The Social Foundations of Language and Thought

Essays in Honor of Jerome S. Bruner

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W · W · NORTON & COMPANY
NEW YORK LONDON

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The Development of Negation in Early Child Language

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While the child's task of learning words seems relatively straightforward it has always bedeviled language theorists. In fact, in having to construct word meanings from words used in conversational settings replete with actions, gestures, objects, and events, the preverbal child faces one of the most difficult yet critical problems of life. Empiricist accounts of the acquisition of word meaning, such as Quine's (1974), assume the adequacy of an ostension theory, by which words paired with objects provide the child with the referential connection required for language symbolization. Compelling arguments have been given against ostension as the source of word meaning (Bruner, 1974–75; Harrison, 1972), but empirical considerations weigh against it as well. The fact that children use negatives among their earliest words provides direct counter-evidence to such empiricist doctrine. Negation has no referent, unlike nominal terms or adjectives (such as color words), and is inherently relational in nature. It is not even logically possible for the child to be taught the use of negation by ostension, for although there are a finite number of normally used words truly ascribable to a particular object, there are an infinite number of words not truly ascribable to it. In other words, there are far fewer things that an object is, than that it is not. Of course, negation has meanings other than the truth-functional meaning of not-x I have been describing, but for all of the negative meanings to be considered the same point holds—one cannot refer to negation.

Fortunately there are more seductive reasons for studying the development of negation in children's language and thought than to rebut an ostension theory of word learning. Negation is a pervasive and essential conceptual and linguistic device, particularly in its meaning of not-x, where x represents some proposition (Jespersen, 1917; Quine, 1960). There are many reasons for the ubiquity of negation in natural language. A mind limited to describing only what *is* the case, without the power of negating, would

be without logic, science, or explicit correction, all of which are reliant on propositional negation (Altmann, 1967; Harrison, 1972; Wilden, 1972). Comparative analyses of communication have shown that negation is central to human language, yet conspicuously absent from the natural communication repertoires of other animals (Altmann, 1967; Sebeok, 1962). Philosophers have taken special note that propositional negation operates on sentences as part of a metalanguage and is, therefore, of a higher logical type than the language it operates upon; they have emphasized that the ability to conceive of propositions as true or false (dependent on the operation of negation by which these values are defined) is one of the central aspects of language comprehension and use (Dummett, 1973; Kant, 1963; Marshall, 1970). It would be naïve to claim that knowledge of the truth-conditions for sentences is all we know as speakers of a natural language, given the rich variety of acts we accomplish in our uses of language (for example, Searle, 1969, 1976), but such rules, integrally tied to the conception of negation, are a major part of our knowledge about language.

The pragmatic conditions of negation use provide yet another motivation for the study of negation development. Negatives in natural language serve to mark a discrepancy from a positive assumption that someone is presumed to believe, whether oneself or another. This social fact about the uses of negation raises a central question in the acquisition of communicative competence. For if the appropriate use of negation requires inferring the belief states of other persons, one might expect the young child to have great difficulties, for the reason that knowledge about the physical properties of objects, social relations, and event contingencies in social and physical interactions has just begun to develop. Whether the differing world views of children lead their uses of negation askew of the pragmatic conditions of adult negation is one problem we must confront.

A major quest in the study of the development of negation and language in general is to explain the emergence of truth-functional negation, used to deny propositions which are not true, from the very early expressions of negation that are affective in nature. The latter uses of negation, as an interpersonal tool for constraining agency by rejection, are vastly different from the use of negation to deny statements. Truth-functional negation is metalinguistic and depends on a knowledge of truth-conditions for predications. In the terminology of early twentieth-century discussions of language development, negation provides a paradigm case of the emergence of the language of "intellect" from the language of "affect."

In this chapter I plan to explore some fundamental aspects of children's acquisition of the semantics of negation, paying particular attention (as one who has worked with Jerry Bruner would) to the transition from prelinguistic to linguistic communication. After examining the range of contexts in which children express negation in their first year of language use, I develop a taxonomy of negative meanings. Results of longitudinal studies of six chil-

dren are then presented which indicate that different meanings of negation emerge in an invariant sequence, whereas individuals vary as to which lexical items they use to express the same negative meanings and in the negative meanings most prevalent in the language they use. The invariance is explained by developments in cognitive representation which allow for the new meanings, and the variation is viewed as resulting from the specific experiences of different children in mother-child discourse. An account of the formation of negative word meanings is provided which emphasizes the interaction between parental uses of negation in specific types of settings and children's first uses of negative terms. Focusing on the interactions in which early negations get used, by both child and adult, removes some of the mystery from negation semantics and from the process by which children come to know the pragmatic conditions of negation use.

Meanings of Negation in Sentences

In the few systematic studies devoted to the semantic development of negation, several meanings of negation have played central roles. An influential tripartite division was proposed by Bloom (1970, p. 173):

1. *Nonexistence*, where the referent was not manifest in the context, where there was an expectation of its existence, and it was correspondingly negated in the linguistic expression;
2. *Rejection*, where the referent actually existed or was imminent within the contextual space of the speech event and was rejected or opposed by the child; and
3. *Denial*, where the negative utterance asserted that an actual (or supposed) predication was not the case.

Bloom found that the syntactic expression of these different negation meanings proceeded in the order nonexistence, rejection, and denial for all three of the American, English-speaking children she studied.

McNeill and McNeill (1968) also realized the insights which a concentration on negation semantics could provide for negation development, beyond the structural descriptions carefully provided by Bellugi (1967) in earlier syntactic studies. Their study reported data for one child from the age of two years three months learning Japanese as a first language. The McNeills proposed a system of three binary feature contrasts for different meanings of negation: Existence-Truth, External-Internal, and Entailment-Nonentailment. These studies by Bloom and the McNeills are often interpreted as each supporting the emergence of semantic functions of negation in the order nonexistence, rejection, and denial (Bloom, 1970, p. 173; Cromer, 1974; de Villiers and Flusberg, 1975), but there are critical dis-

crepancies between them that have even been noted by McNeill (1970, p. 96). A brief review of the findings will make this clear.

The McNeills thought that the task of tracing the course of semantic development for negation would be considerably simplified by observing the acquisition of Japanese, since the four common forms of simple negation in Japanese have different semantic functions and (+) or (−) feature markers on each of the three binary dimensions mentioned above:

1. *Nai (aux)* is a denial of a previous predication, which I will call "nonentailing denial";

2. *Nai (adj)* is an assertion of nonexistence of X given an expectation, by the speaker or listener, that X was previously present (where X is an object or event);

3. *Iya* is a straightforward rejection, glossed as "I do not want"; and

4. *Iiya* is a denial of a previous proposition plus the implication that something else is true; this may be called "entailing denial."

The McNeills viewed negation development as the acquisition of dimensions that are marked (±) in a semantic feature analysis. A central problem with this view, however, is the oddity of the "Existence-Truth" dimension, which is not a dimension at all, unlike the other two. This dimension, they suggest, concerns the "condition" of negation, the existence or lack of either some thing or the truth of some sentence. But sentences and things are of different types. Only sentences have truth-values, so the existence of things and the truth of sentences are not diametrically opposed as are the ± values of the other two dimensions. Since truth-values involve arbitrary and rule-governed truth-conditions for sentences, the "truth" aspect of the McNeills' dimension is of a higher order and logical type than the "existence" aspect, with the consequence that any ± feature analysis with these two conditions is artificial.

The McNeills concluded that the Japanese child's semantic development of negation proceeded in the order of nonexistence, nonentailing denial, rejection, and entailing denial. The difference between Bloom's and the McNeills' findings is that the Japanese child purportedly "had the idea of lingustically registering the truth of statements before she had the idea of linguistically registering her inner states in relation to outer ones" (1968, p. 61), whereas all of Bloom's subjects expressed denial *after* rejection in syntactic expressions.

The developmental histories of negation semantics offered by Bloom and the McNeills dealt with the expression of negative meanings in *sentences* children produced, they do not really address questions about the development of meanings of negation during the single word utterance period. Yet there are important reasons for studying the origins of negation semantics. One is to determine the adequacy of a single negative word for expressing the three negative meanings Bloom discusses, and the fact that "nonexis-

tence first" may be an artifact of the need for specifying a referent of the nonexistence proclamation (Bloom, 1970, p. 219). Since the communication requirements for effective discourse can differentially affect the complexity of expression for different meanings of negation, the developmental order of expression for negative meanings *in sentences* tells us little about the development of negative meanings per se. A second reason is that children display a rich variety of uses for negative words even in the single word utterance period. From a wider perspective, as Vygotsky's psychogenetic method (1978) has shown, the study of the history of behavior that begins at its source, and traces the dynamic relations between its components, holds the promise of explanatory analyses of processes of development instead of descriptive accounts of developmental products.

Negation in the Single-Word Utterance Period

Before progressing to a description of communicative contexts of single-word negatives, we must confront a problem rarely acknowledged for child semantics in general, and not at all for child negation. What exactly is "negation"? Like many words, "negation" does not have any one central or defining essence, but a number of meanings that partake of family resemblances to one another (Wittgenstein, 1958).

Dictionary definitions tell us that negations express such meanings as denials, refusals, prohibitions, and statements of nonexistence. One critical thread running through these expressions is the likelihood of their being expressed by the words "no" or "not," the primary negative particles in English. The dictionary definitions include the meanings of negation distinguished by Bloom and the McNeills, but the problem of polysemy for a negative word such as "no" or "gone" is a difficult one, not unlike the lexicographer's problems with polysemy in general. And unlike other areas of semantics, such as kinship or spatial terms, we have no standard linguistic studies on negation semantics to refer to. Negation is so fundamental a part of lexical meaning in general (for example, in antonymy) that a "semantic field" for negation would include many of the words in a language (Miller and Johnson-Laird, 1976).

How fine a line should be drawn between different meanings of negation? Conceivably, we could have either one general meaning or a proliferation of meanings, literally one for each distinct occasion of use. At least this sets the limits. The level of generality chosen may be motivated by different concerns. Miller (1978) indicates two potential strategies: a lexicographic approach which proliferates senses of a word in its occupation with making as many conceptual distinctions as possible, specifying discourse and selectional restrictions for each specified sense; and a second approach which

only introduces a new sense when combining it with another sense would yield a uselessly overgeneral meaning. The lexicographic approach eventually has its limits, and the latter approach is restricted by how one construes "uselessly overgeneral." We will not settle the problem in this brief discussion, but its consequences for negation semantic development deserve attention.

One striking feature of early verbal negation is the great range of contexts in which the first negative words are used before they are ever combined with other words to form sentences. A problem for the child language investigator analyzing the contexts of use for single-word negation is to delineate psychologically real semantic categories of negation for the child. It would be a great help if the child produced just two different negative words, such as "no" and "gone." each only appearing in set situations, perhaps "no" only to reject objects and "gone" only when people walk out of rooms. But actual negative usage is much more complex than this. Children rapidly generalize negative words to new situations with the same tenacity that they carry over object words to new category exemplars, and the developmental psycholinguist's task requires detailed descriptions of contexts of negation use (both discourse and situational) and the difficult work of trying to detect nuances of meaning that have later consequences in, for instance, later structural differentiation of negation expression. At this time, a complete picture of early negative use is not available, but the following observations provide a sketch for one.

I would like to suggest a tentative resolution of the meaning delineation problem by proposing that certain *families* of negative meanings can be identified in the wide variety of uses of single-word negation, and that several specific questions about the emergence of different meanings for negation in children's speech may then be answered.

As focus for discussion, figure 1 provides an overview of contexts in which negatives were used in the study I will describe or by children followed in previous child language studies.[1] For purposes of exposition, the child's negative utterances are listed separately as to whether they are adjacent to adult utterances or initiated by the child and, hence, nonadjacent.

On the adjacency side of the figure, the types of adult utterances that precede the child negatives are listed. Fuller elaborations of variations of the different contexts are specified in the right-hand side of the figure; these are not presented in the left-hand side purely for reasons of space. The proliferation of distinct contexts in these descriptions will lead us back to the families-of-negative-meanings account already mentioned.

Negation is frequently used to reject parental prohibitions or imperatives, and this negative context frequently recurred in long rounds of turns (that is, iterative loops of adult command-child rejection). Disappearance nega-

1. This literature is reviewed in Pea (1978). The most descriptive published accounts to date are Bloom (1973) and Leopold (1949).

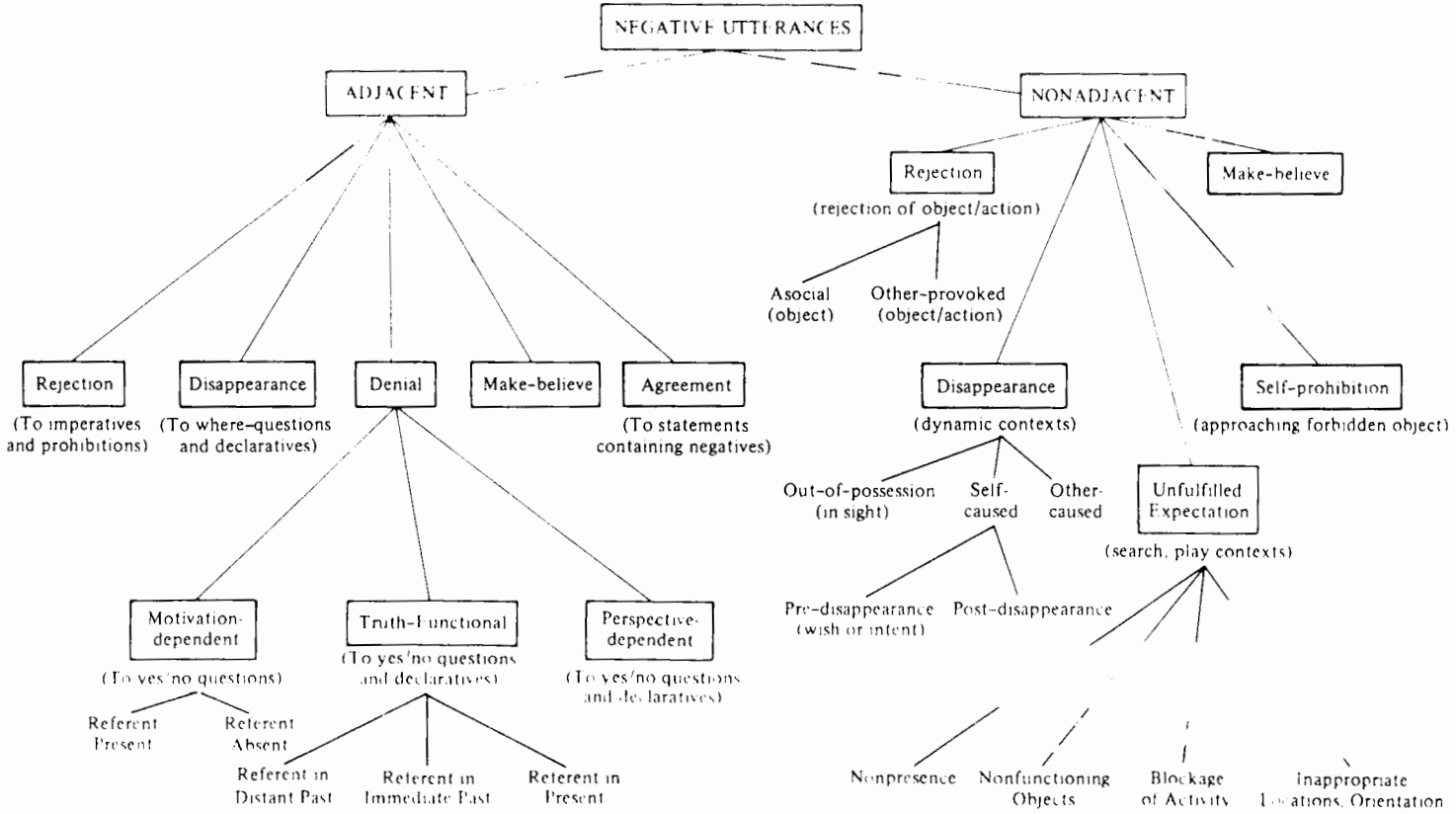


FIGURE 1 Contexts for the use of negation in the first two years of life

tions, such as "gone," were usually coupled with where-questions in discourse, but occasionally with declaratives, each of which often cued a search for a non-present object which, after search, was not found. A variety of disappearance contexts had negative words expressed in them, such as child-caused object disappearance and other-caused object disappearance, and each of these variants may vary along yet other parameters—object in/out of possession of child at the time of disappearance, negative word produced before (as a negative wish) versus after the object disappears, and so on.

Negatives are also often responses to yes/no questions and declaratives and may serve to deny the proposition expressed in the question form. The yes/no questions answered by the child's negatives may be placed in one of at least three categories, requiring different kinds of evidence for an accounting of the truth of the proposition in question. Many questions, such as "Do you want a cookie?", "Can you open it?" or "Can you see the mouse?" depend on the child's desires, abilities, or perspective. Yet another important class of yes/no questions and declaratives express propositions whose truth depends on facts of the world external to the child's viewpoint, such as "Is this Daddy's pipe?" or "Did we go to the fair?" All three classes of yes/no questions may also vary in the dimension of time, so that the proposition in question relates to present, immediately prior, or distant past events.

Other uses of early negation are for make-believe, as in disappearance comments such as the sentence "Roy gone," used with laughter by one child as Roy stood in the child's plain view. Negatives are also sometimes used to agree with prior negative utterances (see Bellugi, 1967; Pea, 1978).

The heuristic diagram presented in figure 1 should not be considered a complete list of early contexts and meanings with which negative words are used, but it captures the diversity of situations in which young children use negatives. One could even proliferate further subcategorizations of the nodes of the figure, differentiating yet more situational variants. But the list of early contexts for "no" and related words used by children is *not* a typology of early meanings for negation, for there is no reason to assume that these "types" (and subtypes, if our diagram delineated more subtle meaning differences) are in any sense distinct in children's conception of their own use of the negative words in these situations. One *could* take a lexicographic approach as an initial guideline for distinguishing different negative meanings that may be psychologically differentiated for the child. The reason, however, why this is a bad first start is that there are certain families of negative word contexts, with many features in common for any given family, that naturally cluster together. Though one still can not conclude that the semantic categories thus obtained match up with distinct negative meanings for the child, the categorization is at least motivated by similarities in the child's behaviors and situational contexts of the different category members.

For example, the child's use of "no" to reject an object offered to her, accompanied by a pushing-away gesture, is very much like the child's use of "no" in rejection of a prohibition constraining her action.

The semantic categories used here for meanings of child negation are a result of such groupings of negative word uses in different contexts, and they resemble in some respects the categories described by Bloom and the McNeills.

Rejection negatives were defined as those action-based negations with which the child rejects an event, person, object, or activity which is in the immediately perceivable context of rejection or imminent in the mother's behavior or utterance (whose truth-value is contingent on the child's current motivations). The "imminent" disjunct of the definition refers to uses of negatives used in contexts in which highly routinized activities provide cues for the child (such as a diaper in the mother's hand) of imminent to-be-rejected actions, and negatives used in response to desire questions such as "Do you want a cookie?"

Disappearance negatives are uses of negatives with reference to the disappearance of something which had been present just prior to the child's utterance but is no longer perceivable to the child. The "something" may be an object or person, an activity, or some form of sensory stimulation (such as the sound of a washer or radio) which disappears or ceases.

Related to the negatives of disappearance but distinct in important ways are negatives of *unfulfilled expectation.* Negatives expressing the meaning of this semantic category are used to comment on constraint on activity, absence other than immediately prior disappearance or cessation, or, more generally speaking, some aspect of the child's continuing line of activity (such as search or play) which does not occur (for example, blockage of movement of bicycle, toys that are malfunctioning) or is not found (a block not in its habitual location).

Truth-functional negation consists of the use of a negative in response to an utterance expressing a proposition that is true or false given the facts of the situation it refers to and, hence, the truth-conditions of language. Such truth-functional negations express logical judgments and constitute a subset of the negatives captured by Bloom's "denial" category defined earlier. This stands in contrast to some rejection negations, which negate a proposition the truth of which depends on the child's own motivations.

Self-prohibition negation is a form of egocentric symbol use in which the child approaches a previously forbidden object or begins to do something which has been prohibited in the past and then expresses a negative. Such negations are not necessarily accompanied by the child's avoidance of the forbidden act.

These five semantic categories of negation will be the central focus in this chapter, with the purpose of investigating general features of the development of different meanings of negation. These categories account for a sub-

stantial proportion of all the negatives children produced in the study reported here, unlike the potential meaning categories of negative agreement, negative wish, make-believe negative, and non-truth-functional denial negation. Such negations do occur during the first year of language use, but only infrequently.

The proliferation of different uses for negation by the age of two years deserves special emphasis, especially because it stands in contrast to arguments by Steffensen (1978) that the word "no" during this period is "lacking in semantic content" and only fulfills the conversational requirement of responding to yes/no questions. The richness of early negation semantics becomes apparent when one studies children's spontaneous use of negation and negation in response to parental linguistic forms other than yes/no questions.

Cognitive Representation and Meanings of Negation

One can now ask, given our characterizations of different semantic categories of negation, in what order the first expressions of different negative meanings develop. Longitudinal data from six children indicate that children first convey inner states via rejection negation, then make comments on the disappearance of things in the world, and only later truth-functionally negate false statements about the world. Individual differences occurred in the developmental ordering of unfulfilled expectation negation and self-prohibition negation, although for all children such meanings preceded the expression of truth-functional negation. These findings may be explained by analyses of the progressively higher-order representational requirements, or cognitive bases, of the conception of different meanings for negation. The general "cognitive complexity" of negation has been a standard observation in studies of adult cognition and child language, but this unanalyzed notion deserves reconsideration.

Negation is a semantic domain which readily lends itself to conceptual analyses of representational complexity. The claim is that for the child to conceive the different meanings of negation that I have described, increasingly abstract forms of cognitive representation are required. Whether one advocates the developmental theory of Bruner, Piaget, or Werner, a familiar developmental progression is the emergence of symbolic or abstract representations from more primitive mental activity limited to concrete motor-affective sensorimotor intelligence. This progression places important limits on negation semantic development.

Rejection negations express inner attitudes of rejection toward behaviors, events, or objects that are embedded in the child's very early motor-affective activities; the topic of this type of negation has no need for internal

representation because it is immediately present in the context of the rejection. Darwin (1872; also Jakobson, 1972) has emphasized in his comparative studies of emotional expression, over a century ago, that the early negative expressed universally with nasal sounds (Jespersen, 1917) and the headshake, or conventional gesture of negation, are each natural signs which directly express attitudes of aversion.

Disappearance negation, on the other hand, typified by the child's comment of "gone" or "no more" as a ball disappears from sight, requires abstract cognitive representation. Unlike the object of rejection negation, the ball is no longer present, and the negative comment must abstractly denote the vanished object or event of disappearance.

These considerations of the cognitive demands of different meanings for negation lead to the prediction that rejection negation, rooted to concrete motor-affective activities, will be the first meaning of negation that children express, followed by the emergence of disappearance negation, which requires the elaboration of more complex cognitive representation. Though such a prediction may seem intuitively obvious, recall that the account of semantic development proferred by the McNeills' (1968) claims that the "natural order" of emergence of meanings for negation is "from outer to inner," from the negative meanings of not-here and false toward expressions of rejection.

Truth-functional negation also requires abstract cognitive representation, of yet greater complexity and of a different logical order. Negatives with this metalinguistic meaning of not-x consist of comments on the use of abstract language by another person and are by definition of a higher logical type than disappearance negation (Bateson, 1968, Wilden, 1972). From the perspective of development in cognitive representation, truth-functional negatives should not be used by the child prior to the meanings of rejection and disappearance.

It is important to observe that, theoretically, all three functions here may be expressed gesturally, with the negative headshake, as well as in single words. For example, the child could shake her head in rejection, when objects disappear, or in response to yes/no questions or false statements. A much more complex developmental landscape than this is revealed in the course of the children's negation development. We will return to the semantic categories of self-prohibition and unfulfilled expectation negation in a later section.

METHODS

The six children studied lived in the immediate vicinity of Oxford, England, and were acquiring English as a first language. Two boys and two girls (HS, SR; CS, JK) were studied from eight months to one year eight months; and one boy and one girl (RT; CB) from one year to two years.

Each child was visited individually in his or her home once each month for about ninety minutes, and videotaped for a total period of thirty minutes while playing, feeding, bathing, and during other home activities. Mothers were also queried about their child's current uses of the headshake and negative words but were uninformed as to the specific questions of the study.

Transcriptions from the video records included all speech produced by the children and adults present, with additional relevant nonlinguistic behavior, for example, actions, pointing, and context (gaze direction, objects present) noted in temporal relation to the vocalizations.

The data for analysis were headshakes and verbal negations, consisting of single or multiword utterances made up of at least one negative word or a word co-occurring with a headshake. Negative words were such morphemes as "no," "not," "n't," approximations of "no" such as /na/ or /nə/ and words such as "gone," "all gone," "away," and "stop." These negatives were transcribed from the video records and from unfilmed but tape-recorded observations which had been supplemented with context notes at the time of the observations.

RESULTS

All six children first expressed rejection negation, and they expressed this meaning in headshakes before they did in speech. Previous studies by Carter (1974) and Ruke-Dravina (1972) also found a gestural priority. Headshakes were first used around the age of one year to one year one month with an age range for the group of ten months to one year two months. For example, RT did not spontaneously use negation until one year one month, when he shook his head on five different occasions, three different times in response to different questions of the form "Do you want——?" where the referent was visible, once in rejection of a prohibition from his mother, and once to reject bicycle clips offered to him.

Four of the children first used the headshake to reject food, diaper changing, face cleaning, and other ritual maintenance acts. The other two children first used the headshake in response to questions pertaining to ritual functions, such as "Do you want some milk?" or "Want to go to bed?" that were redundant given the objects or actions that were at hand.

Considerable differences were found with respect to the time period between the first uses of nonimitative uses of headshakes to reject and the later nonimitative expression of negatives in speech. This gap ranged from one to nine months for the children studied. Rejection was generally the first negative meaning encoded verbally. Two of the six children first used negative speech to express rejection, one used speech to express rejection and disappearance at the same time, while another child first used negative speech to express rejection and self-prohibition. Two males had still not used verbal negation at the last visit when they were one year, eight months.

Table 1 summarizes the ages of the children at first appearance of the different functions of negation, both in gesture and in speech.

TABLE 1

Age in Months at First Appearance of Negation Meanings

Child	Rejection		Disappearance		Truth-Functional		Unfulfilled Expectation		Self-Prohibition	
	Gesture	*Word*	*Gesture*	*Word*	*Gesture*	*Word*	*Gesture*	*Word*	*Gesture*	*Word*
CB	13	15	—	19	—	23	14	16	—	21
CS	10	13	—	13	—	19	—	18	11	17
JK	14	15	—	16	—	19	—	16	15	15
RT	13	15	—	16	—	22	14	18	14	14
HS	11	—	—	—	—	—	—	—	16	—
SR	13	—	—	—	—	—	—	—	—	—

It is important to note that the cognitive representation analysis does not specify that the communicative function of rejection will be the first meaning to be expressed *verbally*. It may be the case that if the headshake alone is efficacious for the child in communication for expressing rejection then it will not necessarily be the first meaning of negation expressed verbally. The central issue is not the order of verbal expression of these meanings of negation, but the order of expression of negative meanings via conventional forms, whether in gesture or speech.

Four of the six children went on to express negative comments of disappearance with the word "gone," predominantly in contexts where objects or persons had disappeared immediately beforehand. They all also expressed important intermediary forms of negation between the affective negations of rejection and the more abstract negatives of disappearance. In the month prior to the use of disappearance negation for each of these children, "gone" was used in contexts where objects fell out of their possession but remained in their clear line of sight, and were often then picked up by the children immediately after they had made the remark. But at this time the children had not made such comments when things actually disappeared. A fifth child had not used the word "gone" for disappearance negation before the completion of the studies, but like the other children, consistently said "ga" when towers of blocks fell over or objects fell from his hands. This development—from "gone" in the sensorimotor present to "gone" for nonpresent objects—suggests that constraints in cognitive representation delay the expression of disappearance negation for absent referents. Such a finding would be expected on this cognitive approach. It also provides new support for Werner and Kaplan's (1963) developmental principle of "distancing," which claims developmental continuity between language fused to action and perceptual schemas in the present, and language distant and differentiated from its referential objects.

Truth-functional negation was the last of these three negation functions to appear for the four children expressing this type of negation at all. Bloom's (1970) more general category of "denial" negatives includes, as mentioned earlier, cases where the child denies previous utterances whose truth is contingent on the child's motivations in the situation, rather than inherent truth conditions of the statement involved. An example of denial negation which is not truth-functional negation is Gia's reply "no, now I do it" to the adult question "now can I do it?" Although the child has negated the adult proposition "I can do it," the truth of that proposition was dependent on Gia's *choice*. Truth-functional negatives, by contrast, are negative comments expressing judgments of the falsity of statements about properties, names, or actions. Several examples illustrating this meaning of negation are given in table 2. Negatives with this meaning were not first

TABLE 2

Examples of Truth-Functional Negation Use

Names

1. (CB, age 2;1)
   Experimenter: Is that a biscuit? (E pointing at CB's apple)
   CB: No, apple.
2. (RT, age 1;10)
   RT: Trains. [RT points to a train he has made with 2 railroad cars; at this point each car is a "train" for him, multiple cars are "trains"]
   Experimenter: Is that a train?
   RT: No. Trains.

Possession

3. (CS, age 1;7)
   CS: Big. [CS points to a large pair of shoes next to her small pair; the large pair are Ned's]
   Experimenter: Is this big? [E points to CB's small shoe]
   CS: No, mine.
   Ned. Big. [CS points to one of Ned's big shoes]

Presence/Absence

4. (CS, age 1;7)
   Mother: Is the ball gone? [M shows CS the ball]
   CS: No.

Misinterpretation Correction

5. (CS, age 1;9)
   CS: Womble. [CS is searching for the Womble doll]
   Experimenter: Ball? [E intentionally misunderstands CS]
   CS: No.
   Experimenter: Womble?
   CS: Yeh.

expressed by headshakes alone, but in speech within a month of the onset of syntactic constructions for all four children. The experimental study of children's negative corrections of false statements provides further support that this meaning of negation emerges around the age of two years (Pea, 1979).

A typical use of truth-functional negation took place in a conversation about the temperature of a bicycle seat. RT (one year ten months) had just had his diaper removed and sat on a very cold metal bicycle seat. When asked "Is it warm?" he answered "No, cold!" This meaning of negation provides the earliest verbal index of rudimentary logical thought, reflecting the awareness of the propositional operation of negation (Pea, 1979).

Bloom (1973), in her studies of single-word speech, also provides support for the sequence of emergence of meanings of negation found here. "Away" was first used by her subject to reject things as they were thrown away and afterwards when things disappeared. Truth-functional negatives later appeared as correct responses to yes/no questions about names and predicates.

One can also ask whether the first conventional negative symbol was extended to express new negative meanings. Recall that the headshake was first used to express the first negative meaning of rejection. But the first expressions of both disappearance and truth-functional negation were not headshakes, for any of the children studied. Rather, disappearance negation was realized in words such as "gone," "stop," and "byebye," while rejection, when expressed in speech, was predominantly coded with "no," and occasionally "don't." Truth-functional negatives were usually "no" or "not," and only two children ever accompanied the truth-functional negative word with a headshake.

It is intriguing that three children combined the headshake with an affirmative word to convey a negative meaning before they used words together in sentences. For instance, "pussy" with an accompanying headshake was used when a cat disappeared from a television screen, and "mumma" with a headshake functioned as a self-prohibition not to touch mommy's glasses. These very creative dual-channel negatives were never the first appearance of a new negative meaning, as one might expect given the genetic primacy of the headshake, but later developments of only brief use.

The cognitive interpretation of negation semantic development charted here has the virtue of providing systematic predictions of developmental sequence for the emergence of different meanings of negation. The focus is on the developmental map sketched by elaborations in cognitive representation that allow for the emergence of new meanings for negation from the origins of conventional negation in communication. Children first convey negation through headshakes for rejection, then comment on disappearance, and later use truth-functional negation in judgments about language use.

Cross-language research would provide a test of the universality of this sequence of emergence.

Topics of Negation and the Genesis of Negation Pragmatics

Another way of relating these findings is in terms of development in the *range of topics* for negations children use. Since rejection negation is the first meaning that negatives are used for, the first topics of negation are concretely present in the child's immediate field of activity and transcend the here and now only when negative comments come, several months later, to mark disappearance. In disappearance contexts, the topic of negation has just recently gone out of view. One might predict that subsequent developments in the distancing of the topic from the child's negative utterance will grade from these immediately prior disappearances to topics of a more general natural, to rulelike assumptions on the child's part. This is strictly true for only two (CB, RT) of the four children who used verbal negation at all during the course of study, and involves the relation between negations of disappearance and of unfulfilled expectation.

Unfulfilled expectation negatives, one might expect, based on norms constructed through experience, will emerge only after disappearance negations, which are not unlike a verbal "orienting" to a change (presence to absence) in the immediate sensory field. CB and RT met this expectation, as did the child described by Bloom (1973), but CS and JK conveyed unfulfilled expectation negatives *before* disappearance negation. Such variation could reflect individual differences, or the developmental invalidity of the distinction between negative contexts of disappearance and unfulfilled expectation, or an overgeneral definition of unfulfilled expectation negation. Evidence points to the third choice. Since *all* of the uses of unfulfilled expectation negation occurring prior to disappearance negation (for CS and JK) were in *action* contexts (either when toys did not work or when the child's movement was blocked), as opposed to unfulfilled expectation negatives commenting on expected *existence* or *location*, the action uses seem to constitute a primitive precursor of the existence and location uses (which for any given child never occurred before the first expressions of disappearance negation).

The more mature uses of unfulfilled expectation negation provide an important insight into the development of negation pragmatics. The more general assumptions on which existence and location negations of unfulfilled expectation are based are at first local norms, or habitual associations, such as the fact that frequently encountered or acted-upon objects have standard locations or spatial arrangements. This developing knowledge about structure in the physical and social environment is describable in terms of scripts

that the child learns, naturally occurring sequences, or configurations of activities, objects, events, and behaviors (Nelson, 1978; Schank and Abelson, 1977). These scripts serve as normative knowledge, so that when differences from them arise, the child marks the discrepancy with negation. This description fits well with the pragmatics of ordinary language negation for adults, with the scripts defining the child's assumed affirmative contexts for negation. They provide the groundwork for continuity in the development of negation pragmatics, since it is also discrepancies from positive assumptions that motivate negation use by adults. Table 3 illustrates the growing range in topics of negation for the four children using verbal negation.

TABLE 3

Developmental Change in Topics of Negation and Number of Negations

	Age in months[a]																	
Child	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
CS	X[b]	0	1	4	1	7[c]	5[c]	7	40	74	39	78	X	59	X	X	X	X	315
JK	0	0	0	0	0	X	4	21	44	22	22	22	20	X	X	X	X	X	155
CB	X	X	X	X	X	4	2	9	5	5	5	7	6	17	45	31	X	17	153
RT	X	X	X	X	1	6	8	1	6	15	1	9	7	53	43	38	111	X	299

[a] The underscoring of the numbers of negations produced at each visit indicates the *highest* level of topic abstraction for the negations used. This does not mean that the occurrence of simpler topics ceased, only that the range of topics with regard to "distancing" from the topic (see text) increased. *Key*: single line = topic in the here & now; double line = topic recently disappeared; triple line = topic expected but not found.

[b] Child was not visited at this age.

[c] Only in response to "Where's X?" questions.

The character of unfulfilled expectation negation is best captured by a few examples. When CB (one year ten months) looked into my toybag, for the previous ten months always containing a ball she favored, she said "ball, Mummy," to which her mother answered "I don't know where it is," to which CB replied "*no* ball, Mummy." Nothing had disappeared; the ball just did not appear where she expected it. During the same visit, CB found a teapot lid, usually on top of a teapot that was now missing, and as she held up the lid, she remarked "no teapot." Similar negative comments were made by CB when:

1. only half an apple, or part of a button was shown in a picture (hence, incompletely);
2. her coat, pot, toys, and other objects were not in their proper places;
3. objects were used unconventionally, as when her mother cut a string with a vegetable knife; and
4. puzzle pieces were placed in the wrong slots.

These cases show that CB's habitual norms, like the other children's, were quite idiosyncratic to her household, yet of great importance to her. So when RT (one year nine months) looked at an empty chair where his cat usually sat, he said, "pussy gone." Or when CS (one year nine months) was asked where Auntie Sonya was (she was in the garden, where CS saw her earlier), she replied, "gone get dinner," probably because Sonya frequently went out to pick up fish and chips. Since CS was in the single-word utterance period at the time and was using "gone" productively, this was very likely a ritual phrase.

One may expect, since negatives in the adult language are used to mark deviations from expectations or norms, that the major development from negative comments based on such local norms as the habitual location of objects would consist of moves toward a more general level of agreement or conventionality. Such a view is hard to support on close inspection.

Potential examples of negations with topics of general knowledge may be heard from the mouths of two-year-olds, but a fuzzy area of indeterminacy exists between cases of habitual location and ones based on what (on first view) seem to be general conventions. JK (one year six months) pulls down the trousers of her G.I. Joe doll and, upon discovering he has on no underpants, says, "no pants." Now is this negation based on general knowledge, a convention adults would share of a form such as "under trousers, one wears underwear"? Or is it one based on the local, habitual association of co-occurrence of pants beneath trousers? The distinction, particularly in common cases like this one, is shaky, yet it is at the heart of one account of negation pragmatic development (Volterra and Antinucci, 1978).

To carry the breakdown of the distinction further, one need only reflect on how the assumptions denied in the negative speech of adults are also often based on local, idiosyncratic norms or expectations, such as "there's no beer in the fridge" when one's spouse was supposed to buy some at the store, or "there's no fire left" after waking up cold from a nap near the hearth. The habitual locations of objects, such as clothes, keys, and furniture, are of great importance for our everyday affairs, just as they are for children.

Many apparent differences between the topics of adults' and children's negations are only illusory. But when the child's topics of negation move beyond the here and now, are they always similar to those of adults? No. Volterra and Antinucci (1978) have characterized the differences that occur as "pragmatic misfires," cases where the presuppositions (or topics, in my terminology) of the adult and child just do not match up. They describe an example where a child looks at a hospital tower and says "Look there is no bell." Yet adults know it is church towers which have bells and are not surprised to see hospital towers without them. The child's task, according to Volterra and Antinucci's approach, is to "pull his own pre-

suppositions into line with the listener's." But how does such an alignment take place?

In their analysis of negation development for Italian and American children, Volterra and Antinucci (1978) stress that the determining factor in the emergence of presuppositions for negation based on "normative classes" shared by adult and child is the developing ability to represent cognitively such abstract general knowledge.

But developments in cognition alone cannot explain such presuppositional changes, which must come from the sociocultural conventions of the child's language community. The process of aligning child-adult language knowledge is accomplished largely through dialogue, and the older child, when such pragmatic misfires occur, is better able to repair the breakdown of understanding with the listener. The few studies of children's responses to clarification requests, though not addressing negative speech per se, indicate the complexity of identifying the source of the misunderstanding (Cherry, 1979; Garvey, 1978; Stokes, 1976).

In adult conversations using negation, too, our knowledge frequently does not match up with our listener's expectations. If it did, as Brown (1973, personal communication), Givon (1978), Labov and Fanshel (1977), Wason (1965, this volume), and others have pointed out, there would be no conversational point to negative utterances. But adults are very adept at clarifying knowledge differences when pragmatic misfires occur and at making explicit their assumptions and background when engaging in discourse. The ability to synchronize assumptions through clarification moves in a conversation when misfires do occur is thus a critical component in the emergence of pragmatically successful negation, once the topic becomes abstracted from the present.

Volterra and Antinucci (1978) describe general developmental patterns in distancing the topic of negation beyond the present similar to those described in this chapter (table 3). There is, however, one other critical difference between the formal linguistic analysis proposed by Volterra and Antinucci and this account of negation topic development. They formally characterize what I have called the "topic" of negation as a "presupposition." The presupposition is then attributed to the child's listener, so that the listener is held to believe p, where p is the presupposition negated by the child.

One of Volterra and Antinucci's examples will make their approach clear. A sixteen-month-old child says "gone" after a flame is blown out from a match. Their interpretation of this utterance is that the child negates the presupposition "the flame is present" which he infers that the listener believes. Two developmental facts argue against the appropriateness of this formal analysis, applied across the board to negative utterances produced by children fifteen to thirty-five months old. Such "presuppositional" structures are taken to be an integral part of the child's cognitive representation

of the speech context and the knowledge state of his listener, yet inferring the beliefs of another person is certainly not a requirement of making such an utterance, since children use many negatives without addressing another person, particularly when objects disappear. Such inferences of beliefs would also require more sophisticated social cognition than two-year-olds seem to have available (Gearhart, 1979; Shantz, 1977). Independent evidence from experimentation is necessary before claiming that children in this period have the ability to infer specific beliefs of another person.

Discourse Contexts of Negation and Lexical Variation in Negation Expression

The development of meanings of negation for children from one to two years old has been explicitly related to the growth of representational abilities. Cognition alone, while allowing more abstract topics of negation, can provide neither the meanings of negation nor the specific words children use to express them. The meanings and forms of negation are conveyed by speakers of the language by virtue of the child's engagement in a sociocultural and linguistic community. This transmission becomes clear from the striking individual differences in negation expression for the children studied longitudinally. Discourse contexts varied across mother-child dyads, and variations in the words children used to express negative meanings occurred.

Topic initiation provides a useful focus for a look at discourse contexts for negation. Adult-initiated negatives are those which the child produces after an immediately preceding adult utterance. Self-initiated negations are those which are not adjacent to adult speech but are spontaneously used.

The central finding from an overall analysis of self-versus-adult-initiated negation is somewhat surprising: 40 percent (or 367/922) of the total negatives produced by the four children who spoke during the period of study were initiated by the child. This means that children were making negative comments on their own a considerable amount of the time, when things and people disappeared, when toys would not work as they should, when things were not found in their habitual locations, and in self-prohibition.

Negation topic initiation for any given mother-child dyad is not, unfortunately, very informative if one seeks out developmental trends. One might suspect that children would at first produce negatives predominantly in response to adult utterances and, with development, come to be able to introduce negations spontaneously which before required maternal conversational support. This suspicion is consistent with recent data indicating that propositions are first constructed across utterances produced by mother and child and that this discourse experience supports the child's later ex-

pression of propositions on her own (Keenan, Schieffelin, and Platt 1976; Ninio and Bruner 1978). But topic initiation for negation does not seem to follow such a pattern. The picture is one of great interindividual variability and substantial up and down fluctuations across sessions in the proportion of self-initiated negations for any individual child.

Large individual differences occurred in the overall predominance of self or adult initiated negation. For example, CS, whose mother was extremely prohibitive and constraining in her child-rearing, produced only 20 percent (or 64/315) of her overall negatives spontaneously, since most of them were in emotionally charged negative retorts to her mother's commands and prohibitions. JK produced 72 percent (or, 111/155) of her negatives spontaneously; this was largely a consequence of her mother's fostering of independent play, often accompanied by what might be described as egocentric speech. The other two children are near the 40 percent average (CB: 49 percent, or 75/153; PT: 39 percent, or 117/299).

One consequence of such differences is that the different children produce radically divergent overall proportions of different meanings of negation; 58 percent of JK's negatives were comments on disappearance, whereas only 7 percent expressed rejection. Recall that it was JK's mother who fostered independence and solitary play. CS's language environment, however, was characterized by constraint and commands, and 37 percent of her negations expressed rejection, while only 26 percent were comments on disappearance. So in one important sense, the predominant types of discourse contexts for negation provided by mothers can affect the predominant meanings of negation children choose to express. It is in this light that the agreement in developmental ordering of negative meanings for the different children is all the more striking.

Specific negative meanings were sometimes expressed by words idiosyncratic to the conversations of particular mother-child dyads. JK and CS, for example, unlike CB and RT, shook their heads as they named the possessor of prohibited objects in expressing self-prohibition negation, a reflection of the parents' prohibitions in statements such as "that's *Mommy's*" modeled with headshaking. Specific prohibitive formats between mother and child yielded other special self-prohibition negatives, such as JK's "don't eat it" for soap bars, and CS's "mustn't bite" when playing with her sister, each of which were used during the single-word utterance period.

Such lexical variation was not limited to expressions of self-prohibition negation. Only JK used "done" in rejection of objects she was tired of, only CS used "I 'nt" to reject commands (it is an Oxford working class slang contraction for "I won't"), and only CB used "alldone" for disappearance negation when machines stopped. More examples could be adduced, and in each case uses of the specific lexical expression of the negative meaning are to be found in the child's previous language environment in similar situations.

Lexical variation was not the rule, however, in the words used to express a specific negative meaning. All of the children used headshakes and "no" for rejection, "gone" and "allgone" for disappearance, and "no" for truth-functional negation. But the existence of such clear cases of lexical variation provides proof that the forms of negation are a result of the conversational environments provided by the child's language peers.

An Interactionist Perspective on the Origins of Negation Semantics

The emergence of negation semantics may be framed in terms of three major phases. In the first, the child's task is to discover the meaning of negatives in the speech of the adult, to form an initial basis or core to the meaning of "no" and related negatives. In the second, the child first uses negation and begins to generalize negation to novel situations. In the third phase, discourse contexts for negation shape the elaboration of negative meanings conveyed by the child, a phase where the child enters a dialectic of language interaction and apprenticeship in which her negatives get responded to and in which negatives that are heard in discourse addressed to the child are assimilated to the child's current (and accommodating) conceptions of negation. The processes by which conventions of adult negation get stored and adapted as the child's lexicon for negation changes in both lexical forms and meanings are the ultimate aim of explanatory accounts of such developments, but for now our analyses are confined to descriptions of maternal speech, the child's speech, and probable inferences as to how the dialectic of communicative exchange contributes to language development. The key to such processes is ultimately to be found in careful studies of the conversational contexts in which early word meanings are negotiated. The first two of these phases are the focus of the following section, which describes the origins of negation in interactional contexts and the child's earliest reactions to and uses of negation.

The Genesis of Negation Comprehension

The predominant meaning of negation in the life of the child during the first year of life is prohibition. Prohibitions from the parent, usually expressed with "No!" and headshake, are addressed to children as they become increasingly ambulatory in the period between nine months and one year. Such prohibitions interrupt and constrain the child's actions, some of which, if carried to completion, would harm the child, for example,

handling electrical sockets, hot or sharp objects, or damage property deemed valuable (books, records, glasses).

Spitz (1957) sees the child's uncompleted act in conjunction with the parent's negative word or gesture as a major source of the first meaning of "no" for the child. His account assumes that the child's frustrated *id* drives thereby endow the negative word and gesture with a specific affective cathexis that ensures the child's remembrance of the negative symbols. The child's first use of negation, on this view, is a result of identification with the prohibiting parent, and refusal or rejection is the first meaning since the symbol is imbued with aggressive cathexis in the unpleasurable experiences associated with its memory traces. Apart from the status of the psychoanalytic components of this theory, it is certainly consistent with observations that "no" is one of the first words children learn (Gopnik, 1978; Leopold, 1949; Nelson, 1973) and one of the most consistently used words throughout the single-word utterance period (Bloom, 1973), the finding that rejection is the first meaning of negation children express, and the prevalence of prohibition negation in the language of parents to children for my case studies. The case for prohibition and constraint as the context for children's first learning of a meaning for negation is best put in a genetic description of prohibition comprehension.

For child safety, the parent must establish an effective verbal means of constraining child exploration. Child language diarists often note the early comprehension of "no" in prohibition at nine months to ten months (Leopold, 1939, p. 112; Lewis, 1963, p. 43), and the claim is made that the child halts actions more as a result of the loudness, pitch, duration, and suddenness of onset of "no" than by virtue of its conventional meaning.

Such prominent attitudinal characteristics of the negative speech signal may provide some substantive ground to Spitz's claim that negative word and gesture become endowed with a "specific affective cathexis" as a result of the adult's prohibitions. But how exactly do parents get children to comply with verbal prohibitions? A general framework for this accomplishment may be charted from observations made during the period from eight months to eleven months for four English children; it also provides insights into the child's formation of a concept of negation as constraint.

Parents at first physically constrain children when they issue verbal prohibitions. Just as in early command situations, where the mother says "Give me the ball" as she gently pries it from the hand of the child and later accomplishes the same act with an open palm and ultimately the verbal command alone, the prohibiting mother says "no" and shakes her head as she pulls or lifts the child away from the forbidden act. Soon the adult wishes prohibition compliance at a distance by language and gesture alone, and within a month of physical constraints, children manifest signs of understanding "no" and the headshake in a prohibition situation. The child withdraws from objects, or impedes action (even if only temporarily)

before renewing progress to the forbidden act. The child also demonstrates forms of inhibition with regard to the prohibited object or act, which are action analogues of later self-prohibitions. Intentionally disobeying is yet another sign of understanding.

Several distinctive levels of prohibition reaction reflect increasing understanding and approach what the adult counts as prohibition negation comprehension.

It is first important to note that the child brings well-developed (if primitive) means for rejection to the task of prohibition comprehension. Displeasure is displayed by physical means; the child rejects objects or actions by turning her head aside, pushing or throwing the aversive thing away, or flailing her arms (see Bühler and Hetzer, 1935). The means for communicating rejection here are as strikingly direct as were the parent's initial prohibitions of forced compliance by physical means. Parents also frequently interpret these behaviors as expressive of negation and expand them with lexical negatives: "no, no, don't want it." Ryan (1974) has emphasized the importance of such intent interpretations for the eventual linguistic expression of intention.

The child does not, however, initially use behaviors from the physical rejection repertoire to respond to parental prohibitions. Cries are used at first, and it is a month or more before the onset of physical rejection of prohibition. The children's prohibition reactions quickly change form. When the parent first uses verbal prohibition without physical constraint, the child ignores the prohibition in nonunderstanding. Then if the prohibition is made persistent, by repetition, louder voice, or physical constraint, it may be effectively heeded by the child. A standard part of this last scenario is the look from the child to the prohibiting parent, generally with body aligned in the direction of the prohibited object, or even still touching it. The child looks to the prohibitor but does not immediately withdraw. Prohibition sequences while the child continues to touch the prohibited object are marked by numerous replays of touch-prohibition-look rounds. The child's withdrawals, if they occur at all, are very short-term.

Two of the four children at nine months presented striking inhibitory behavior when such repeated prohibition cycles were prevalent. After an initial string of prohibitions and withdrawals, the child begins to approach the forbidden object and spontaneously inhibits a repetition of the prohibited action; the child looks at the prohibited object, arm aims out toward it, is self-impeded in midstream, then slung back and forth several times in approach-avoidance fashion, and withdrawn (CS was prone to touch a radiator that was often hot, and SR had a favorite rubber tree leaf).

For each of the children there next occurred what adults often describe (Lewis, 1963) as guilty, "permission requesting" looks to the parent, at first immediately after a prohibition the child has complied with in the middle of a renewed approach toward the object. Such looks were later

used in anticipation of prohibition. Looks would be made in the parent's direction before any prohibition had been made in the immediate context, as the child prepared to touch what the parent felt he or she "knew" should not be touched. Concurrent with these anticipatory "permission requesting" looks were instances where the children reacted against prohibitions by using primitive physical means of rejection (arm waving, fretting sounds) which were at a distance for the first time from their "object"—the parental prohibition. Werner and Kaplan (1963) note that such progressive distancing between the child and the object of reference results in a shift from ego-bound things of action to ego-distance objects of contemplation. The primitive means of rejection once directly affecting the rejected thing (the child pushed things away) now represents that same pushing away or rejecting at a distance.

One other feature of prohibition reactions in this period is the "sneaky smile," where the child's actions superficially resemble earlier times when the prohibition was ignored out of nonunderstanding, except that now the child smiles at the parent in defiance and continues with the forbidden action after demonstrating prohibition compliance on earlier occasions. The children at this point, from ten months to eleven months, have begun to use primitive rejection and open defiance to reject constraint and prohibition.

Apart from the later development of the headshake, already described, this completes the major changes in the development of children's prohibition reactions and eventual comprehension. A noteworthy feature of this development is the progressive growth of the dyadic nature of prohibition. The child learns to react to the prohibition in two quite divergent ways: *compliance*, a measure of which, from the adult viewpoint, is nonrebellious withdrawal (passivity), and *defiance*, where the child comes to display an autonomy from the parent's wishes and exerts a control over his or her own behavior (activity). In learning the constraining nature of prohibitive acts vis-à-vis the prohibitive communication relationship, the child is learning to inhibit actions in the socially prescribed way. The child is also, however, learning how to inhibit others by constraining them via negative reactions to prohibitions. Prohibition is thus an area of early language comprehension where the realization of role reversibility so central to language becomes naturally emergent as the child attains active agency.

These observations complement those of Lewis (1963) and Spitz (1957) in marking out several intermediate steps of "understanding" the adults' negative prohibitions before the child ever begins to use negative symbols. Children first reject parental prohibitions at a distance by unconventional (nonsymbolic) physical means which they had previously utilized to physically, or directly, reject things. Spontaneous inhibitions of frequently forbidden acts by several children suggest the advent of an internalization of prohibition constraints that need not be current to be effective. This internalization is most obvious in the oft-observed phenomenon of ges-

tural and verbal self-prohibition, a subsequent development of great importance for understanding the development of negation semantics.

The First Uses of Negation

We have already seen that the first meaning of conventional negation conveyed by children is rejection. Spitz (1957) claims that prohibition refusal is invariably the first use of negation, but the longitudinal studies of negation here do not support this claim. Several children first used negation to reject food at feeding, while others first used rejection negation in response to actions such as diaper changing, or in response to ritual questions such as "Do you want a drink?" Children's initial extensions of negative symbols to new contexts were confined to these variants of rejection—of action, object, prohibition, or question (also see Carter, 1974).

Soon after the establishment of rejection negation, the use of negation in self-prohibition appeared for all but one of the six children studied. Many careful observers of child development have noted early instances of negation, whether in gestural or verbal form, which occur when the child is about to touch or is touching a "forbidden object" (Bloom, 1973; Bruner, Caudill, and Ninio, 1976; Edwards, 1978; Escalona and Corman, 1971; Greenfield and Smith, 1976; Piaget, 1962; Spitz, 1957). Such a development is typically brief in duration.

All of the examples of "self-prohibition" cited in this literature involve acts which the child has been forbidden to do in the past, and what appears to occur is that the child issues a self-command to not do what he or she is about to do or is in the course of doing. As an operational definition, "self-prohibition" is somewhat of a misnomer for this behavior, because the child often touches the object anyway. The situation might be more accurately depicted by saying that the child is saying to self what the parent has said when the same thing has been done in the past. But what is the import of this observation?

Past interpretations of this phenomenon have been psychoanalytic in nature. Escalona and Corman (1971) remark that self-prohibition demonstrates that the child has "internalized something like a conscience." Spitz's (1957) interpretation of this type of negation follows that of Anna Freud (1952) in her discussion of preliminary phases of superego development. He suggests that the child has assumed the role of prohibitor and is engaged in the make-believe game of carrying out the forbidden action playing ego against self. Whether one accepts the "conscience" or "self-awareness" interpretation or neither, the use of "no-no" or headshake when in the midst of a forbidden action is a significant step on the way to the development of truth-functional negation. Whereas before, symbolic negation for the child has been a means of rejection, it has not involved *norms* of any

sort but only the child's internal decisions of "I want this; I don't want this." By externally rehearsing the two roles of the prohibited, socially constrained act, the child is in sequence playing out the roles of self-as-action-proposer and other-as-action-constrainer. The awareness of this contrast is most striking when the child actually stops the action as if the parent had been the one to say "no" rather than self, as several observers have noted (see Greenfield and Smith, 1976).

Knowledge of this contrast between affirmative and negative messages is thus displayed; the child both initiates and negates the initiation. So whereas in the past the affirmative and negative were conveyed in the relationship between parent and child, it has now become transmuted to within the self.

Such transmutation has several important consequences. One is the internalization of conventional norms for permissible-nonpermissible acts, the other is the fact that this contrast of affirmation-negation is internally represented with the linguistic "no" as negative form. This may be compared with the cognitive interpretation of "egocentric speech" in preschoolers by Vygotsky (1962), who argues that such speech serves an external planning function which, when it diminishes in frequency and finally disappears, has in fact become internalized and mediates thought processes. The development of all higher mental functions, including concept and word meaning formation, is in Vygotsky's (1978) theory a result of the transmutation of the interpsychological, or, socially accomplished process to the intrapsychological, or, internally regulated process. In this theory, we view "self-prohibition" as a turning "inward" of the externally accomplished interpersonal negation of prohibition. "Self-prohibition" provides an external index, soon to disappear, of the child's conceptualization of an affirmative-negative contrast that incorporates external social norms extrinsic to the child's immediate need satisfaction. This internal binary contrast provides one of the conceptual bases for later negations of judgment involving truth-conditions for utterances.

The child later comes to use such truth-functional negation to express judgments on the use of language by others to predicate properties and existence of things. Edwards (1978) and Bateson (1968) have also presented proposals relevant to the phenomenon of self-prohibition and consonant with this Vygotskian orientation.

Edwards (1978) suggests that one important source of early word meanings for the child are the constraints that the adult imposes on the child's actions by social prohibition, as well as those imposed by the natural constraints of the physical world. He discusses cases where the child comes to use words in contexts which seem to derive from the use of the same words by the adult to impose constraints on the child's freedom of action. Several of these words are then extended to situations of constraint imposed by the physical world, such as when the child could not put building blocks together.

Edwards focuses on three realms of meaning: negation, possession, and several words "which in the adult grammar would be classified as Verbs and Adjectives." He shows the close connection between prohibitions and the child's use of rejection negation and of possession. "No," "no touch," "mummy's," and "don't," among other words and phrases, are all used by one of the children in what appear to be self-prohibitive contexts. The child proceeds to touch objects that have been prohibited by the parent in the past, such as her parents' books, glasses, pencil, and watch. When the child denotes "ownership" of the prohibited objects in her vocalizations, Edwards suggests that this is due to a primitive ownership notion based upon previous impositions that have conveyed the idea of "privileged access" to certain objects by others. One example clearly shows that these social constraints are basic to the child's conception of possession at this point (A is the child, S is the mother, E is the experimenter):

	Language	*Context*
A:	No touch.	[A looking at E's tape recorder]
S:	No touch.	
	No.	
	That's correct.	
A:	Mummy's tape.	[A pointing and looking at the tape recorder]

The tape recorder, A has been told many times before, is not to be touched. Alice's mother had never been to a recording session before and did not own a tape recorder, yet the child assimilated the forbidden object to her general schema of objects her mother possesses which are not to be touched.

Similar constraints are involved in A's use of the word "leave" in self-prohibitive contexts, which seems to derive from her parents' phrase "leave it" or "leave it alone," rather than being a Verb. In addition, words one might view out of context as Adjectives convey quite different meanings in context, such as "big" when two objects will not fit together (i.e., one of them is "too big"), "sharp" for a kitchen knife that is a forbidden object, and "stuck" when two objects will not go together as a child wishes. Most of these words involve physical constraints imposed on the child's actions.

So from a radically different perspective than the psychoanalytic account of Spitz (1957), Edwards (1978) draws the similar conclusion that constraints on the child's actions provide an early source of word meaning and that such a notion of contraint is psychologically real as a component of the child's early word meanings for negation stemming, ultimately, from the communicational contexts of social constraints on the child's actions.

Edwards' data highlight one area of early word meaning where the effect of social mores is pristine in form, since not all cultural subgroups prohibit children from touching the objects from which this child was restrained. With regard to the development of negation pragmatics, the child is learning

sociocultural conventions for negation use. Obeying negation prohibition is a salient early affirmative context for negation.

The second proposal is Bateson's (1968), where, in tracing a speculative evolution of arbitrary denotative "naming" and truth-functional negation from an earlier iconic signal code, he suggests that "It appears likely that the evolution of the simple negative arose by introjection or imitation of the vis-à-vis, so that 'not' was somehow derived from 'don't' " (1968, p. 626).

Bateson does not mention self-prohibition, but the "don't" negation he describes as accomplished in interaction patterns when one organism proposes a pattern of action that another forbids with "don't" is what we we have called prohibition. Bateson proposes, following the passage cited above, that we "look for the evolutionary roots of the simple negative among the paradigms of interaction."

Though Bateson's hypothesis refers to processes of phylogenesis, we are clearly dealing with an analogous problem in tracing the ontogenetic sequence from the "no" that serves the "don't" function of rejecting, to the use of "no" and "not" for expressing truth-functional judgments. I have suggested that the constraint on actions serving as a source of early negation meaning becomes internally represented and that "no" as constraint provides the cognitive index, or, root negative conception necessary for the later use and understanding of truth-functional negation. The child's progress in establishing the metalinguistic nature of such mature negation is reflected in the progressive severing of the temporal link between topic and utterance of negation, which is accomplished through development in cognitive representation. Constraints on children's behavior provide the seeds for the semantics and pragmatics of negation.

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