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As Gruber (this volume) has observed in connection with *want* in English-speaking children's sentences, this is one of the first verbs children use with a subordinate clause. He says that "if performatives are universally obligatory, as Ross holds, it represents a minimal degree of complexity for the child to generate *want* as an embedding verb" (p. 444).

The inclusion of performative structures in the model allows us to find a possible explanation for the vocatives which often occur in Claudia's language and which are otherwise difficult to interpret.⁴ Vocatives can, in fact, be interpreted as the lexicalization of the semantic material which fills in the first argument of KNOW or DO in "describing" and "requesting" configurations, respectively. As instance of the first type, we have:

<i>Mamma ianne</i>	(Claudia tells her mother that the spinning top is turning)
Mommy spinning top	
<i>Mamma piitto</i>	(Claudia shows her mother her navel)
Mommy belly button	
<i>Papà a tati</i>	(Claudia tells her father that the researchers are present)
Daddy people	

and of the second type:

<i>Papà dicchi</i>	(Claudia asks her father to play some disks)
Daddy disks	
<i>Mamma a papis</i>	(Claudia asks her mother to draw)
Mommy pencil	
<i>Mamma iacca</i>	(Claudia asks her mother for water)
Mommy water	

5. We have been arguing that in the period of time under consideration Claudia's sentences have an underlying semantic structure which includes (a) a predication with its necessary NP-complements and (b) a performative superstructure. No change occurs in this period in the general nature of the semantic configurations that Claudia lexicalizes. A quantitative change does occur, however, in the lexicalization process itself, in that Claudia is able to lexicalize an increasing number of elements which are present in the underlying configurations. This is reflected in the increase of the mean length of her sentences.

It is interesting to observe that no element is present in Claudia's sentences which does not belong to the sentence nucleus, that is, predication plus NP-complements. It is only at a later stage that additional structure is added to Claudia's configurations and begins to emerge in her sentences. Data we are now processing seem to show that this additional structure takes the form of adverbials, that is, predications which take the sentence nucleus as one of their arguments.

⁴ In his purely distributional analysis of child language, Braine (1963) deliberately excludes the vocatives from the data.

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JAPANESE •

What Does a Child Mean When He Says "No"?¹

— David McNeill and Nobuko B. McNeill

The emergence of negation in English is a portrait of a child's resolution of complexity. Very roughly, negation in English requires two transformations—one to remove an underlying negative element from where it is located in the deep structure of a sentence, and the other to introduce an auxiliary verb (*do* or *can*) to support this element in the surface structure (Klima, 1964). This sketch omits most significant matters, but it reveals an important part of what a child must acquire in order to negate in the English manner.

From *Proceedings of the Conference on Language and Language Behavior*, edited by E. M. Zale. New York: Appleton-Century-Crofts, 1968, pp. 51-62. Reprinted by permission of the authors and the publisher.

¹ This report is a slightly revised version of the paper presented by the major author, David McNeill, at the Conference on Language and Language Behavior. It is based on research supported by a contract with the Office of Education, U.S. Department of Health, Education and Welfare, under provisions of P.L. 85-531, Cooperative Research, and Title VI, P.L. 85-864, as amended.

One hypothesis about language acquisition is that it rests on a set of specific cognitive capacities. These may be innate and may be described by the so-called theory of grammar, or linguistic theory (Chomsky, 1965; Katz, 1966; McNeill, 1968). The suggestion is that the universal form of language reflects children's capacity for language—language has the form described by the theory of grammar because of the innate capacities of children to acquire language. Children's capacities everywhere in the world impose the same features on language, which, therefore, appear as linguistic universals.

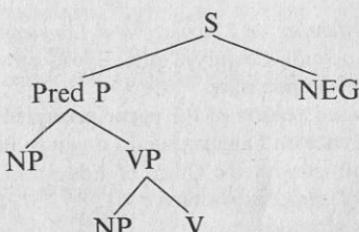
An advantage of this view is that it accounts for the existence of linguistic abstractions, features in adult grammar that are *never* included in the overt forms of speech. Such features, of course, cannot be presented to children; yet, they exist as a part of adult linguistic knowledge. On the capacity hypothesis, such abstractions are held to be linguistic universals, deriving from children's capacity for language, and they are *made* abstract through the acquisition of transformations.

An example of a linguistic abstraction, never presented as an overt form of speech, is the location of NEG at the beginning of the deep structure of English sentences. On the capacity hypothesis, this abstraction is *possible* because the location of NEG on the boundary of a sentence reflects an aspect of children's capacity for language. This principle would be, roughly, that every proposition can be denied by attaching to it a minus sign.

In this light, it is interesting that Bellugi (1964) finds the earliest negative sentences from children to be NEG + S and S + NEG—i.e., sentences in which a negative element (usually *no* or *not*) is placed outside an otherwise affirmative sentence. Examples are *no drop mitten*, and *wear mitten no*. This form of negation persists until a child shows independent evidence of having the two transformations mentioned above, at which time it completely disappears—having now presumably become abstract (McNeill, 1966). The same is true of the primitive negation of children learning Russian (Slobin, 1966) and French (our records).

THE SYNTAX OF NEGATION IN JAPANESE

We mention these findings with children exposed to English and other languages in order to compare them to the development of negation in Japanese. Syntactically, negation in Japanese is rather simple. Except for order, the relevant part of the deep structure is identical to the deep structure of English sentences:



In Japanese, however, there are *no* order-changing transformations involved in carrying the negative aspect of this structure to the surface. The surface structure of a negative Japanese sentence is also *NP NP V NEG*. On the capacity hypothesis, therefore, the development of negation in Japanese should be likewise simple. Indeed, on the capacity hypothesis, Japanese children should not be *able* to make syntactic errors.

We thus take it to be consistent with the English findings and the capacity hypothesis that neither of the two children we have been following has *ever* uttered a grammatically-deviant negative. Their negative sentences are identical to some of the negatives that Bellugi described, i.e., *S + NEG*, and this is entirely correct in Japanese.

Syntactically, the development of negation thus poses no problem in Japanese. The language does not require more from children than is already available in their general capacity for negation. In Japanese, the problem is of a different sort.

THE SEMANTICS OF NEGATION IN JAPANESE

Although syntactically simple, negation in Japanese is *semantically* complex. In contrast to English, for example, the language provides several distinct forms; it is here that one can gain some insight into the process of development.

There are four common forms of negation in Japanese: *nai* (aux), *nai* (adj), *iya*, and *iiya*. *Nai* (aux) is the form introduced into the phrase-marker given above. It is attached both to verbs, as indicated, and to adjectives. *Nai* (adj), like all adjectives in Japanese, has verbal force, so that one can say, for example, *peace-nai*, meaning *there is no peace*. *Iya* stands alone, and means, roughly, *I do not want*. *IIya* also stands alone and means that what was just said is wrong *and* something else is right. There are other forms than these four, but they are restricted to special situations—formal speech, for example.

These four forms—*nai* (aux), *nai* (adj), *iya*, and *iiya*—embody three dimensions of meaning. *Nai* (adj) is used in such sentences as “there’s not an apple here,” said after someone has asked about a place where there is no apple. The use of *nai* (adj), therefore, depends on the *non-existence of objects and events*.

Nai (aux) is used in such a sentence as “that’s not an apple,” said after someone else, pointing to a pear, said, “that’s an apple.” The use of *nai* (aux), therefore, depends on the *falsity of statements*.

Iya is used in such sentences as “no, I don’t want an apple.” *Iya* by itself conveys the idea of “I don’t want,” and its use, therefore, depends on *internal desire*, or the lack of it.

IIya is used in such sentences as “No, I didn’t have an apple, I had a pear.” Contrastive stress can convey this idea in English: “No, I didn’t have an *apple*, I had a *pear*.” The import of *iiya* is that one alternative (already mentioned or somehow in mind) is false and another is true. We will call this type of negation *entailment*, since, in this case, the negation of one statement entails the truth of another.

The four kinds of negative in Japanese thus involve three dimensions, or contrasts: *Entailment-Non-entailment*, *External-Internal*, and *Existence-Truth* (the last to be understood as indicating the *condition* of negation—the *existence* or lack of it, of some *thing*, versus the *truth*, or lack of it, of some *sentence*).

One can organize the dimensions of negation into a cube, always a mark of progress in this area, and locate the four negative terms in Japanese at the appropriate corners (see Fig. 1).

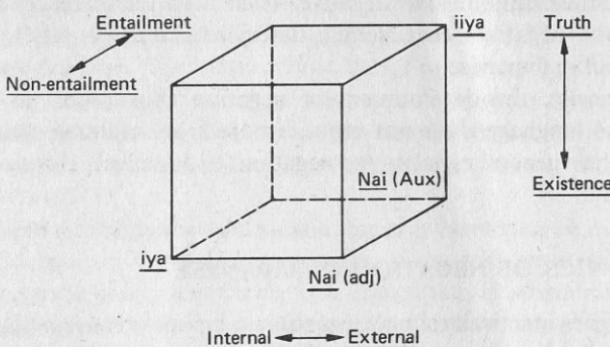


Figure 1.

Alternatively, one can define the terms of negation in Japanese by means of feature matrices:

	NAI (adj)	NAI (aux)	IYA	IIYA
Existence	+	-	+	-
Entailment	-	-	-	+
External	+	+	-	+

According to these matrices, *iya* and *iiya* are diametrically-opposite kinds of negation, and the two kinds of *nai* are identical, except that one depends on the non-existence of objects and the other on the falsity of sentences. Both implications accord with native intuition.

The matrices also help explain what always strikes English speakers as a bit of oriental exotica, when they first learn how Japanese affirm or deny negative questions. If someone asks, in English, "Is there no pear?" and you wish to give an affirmative answer, the correct response is "no, there is no pear," or some more idiomatic variant. In Japanese, however it is the reverse. If one wishes to give an affirmative answer, the reply should be, "Yes there is no pear." A similar reversal exists for denial. In English it is "yes, there is a pear," but in Japanese it is "no, there is a pear."

The difference is that "yes" and "no" in Japanese are (-Existence),

whereas "yes" and "no" in English are (+ Existence). Thus, the Japanese "yes" refers to the truth-value of the sentence, whereas the English "yes" refers to the existence of the pear. Similarly for "no" in the two languages: in Japanese it signifies a false statement, whereas, in English it signifies non-existence.

The cube indicates that there are four other negatives possible but not used in Japanese. One, for example, would be a negative that denies the *truth of statements* on the grounds of *internal desire*, but which does not entail a true alternative. It would be a negative for existentialists: What you don't desire is false, but nothing in particular is thereby true. This is despair.

These three dimensions can be found in English negation also, but English is ambiguous with respect to them. The English "no" is (+ Existence) when discussing the physical environment, but it becomes (- Existence) in other contexts: for example, "three plus two is six," "no." And when one says, "No, anything but *that!*," presumably the left side of the cube is evoked. But English does not have separate terms sorted out in the analytic Japanese manner. When a child says, for example, *no dirty* in English, he is at least four-ways, and possibly eight-ways, ambiguous.

Japanese, since it distinguishes among words along the three dimensions of negation, makes it possible to trace the order in which the dimensions emerge. We have looked for patterns of confusion—which negatives replace others—and from these patterns have attempted to infer the sequence of development. In effect, we have asked, how is the cube built up? Or, equivalently, in what order are the rows of the feature matrix added?

THE DEVELOPMENT OF NEGATION IN JAPANESE

We have worked with tape-recordings of the speech of two Japanese children. Both children are girls and both live in Tokyo. To date, there is some seven months' accumulation of speech. One of these children presents very little data, and what she does present so far eludes our understanding. The other child, whom we call Izanami, will be described here.

At 27 months, the youngest age at which we have recordings, three of the four negative forms occur. These are *nai* (adj.), *nai* (aux), and *iya*. *Iya* is always used alone. *Nai* (adj) is used alone and after nouns, and both are correct syntactic contexts in Japanese. *Nai* (aux) is used with just one verb—*shira-nai*—meaning "I don't know."

Of the two forms abundantly present at 27 months, *nai* (adj) is always used when called for, as far as this can be judged from context. That is, whenever non-existence is referred to, Izanami uses *nai* (adj). *Iya*, however, is often replaced by *nai* (adj). For instance, if Izanami's mother said, "Let's give you some," Izanami would sometimes apparently reply, "There's no giving," instead of "I don't want." *Nai* (adj) intruded thus into as many as 40 per cent of the contexts appropriate for *iya*. *Iya*, on the other hand, never intruded into contexts appropriate to *nai* (adj).

This pattern of confusion would arise if Izanami did not yet know *any* of the dimensions involved in negation, but reacted instead only to non-existence. Then *nai* (adj) would be used whenever called for, and *iya* (being in her vocabulary) would oscillate with *nai* (adj) in contexts calling for an expression of personal desire, but not involving non-existence. Let us assume then that Izanami began with the registration of simple non-existence as the occasion for negation. In effect, she began with the *nai* (adj) *termini* of each of the three dimensions, but did not yet have the dimensions themselves. She built from *Existence*, *Non-entailment*, and *External*. We have called this *Stage 1*.

About two months later, two things happened to *iya*. First, it began to appear in contexts calling for *nai* (aux). For example, if Izanami's mother said (falsely), "This is an apple," pointing to a pear, Izanami would reply with *iya*, apparently meaning "I don't want it." This is only apparently odd. We will return to it shortly. The second development with *iya* is that it began to appear in contexts calling for *iiya*.

The last intrusion, *iya* in place of *iiya*, is totally inexplicable on the feature analysis. These terms share no features—they are at opposite corners of the cube—and so should never be confused, so long as at least one dimension has been acquired. Moreover, *iya* has been present in Izanami's vocabulary since the beginning, but it appears in contexts calling for *iiya* only now, after two months. We are fairly certain, therefore, that the intrusion is the result of a new development.

Let us suppose that it is not *iya* but really *iiya* that appears in contexts calling for *iya*. Vowel-vowel sequences are common in Japanese, but Izanami has none at this time. Since *iya* and *iiya* can be distinguished only through a difference in vowel length, it is at least possible that Izanami intends to say *iiya*, even though she actually says *iya*. In support of this interpretation is one further fact. From the beginning, *nai* (adj) has appeared in contexts calling for *iiya*, but the intrusion ends at this same time—again, indicating that Izanami has acquired *iiya*. If we accept the interpretation that Izanami says *iya* when she intends to say *iiya*, we can conclude that Izanami has added the *Existence-Truth*, or the *Entailment-Non-entailment* dimensions, or both.

Of the two, the evidence favors *Existence-Truth*. Recall that contexts calling for *nai* (aux) begin taking *iya* about this time. Instead of saying, "It's not an apple," Izanami apparently says, "I don't want an apple." However, if it is really *iiya* appearing in place of *nai* (aux)—so that she is saying, "It's not an apple (but something else)"—we then know that Izanami has acquired the *Existence-Truth* contrast only. It could not have been *Entailment-Non-entailment* because *iiya* and *nai* (aux) are distinct on this feature—one being *Entailment*, the other being *Non-entailment*. They could not be confused, if this dimension had been acquired. However, they are alike on *Existence-Truth*, both being marked for *Truth*, and so could be confused if Izanami had acquired this dimension alone.

Thus, the first dimension to emerge is *Existence-Truth*, and its appearance marks *Stage 2*, at which time Izanami's knowledge of negation presumably is as follows:

	NAI (<i>adj</i>)	NAI (<i>aux</i>)	IYA	IIYA
1. No contrasts				
2. Existence	+	-	+	-

Stage 3 took place two months later. The replacement of *iya* by *nai* (*adj*), which has been present from the beginning, stops altogether. Izanami no longer apparently says, "There isn't an apple," when she should say, "I don't want an apple." The new development must signify acquisition of the *External-Internal* dimension, as well as the virtually certain appearance of *iya* (as opposed to the truncated *iiya*). No other possibility exists, given our semantic analysis, since *External-Internal* is the only dimension on which *iya* and *nai* (*adj*) contrast. There is no problem here of distinguishing *iya* and *iiya*, of course, since the observation involves the pronunciation (or lack of it) of *nai*. For the same reason, no assumptions are made about the meaning of *iya* when Izanami uses it, but only about the existence of *iya*-contexts.

Thus, Izanami has two dimensions by Stage 3, and *iiya* and *nai* (*aux*) are synonyms:

	NAI (<i>adj</i>)	NAI (<i>aux</i>)	IYA	IIYA
1. No contrasts				
2. Existence	+	-	+	-
3. External	+	+	-	+

About a month later, Izanami apparently acquired the *Entailment-Non-entailment* dimension. The evidence is that she distinguished *nai* (*aux*) from *iiya*, and so eliminated the remaining confusion: (*i*)*iya* no longer appeared in *nai* (*aux*) contexts. Thus, Izanami developed the entire system of negation in Japanese in some five months' time.

At the moment that *Entailment-Non-entailment* emerged, an interesting further development occurred. A new word, *chigau*, appeared, and did so in considerable numbers. It has been completely absent from Izanami's speech before this time.

Chigau is not a negative. It is variously translated as "different," "wrong," or "disagree"—and so is different from such words as "no," "not," or "no-but." Syntactically, it is a verb.

However, Izanami uses *chigau* in none of the senses just given. For her, *chigau* is an omnibus negative, used in completely diverse contexts. It appears in situations calling for *iiya* and *iya*—even though *iiya* and *iya* share no features of negation at all—and possibly appears also in contexts appropriate to *nai* (*adj*) and *nai* (*aux*), although we have not observed this. If we assume that Izanami's use of *chigau* has not demolished the system of negation just developed—as, indeed, it apparently has not, since she continues to use the four terms of negation as well—we must conclude that *chigau* has negative import but is marked on none

of the dimensions of negation. Thus, it appears in contexts calling for Truth as well as Existence, External as well as Internal, and Entailment as well as Non-entailment. In fact, Izanami's use of *chigau* resembles most closely the use of *un-uh* in English: "Do you want some?" "Un-uh"; "Did you have a pear?" "Un-uh, I had an apple"; "Springfield is the capital of Massachusetts." "Un-uh"; "Does she have a wart on her nose?" "Un-uh." *Un-uh*, too, represents omnibus negation.

How are we to account for the sudden appearance of an omnibus negative? It seems most plausible to suppose that Izanami's use of *chigau* reflects the concept of negation, as opposed to the particular forms of denial (*iya*, *nai* (adj), etc.), or the particular dimensions of negation. As such, *chigau* adds the idea of general denial, as an abstract possibility, and so liberates negation from the semantic constraints represented in the three contrasts of Truth-Existence, External-Internal, and Entailment-Non-entailment.

However, the interesting fact is not so much that Izanami eventually developed a form of omnibus negation, but that she did so *after* having developed the various special forms of negation. For Izanami's parents use *chigau* in the omnibus sense, too. *Chigau*, as a kind of featureless denial, has been presented to Izanami as a model throughout the five-month period we have studied (and doubtlessly before), yet Izanami resisted developing *chigau* precisely until she had acquired the last of the three contrasts of negation. On this evidence, generic negation is not primitive, as often claimed. It is, instead, a late development, constructed from, and possibly summarizing, the three features of negation discussed above. It is these features that are preliminary. If anything in Izanami's history of negation reflects some aspect of children's capacity for negation, it is the features of negation and not the general concept of denial.

We can summarize our findings, and answer the question, "What does a child mean when he says 'no'?" by setting down the following five points:

1. At first, Izanami had no features of negation at all. At this point "no" meant something did not exist, and nothing more. Subsequent development consisted of forming contrasts with the ends of the dimensions represented in *nai* (adj); that is, with Existence, External, and Non-entailment.

2. The first such contrast to emerge was between Existence and Truth. In addition to marking the existence and non-existence of events and objects, Izanami came to mark the correctness and incorrectness of statements. By Stage 2, "no" had come to mean false, as well as not here, creating an order of development that appears to be quite natural. Izanami judged relations about language only after she had judged other relations about the external world.

3. The next contrast to emerge was between External and Internal. Besides registering the non-existence of events, Izanami began to mark her desires concerning events. By Stage 3, "no" meant disapproval or rejection, as well as false and not here. Another direction of development, therefore, was from outside to inside, and this, too, seems to be in a natural order. Note that Izanami had the idea of linguistically registering the truth of statements before she had the idea of linguistically registering her inner states in relation to outer ones.

4. The last contrast to emerge was Entailment-Non-entailment. With this dimension, "no" also came to mean "no but," which requires an ability to organize statements into mutually exclusive pairs. Because Entailment-Non-entailment requires a child to hold in mind two propositions at once, it would naturally follow either of the other two contrasts, both of which involve judgments about single propositions or events.

5. The last step was the formation of an abstract concept of negation—the equivalent of *un-uh*. If *chigau* is a construction, its appearance last is also natural.

It is possible that these same steps, insofar as they follow a natural order, are also taken by English-speaking children. As pointed out above, the three dimensions of Japanese negation are used in English as well. Hopefully, future work will discover some way to investigate this possibility.

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