HIDDEN MEANINGS: THE ROLE OF COVERT CONCEPTUAL STRUCTURES

IN CHILDREN'S DEVELOPMENT OF LANGUAGE

Melissa Bowerman

University of Kansas, USA and
Max-Planck Institute for Psycholinguistics
Nijmegen, The Netherlands

Language has long been esteemed as the crowning achievement of the human symbolic capacity. In consequence, the processes by which children learn to talk intrigue not only scholars who are interested primarily in language itself but also those concerned with more general questions about how children come to engage in symbolic activities.

What aspects of symbolic development can research on language acquisition help to illuminate? We have, I think, barely begun to mine this rich source of information. Certain essential questions have undeniably been posed. These include, most centrally, whether the ability to use linguistic symbols to represent nonlinguistic entities is, as Piaget hypothesized, embedded in the emergence of a broader symbolic capacity underlying other representational activities. Other sorts of clues provided by language acquisition to the nature of symbolic development have been largely neglected, however. Yet some of these lesser-known aspects of child language may well turn out to be critical for a thorough understanding of linguistic symbolic development, and perhaps symbolic development more generally, especially when we look beyond the very first steps of acquisition upon which researchers have primarily concentrated.

The discussion of the present chapter is divided into two major sections. First, some limitations of the current approach to symbolism in language development are discussed. This is followed by an overview of some data that further illustrate the arguments advanced here, and indicate what kinds of additional information can be obtained by enlarging the scope of our investigations.

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SYMBOLS AND MEANINGS IN LANGUAGE

The neglect of certain aspects of linguistic symbolic development can perhaps be attributed to the prevalence in the field of child language of a relatively circumscribed approach to two basic problems: which entities qualify as linguistic symbols and what or how these symbols can be said to "mean", "stand for", or "represent". We take these up in reverse order.

Meaning

The approach to meaning that characterizes much recent work on linguistic symbolic development is consistent with a growing trend among language researchers in many fields to conceptualize language primarily in terms of its function as a system for communication between interacting speakers. The effect of this theoretical orientation is to focus the search for relationships between symbol and symbolized around meanings that constitute a relatively explicit part of the speaker's intended message.

A pioneering study in 1975 by Bates and her colleagues (Bates et al, 1975) is a good example of such an approach. These researchers explored the emergence of first linguistic symbols within the larger context of early communicative development. They found clear evidence that before the end of the first year of life children become capable of intentional communication, e.g. purposefully trying to get an adult to give them an object or to look at an object. These communicative goals are achieved nonlinguistically at first, with gestures and eye contact. Gestures gradually begin to take on a more ritualized quality, and eventually words appear in the same communicative contexts. Words are thus seen as a means, comparable to although more sophisticated than gestures, of achieving communicative ends, and their meaning or symbolic value is interpreted primarily with respect to their capacity to carry out this function.

Many studies of language development beyond the first words also implicitly or explicitly identify the meaning of linguistic forms with what the speaker tries to express when he uses them. This can be seen, for example, in the frequency with which the term "communicative intention" is used interchangeably with the terms "meaning" or "semantic function" in the literature. The child is typically seen as formulating "meanings" prior to language on the basis of his independent cognitive capacities. At a certan point after he becomes capable of conceptualizing a particular meaning, e.g. possession or spatial location, he may begin to want to "express" it. At first he uses whatever linguistic or nonlinguistic devices he has at his disposal. Eventually, however, he identifies and begins to use the specific linguistic forms with which these meanings are conventionally associated in his language

(e.g. words, word order patterns, inflections).

The study of how the child learns to represent and convey his communicative intentions with arbitrary linguistic symbols is certainly an important part of any investigation into the development of linguistic symbolism. But too exclusive a focus on what the child intends to communicate with his utterances misses a critical property of linguistic symbols: that (with the exception of proper names) they do not _directly_ represent the contents of the speaker's message. Rather, they do so only indirectly, by way of a network of backgrounded meanings and meaning contrasts that lie for the most part outside of awareness and do not figure as part of the speaker's intended message at all. This is not a novel point, of course, but I think it bears repeating and emphasizing in an era when attention seems to be more often on _what_ a linguistic symbol represents - e.g. the entiti(es) (objects, events, etc.) to which it directs the listener's attention - than in _how_ it succeeds in representing.

The following anecdote can serve as a simple, preliminary illustration of a backgrounded meaning contrast; more elaborate examples will be discussed later. As an exercise in linguistic relativity, I once modelled for a class of students a series of actions involving separation and coming apart, such as opening a door, unwrapping a bandaid, removing glasses, unscrewing a jar, and peeling an egg. The students, who spoke English, Spanish, or Japanese natively, were asked to jot down for each action a simple sentence describing what I had done. In subsequent analyses of the data generated in this way, we found a number of interesting differences in the way acts of separation were classified in these languages. Among these was a distinction between English and Japanese in the encoding of two particular actions: taking a piece out of a flat jigsaw puzzle and removing a small Fisher-Price peg doll from a shallow circular niche into which it fit in a toy bus. All of the English speakers had referred to both of these actions as take out. The Japanese speaker, however, had called the former by one verb and the latter by another.

On what grounds were these two acts, which seemed quite similar to the English speakers, distinguished? The Japanese speaker could not answer this question on the basis of immediate introspection. However, she could provide examples of other actions that would be referred to with one or the other verb, and she could also judge the appropriateness of a given verb for a given action. By analyzing a set of exemplars for each verb, the class finally concluded that the "peg doll" verb was used in the context of the removal of relatively long, thin objects from relatively tight-fitting surroundings, e.g. a sword from a sheath, a nail from the wall, a pencil from under the arm. The "puzzle piece" verb covered other (not all) acts of separation that would

typically be called <u>take out</u> in English.

The Japanese speaker's difficulty in formulating the distinction between the two verbs is important. It indicates that her "communicative intentions" when she produces a sentence with one or the other of them do not include, in any straightforward way, the goal of drawing a contrast between removals of long, thin objects from tight surroundings and removals of other kinds. Her thoughts - like those of the English-speaker - are occupied with the specific event to be communicated. But in order to make reference to this event she must implicitly categorize some of its properties so that she can select the conventionally appropriate verb. The fact that she has no trouble doing this shows that she fully controls the meaning distinction, even though she has difficulty bringing it to conscious awareness.

Although this particular example involves Japanese, there is nothing at all exotic about it.[1] Every sentence we utter requires a host of comparable on-line decisions involving selections among alternative linguistic forms on the basis of subtle meaning distinctions of which we are largely unaware. Whatever form the young child's "communicative intentions" may take prior to speech, they cannot be mapped <u>directly</u> onto linguistic symbols. Rather, the child must learn how to filter them through a system of semantic categories: to rapidly and unconsciously partition the referent event, experience (etc.) into appropriate components and to assign these components to larger meaning categories whose properties may be relatively far removed from the "intended message". The makeup of these categories in at least some semantic domains is subject to universal, biologically given perceptual or cognitive constraints (see Clark and Clark, 1977, Chapter 14 for a review), but it is by no means fully determined; there is still considerable cross-linguistic variability. This means that the process of learning the semantic categories of a language - the system through which the symbolization or representation of specific meanings is achieved - must involve a complex interaction between the child's own nonlinguistic conceptual predispositions and the language-specific aspects of the linguistic input he receives.

<u>The form of linguistic symbols: What aspects of language can be linked to meaning?</u>

In the preceding section the concept of "backgrounded" meanings through which more specific messages are expressed was illustrated with reference to the grounds on which speakers choose among alternative lexical items. But the linguistic forms with which meanings are associated are not always so easily identified.

In picking out linguistic forms for study, just as in choosing meanings to investigate, our tendency, understandably enough, has been to concentrate on those entities which are most accessible to our conscious reflection. These include surface segments of the language such as words and inflections, and - only somewhat more abstracted from the surface string - patterns of intonation (e.g. rising versus falling) and word order (e.g. N-V-N). Once such a unit has been selected for study, the question is typically asked "What meaning does the child associate with this form?" Alternatively, the problem may be approached from the opposite direction: "How does (or simply 'Does') the child express meaning X, even though he may not yet have acquired the word/inflection/ intonation pattern (etc.) with which this meaning is conventionally encoded?"

These are necessary questions, of course. But the net they cast in the search for how the child acquires the meaning system of his language has big holes, and many meanings that play a specifiable role in the language slip through unseen and unsuspected. These are the meanings that Whorf (1956), their most astute observer, termed "covert classes" or "cryptotypes" because they are not associated with any specific linguistic forms in the way that plurality, for example, is associated with <u>-s</u> and past time with <u>-ed</u> in English. Instead, they make themselves felt through their "reactances" (Whorf, 1956: 70): their influence upon the acceptability of potential combinations of, or operations upon, overt forms.

Whorf gave a number of interesting examples of cryptotypes in English. One, to which we shall return later, is the class of

transitive verbs of a covering, enclosing and surface-attaching meaning, the reactance of which is that UN- may be prefixed to denote the opposite. Hence we say 'uncover, uncoil, undress, unfasten, unfold, unlock, unroll, untangle, untie, unwind', but not 'unbreak, undry, unhang, unheat, unlift, unmelt, unopen, unpress, unspill'. (1956: 71)

Other examples discussed by Whorf include the semantic characteristics of verbs that <u>cannot</u> be followed by the particle <u>up</u> with the meaning "completely, to a finish" (cf. <u>break/cover/eat it up</u> versus *<u>spread/waste/stab/rock it up</u>). Still other cryptotypes are discussed (although not under this name) by, among others, Binnick (1971), (the semantic class of verbs that can be used both intransitively and, with an additional causative sense, transitively); and Zwicky (1968), (the semantic distinction between verbs that take a marked infinitive in their complements, e.g. <u>persuade</u>, <u>want</u>, <u>plan</u>, versus those that occur with the present participle, e.g. <u>find</u>, <u>imagine</u>, <u>avoid</u>).

The meaning categories associated with cryptotypes typically lie well outside of awareness. How many native speakers of English have any idea that there is semantic consistency to the class of verbs that can be un-ed, much less intend to communicate to their listener, when they use a verb such as untie, that the event to which they refer constitutes the reversal of an action belonging to this class? Yet observers of cryptotypes have argued that speakers nevertheless have a feel for such meanings. Whorf, for instance, noted that if a verb were invented, e.g. flimmick, meaning "tie a tin can to":

> then it falls into the cryptotype [of verbs of a covering, enclosing, and surface-attaching meaning] and I can say, e.g., 'he unflimmicked the dog'. But, if it means 'to take apart', there will be no tendency for anyone to make a form unflimmick meaning 'put together'; e.g., 'he unflimmicked the set of radio parts'. Such a form will appear strange and unacceptable. Similarly a knowledge of this cryptotype previous to the adoption of the new words 'camouflage' and 'wangle' would have enabled us to predict that it would be possible to say 'uncamouflage' it', but not 'unwangle it'. (1956: 71)

Making the point more generally, Zwicky (1968) points out that when speakers are presented with nonsense words whose specified meanings fall within the range of a cryptotypic class of English words, "it is possible [for them] to make extensive inferences about the syntactic behavior of these words solely on the basis of their meaning, and often one's intuitions about the 'expected' versus the 'unexpected' properties of the words are quite clear."

To summarize to this point, I have noted that studies of the development of language qua symbol system have revolved primarily around a restricted set of problems concerning what the speaker intends to communicate (which is construed as "that which is symbolized") and the explicit linguistic forms, e.g. words, inflections, or intonation patterns, that communicate it ("the symbols"). However, meaning plays a more extensive and subtle role in the structure of language than this approach can capture. If we want to achieve a thorough understanding of language as a developing symbol system, we will need to pay at least as much attention to the backgrounded, unconscious meanings that mediate the transmission of a speaker's message - often in the absence of direct "morphemic" realizations - as we do to the speaker's communicative intentions. It is, in fact, quite possible that this is where the most fruitful explorations of links between language and other symbolic activities will take place, rather than in the currently more emphasized capacity to use one entity to represent another. This is because backgrounded meanings in language presumably draw ultimately on the same capacity to make unconscious

comparisons and analogies among disparate experiences that contributes to imagery in art, poetry, metaphor, dreams, and the like.

SOME HIDDEN MEANINGS

How can we get at the shadowy conceptual structures that guide and influence children's use of language, but that are neither directly part of their communicative intentions nor necessarily associated with specific forms such as ball or -ed? One abundant source of clues is children's speech errors - ways in which their speech departs, either systematically or sporadically, from conventions of the adult speech to which they have been exposed.

Some error types selected to illustrate possible methods in the investigation of background meanings as well as some results are presented below. The analyses draw primarily upon spontaneous speech data from my two daughters, Christy and Eva, whose language development I have followed closely by taping and daily diary notes from the time of first words. Each error type is also extensively represented in my records by examples gathered less systematically from a number of other children in comparable age ranges; these supplementary data indicate that the processes for which the errors give evidence are widespread among English-speaking children.

Most of the speech errors in my data that are relevant to questions about the role of hidden meanings in language development can be grouped into two major categories: overregularizations and word substitutions. The process of overregularization, or the application of a grammatical pattern to forms that constitute exceptions to it, is well known to students of child language from studies of the acquisition of inflectional morphology (e.g. the familiar comed and foots). But the pervasiveness and importance of this process in the domains of syntax and derivational morphology (word formation) has not, I think, been fully appreciated (see Bowerman, 1982b, for a variety of examples). The usefulness of errors of overregularization for the study of covert meanings is that the rules or grammatical patterns that are overused often have subtle semantic correlates - i.e, they are extended only to words or to configurations of elements sharing a particular semantic property.

Word substitution errors involve the use of one word where another is required by either nonlinguistic or linguistic context, or both. One well-known class of such errors is termed "overextension": the use by a young child of a word (such as doggie) not only for members of the category that adults associate with the word but also for certain referents that fall outside it and for which the child typically has no conventional label as yet (e.g. cats, horses; see Clark, 1973).

A second kind of word substitution error occurs among older preschool children whose grammars and vocabularies are already relatively well developed. It involves confusion or interference between two or more words (or, sometimes, between a word and a bound morpheme) that have had a previous history in the child's speech of being used appropriately and separately, each one in its own semantic domain (see Bowerman, 1978, for an introduction to the phenomenon and general discussion). These errors are reminiscent of adult "slips of the tongue" involving semantically related words, e.g. "I really like to - hate to - get up in the morning" (Fromkin, 1971), in the sense that they are occasional rather than routine. They differ, however, in that any particular error by an adult is unlikely to be heard again, whereas in child speech an error of a given type may often be observed repeatedly over a relatively short period of time.

Linguists and psycholinguists interested in adult slips of the tongue involving semantically related words have proposed an explanatory model that appears applicable to childen too (e.g. Laver, 1973). According to this model, such errors result from lapses in the resolution of competition between lexical items. When the speaker plans to encode a particular event, a given component of his mental representation of the event may activate more than one candidate lexical item. The speaker must then evaluate these items for their appropriateness and select the best. Ordinarily this unconscious editing process works smoothly, but occasionally a less appropriate competitor wins out. In another possible outcome the conflict is resolved by the combination of two forms, as in fantabulous (fantastic + fabulous).

Word substitution errors, like overregularizations, provide information about the way meaning is organized in the speaker's head, but in a different way. Here there is no discernable pattern or rule to which a meaning category is linked, discoverable by inspection of the semantic characteristics of a large number of forms conforming to the pattern. Instead, the meaning category is inferred by comparing the meanings of two or more forms that compete with each other to find their common element(s), or, in the case of everextensions, by comparing all the referents to which the word is extended.

What is fascinating but as yet poorly understood about substitution errors is that they exhibit a kind of hidden logic. Overextensions and competitions among words do not take place on the basis of all conceivable similarities among the referent objects or events. Rather, they appear to be based on similarities that are linguistically "sensible", in that they play a specifiable role in the structure of one language or another. Sometimes the errors reflect a concept that is required for the child's own language, but in connection with forms that the child has not yet

acquired. Alternatively, the concept in question may have no clear function in the child's language, but be important in the structure of other languages, often even in connection with a form parallel to the one the child has linked it to. This flexibility in the way meanings "surface" in the child's speech - i.e. in the forms over which they exert an observable influence - has interesting cross-linguistic parallels. As Fillmore (1968:3) notes, for example, meanings that have obvious morphemic realizations in one language often show up in other languages as cryptotypic influences on selectional constraints or transformational possibilities.

In sum, the picture that emerges is of a child broadly equipped for language learning. The meaning categories he entertains - either relatively stably, as in the case of persistent overextensions, or more fleetingly, in the course of selecting among possible words - go beyond the set he will actually need for his own language. Nevertheless, they are still constrained in such a way that they have potential linguistic relevance. These arguments will be illustrated below in connection with particular examples; see also Bowerman (1980) and Clark (1976) for further examples and discussion.

UN- again

An intriguing set of interrelated errors that illustrate processes of both overregularization and competition between related known forms involves the child's acquisition of productivity with reversative un-. Whorf, as noted, argued that speakers of English have an implicit feel for the covert semantic category associated with un- prefixation, i.e. (reversal of) an act of covering/enclosing/surface-attachment. Although he himself adduced no empirical evidence to support this claim, we can see that he was right by inspecting patterns of un- usage in children's speech.

Children start out by learning a number of everyday English verbs prefixed with un-, like untie, unfasten, and unfold, apparently without recognizing that two morphemes are involved. Considerably later - after a year or more - they begin to produce novel verbs with un-, a sure sign that analysis into constituent morphemes has taken place. Some children - Eva, for example - appear to recognize the "right" semantic category from the onset of productivity, as indicated by the fact that most of their coinages involve verbs that fall within the category, e.g.:

1. E 3;10[2]   M: I have to capture you. (Grabbing E in a game.

         E: Uncapture me! (= release, let loose; as E tries to pull free.)

2. E 3;11   (E coming to M with clip earring hanging from
                her ear.)

             E: How do you unsqueeze it?

             M: What?

             E: How do you unget it...undone?

(Similarly, unclothes [= take clothes off]; untight [= loosen];
unpeel [= peel]).[3]

Other children, however, come to an appreciation of the
category more gradually. Christy, for example, initially produced
many novel verbs in un- which either directly violated the
category, in that they specified the reversal of an act of
detachment, uncovering, or moving out (etc.) instead of the
converse (cf. examples 3 and perhaps 4 below), or for which the
category was simply irrelevant (example 5):

3. C 4;5   (C has asked M why pliers are on table.)

             M: I've been using them for straightening the
                wire.

             C: And unstraighting it? (= bending it)

4. C 3;9   This is pooey that's coming out of here. (In
             tub, showing cup with water spouting out of
             holes.)

             And that's how to make it uncome. (Blocking
             holes with hand.)

5. C 4;7   (C very angry with M for denying a request.)

             C: I hate you! And I'll never unhate you or
                nothing!

             M: You'll never unhate me?

             C: I'll never like you.

After an extended period of relatively indiscriminate un-
prefixation, Christy began increasingly to limit the operation to
verbs of "covering, enclosing, and surface-attaching meaning" as in
the following:

6. C 5;1   (M working on strap of C's backpack.)

             M: Seems like one of these has been
                shortened, somehow.

             C: Then unshorten it. (= lengthen)

7. C 5;1   I unbended this with [= by] stepping on it.
             (= straightened; after stepping on a tiny
             plastic three-dimensional triangular roadsign,
             squashing the angles out of it.)

8. C 5;1   He tippitoed to the graveyard and unburied
             her. (Telling ghost story.)

9. C 7;11   I'm gonna unhang it. (Taking stocking down
             from fireplace.)

Although Eva and Christy followed different paths in their
implicit analyses of the semantic correlates of un- prefixation,
they both arrived at an understanding of the covert meaning
category associated with this operation, as shown by the
restriction of their coinages to verbs of this class (see Bowerman,
1982b, for further examples and discussion). At this point an
interesting further development took place. The children began to
show evidence, in both substitution errors and related blends, that
un-, now firmly associated with what we may call acts of separation
(i.e. the reversal of acts of covering, enclosing and surface-
attaching), had come into competition with various other forms that
were called for in particular speech contexts. These other forms,
which the children had previously used perfectly correctly in such
contexts, include both single-word verbs like open that already, by
virtue of their lexical meaning, refer to an act of separation, and
two-part verbs like take off, that achieve reference to separation
with a locative or stative particle. Some examples of early and
later redundant blends are given in 10-15 (one nice example from a
different child is included, and see also 2 above), and of the
replacement of a locative or stative particle by un- in 16-18:

10. C 4;11   Will you unopen this? (Wants D to take
             lid off styrofoam cooler.)

11. E 4;7   E: (Holding up chain of glued paper strips):
                I know how you take these apart. Unsplit
                them and put 'em on.

             M: How do you unsplit them?

             E: Like this. (Pulling a link apart.)

12. Scott   How do you <u>unbreak</u> this? (Trying to pull
    5;2   sheet of stamps apart.)

13. E 3;5   How do I <u>untake</u> this <u>off</u>? (= take this off.
             Trying to get out of swimsuit.)

14. E 4;11   ...and then <u>unpress</u> it <u>out</u>. (= press it out.
    (Showing how she gets play dough out of a mold by
             pressing it through.)

             M: How do you unpress it out?

             E: You just take it out.

15. C 4;9   You can <u>take</u> it <u>unapart</u> and put it back
             together. (= take it apart. C manipulating
             a take-apart toy.)

16. E 4;2   D: Pull your pants up, Eva. (E has pants
                sagging down.)

             E: Somebody <u>unpulled</u> 'em. (= pulled them
                down/off.)

17. C 5;6   ...So I had to <u>untake</u> the sewing. (= take
             the sewing/stitches out. Telling about sewing
             project at school.)

18. C 10;8   And then I <u>untook</u> it and studied it. (=
             took it apart. Telling how she made a paper
             cup by dismantling and analyzing another one.)

These errors are intriguing on at least two grounds. First,
they indicate that beyond a certain point in development, the
intention to encode a given act of separation does not necessarily
present itself to the mind as a unit, neatly tagged with a suitable
lexical item. Instead, the child now seems, at least sometimes, to
conceptualize the event in two hierarchically related ways at the
same time, with each conceptualization "pulling" for a different
linguistic form. Most concretely, the child recognizes the act as
an instance of, for example, "opening" or "breaking", and she
retrieves the lexical item directly associated with this concept.
But at the same time she is sensitive to the kinship of the act
with a wider range of acts of separation including, perhaps,
"unfastening" and "untying"; this we can infer from the fact that
<u>un-</u> has been activated as well as the more specific verb in the
process of encoding the act.[4]

Simultaneous classification at two different levels of
abstraction is not routinely needed for talking about acts of
separation in English. However, hierarchical classification as a
general process is extensively represented in the languages of the
world. For example, many languages have numeral or verbal
classifier systems that require objects to be doubly classified, as
suggested by literal translations like "seven flat-things rugs",
"sixteen long-things poles", "three round-things gourds", and "five
long and flexible-things ropes" (examples taken from Clark, 1976).
We also see hierarchical classification at work closer to home, for
example in English sentences like "Beyond the mountain <u>stands a
forest/lies a lake</u>", and "He left the <u>car sitting</u>/ a pile of <u>lumber
lying</u>/his <u>bike standing</u> in the driveway". Here, an object (e.g.
car, bike) is encoded both at a relatively specific level, as
specified by the noun, and also on the basis of much more abstract
properties of shape and orientation, as indicated by the three-way
choice offered by <u>stand</u>, <u>sit</u>, and <u>lie</u>.

A second interesting aspect of children's substitution errors
and blends involving <u>un-</u> is that they are often quite parallel to
the <u>correct</u> way of encoding the act in question in Germanic
languages that are closely related to English, such as Dutch (see
Bowerman, 1981). Thus, where English uses <u>un-</u> + verb, Dutch may
use verb + particle or simply a bare verb, and vice versa, as
illustrated in Table 1 (Dutch examples underlined).

Despite the fact that "acts of separation" are divided up into
comparable semantic subcategories in these two languages, these
subcategories are then distributed among the available formal
devices in what seems to be a rather arbitrary way. This suggests
a lack of psychological unity specific to the acts sharing a
particular formal device (e.g. verbs in <u>un-</u>, verbs in <u>-off/out</u>),
and points instead to the semantic coherency of the domain of "acts
of separation" as a whole. And this is, of course, exactly what
the children's errors, in a different way, also indicate.

The spatial metaphor

Another large body of substitution errors in my data involves
the use of a word or phrase conventionally associated with a
spatial concept to refer to a temporal or stative concept. (The
converse error, use of a temporal or stative word for a spatial
concept, also occurred, but much less frequently; see Bowerman,
1978 and 1982c for general discussion).

These errors are particularly interesting because of their
relevance to a claim that has been made by many linguists and
psycholinguists: that space is often used as a metaphor for
thinking about and communicating nonspatial meanings. Whorf, for
example, noted the prevalence in English and related languages of

Table 1: Encoding Acts of Separation: Some comparisons between
          English and Dutch.

	un- + V	V + particle e.g. off/out	Single word
Some parallel forms	I unload/ ik ontlaad	I chop off/ik hak af I cut out/ik knip uit	I open/ ik open
Some cross- overs	I unpack ⟷ ik pak uit (=I pack out) I unhook ⟷ ik haak af/uit (=I hook off/out)		
	het ontglipt ⟷ it slips out (=it unslips) (e.g. a secret)		
	ik ontvel ⟷ (=I unskin)		I skin (e.g. my knee)

physical, spatial metaphors as in "I 'grasp' the 'thread' of
another's arguments, but if its 'level' is 'over my head', my
attention may 'wander' and 'lose touch' with the 'drift' of it..."
(1956:146). Whorf considered the use of space for nonspatial
meanings to be language-specific, but other investigators have
argued on similar and other linguistic grounds that this metaphor
serves as a deepseated, universal organizing principle of the human
mind (e.g. Jackendoff, 1978; Lakoff & Johnson, 1980; Talmy, 1976).

    Arguments based on linguistic idioms and other structures,
although interesting and certainly plausible, do not give firm
evidence for cognitive structure in the head of individual
speakers. This is because speakers could, in principle, learn to
use conventional spatial metaphors, as well as other linguistic
structures suggesting the metaphorical use of space, without in
fact ever "recognising" the spatial metaphor they entail. What is
needed is evidence that spatial metaphors are actively at work in
the speaker's head - for example, serving to guide on-line
linguistic performance. This is exactly the kind of evidence that
word substitution errors can provide.

    Consider the following examples:

19. E 3;9   Can I have any reading behind the dinner?
             (= after. To M, who is fixing dinner;
             request to be read aloud to.)

20. C 7;6   I don't remember behind those two. (= before.
             C has just been recalling her last two birthday
             parties; cannot remember any previous ones.)

21. E 4;10   Today we'll be packing 'cause tomorrow there
             won't be enough space to pack. (= time.
             The day before the family is to leave on a
             trip early in the morning.)

22. C 7;2   Do we have room before we go to bed for
             another reading? (= time. M has been
             reading aloud in the evening; just finished
             book.)

    These utterances all require a very specific temporal
preposition or noun. Instead, a parallel word from the spatial
domain has been "imported". Such errors were observed only
occasionally in Christy's and Eva's speech, although they recurred
systematically over a long period of time. Their onset was
preceded by a period of many months in which both the needed
temporal word and the substituted spatial word had been used
correctly as required.

    The occurrence of such errors, even only occasionally, gives
general grounds for concluding that the child makes an implicit
analogy between space and time. But what is the exact cause of the
errors? Does the child conceptualize the temporal event in a
temporal way, but sometimes accidently choose a spatial word
because semantic links have now been forged between temporal and
spatial lexical items? Or does she in fact sometimes conceptualize
the event directly in terms of a spatial analogy, and then simply
select the spatial word that is appropriate? The answer is not
clear in the case of the foregoing examples. There are, however,
examples that allow us to infer relatively confidently that the
child has indeed conceptualized a temporal event in a
thorough-going spatial way. This is because there is no simple
one-to-one correspondence between a temporal and a spatial word;
instead, the spatial metaphor affects the casting of the entire
sentence. For example:

23. C 4;5   (C telling sequence of activities at a birthday
             party she has just been to): The balloons is
             on the other side, after I ate. But there
             might have been more on the first side. ("On
             the other side" = after (the eating); "on the
             first side" = before (the eating).)

24. E 6;9   You know what I don't like, Mom? Friday is
             covering Saturday and Sunday so I can't have
             Saturday and Sunday if I don't go through Friday.

    Another set of related errors involves the verbs put and take.
These are conventionally associated, in sentences of the kinds in
question, with acts in which an agent causes an object to undergo a

change of spatial location. But they are used here instead to
refer to acts in which an agent brings about a change of state.
The called-for verb in such contexts is either make, get, or
sometimes a so-called "lexical causative"; these verbs had also
been well established previously in the child's speech. The
following examples illustrate the genre:

25. (C 4;3   I putted part of the sleeve blue so I
                crossed it out with red. (Telling M about
                mistake in drawing.)

26. E 4;7   I'm not going to put it too long. (E
                cutting pieces of yarn for a doll's hair.)

27. C 4;7   Put it all filled. (= fill it (up).
                Instructions to M, who is filling C's cup.)

28. E 3;9   I'm taking those cracks bigger. (E pulling
                on cracked peanut shell.)

29. E 6;1   I'm also gonna have to have soapy water 'cause
                Christy took it all soapy. (At the end of
                long list of complaints about having to bathe
                after C in the same bathwater.)

30. C 3;9   M: Stop unbuttoning me. (As C tries to
                   unbutton one of M's shirt buttons.)

                C: I'm not taking you unbuttoned.
                   (= unbuttoning you.)

     The lag in the onset of substitution errors in the domain of
space-time-state begs for explanation. Does the analogy between
spatial and non-spatial concepts arise in the child's mind only
after a period in which the different domains are conceptualized in
unrelated ways? If so, does the analogy emerge purely
spontaneously, or does it reflect the child's linguistic
experience? Adult English has many words with both spatial and
nonspatial conventional uses, e.g. go downtown (spatial), go on
until 4 o'clock (temporal), go white with rage, (stative).5 These
words, along with various idioms, could in effect continually
invite the child to see a connection between space and other
domains. Once made, the connection could then begin to "leak" into
other aspects of language where it does not belong in conventional
usage. This latter explanation would provide an account of the lag
between the acquisition of the relevant words and the time at which
the errors set in. At present, however, there are no clear grounds
for deciding upon this or any other interpretation (see Bowerman,
1982c for further discussion and examples).

Kinds of instruments

     For a final illustration of a "hidden meaning", we turn to a
set of interrelated errors involving both systematic overextension
and, at a later age, sporadic substitutions. These errors differ
from the ones discussed earlier in that they do not suggest a
semantic kinship between two words per se. Rather, they indicate
that the child perceives some similarity in the abstract semantic
function of the sentence constituents that follow and are
"introduced" by these words.

     By way of background, a quick review of what is meant by
assigning an "abstract semantic function" to sentence constituents
is in order. Before about 1970, children's utterances were
described by investigators of language development primarily in
terms of the form and arrangement of the words they contained.
After this time there was increasing realization that important
aspects of the child's linguistic competence were missed unless
some "deeper" or "more abstract" level of description was provided
(see Bloom, 1970, for seminal arguments). But what should this
description look like? Motivated both by theoretical considera-
tions and the need for a convenient descriptive taxonomy,
researchers began increasingly to draw, directly or with
modifications, upon the set of "case relations" proposed by
Fillmore (1968) as needed for the adequate analysis of adult
language (e.g. Bowerman, 1973; Brown, 1973).

     A case relation, or simply case, is defined as the semantic
relationship that holds between a noun phrase and the verb with
which it is associated. Fillmore's list of candidate cases
included, for example, Agentive, "The case of the typically animate
perceived instigator of the action identified by the verb", and
Instrumental, "The case of the inanimate force or object causally
involved in the action or state identified by the verb" (Fillmore,
1968: 24). The case relationship holding between a noun phrase and
a verb is in principle independent of the syntactic structure of
the sentence; for example, Mary functions as Agentive in both Mary
gave John a present and John received a present from Mary, despite
striking differences in its syntactic treatment. It is interesting
to note that in making arguments for the necessity of a notion of
case, Fillmore explicitly invoked Whorf and the concept of "covert
categories". Specifically, he argued that even though many
languages, including English, do not mark case relations overtly
and consistently with a set of case endings or other devices, these
relations nevertheless have a "reality" that is manifested through
various subtle grammatical constraints.

     Fillmore's arguments, along with his list of candidate cases,
had considerable intuitive appeal. A major problem, however, was
that it proved difficult to justify any particular set of case

relations and their precise definitions over other potential taxonomies. Fillmore himself (1971) discussed various interpretive problems with respect to adult language. For child language the dilemma is even more acute, since on psychological grounds a number of possible breakdowns are plausible (see Bowerman, 1976; Brown, 1973) and there may be few or no grammatical markers or operations to serve as guides. In consequence, despite over a decade of research and the introduction of various procedures for determining whether young children indeed operate with (for example) a category of Agent (e.g. Braine, 1976; Golinkoff, 1981), the problem of psychological reality has never been satisfactorily resolved.

I do not intend here to tackle the issue of the psychological reality of case relations in child language as a whole. Rather, I would like to show how data from a rather unexpected source can potentially be brought to bear on the problem. Specifically, the argument will be that certain kinds of errors support a particular hypothesis of Fillmore's concerning the makeup of the Instrumental case.

Fillmore's hypothesis. The realizations of the Instrumental case that are most familiar to us from Fillmore's 1968 treatment involve a noun phrase referring to a concrete object used by an Agent in bringing about an action. If the Agent is mentioned, the Instrument is introduced by the preposition with, as in Suzy ate her cereal with a silver spoon, Jim broke the window with a ball, and George opened the door with his spare key. Some verbs permit omission of the Agent, in which case the Instrument, if mentioned, will become the sentence subject, as in A ball broke the window.

In his 1971 discussion of "Some problems for case grammar", Fillmore extended his interpretation of Instruments. This case was now seen to include not only noun phrases referring to concrete objects and forces such as "wind" or "air pollution", but also clauses referring to an entire action or event seen as instrumental in bringing about some second action or event. In the underlying structure proposed by Fillmore for sentences with such constituents, the clause specifying the causing event and the clause specifying the resulting event are both embedded into a higher predicate suggested by the word cause, as manifestations of the Instrument and Goal cases, respectively; for example [I hit the ball]$_{Instr.}$ CAUSE [the ball went over the fence]$_{Goal}$ and [She tapped her fingers on the desk]$_{Instr.}$ CAUSE [I became irritated]$_{Goal}$. Underlying configurations of this general type are related to several different surface structures, according to Fillmore's analysis, e.g. I hit the ball and that made it go over the fence, I hit the ball over the fence, I made the ball go over the fence by hitting it; Her tapping her fingers on the desk irritated me, She irritated me by tapping her fingers on the desk.

Fillmore's proposal is, most basically, a claim about cognitive organization. Do speakers indeed entertain, as the proposal implies, a relational category that is broad and abstract enough to encompass not only spoons, keys, and possibly less tangible entities like "wind" that play a causal role in bringing something about, but also causally-involved actions or events in their entirety? There is evidence, in the form of certain errors involving prepositions, that they indeed do, and from a surprisingly young age.

With and by. In Christy's and Eva's speech, as in that of other English-speaking children, the first realizations of the Instrumental case were simple nouns referring to body parts and common tools such as eating utensils. At first these were unmarked, as in eat fork. By age two or before, with began to introduce the noun, e.g. (Christy): I drink it with mouth; I eat chocolate with a spoon; (Eva): How come cut with knife? I feel it, Mommy, with my hands.

A long time passed - about a year for Eva and a year and a half for Christy - before the children began to produce sentences in which a causing action is explicitly mentioned in a separate clause. Interestingly, a number of sentence patterns of this type emerged more or less simultaneously in each child's speech, suggesting that an analysis which, like Fillmore's, formally captures the conceptual similarity among such sentences is on the right track (see Bowerman, 1977, 1982a).

More important for present purposes, however, is Fillmore's claim that sentences of this latter type are conceptually related to simpler ones in which an object used in performing an action is specified. Is there evidence for this analysis? There is: when the children first began to produce sentences with by-clauses, both children for some time consistently used only with instead. For example:

31. C 3;6   Anyway, you made me cry with putting that
              up there. (After M had put a desired object
              out of reach, causing C to cry.)

32. C 3;7   I'll clean up the yard with rolling it [=
              snow] up in little balls. (C describing how
              she intends to clear the yard of snow.)

33. E 2;8   I pinched my finger with taking this off.
              (Showing M a ring.)

34. E 3;1   I'm making a rug with cutting little lines.
              (As E cuts fringe into end of rectangular
              piece of paper.)

(See also 7 above for a comparable example from a later age.)

This overextension is very revealing, since it indicates that for the child there is a conceptual linkage between the earlier established notion of an object used instrumentally and the later-learned (or at least "later expressed") notion of an action or event that brings about another action or event. Later developments support this inference further. Within about two months after starting to produce by-clauses incorrectly marked with with, the children acquired the needed form by and proceeded for some time to use it more or less interchangeably with with. Some illustrations of correct usage, for example, include these:

35. C 3;11   I cleaned them up by eating them.
             (Describing how she had gotten rid of
             cookie crumbs.)

36. E 2;10   I can tear off the paper by tearing it.
             (Showing how she can take a sheet of paper
             off a pad.)

And now, within a few weeks of the establishment of by in by-clauses, a remarkable interference back on with-phrases was observed in both children's speech: the occasional use of by to introduce a noun phrase referring to an instrumental object, in place of the conventionally required with. For example:

37. C 4;3   You scratched me by your long fingernails.

38. C 4;4   I just eat it by my spoon.

39. E 3;0   I put a little bit in by my spoon.

40. E 3;3   I can clean the table by these. (= rags.)

Apparently the child's mental representation of an object instrument had enough in common with her representation of a causal action - even though the causal actions referred to in her sentences often involved no instrumental object - that the preposition newly associated with the latter could now also be activated in the context of the former and interfere with a correct usage pattern established more than a year previously.

Instrumental Case

Age	Noun phrase: with NP	Clausal: by V-ing
CHRISTY	(Open the door WITH A KEY)	(Open the door BY KICKING IT)

CHRISTY
2;0
2;4
2;8
3;0
3;4
3;8
4;0
4;4
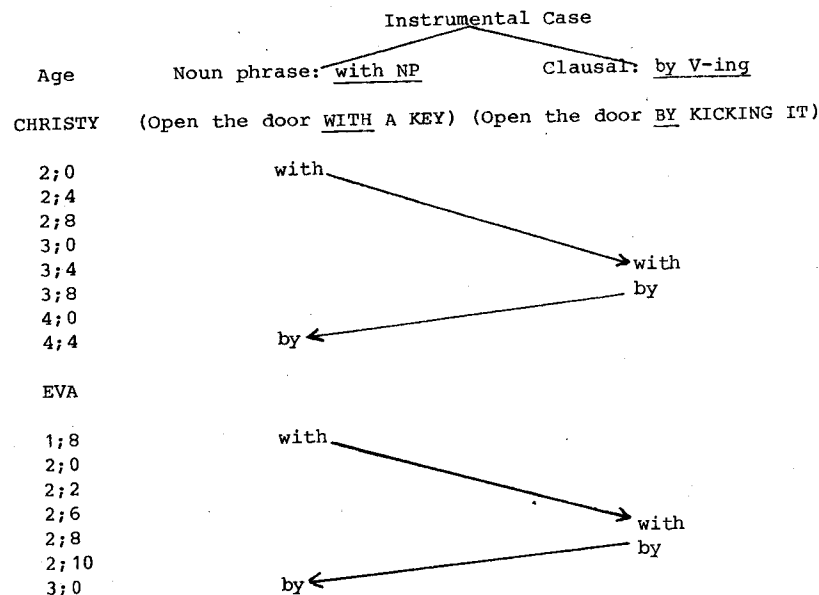
EVA

1;8
2;0
2;2
2;6
2;8
2;10
3;0

Figure 1: Usage of with and by over time for two children

The pattern of preposition usage over time that I have just described can be represented schematically as in Figure 1. In the upper left-hand corner of each child's panel is shown the age of onset of with to correctly mark nouns specifying object instruments. The consistent overextension of with to by-clauses, a year or more later, is shown by the arrow connecting this first with to the with in the right-hand column. The slightly later onset of the by required in such contexts is shown just below this second with. Finally, the still later onset of occasional errors in which object instruments are marked with by is shown at the bottom of the left column, at the receiving end of an arrow connecting it to the inferred source of interference from by-clauses.

Where does the child's equation of objects used instrumentally and causally-involved actions come from? It has been suggested to me that it might be introduced to the child by experience with language itself. Even though instrumental noun phrases and instrumental clauses are conventionally marked in English by different prepositions when they occur in positive sentence constituents, in negative sentence constituents they both are introduced by without, as in I ate my cereal without a spoon and I

made you cry without even touching you. It is difficult to rule
this explanation out completely on the basis of my present data,
but I think it is unlikely. This is because at the time that
errors involving with in by-clauses first appeared, and for some
time thereafter, the child produced no negative by-clauses at all.
Without in simple instrumental phrases had occurred very
occasionally but was not yet well established. In sum, there is no
evidence that the child had the necessary knowledge of a shared
marker.

If language does not suggest to the English-speaking child the
conceptual similarity between objects used instrumentally and
causally-involved actions, then it is an equivalence that must
arise in the child spontaneously. If so, it is nevertheless a
linguistically useful equivalence, since many languages do
explicitly categorize instrumental objects together with
instrumental actions/events by the use of the same case ending, and
even the English-speaking child will eventually find the
equivalence helpful in making sense of the use of without in
superficially different kinds of contexts.

CONCLUSIONS

Recent research on language as a developing symbolic system
has concentrated heavily on the question of how children come to
use linguistic entities to represent nonlinguistic entities. In
this chapter I have argued that the focus on this issue, essential
as it is, has tended to encourage interest in the more conscious,
"surfacy", communication-oriented aspects of symbolic processes at
the expense of more unconscious, covert processes that may be
linked only very indirectly to communicative activities. And yet
these latter processes, perhaps precisely because they are
relatively far removed from the immediate, everyday concerns of
conveying messages, may offer the most profitable hunting grounds
for scholars interested in uncovering the most basic conceptual
organizing principles of the human mind - principles that can be
expected to underlie not only language but many other sorts of
symbolic activities as well.

In this chapter I have concentrated on a particularly rich
source of clues to subterranean conceptual processes - children's
occasional or consistent speech errors. And I believe that this is
a source we have barely begun to tap. But of course it is not the
only way to exploit child language in looking for backgrounded
meaning categories - experimental approaches as well as other ways
of analyzing spontaneous speech data can also yield valuable
information. Taken together, studies of child language that
explore the ways in which children categorize and structure their
experiences for purposes of language use have much potential for
revealing elusive aspects of the human symbolic capacity.

NOTES

[1] In fact, after wondering at the "foreignness" of the basis on
which Japanese distinguishes between removals involving puzzle
pieces and peg dolls, the English-speakers of the class were
abashed to suddenly realize that the choice between English take
out and pull out is made on related, although not identical,
grounds.

[2] Notation in these and other examples: C = Christy, E = Eva,
M = Mother, D = Daddy. Age shown in years; months.
... (sentence initial), indicates that part of the sentence is
omitted; (mid-sentence), indicates a pause without sentence-final
intonation contour.

[3] Some of the verbs to which the children attached un- are also
"novel", in the sense that they cannot be used directly as
transitive verbs in adult speech. These verbs are typically
derived from existing lexical items in patterned ways, see
Bowerman, 1982a.

[4] The reader may reasonably object that this analysis is more
powerful than is necessary. For example, it might be that the
intrusion of un- into lexical contexts where it does not belong
reflects only a very "local" competition between two words - one of
them prefixed with un- - that are both appropriate or nearly so for
the referent action in question. In example 11, for instance, the
conflict might be between split and undo. If this is the case,
runs the objection, then it would be unnecessary to credit the
child with a more abstract classification of the referent act as an
"act of separation". This more restrained explanation would indeed
suffice if all the errors involved acts for which a relatively
appropriate un- word exists. But this is not the case; for
instance, there appears to be no un- verb which is even roughly
appropriate for the act in question in example 16. If the
intrusion of un- into at least some contexts cannot be explained by
reference to a semantically very closely related un- word, then we
must assume that the child is capable of perceiving more remote
connections between an act like "opening" or "pulling off" and
verbs prefixed with un-; this is what is intended by the proposal
that the child is capable of classifying the referent as an "act of
separation".

[5] Put and take of course also have nonspatial uses, not only in
sentences structurally and semantically dissimilar to those in
which the children made errors (e.g. It took him a long time) but
also in more similar ones, e.g. The vet put the dog to sleep, The
chairman put the rumour to rest, John took the suggestion into
account. But there is no evidence in the children's speech that
they knew anything about these uses at the time their stative uses
of put and take set in.

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SECOND LANGUAGE ACQUISITION:

INTRODUCTION

William C. Ritchie

Syracuse University
United States of America

Though practical interest in the problems of second language
acquisition and use has a lengthy history (see Kelly, 1969, for a
survey), the emergence of an independent and identifiable body of
"pure" theory and research in the area occurred only in the late
1960's and early 70's. Since that time research in the field has
grown tremendously in both breadth and depth. A wide variety of
cognitive and affective factors have been identified as conducive
to or inhibitive of second language acquisition, the course of
acquisition has been described (if not explained) in certain
limited cases and compared with that of first language acquisition
and to the pidginization of standard languages, and a variety of
theories and insights - some of the latter quite genuine - have
arisen.

The most central questions in the field, however, concern the
role of biological maturation and its influence on the capacity for
the acquisition of any language - whether a first or a second.
Great impetus was given to the investigation of biological factors
in second language acquisition by Lenneberg's hypothesis
(Lenneberg, 1967) that there is a "critical period" for language
acquisition akin to imprinting in certain species of birds as
investigated most prominently by Konrad Lorenz. Lenneberg further
related the end of the critical period to the completion of
lateralization of brain function at approximately the age of
puberty, though this specific claim is highly controversial (see,
e.g. Krashen, 1973).

During this same period, a new and more restrictive (hence,
empirically more adequate) theory of the syntax of natural
languages has emerged in the work of Chomsky and his colleagues
(see, e.g. Chomsky, 1981). Though research on second language