early development of negation.

7.2.3. Kathryn I

The negative sentences that Kathryn produced at Time I were presented in Table 6.2, Chapter 6. These utterances have been categorized semantically and are presented once again in Table 7.6 for the purpose of the present discussion.

Table 7.6. Categorization of Negative Utterances, Kathryn I

Nonexistence	Rejection	Denial
no pocket no pocket in there no sock no fit (7) no zip no turn no close no window ə no	no dirty soap ə no chair no sock	no dirty
no (11)	no (24)	no (3)

Note: Numbers in parentheses refer to the number of times the utterance occurred in the text, discounting immediate repetitions.

Kathryn used syntactic negation to express *nonexistence* most productively. She had also begun to express *rejection* and *denial* syntactically; these sentences were few in number and did not differ in structure from those negative sentences that signaled *nonexistence*.

There were also two utterances at Time I that were not classed as negative sentences: "no Mommy" and "no outside." These sentences were extracted from the text and included in the original analysis of sentences for semantic categorization because they appeared, superficially, to be negative sentences—they included a negative marker and they lacked final contour or open juncture after "no." As discussed in Chapter 6, once the contexts in which these utterances occurred was evaluated, it turned out that the negative marker "no" was an anaphoric, external element that applied to a foregone utterance or situation. This anaphoric "no" did not have effect on the rest of the utterance with which it was juxtaposed. Neither "Mommy" nor "outside" were being negated—Kathryn wanted Mommy to comb her hair, Kathryn wanted to go outside.

Kathryn also used "no" as a single-word utterance; the distribution of "no" in terms of function was 11 instances of *nonexistence* (4 in response to questions), 24 instances of *rejection* (15 in response to questions or comments); 3 instances of *denial* (2 in response to comments), and 17 indeterminate instances of "no" (6 in response to questions). As was true with Eric and Gia, "no," when interpretable, signaled *rejection* most often.

Whereas Gia used the reciprocal form "yes" far more frequently than "no" and Eric did not use a reciprocal form at all, Kathryn used two contrasting forms—"no" and affirmative "O.K." There were 55 instances of "no" and 43 instances of "O.K." (including 1 expression of "yes"). When questioned about Kathryn's use of "O.K." rather than "yes," her mother reported that this was a "new stage"—earlier, Kathryn had used only "yes."

7.2.4. Comparison of the Three Children and Summary of Phase 1

The fact that Gia rarely expressed negation was the important difference among the children. She produced fewer constructions with a negative element at Time III than she had at Time II, and all constructions with a negative element in texts I, II, and III were indeterminate in interpretation more often than they could be interpreted as negative. Negation was still a marginal structure at Gia IV, but the constructions that did occur could be interpreted as negative and tended to be appropriate. Although Gia evidently understood negative sentences in the speech she heard, negative constructions were not productive in her own speech. In contrast, Eric and Kathryn each had developed a productive system of syntactic negation that was primitive

in structural complexity and did not differentiate semantic function. The children's general linguistic maturity, as measured superficially by mean length of utterance, was essentially similar, although Gia's utterances were somewhat longer than either Eric's or Kathryn's. An account of development in the three semantic categories by the three children in Phase 1 is presented in Figure 7.1.

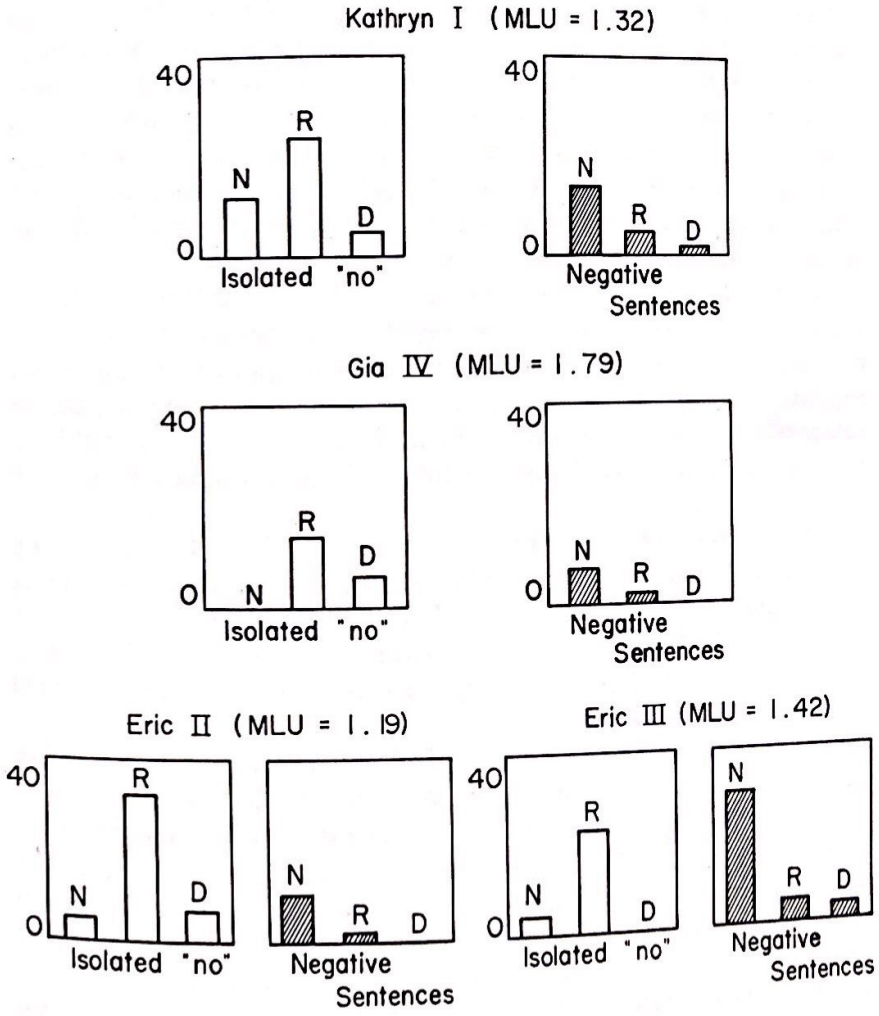

Figure 7.1. Phase 1 in the development of negation: frequency of isolated "no" and negative sentences in the semantic categories nonexistence (N), rejection (R), and denial (D).

The structural form of these first negative sentences was a negative operator in pre-position before nominal or predicate forms. Sentence-subjects were not expressed, even though the children produced affirmative sentences that included sentence-subjects. Negated predicates were reduced—there was deletion of verb or object forms when one or the other occurred in production—even though verb-object phrases were the most productive constructions in the texts of all three children. The syntactic operation of negation served to increase sentence complexity, which resulted in a reduction of the surface structure of sentences—as discussed at length in Chapter 6. The existence of the deleted formatives in the underlying structure of the reduced sentences was postulated on the basis of (1) behavioral and contextual evidence, which revealed that the negative element actually had effect on unexpressed intervening constituents in such sentences as "no window," "no chair" in Kathryn's texts, and "no 'chine," "no more dumpcar," and "no train" in Eric's texts; and (2) the productivity of sentence-subjects in the Kathryn I text.

The grammars that were presented earlier for Kathryn and Eric accounted for the operation of negation, although the syntactic mechanism was different for each. In Kathryn's phrase structure, the negative element appeared as a syntactic operator before the major category constituents—predicate NP and VP—and it was possible to infer an unrealized underlying structure with the grammatical function sentence-subject.

In Eric's phrase structure, there was limited evidence for postulating the occurrence of a subject node before the negative element; subject forms were less productive at Eric III than at Kathryn I and did not occur at Eric II. Interpretation of negative sentences did not depend on the representation of an underlying constituent with the grammatical function sentence-subject.

At Eric II, "no more," was included as a pivot with privileges of occurrence before noun forms only. At Eric III, the negative element "no" was included as an element in the pivot class with effect on sentence NP and VP. Its operation on NP required the specification of Q (the quantifier "more") in the derivation of NP; negation of noun forms at Eric III was specified as negation of recurrence. Nonexistent objects were those that had existed previously. An analogous distinction exists in the adult model between "no bananas," bananas simply do not exist, and the partitive "no more bananas," bananas had existed previous to their nonexistence. Eric had not made this distinction as yet; the nonexistence of objects had only the one dimension for him—nonexistence after his previous experience of it.

All three children used "no" as a single word to signal *rejection* most often. Eric did not use a reciprocal form "yes," Gia used "yes" far more frequently than "no," and Kathryn used both affirmative "O.K." and negative "no."

The earliest negative sentences expressed *nonexistence* most often. Kathryn and Eric had begun to express *rejection* and *denial* syntactically, but sentences signaling *nonexistence* were far more frequent. Both children, although they had begun to differentiate negative sentences semantically, used the same syntactic structure for sentences with different semantic intent. Even though Eric had differentiated two negative forms in isolation, "no more" and "no," in earlier expressions of *nonexistence* and *rejection*, he did not differentiate these same semantic categories in the earliest syntactic constructions. The negative sentences that Gia produced expressed *nonexistence*.

At the close of Phase 1 in the semantic and syntactic development of negation, there was evidence that the children knew something about three different semantic categories of negation—they were able to express *nonexistence*, *rejection*, and, less often, *denial*. The children were able to produce syntactic constructions that signaled *nonexistence*, but for the most part, expression of *rejection* and *denial* was limited to the single-word utterance "no." As syntactic expression of rejection and denial began to emerge, the syntactic structure of the linguistic expression was the same for the three categories.

Thus, in the early development of negation it was possible to differentiate three alternative interpretations of negative utterances. But the acquisition of linguistic expression was limited at first to only one productive syntactic structure in the speech of each child, and there was no structural differentiation of the three semantic categories.

7.3. Structural Differentiation of Semantic Categories of Negation: Phase 2

The children had begun to use sentences that expressed semantic notions of *rejection* and *denial* in Phase 1, and the syntactic structure was not rich enough to distinguish these sentences from sentences that signaled *nonexistence* and occurred far more frequently.

The first phase was realized in those texts of Kathryn (Time I) and Eric (Time III) in which mean length of utterance was less than 1.5 morphemes and in the text of Gia (Time IV) in which mean length of utterance was 1.79 morphemes. At the conclusion of Phase 2, mean length of utterance was less than 3.0 morphemes for all three children: 2.83 at Kathryn III, 2.84 at Eric VI, and 2.75 at Gia VI.

The distinction between Phase 1 and Phase 2 was most apparent in a comparison of the negative sentences produced by Kathryn at Time I with those at Times II and III.

7.3.1. Syntactic Negation at Kathryn II

There was an increase in the number of interpretable negative sentences from 19 at Kathryn I to 62 at Kathryn II; these have been categorized in terms of function and presented in Table 7.7. Several developmental changes distinguished the sentences at Time II from those that had occurred at Time I.

First, syntactic expression of all three semantic categories was productive at Kathryn II. Although sentences expressing *nonexistence* were most frequent, there was a substantial increase in the number expressing *rejection* and *denial*.

Structurally, 34 of these 62 sentences (the bracketed sentences in each category—for example, "no skirt," "no fit," "no truck") were similar to the negative sentences at Time I and would have been generated by the grammar that was proposed for the earlier Kathryn I text:

K: I phrase structure:

$$1.\ S \rightarrow Nom + Ng\begin{Bmatrix}NP\\VP\end{Bmatrix}$$

with obligatory operation of the reduction rules as specified in the transformational component:

$$(2)(a)\ X - Ng - Y \Rightarrow Ng - Y$$
$$(b)\ \# - X - Y - Z \Rightarrow \# - x_i - x_j$$

The inclusion of a negative element ("no") in the underlying structure of a sentence at Time I necessitated reduction in its surface structure. Sentence-subjects were deleted obligatorily, and complexity after the negative element—such as inclusion of verb and complement—was also reduced. Having chosen to express negation, there was an obligatory structural constraint on production of the sentence at Time I.

The remaining sentences in Table 7.7 could not have been generated by the Kathryn I grammar because of two important changes: (1) production of the negated predicate was more structurally complete with inclusion of both the verb and predicate complement—for example, "no lock ə door," "no find ə tank"; and (2) sentence-subjects were expressed—for example, "Kathryn no shoe," "Kathryn no like celery."

Table 7.7. Categorization of Negative Sentences, Kathryn II

Nonexistence	Rejection	Denial
[no skirt no cup no wagon no books no driver in the car no hat all gone magazine]	[no bear book no meat no slide away no go outside]	[no Wendy (2) no candle no tire no truck no ready no plop no Jocelyn]
Lois no hat	no put in there	this ə no Lois
Kathryn no shoe (2)	no make ə truck	
Mommy no picture there	no ə house lambs	no Daddy hungry
[no fit (8) no fit here no stand up no under no go in no go first no go in there (2)]	no want	
	no want this	
	ə no want ə go now	
no lock ə door		
no find ə tank		
no have ə this		
no like celery, Mommy		
this ə no goes		
man no go in there		
Kathryn no /fɪk/ this		
Kathryn no fix this		
Kathryn no like celery		
Kathryn not quite through		
Lois ə no coffee		
me like coffee		
Kathryn have ə socks on		
can't see (2)		
ə can't see		

Note: The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child. Utterances within brackets are those that could be accounted for by the grammar at Kathryn I. Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions.

However, these changes in the allowed structural complexity of produced sentences applied only to sentences that signaled *nonexistence*; not only did these sentences occur with greatest frequency in

the corpus, but they were also the most structurally complete. There was no production of sentence-subject in expression of *rejection*, although the understood subject was Kathryn and "Kathryn" (or "me") occurred as sentence-subject in six sentences that expressed *nonexistence*. The most grammatically primitive sentences were those that signaled *denial*—these were most similar in form to the early negative sentences at Kathryn I and were generally only two morphemes.

The reduction transformation that had operated obligatorily at Kathryn I assumed optional status at Kathryn II. Three-term subject-verb-object strings occurred in performance in affirmative sentences; it was significant that they occurred only in that category of negative sentences that had been most productive in the preceding corpus—sentences that signaled *nonexistence*—but not in the categories *rejection* and *denial*, which had not been productive previously. In the discussion in Chapter 6 of the constraints that motivated reduction, it was pointed out that those structures that were more recently learned (in terms of their productivity in performance) were also those that were most vulnerable to deletion. The evidence just presented gives further support to that conclusion.

However, the constraint on structural complexity in performance was still operative, as demonstrated in a comparison of the three sentences "Kathryn no shoe" (two occurrences) and "Kathryn have ə socks on," which occurred in similar speech events—Kathryn was barefoot. Similarly, the verb form "want" was productive and occurred frequently in affirmative sentences—it had also occurred at Kathryn I—but it was expressed in only three sentences that signaled *rejection*, although its occurrence in the underlying structure was easily postulated from the contextual and behavioral data. For example, Kathryn did not *want* the bear book, Kathryn did not *want* to make a truck. Although a grammar has not been constructed as yet for the later text at Kathryn II, the negative sentences at Time II appeared to be among the least structurally complex sentences that occurred.

Another productive sentence type at Kathryn II that had only marginal occurrence at Kathryn I was the expression of anaphoric "no" with an affirmative sentence—for example, "No Kathryn want play with self" and "No Lois do it." These sentences were discussed at length in Chapter 6—but it is pertinent here to point out again that sentences with the structural description *"no" plus affirmative sentence* were generally more structurally complete than the great majority of the negative sentences that occurred at the same time. The negative element did not apply semantically to the sentence and so did not affect (that is, reduce) its structure.

The form of the negative element was invariant at Kathryn II. As at Kathryn I, the form was "no," with marginal occurrence of "can't" in two sentences expressing *nonexistence*.

In summary, there was a marked increase in the number of negative sentences at Kathryn II. The functional distribution of these sentences followed the distributional trend observed at Kathryn I: the greatest number of sentences that occurred signaled *nonexistence*. But whereas *rejection* and *denial* were marginal at Time I, syntactic expression of these categories was productive at Time II. *Nonexistence*—the only category that was productive at Kathryn I and the category that occurred most frequently at Kathryn II—was also the category that was most structurally complex in performance. Sentences expressing *denial*—the category that was least productive, with only one instance at Time I—were also the least complex negative sentences at Time II.

The syntactic placement of the negative element depended upon the effect of negation within the sentence. The negative element occurred immediately previous to the structure over which it had immediate effect—in prepredicate position, following the sentence-subject. In those sentences where the negative element preceded the sentence-subject, the behavioral and contextual interpretation revealed that the negative reference was anaphoric. Such sentences were actually affirmative and not within the scope of the negative effect, even though the negative element was produced without juncture contour. The one exception was the last sentence in Table 7.7 expressing *denial*: "no Daddy hungry."

Kathryn's negative sentences at Time II, as at Time I, could be described as having occurred in Period A in Bellugi's (1967) account of negation: mean length of utterance was still below 2.0 morphemes; the shape of the negative element was limited to one form—"no"; and there was no inflection of nouns and verbs. However, contrary to Bellugi's observation that the negative element was not positioned within the sentence, expression of sentence-subject in Kathryn's negative sentences always preceded expression of the negative element. Where the negative element preceded the subject of a sentence, the sentence was affirmative. Thus, evaluation of the semantics of these sentences revealed that different uses of "no" were marked by placement of the negative element before or after sentence-subjects.

7.3.2. Syntactic Negation at Kathryn III

Syntactic Expression of Nonexistence. There were fewer sentences expressing *nonexistence* at Kathryn III—25 sentences, as compared with

42 at Kathryn II; these have been extracted from the total number of negative sentences that occurred at Kathryn III and presented in Table 7.8.

There were still a few sentences that were similar in structure to the earliest negative sentences at Kathryn I: "no boy" and "no children." The remaining sentences were similar to the sentences that expressed *nonexistence* at Kathryn II in the inclusion of sentence-subjects and predicate complement constructions with verbs. But the sentences in Table 7.8 also differed from those that expressed *nonexistence* at Kathryn II in two important respects. The proforms "I," "this (one)," or "that" replaced the noun forms that had occurred with the same grammatical function, sentence-subject, at Kathryn II. Further, the form of the negative element was variable. In addition to "no"—the only form at Kathryn I and II—there were alternative forms: "not," "do" (with negative intent), "don't," "doesn't," and "can't."

In contrast to the syntactic placement of the negative element in all the sentences discussed so far, there were two sentences in which "no" occurred in sentence-final position. These appeared to be proforms analogous to "none" in the adult model:

(10) K:III (Kathryn had discovered a label on the underside of one of the blocks; she picked up a different block to see if it had a similar label, which it did not) > this one ə no.

(11) (Picked up a third block as in (10); block did not have a label) (Picking up fourth block and seeing label on it) > this one have no. this one have!

There was no immediately apparent motivation for the variation in the form of the negative element in expression of nonexistence. All were present tense forms. Kathryn was the specified actor-agent in sentences with "can't," "don't," and "not." The verb "fit" (the most frequent verb in previous negative sentences at Time I and Time II) occurred with "not," "don't," "do," and "doesn't" (but not with "no," which had always negated "fit" previously).

The sentences expressing *nonexistence* in Table 7.8 are similar to the sentences in the second stage in the acquisition of negation, Period B, described by Bellugi (1967), where the negative element occurred with alternative forms. But as observed also by Bellugi, the different forms

Table 7.8. Negative Sentences that Signaled Nonexistence, Kathryn III

no boy	ə doesn't fit
no children	this not fits!
no more choochoo train	this one don't fit
no part that	this one do fits (2)
ə no hand there	this one don't fits (2)
	this one don't
no bring lambs	that's not ə turn
no stand up	Kathryn not go over here
not going away (2)	ə can't find ə saucer
	I can't open it
this one ə no	I don't go sleep
this one have no	Mommy no play 'corder

Note: Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions.

of the negative element "don't," "doesn't," "can't" were not transforms of the auxiliary formatives "do" or "can." Development of the verbal auxiliary in affirmative sentences was limited at Kathryn II to two verb inflections: progressive "-ing," which was productive without "be," and present tense "-s" ("here comeses! here comes!"), which was marginal. The forms "that," "it," "here," "there," "where," and "what" occurred also with final "-s"; the two forms of each were in apparent free variation, as at Kathryn II. But the past tense "-ed" did not occur, and there was no occurrence of forms of "be" or modals before verbs, except occasional occurrence of "this is" and "I'll." The form "do" functioned only as a main verb and was not inflected for person or tense.

However, in two respects, the children described by Bellugi in Period B appeared to be linguistically more mature than Kathryn was at Time III. First, Kathryn had not learned the person and number paradigms for personal pronouns as had the subjects Bellugi studied in Period B. The only productive personal pronoun forms she used in affirmative sentences were the first person alternants "I," "me," "my," and "mine." Second, although progressive "-ing" was productive at Kathryn III in affirmative sentences, it was marginal in negative sentences. This second distinction was important because Bellugi reported that the newly introduced alternative forms of the negative element, "don't" and "can't," were restricted in her data to occurrence before nonprogressive main verbs, whereas "no" and "not" were used before verbs with "-ing." With rare exceptions, however, progressive verbs were affirmative at Kathryn III.

The remaining negative sentences that were obtained at Kathryn III in the categories *rejection* and *denial* are presented in Table 7.9. While both categories continued to be productive at Time III, the number of sentences that signaled *denial*—previously the least productive category—far exceeded the number that expressed *rejection*. Syntactic expression of *denial* occurred as frequently as expression of *nonexistence*.

Table 7.9. Negative Sentences that Signaled Rejection and Denial, Kathryn III

Rejection	Denial
no going home	no Eric
no put it back	not making muffins
	ə not break it
don't get my room	I not tired
don't want go in other room	I not have some fruit
	this man not brother
I ə not go in bathroom	not magic
I don't want play with Lois	that not " 'body home"*
I don't want get those ə my room	that not cat
I don't want to comb hairs	that not ə pot
I don't want those shoes	that's not tea
I don't need pants off	that's not scramble
ə don't like that	this not ə pancake
	this not ə doughnut
	that's not ə apple
	that's not apple
	that's not ə man
	this ə not brother
	that not ə sister
	this not ə boy
	that's not ə sister
	that's not ə lady
	that not baabaa black sheep
	that not ə ugly
	that not ə rabbits house
	that not blue one
	that's not ə pink one
	that not brother
	that not

* Kathryn was referring here to the title of the book "Anybody at Home?" which she always referred to as " 'Body Home↓."

Note: The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child.

In each category there were a few sentences that were similar to the earlier syntactic structures at Time I and Time II: "no put it back" and "no Eric." However, the great majority of the sentences that signaled *rejection* and *denial* were substantially different in syntactic structure from the sentences that occurred with the same functions at Kathryn II. In each of the categories, more complex structures replaced the simpler structures observed earlier, and the sentences within each category were remarkably similar in form. The sentences arranged in Table 7.9 confirmed Bellugi's (1967) observation of "across-the-board appearances of some aspects of grammatical systems in the language, often accompanied by a great rise in frequency of structural types."

Syntactic Expression of Rejection. Just as there were progressive changes in the development of expression of *nonexistence* at Time II, there were significant developmental changes in the form of expression of *rejection* at Time III.

First, sentence-subjects were produced in sentences that expressed *rejection*. Whereas at Time II the understood subject (on the basis of contextual and behavioral information) was Kathryn, sentence-subjects never occurred in the production of sentences that signaled *rejection*—even though the first person subject was expressed in those sentences that signaled *nonexistence* at the same time. At Time III, the understood subject was Kathryn in all but two of the sentences that signaled *rejection* and was expressed (as in expressions of *nonexistence*) with the pronominal form "I."

A second development in the expression of *rejection* was the expression of the catenative verb, "want" or "need," on which the negative element had a direct effect. Such a catenative form had been postulated as a deleted intervening constituent at Kathryn II; "want" had been productive in affirmative sentences and occurred marginally in expression of *rejection* at that time.

However, in the two least complex sentences that expressed *rejection*—"no going home" and "no put it back"—there was no expressed sentence-subject, there was no catenative verb, and the form of the negative element was the primitive "no" (rather than "don't," as in all other sentences in the category). It was also the case that these two sentences involved negation of an event in which someone other than Kathryn was actor-agent. That is, it was the investigator who was going home and putting something back. Thus, Kathryn learned syntactic expression of *rejection* first as expressing negation of her own desire or wish to have or to do something. This was true of all of the previous

sentences that signaled rejection, as well as of most such sentences at Time III. As a result, development of the linguistic expression of rejection proceeded toward expression of the first person sentence-subject and the operation of negation on a catenative verb form before a predicative construction at Time III. After gaining a certain competence with this structure, Kathryn began to express *rejection* of an event that involved someone else as actor-agent; in doing so, she reverted to the earlier, more generalized syntactic structure—as in "no going home" and "no put it back." It would be expected that the form of this sentence type in the subsequent texts would approach the adult form of the negative imperative "don't go home" and "don't put it back," where the sentence-subject is the unexpressed "you." But at Kathryn III, use of the negative element "don't" was restricted, in expression of *rejection*, to those sentences in which Kathryn was the subject of the catenative verb (on which the negative element had effect) and the main verb as well.

This interpretation of Kathryn's development of rejection coincides with the description of the semantic contrast "internal-external" proposed by McNeill and McNeill (1967): the negative element in Japanese, "*iya* . . . conveys the idea of 'I don't want,' and its use, therefore, depends on *internal desire*, or the lack of it." McNeill and McNeill concluded that this was the second category of negation acquired by their Japanese subject after "existence-truth." This was also the second category of negation that Kathryn acquired—after *nonexistence*. The frequency of occurrence of syntactic expression of *rejection* increased from Time I to Time II. Although frequency remained constant at Time III, the produced structure of these sentences had increased in complexity at Kathryn II, and complexity increased again at Kathryn III.

Syntactic Expression of Denial. The linguistic expression of the semantic category *denial* developed last—after *nonexistence* and *rejection*. There had been only one instance of denial at Kathryn I, and although there was an increase in frequency, with ten sentences at Time II, the structure of the ten sentences was the same as the one sentence that signaled *denial* at Time I.

At Kathryn III, *denial* was the most productive category of negative sentences that occurred. It should be pointed out that the substantial increase in the number of these sentences was not contrived. That is, there was no attempt to 'test' Kathryn's ability to express *denial* (as described subsequently in the attempt to 'test' Gia's responses to yes-no questions at Gia V).

In addition to the substantial increase in the frequency of sentences

that signaled *denial*, there were significant changes in structural complexity as well. The syntactic structure that Kathryn had used to express *denial* at Times I and II was the same as the first example at Time III in Table 7.9: "no Eric." However, this was the only instance of the primitive structure in the 29 sentences that signaled *denial* at Time III. In all the other sentences, there was only one form of the negative element: "not." In 3 of these sentences, there was inclusion of nominal subjects: "I not tired," "I not have some fruit," and "this man not brother." In 3 other sentences, there was no expression of sentence-subject. But in all the remaining 22 sentences, the sentence-subject was a form of the demonstrative pronoun: "this," "that," or "thats."

In the preceding text at Kathryn II, the occurrence of demonstrative pronouns in sentence-initial position with a predicate nominative was one of the most productive constructions. Examples of the 308 occurrences of this sentence type presented in Table 3.1 of Chapter 3 included "this ə slide," "that ə baby," "this my tiger book." Only one of these 308 sentences expressed negation at Kathryn II; all were affirmative sentences except for "this ə no Lois," which occurred in response to the question "Is this Kathryn's, or is this Lois's?" At the time when this sentence type was one of the most productive structures in her grammar, Kathryn never used it to express negation as she did productively six weeks later, at Time III, to signal *denial*—for example, "that not ə sister," "this not ə doughnut."

This restriction on the use of demonstrative pronouns and negation at Kathryn II was not simply a constraint on sentence length; such sentences as "this ə my Kathryn toys ə floor," "this ə Mommy's fuzzy sweater" occurred at Time II. The fact that "no" was not included as one of the 'permitted' number of words in an utterance could not be attributed simply to some sort of memory limitation. Although Kathryn expressed the semantic concept of *denial* in such utterances as "no candle," "no Wendy" and also used the syntactic structure that subsequently signaled *denial*, there was no evident relation between function and ultimate surface structure in Kathryn's production at Time II. Subsequently, however, at Time III, the linguistic structure and the cognitive semantic concept were somehow joined in production. Thus, the semantics of *denial* (meaning) and the ultimate structure that signaled *denial* (form) existed at Time II but did not exist in concert until Time III.

Progressive Differentiation of the Negative Element. Of the variants of the negative element in the speech Kathryn presumably heard, she chose one form, "no," as the negative element for the earliest syntactic

expression of negation: to signal *nonexistence*. At Time I and Time II, when negative sentences began to express *rejection* and *denial*, Kathryn used the same negative element, "no," in the linguistic expression of all three semantic categories. Subsequently, when she began to differentiate the form of the negative element and when the variants "not," "don't," "can't," and "doesn't" appeared in negative sentences, "don't" was used almost exclusively to signal *rejection* and "not" was used exclusively in sentences that signaled *denial*. All the variants appeared in the group of sentences that expressed *nonexistence*.

It is not the case that expression of *rejection* is limited, in the adult model, to constructions with "don't," or that expression of *denial* is limited to constructions with "not." It may be true that rejection of a desire to do or to have something is most often expressed by the structure "I don't want," but there are alternatives—for example, "I won't." Virtually all Kathryn's sentences that signaled *denial* referred to statements of identity (for example, "that's not scramble" in response to "doesn't that look like scrambled egg?" referring to the yellow wheel on a plate). The same structure would occur in contradiction of a statement of identity in the adult model, but, again, there are alternatives—for example, "It isn't a scrambled egg," or the adult might respond to the question with "it doesn't" (look like a scrambled egg).

The form of the negative element in the adult model depends upon the structure of the verbal auxiliary, and the form of the auxiliary directly reflects the notions of tense, aspect, and agreement with subject number and person. Kathryn's linguistic expressions of *rejection* and *denial* were limited, in most cases, to only one dimension (or none) of each of these notions. For example, present tense prevailed in all the sentences, Kathryn was the agent of rejection, and a form of the demonstrative pronoun was the subject in expressions of *denial*.

The status of the verbal element in expressions of *denial* and *rejection* was quite simple. The verb on which the negative element had effect in expression of *rejection* was limited to a stative catenative verb—"want." In most of the expressions of *denial*, there was no verb (exceptions were "not making muffins," "ɔ not break it," "I not have some fruit"). A form of "be," on which the negative element would have effect in the adult structure, was not included in any of the sentences expressing *denial*. The copular "be" was not yet productive in affirmative sentences, and there was no contrastive notion to account for the alternation of "that" and "that's" in the text.

The relatively homogeneous structures used for statements of *rejection* or *denial* limited the form of the negative element as well. Kathryn learned a particular form ("don't" or "not") as the negative element in a particular structure (for expression of *rejection* or *denial*). In contrast, expression of *nonexistence* involved a number of variables. In addition to nominal negation in reference to objects that did not exist, there was predicate negation expressing nonoccurrence of events. In predicate negation, there was reference to both first and third person agents and negation of predicates with both action and stative verbs. Kathryn attempted to express corresponding variation in the form of the negative element in expression of *nonexistence* with the modal forms "don't" and "can't."

It was also possible that the homogeneous structures and forms of the negative element that Kathryn learned for expressing *rejection* and *denial* were the most frequent structures with these functions in the negative sentences she heard. However, there is no available count of most frequent structures in the adult model or, more specifically, in the speech Kathryn heard.

The effect may also have been developmental. Because linguistic expression of *nonexistence* was differentiated and learned first and *rejection* and *denial* were learned subsequently, the negative sentences at Time III may have reflected the fact that Kathryn also recognized the potentiality for variation in structure and attempted to express it in *nonexistence* before recognizing possibilities for variation in the forms of *rejection* and *denial*.

The important fact was that the differences in the form of the negative element observed at Time III, after occurrence of a single form "no" at Time I and Time II, was not simply a matter of free variation. On the contrary, progressive differentiation in the form of the negative element was a functionally motivated variation that was directly related to the linguistic expression of the three semantic categories—*nonexistence*, *rejection*, and *denial*.

In summary, Kathryn learned the syntactic expression of the semantic categories of negation in the order (1) *nonexistence*, (2) *rejection*, (3) *denial*. Although she had already begun to express *rejection* and *denial* in negative sentences at the time of the first observation, the fact that *nonexistence* was expressed most frequently at Time I and subsequently developed in syntactic complexity before the other two categories at Time II, provided evidence for the conclusion that *nonexistence* was the first category expressed syntactically.

At Time II the occurrence of sentences signaling *rejection* was as frequent as sentences that expressed *denial*, but there was an accompanying increase in structural complexity in *rejection* while the structure

of *denial* at Time II was most primitive—the same structure used initially to express *nonexistence*. Subsequently, at Time III, although the number of sentences expressing *rejection* remained constant, there was further increase in structural complexity. However, the most significant change at Time III was a 200 percent increase in the number of sentences that expressed *denial*—accompanied by a substantial change in structural complexity.

The conclusions that have been drawn from the data collected from Kathryn were confirmed by the data collected over a longer period of time from Eric and Gia. But just as the children differed in their rates of acquisition of syntactic negation, there were substantive, although relatively minor, differences among them as well.

7.3.3. Syntactic Negation, Eric IV to VI

The fourth, fifth, and sixth observations of Eric approximated the same developmental period that has just been described as Phase 2 in Kathryn's development of negation.

Eric IV. All the negative sentences that occurred at Time IV have been categorized and are presented in Table 7.10. Sentences that signaled

Table 7.10. Categorization of Negative Sentences, Eric IV

Nonexistence	Rejection	Denial
ə no more	no more tank	no, not blue
ə no more cleaner	no more train	
no more light (2)	no more book	
no more lights	no more noise	
no more cleaner (2)	ə no read ə book	
no more pieces (2)		
no more choochoo train		
no more 'chine		
no more people		
no more man		
no fit /tu/		
no↑·i fit		
no wheels		
no ə think so		
train wheels /tu/ none		

Note: Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions. The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child.

nonexistence continued to occur most frequently in the text, and *denial* was still a marginal class, with only one instance (a decrease from three occurrences at Eric III). There was an increase in the number of sentences that signaled *rejection*; this was the significant development at Time IV—the emergence of *rejection* as a syntactically productive category. However, sentences that expressed *rejection* were not differentiated formally from the other negative sentences that signaled *nonexistence*.

Eric continued to use two forms of the negative element "no" and "no more" in complementary distribution as at Time III: "no" operated in predicative constructions, and "no more" appeared in immediate constituent structure with nouns.

There were no changes in the produced structural complexity of negative sentences, although mean length of utterance increased from 1.42 at Time III to 1.69 at Time IV. Even though sentence-subjects and verbs with predicate complements were fully productive in affirmative sentences, they were not yet expressed in negative sentences.

There were also several unique negative structures, as in all the previous texts from Eric: "no ə think so" (an attempt at a familiar phrase), "train wheels /tu/ none"[1] (an attempt at the negative pronominal form in response to the question "Does the train have wheels?"), and "no, not blue," the only occurrence of "not" (to signal *denial*).

Eric V. There was a substantial increase in the number of negative sentences from 24 at Time IV to 56 at Time V; the sentences that were produced at Time V have been categorized and are presented in Table 7.11.

There was no difference between Time IV and Time V in the relative frequency of occurrence of negative sentences in the three semantic categories. Sentences signaling *nonexistence* occurred most often, and *rejection* was expressed less often, but productively, while *denial* was still not productive. But whereas there was no change in the status of the three categories in terms of relative productivity, there were important changes in the complexity of sentences expressing *nonexistence* and *rejection*.

[1] The form "/tu/" occurred frequently in the fourth and fifth texts, with apparent confusion between the homophonous forms "too" and "two," as demonstrated in the example given in Chapter 2: E:V "man ə good boy. /tu/. /tu/ shoe. man ə good boy /tu/. /tu/ shoes/." The utterance "train wheels /tu/ none" at Time IV was part of an extensive speech event in which Eric was comparing the train (which had no wheels) with the car (which did have wheels) and trying to express the difference between them.

Table 7.11. Categorization of Negative Sentences, Eric V

Nonexistence	Rejection	Denial
no more ball	no more cluckcluck	no fire engine
no more tank	no bib	no more fire engine
no more 'chine (3)	no piece ə clay nose	ə no piggies
no more birdie		
no more water	no flush	
no more water, Mommy	no have it	
no more lamb	no throw it (2)	
no more bridge	don't throw it	
no more fire	no in there	
no more pigeon		
no more man	no lollipop	
no more book		
ə no more light (2)	no, I didn't go back roller coaster	
no more fire engine	I no like to	
no more tank	no, I didn't	
no fire engine (3)		
oh no fire engine!		
no fire car		
ə no ice cream		
you no bring choochoo train		
I no reach it		
ə no fall down		
and ə no sit down		
not here		
not crying		
doesn't fit		
oh doesn't fit!		
ə doesn't fit (2)		
I didn't do it		
I didn't crying		
ə didn't have it		
I can't		
I didn't		
no, I didn't		

Note: Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions. The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child.

For the first time, sentences that expressed *nonexistence* included expression of sentence-subject—most often the pronoun "I." However, except for the occurrence of "it" after verbs, there was only one instance of predicate complement construction with verbs: "you no bring choo-choo train." Even though these sentences were longer than the negative sentences at Time IV, with inclusion of sentence-subject, they were still among the least complex sentences that occurred in the entire text. One of the first sentence structures Eric used, at Time II, was verb-object, but he still did not use this structure productively in negative sentences at Time V.

There was a differentiation in the form of the negative element in syntactic position before verbal predicates. The two forms "didn't" and "doesn't" replaced the form "no" in seven sentences with predicate negation. The corresponding affirmative forms "did" and "does" never occurred in the text—"doesn't" and "didn't" appeared to be uniquely negative formatives in the same sense as "no" and "no more." Although it may have been accidental, the forms occurred with appropriate temporal reference in all but one instance of "didn't." Progressive verb inflection was productive in affirmative sentences at this time, but the past tense was not.

Among the sentences that signaled *nonexistence*, there were many that were structurally the same as those that occurred in each of the earlier observations—for example, "no more ball," "no more tank," "no more bridge." However, there was a difference in the distribution of "no" as an alternative form of the negative element. "No" continued to occur in syntactic environments before predicate constructions, as in "I no reach it" and "ə no fall down," but "no" occurred before noun forms that did not have the function sentence-object. That is, in the sentences "no fire car," "no fire engine," and "ə no ice cream," the "no" affected the noun form directly and signaled its nonexistence.

This distinction between "no" and "no more" at Time V may have been analogous to the use of the two forms in the adult model: "no bananas" and the partitive "no more bananas." That is, Eric appeared to distinguish between the nonexistence of something he had experienced previously—for example, "no more fire engine" (Eric was pushing a truck under the bridge and the bridge collapsed on it) and "no fire engine" (Eric looking out the window, not seeing any fire engine on the street). However, it was also the case that "no more," which was the earliest, primitive form of the negative element in Eric's texts, no longer occurred in the subsequent text at Time VI. The use of the form "no" at Time V—to express simple *nonexistence* of objects that were not also

predicate objects—may have represented a transitional stage, before Eric relinquished "no more" as a negative marker.

Syntactic expression of rejection used the form "no" most often, and there was only one occurrence of the primitive "no more." There were three sentences that included the subject "I" (two of these with "didn't" as the negative element), and these sentences differed from all but one of the rest of the sentences that signaled rejection. The last four sentences listed in the category rejection in Table 7.11—"no lollipop," "no, I didn't go back roller coaster," "I no like to," and "no, I didn't"—signaled Eric's not wanting to do or to have something—the same kind of rejection used productively by Kathryn. The sentences "no, I didn't go back roller coaster" and "I no like to" occurred in the following sequence:

(12) E:V (Eric had been on a roller coaster the previous weekend; Mommy was prompting Eric to tell Lois about it)
Would you like to go again on the roller coaster?
[> no, I didn't go back roller coaster.
no!
like to. like to. like to.
> I no like to.]
(Eric shaking his head)
You don't want to go again?

However, the remaining nine sentences were negative directions with the second person subject as agent understood. For example, "no more chuckchuck" (Eric wanted Mommy to stop imitating a chicken), "no flush" (Eric didn't want Mommy to flush the toilet until he was out of the way). Only one of these sentences used the adult form of the negative imperative "don't."

There were more indeterminate sentences than occurred previously, and it was possible to infer semantic intent in some of these utterances, but only tentatively—for example:

(13) E:V (Eric standing next to the baby's bassinet looking at the bottle of shampoo)
no good.

(14) (Eric had picked up the shampoo and held it, then remonstrating to Lois, who was watching him)
[>no had it.
/e/ had it, Bloom.]
(Eric put the shampoo back)

It appeared, in (13), that Eric was referring to not being allowed to play with the baby's shampoo, and in (14) he appeared to be acting out this reproof with the investigator.

Table 7.12. Categorization of Negative Sentences, Eric VI

Nonexistence	Rejection	Denial
no more lollipop	I think no more	that not lollipop
no Daddy		that's ə not bridge
oh no Daddy!	no playing (2)	no, not ə yellow
no apple (3)	don't cry (2)	no, that's ə not choochoo train (2)
no choochoo train (4)	don't touch it	
oh no choochoo train (2)	don't eat it	
no choochoo train tonight	don't fall down	
	don't fall down, little man	
have no shoes	don't drag it next time	
	don't take ə choochoo train home	
nothing	no, don't touch it (2)	
nothing there		
didn't see choochoo train		
it doesn't go		
it doesn't fit in here		
I can't		
I can't climb up		
/i/ can't fit on		
I can't fit in (2)		
I can't eat it		
ə can't go in		
I can't find the bridge		
they can't go on the door		
choochoo train can't go anyplace		
you can have it. no.		
you can have it		
ə couldn't see ə duck		
Eric couldn't see ə duck		
and I couldn't see piggies		
I couldn't see them		
I couldn't find ə choochoo train		

Note: Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions. The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child.

The three sentences that signaled *denial* used the same structure as negative sentences that had occurred in earlier texts: "no fire engine," "no more fire engine," "ə no piggies." The syntactic expression of *denial* was still nonproductive, and the utterances that did occur were among the least complex negative sentences at Time V.

Eric VI. There were 55 negative sentences in the text at Time VI; these have been categorized according to function and are presented in Table 7.12. Sentences signaling *nonexistence* continued to occur most frequently, and these sentences were more structurally complex than at Time V. The developmental changes that had begun to emerge at Time V were fully productive at Time VI.

Only 4 of the 20 predicate negations occurred without production of sentence-subject and in 3 of these sentences there was a phonological element (/i/ or /ə/) which might be interpretable as a rudimentary pronoun form. In addition to the first person "I," the sentence-subject constituents included "you," "it," "they," and the nominal forms "Eric" and "choochoo train." The person and number paradigms for pronouns were productive in affirmative sentences at Eric VI, whereas they had not begun to emerge at Kathryn III.

The predicate phrase structure with inclusion of verb and complement was productive for the first time in negative sentences at Eric VI—for example, "I couldn't find ə choochoo train" and "they can't go on the door."

There were significant changes in the form of the negative element used in expressions of *nonexistence*. The primitive form "no more," which had been used most often in all the previous texts, occurred only once at Time VI. The prevailing form of the negative element that signaled *nonexistence* of objects was "no." The differentiation observed earlier between simple *nonexistence* and *nonexistence* of something that had occurred previously was no longer tenable. "No choochoo train" and "no apple" referred to nonexistence after previous existence, and "no more lollipop" was the only instance of partitive "no more."

A second important change in the negative element was the consistency of the form used in negated predicate constructions. Whereas the earlier variants "didn't" and "doesn't" occurred less often than at Time V, the three forms "can" (with negative intent), "can't," and "couldn't" were used in all the remaining predicate negations. Moreover, the forms were contrastive: "couldn't" always signaled previous events—the perfective or past tense; "can" and "can't" signaled events that occurred during the utterance or immediately previous to and during the utterance. The positive alternatives of these forms—"can" and "does"—never appeared in the text.

Syntactic expression of *rejection* continued to be productive, and the structure achieved the form that had been anticipated in the earlier texts: the negative imperative, with "don't" as the form of the negative element and the sentence-subject unexpressed but implied as the listener. The only expression of *rejection* where Eric was the agent was "I think no more"—Eric had played with a puzzle and was leaving it to play with the train.

Thus, Eric and Kathryn differed in the acquisition of the linguistic expression of *rejection*. Kathryn expressed rejection in terms of her not wanting to do or to have something, and ultimately expressed the first person subject and catenative verb in structurally differentiating these negative sentences. In contrast, Eric acquired the form of the negative imperative to express *rejection* first.

Although syntactic expression of *denial* was only marginally productive, in the five sentences that occurred with the function *denial*, the negative element was "not," and there was a demonstrative pronoun as subject in all but one of the sentences—the same structure used by Kathryn at Time III. Earlier, Eric had used "no more" or "no" as the negative element in expression of *denial*; but, whereas at Time VI "no more lollipop" occurred in expression of *nonexistence*, "that not lollipop" was used at the same time to express *denial*.

Thus, the developmental changes that characterized Phase 2 in Kathryn's development of negation had begun to emerge or were anticipated at Eric IV and V and became productive at Eric VI. The three semantic categories of negation were syntactically productive—although syntactic expression of *denial* was only marginally productive. The surface form of the negative sentences was structurally more complex, although there were still productive structures that occurred in the affirmative sentences in the text, but not in the negative sentences (for example, catenative verbs and progressive "-ing"). Sentence-subject constituents were included in expression of *nonexistence* and verb-complement predicate structures were productive in expression of *nonexistence* and *rejection*.

There was progressive differentiation in the form of the negative element, and the forms that were productive at Time VI were differentiated according to sentence function: "don't" was used exclusively to signal *rejection*; "not" was used exclusively to signal *denial*; the contrastive forms "can't" (alternating with "can") or "couldn't" and "doesn't" or "didn't" signaled predicate *nonexistence*; and "no" sig-

naled *nonexistence* of objects most often. The sequence in which the syntactic expression of the three semantic categories of negation developed was (1) *nonexistence*, (2) *rejection*, (3) *denial*—the same developmental sequence that was observed in the negative sentences produced by Kathryn.

7.3.4. Syntactic Negation, Gia V and VI

The development of negation began most slowly in the texts obtained from Gia. In the first three texts, syntactic expression of negation was indeterminate in interpretation more often than not. In the fourth text, the number of negative sentences was so small that only tentative conclusions were possible. Because most of the sentences signaled *nonexistence*, it was concluded, tentatively, that the syntactic expression of negation was marginally productive at Time IV and signaled *nonexistence*.

Gia V. The number of negative sentences increased from 6 at Time IV to 20 at Time V, and all but one of the 20 could be interpreted. If the syntactic expression of negation had only marginal status at Time IV, it could be considered productive at Time V. All the negative sentences at Gia V have been categorized and are presented in Table 7.13.

Table 7.13. Categorization of Negative Sentences, Gia V

Nonexistence	Rejection	Denial
no more cookie	no want that	no, not
no draw ə cushion	no watch (2)	
no play ə matches	no take home	
can't doed it (3)	no MopTop	
can't open door	no pinch ə cheek (2)	
can't reach it	not that book	
can't reach pretzel	don't break it	

Note: Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions. The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child.

There were only two syntactically productive categories—*nonexistence* and *rejection*—and a similar number of sentences occurred in each. There was only one instance of *denial*, and it was not strictly syntactic—the reinforced negative element, "no, not" (in response to the question

"Is the doll cold?"). There were also ten utterances (not presented in Table 7.13) that were interpreted as anaphoric "no" preceding an affirmative statement. In six of these, a single word followed the anaphoric "no." These utterances were elicited in an attempt to 'test' Gia's competence in expressing *denial*. For example, the investigator held up the figure of a boy and asked, "Is this the baby?" or held up the figure of a man and commented, "This is a girl." In each instance, Gia said "no" and named the figure correctly, rather than denying the identity suggested by the question or comment. It was concluded that syntactic expression of *denial* was not operative at Gia V.

The negative sentences were among the most structurally primitive sentences that occurred at Time V. For example, there was no expression of sentence-subject in any of these sentences, even though expression of sentence-subject had been productive in affirmative sentences since Time II.

There was variation in the form of the negative element; "can't" occurred only in expression of *nonexistence*, and "no" occurred in expression of *nonexistence* and *rejection*. Other forms—"no more," "don't," and "not"—each had unique occurrence.

Expression of *rejection*, as in Eric's texts, referred to the listener as agent, except for one sentence ("no want that").

The development of syntactic negation at Gia V was distinguished by two important factors: (1) there was substantial evidence that Gia had learned the cognitive-semantic notion of negation as a concept that could be expressed syntactically; and (2) there were two semantic categories of negation that were syntactically productive—*nonexistence* and *rejection*. The two classes of negative sentences were structurally differentiated only in the use of "can't" exclusively as a negative element before verbs in negation signaling *nonexistence*.

Gia VI. Any doubt about the status of negation in Gia's grammatical competence was dispelled at Time VI, when 121 negative sentences occurred and only 3 of these could not be interpreted. The proportion of sentences in the categories *nonexistence* and *rejection* was the same as at Time V, with a similar number of sentences (49 and 45) in each category at Time VI. But whereas there was only one expression of *denial* at Time V, there were 24 sentences that signaled *denial* at Time VI, so that all three categories of negation were fully productive in syntactic expression. All these sentences are presented in Table 7.14.

In addition to the 500 percent increase in the number of negative sentences, there was a substantial difference in the produced structural

Table 7.14. Categorization of Negative Sentences, Gia VI

Nonexistence	Rejection	Denial
no pockets	I no make duty in the potty!	I didn't (2)
there's no more	I don't ə microphone	no, I didn't (3)
there's ə no money	no! I don't want it	
it's not in the bag		I not
		I'm not unhappy
I can (19)	no soap cup	I not smell
I can't (8)	no, not my button	
I can put here	don't (10)	it's not (3)
I can't put this here	don't! I say no!	it's not ready
I can put this pussy cat here	don't go (2)	it's not stop
I can't doed it	don't scare	it not all wet
I can't get out	don't stay (4)	it's not ə big spoon
I can't see it	don't say that! (2)	no, it's not raining
I can't fix it	don't take chair!	it's not cold out
I can't get it	don't take it	no, it's not the teddy bear
I can't reach	don't read it!	no: it's not yours
I can't ə put ə lamb in	don't push two	
it don't fit	don't touch this one	this not my stick
no, it don't fit	don't touch ə big one	that's not mines
this don't fit in	don't touch my block! (3)	that not Mommy
and this don't fit in too	don't turn the page	that's not little
you don't make duty in your diaper	don't hold on ə seesaw	/ðɣ/not yours
I didn't make dirty—/ no duty in my diaper	don't stay in my room	
	don't take your microphone	
no, I not	don't stand over it	
no, it don't go in this box	don't take the belt out	
	don't take my diaper	
	don't pull my pants down	
	don't go in the room	
	don't go in here until few minutes	
	no, don't here	

Note: Numbers in parentheses refer to number of occurrences in the text, discounting immediate repetitions. The underlined words are those that occurred in an immediately preceding utterance produced by someone other than the child.

complexity of the sentences at Time VI in comparison with the sentences with the same functions at Time V, when the structural differentiation of the two categories *nonexistence* and *rejection* was rudimentary.

Whereas there had been no expression of sentence-subjects in negative sentences at Time V, in expression of *nonexistence* at Time VI there was inclusion of sentence-subject in every utterance except one ("no pockets"). The form of the subject was the pronoun "I" most often, but "you," "it," "this," and "there's" also occurred.

The only instances of expressed sentence-subject in sentences that signaled *rejection* were "I no make duty in the potty!," "I don't ə microphone," and "no! I don't want it," and each referred to Gia's not wanting to do or to have something. All the remaining sentences signaled *rejection* of an event that involved the listener as actor-agent, and the sentence-subject was implied but not expressed. Thus, Gia and Eric were similar in the development of syntactic *rejection*—both children learned the structure and function of the negative imperative first. The form of *rejection* in Kathryn's texts—the negation of *desire* with expression of the catenative verb and subject "I"—was only a marginal structure in the texts of both Gia and Eric.

Most of the sentences in Gia's text that signaled *denial* included the form "it's" as subject—a form that was not used by either Kathryn or Eric. In addition, Gia used the subject forms that Kathryn and Eric used: "that," "that's," and "this." There did not appear to be a motivating difference between "it's" and other forms. Expression of *denial*, as with Eric and Kathryn, negated statements of identity most often.

Finally, as observed in the negative sentences of Kathryn and Eric at the culmination of Phase 2, there was a functionally motivated differentiation in the form of the negative element. Except for the utterance "I didn't," which expressed Gia's denial of having done something, the negative element "not" was used in all expressions of *denial*. Except for the single occurrence of each of the forms "no," "not," and "no more," the negative element in all expressions of *rejection* was "don't."

The negative element was variable in expressions of *nonexistence* with occurrence of "no," "not," and "don't," in addition to the most productive form, "can't" (which alternated with "can" produced with negative intent). There did not appear to be a meaningful difference among the forms that occurred—for example, "this don't fit in" and "I can" occurred in similar speech events. As observed also with Kathryn and Eric, the auxiliary forms *can*, *do*, or *did* never occurred in affirmative sentences. Rather, the forms "can't," "don't," and "didn't" appeared to have been learned as alternants of the forms "no" and "not." Although progressive "-ing" was fully productive in affirmative sentences, there was no occurrence of progressive verbs in negative sentences, so that the observation by Bellugi (1967) that the forms

"don't" and "can't" were restricted to occurrence with nonprogressive main verbs in her data did not apply to the data collected from Kathryn, Eric, and Gia.

7.3.5. Comparison of the Three Children and Summary of Phase 2

The sequential appearance of syntactic expression of *rejection* and *denial*—after the appearance of *nonexistence* in Phase 1—was one important aspect of Phase 2. Although sentences signaling *nonexistence* continued to occur most frequently in most of the texts, structures signaling *rejection* and then structures signaling *denial* became productive. A schematic account of the proportional distribution of negative sentences in terms of function in Phase 1 and Phase 2 is presented in Figure 7.2.

Just as the different semantic categories appeared sequentially in the order *nonexistence*, *rejection*, *denial*—subsequent, progressive increase in the produced structural complexity of each category followed the same order. Expression of sentence-subject and the occurrence of the verb and complement constituents of predicate phrases were evident in sentences expressing *nonexistence* before these same forms were expressed in *rejection* or *denial*. When the syntactic structure of sentences expressing *rejection* subsequently increased in complexity, the most primitive syntactic form was used in the expression of *denial*.

A second important aspect of Phase 2 was the development of different but relatively homogeneous structures for the expression of the different semantic categories. The syntactic structure of expression of *denial* developed last and was similar in the sentences of the three children—the subject "this," "that's," or, in Gia's sentences, "it's" before the negative element. The complement was a single word—a noun form most often, but adjective forms also occurred ("that's not little" at Gia VI). Generally, there was no verb in these sentences. Final "-s" occurred with "that" and "it," but the inflectional paradigm of "be" was not yet productive in the affirmative sentences in the texts. There was no evidence that "it's" or "that's" represented contractions with the copula "be."

There were two forms of *rejection* (the second category in the developmental sequence), and the children differed in their use of each; either one or the other was productive in the negative sentences of each child, but not both. Kathryn expressed *rejection* of something that she didn't want to do or to have. The ultimate structure she used at Time III included expression of the sentence-subject "I" and the catenative verbs "want" or "need" before a predication that involved Kathryn as agent.

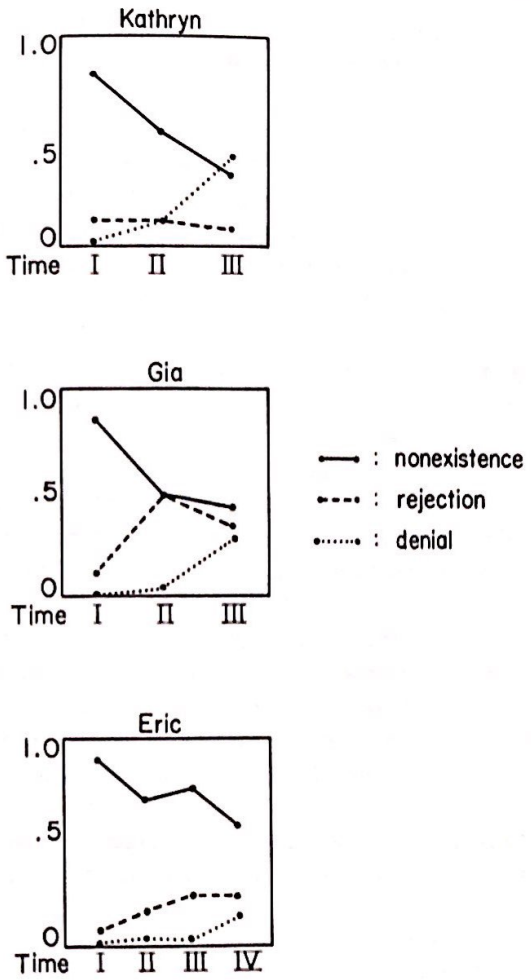

Figure 7.2. Development of negation, Phases 1 and 2: proportional distribution of negative sentences in the semantic categories nonexistence, rejection, and denial.

This was the same form of negation described by McNeill and McNeill (1967) as "internal-external"—the "lack" of "internal desire," and was also the second form of negation acquired by their Japanese subject.

However, Eric and Gia acquired an alternative form of *rejection*. Although both children produced sentences that were functionally similar to the expression of *rejection* by Kathryn, their use of these forms was marginal, and such sentences were less structurally complete than the expression of *rejection* that involved the receiver as agent. This

second form of *rejection* anticipated the form of the negative imperative in the adult model. There was no catenative verb form and no expression of sentence-subject.

Two sentence types were used to signal *nonexistence*—predicate negation where the referent was the nonoccurrence of events ("I can't climb up" at Eric VI) and nominal negation where the referent was the *nonexistence* of objects ("no choochoo train," also at Eric VI). Whereas nominal negation had been the predominant expression of *nonexistence* in the earliest texts, predicate negation predominated in the later texts of all the children. Expression of nominal negation was simplest—most often the negative element "no" in juxtaposition with a noun or noun phrase. These constructions were not included in larger constructions; the one exception was "have no shoes" in response to the question "Does the little boy have shoes?" at Eric VI.

Predicate negation, for all three children, came to include expression of sentence-subject (the first person "I" most often) and elaborated predicate phrase constructions with verb and complement forms.

Finally, the third distinguishing feature of Phase 2 was the progressive differentiation in the form of the negative element motivated by the different syntactic structures that signaled the different semantic categories of negation. All three children used "not" to signal *denial*. Although the function and structure of the expression of *rejection* differed among the three children, the same form of the negative element, "don't," was used.

The negative element that was used in expression of *nonexistence* was the most variable. Both Kathryn and Gia used different forms of the negative element which appeared to be unmotivated—"can't," "don't," "not," and "no." However, the negative element in Eric's sentences was consistent; "can't" and "couldn't" occurred almost exclusively at Time VI, and the forms were temporally contrastive, even though Eric had not yet distinguished temporal reference in affirmative sentences.

It was most significant that at the time that negative sentences first began to be differentiated on the basis of function, that is, when negative sentences were used with different semantic intent, the syntactic structure used for each was the same. When the children subsequently developed more complex syntactic expression of *nonexistence*, the syntactic structure of the earliest sentences that occurred at the same time with different functions, that is, *rejection* and then *denial*, was invariably the same as the primitive form of the first sentences that had expressed *nonexistence*.

Thus, it was not necessary for the children to learn a new or different

structure in order to express a new or different semantic intent. Initially, there was one meaning (m_1) of negation and one form (f_1). Subsequently, when two meanings were interpretable, (m_1) and (m_2), it was not the case that the appearance of (m_2) corresponded to the appearance of a second form (f_2), as might have been expected:

Time A: (m_1)—(f_1)

Time B: (m_1)—(f_1)

(m_2)—(f_2)

Rather, the appearance of a different form was associated with the first meaning (m_1), while, at the same time, the earlier form (f_1) was used to express the second meaning:

Time A: (m_1)—(f_1)

Time B: (m_1)—(f_2)

(m_2)—(f_1)

The acquisition of linguistic expression did not proceed hand in hand with cognitive-semantic development. Learning to express a new semantic category of negation did not involve learning a new structure for its linguistic expression at the same time. Neither was it the case that certain linguistic forms were productive in the children's speech before they knew something about the corresponding underlying cognitive notions. New, more complex structures developed and correlated with semantic categories only after expression of the categories with simpler, familiar structures had become productive in the texts.

The children differed in their rates of acquisition. Phase 1 was identified in the texts Kathryn I, Eric III, and Gia IV and Phase 2 in the texts Kathryn III, Eric VI, and Gia VI, so the transition from Phase 1 to Phase 2 was accomplished in the course of two observations of Kathryn and Gia and three observations of Eric. Although Gia's rate of development was initially the slowest, she caught up between Time V and Time VI.

In summary, even though there were differences in their rates of development and relatively minor formal and substantive differences in their linguistic development, the fact that the three children learned to differentiate the semantic categories in terms of structure in the sequence *nonexistence*, *rejection*, *denial* was the dominant feature of Phase 2 in their acquisition of syntactic expression of negation.

7.4. Early Sentence Negation: Sequential Development and Interpretation

On the basis of the relative frequency of occurrence of sentences in the different semantic categories of negation, and the progressive developments in the syntactic complexity of these sentences, the order of acquisition for all three children was specified as *nonexistence, rejection, denial.* This sequence is similar to the sequence that McNeill and McNeill (1967) anticipated in the development of negation by their Japanese subject, with two differences: a minor difference in the specification of the function of *rejection,* and a more substantial difference in their specification of the first semantic contrast. In the first contrast they observed, their subject marked the "correctness and incorrectness of statements" in addition to "nonexistence of objects and events."

Because the same sequence occurred in the acquisition of negation by the three children in this study, and there is some evidence for postulating a similar sequence of development in Japanese, it is reasonable to speculate on a rationale underlying this sequential development. Several reasons can be advanced to account for children learning certain syntactic structures before others. The factors of structural complexity and frequency of exposure or the child's experience with specific structures are two factors that are usually suggested; certainly, they play some part in the fact that use of passive sentences, for example, occurs late in the course of development.

In terms of the structural complexity of the ultimate linguistic expression of the three semantic categories, however, expression of *denial* appeared to be least complex. The shape of the negative element was constant; there was no expression of a verbal element—the complement structure on which the negative element had direct effect was a single word most often; and there was the use of a relatively constant, familiar proform as sentence-subject. In contrast, expression of *nonexistence* was ultimately most complex with expression of different sentence-subjects, variable verbal constituents with predicate complement constructions, and wide variation in the possible forms of the negative element. But expression of *denial* developed last, whereas syntactic expression of *nonexistence* developed first.

However, it was also true that in *nonexistence* the negative element had direct effect on the nominal or predicate form—for example, "no pocket" and "no fit." Expression of *rejection* involved negating the child's *wanting* to have or to do something, for example, "no (want) dirty soap"; or negating his wanting someone else to do or to have something, for example "(you) no flush" and "(you) no have it"—with an implication of more complex underlying structure.

As has been pointed out, there was no way of determining which syntactic structures were most frequent in the speech the children heard. It is a matter of speculation as to whether statements of *nonexistence* occurred more often than statements of *rejection* or statements of *denial* in the speech that the parents of the children addressed to them. In Bellugi's (1967) analysis of the negative sentences that each of the mothers of the children in her study used in a period of four hours, "basic sentence negation . . . 'you can't do that,' 'that isn't right,' 'he doesn't want it'" occurred most often, and negative imperatives occurred less frequently.

One reasonable explanation for early attention to syntactic expression of nonexistence before *rejection* was the adequacy of "no" as a single-word utterance (with appropriate behavior) in expressing *rejection*; "no" worked in expressing *rejection,* whereas "no" or even the more explicit "no more" (and appropriate behavior) communicated little information about *nonexistence.* The fact that the referent was not manifest in the context necessitated its inclusion in expression in order to transmit the information of *nonexistence.* In contrast, the fact that the referent was present—actually in *rejection* situations and symbolically in *denial* situations—made reference somewhat redundant. Thus, the children 'needed' to express *nonexistence* syntactically in order to transmit information, whereas syntactic expression of *rejection* and *denial* was less necessary.

The fact that *denial* involved a symbolic referent—the child had to perceive the referent in something said—probably accounted in part for the fact that *denial* developed last. It was observed in Chapter 2 that the children's earliest utterances tended to occur infrequently in relation to another utterance (from someone else or from themselves). Further, McNeill and McNeill (1967) observed that statements of denial usually entailed alternative affirmative statements—for example, "that's not mines. that's dolly's" at Gia VI (whether or not the alternative affirmative statement was actually expressed). Their suggestion is reasonable that "Entailment–Non-entailment" (*denial*) "requires a child to hold in mind two propositions at once" and so would be acquired after contrasts that involve only one proposition (as in *nonexistence* and *rejection*).

In summary, Kathryn, Eric, and Gia approached the task of learning negation—which, in the adult model, is a complex, explicitly differen-

tiated grammatical subsystem—systematically and similarly. It was possible to trace their acquisition of syntactic structure in relation to the semantic correlates of negation. Further, by studying the acquisition of each of the three children individually and then comparing the obtained sequences of development, both similarities and individual differences were revealed.

The findings presented here appear to complement the description of the acquisition of syntactic structure in early sentence negation proposed by Bellugi (1967). The descriptions of the form of negative sentences in Bellugi's data were generally similar to the surface features of the sentences of Kathryn, Eric, and Gia. The negative sentences produced by the three children in the developmental stages described as Phases 1 and 2 could be described as having occurred in the earliest developmental periods that Bellugi described. However, when information about the semantic correlates of the sentences was considered, it was possible to study the syntax of negation more deeply, and to inquire into the underlying motivation of syntactic form.

8 Learning to Talk

In the course of this study, it was clear that the children's sentences were not incoherent. Semantic interpretation of utterances could be inferred in most instances so that the inherent structure of sentences could be evaluated. Thus, the failure to reach the children's 'intuition' about language was less of an obstacle to describing their language than might have been anticipated.

It has been pointed out that the study of linguistic performance must take into account the fact that children (as well as adults) make 'mistakes' in talking—that factors such as memory limitations and environmental distractions interact with underlying competence (Chomsky, 1965, pp. 3 4; Cazden, 1967). It was clear that the children made mistakes in talking; there were 'false starts,' unmotivated reduplication such as repeated syllables and words, and unfinished utterances. Representative examples included "more raisin more" and "/bei/— Mommy milk" at Kathryn I and "I get horsie 'chine" at Eric III. However, it was significant that, first, such utterances as these did not fit any of the productive structures that could be identified in the data—each represented a unique class of 'one'; and second, the occurrence of this kind of surface error, as a result of production accident, was relatively rare in the texts. This last observation coincided with the report by Labov (1966)—that speakers of a language speak in sentences that are essentially grammatical. The speech of the children confirmed this observation; their random, accidental mistakes were inconsequential and not a dominant feature of their linguistic production.