THE EMERGENCE OF THE INDEFINITE NULL COMPLEMENT[1]

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Since Bowerman's (1974) seminal paper on novel lexical causatives in child language, developmental psycholinguistics has tended to view lexically subcategorized alternations in argument structure as restructurings of either a semantic or syntactic nature (Lord 1979; Pinker 1989). A recent example of this general view is found in Pinker (1989), who proposed "when a verb's meaning changes, its argument structure changes as an automatic consequence" (p 63). This hypothesis is not without problems. One problem is defining exactly what constitutes a semantic transformation. A second problem is that the hypothesis ignores the fact that there are argument structure alternations which have discourse-pragmatic licensing as well as semantic licensing.

Let us take as an example the various subclasses of English transitive verbs that can be used with omitted undergoers. The theoretical construct "undergoer" is taken from Role and Reference Grammar (RRG) (Foley & Van Valin 1984; Van Valin 1990, in press). I use it here because it signifies a relationship between an NP and a clause that is intermediate between the fine-grained thematic roles (patient, theme, effector) and abstract grammatical relations. Sentences 1a-f contain examples of three classes of transitive verbs that can omit their undergoers. The three classes are the *shave*, *win* and *read* type verbs. These classes differ in the way the missing undergoer influences our interpretation of the surface intransitive forms. The paired sentences of 2a-c capture these differing interpretations in everyday language.

1. a. William dressed / shaved Tom.
   b. The Cubs won / lost the game.
   c. Tom read the book / ate the steak.
   d. William dressed / shaved.
   e. The Cubs won / lost.
   f. Tom read / ate.

2. a. William shaved ---> William shaved himself.
   b. The Cubs won ---> The Cubs won the game.
   c. Tom read ---> Tom read something or other.

Problematic is the fact that for the *shave* and the *win* type verbs, the surface intransitive forms do not seem to effect a change in the predicate type, so much as a narrowing of the range of possible referents for the implicit undergoer.

This is not the case for *read* type verbs, where there is
evidence that the omission of the undergoer reflects a change of
predicate type from accomplishment to activity predicates
(Vendler 1967; Dowty 1979). With undergoers of specific quantity,
the verbs of this class enter into accomplishments as can be seen
in 3.

  3. a. He read the entire dissertation in five minutes.
     b. He ate all the spagetti in five minutes.
     c. *He read the entire dissertation for five minutes.
     d. *He ate all the spagetti for five minutes.

In contrast, the surface intransitive form of *read* and *eat* are
usually construed as activities, as can be seen in 4.

  4. a. He read for five minutes.
     b. He ate for five minutes.
     c. *He read in five minutes.
     d. ? He ate in five minutes.

Even this generalization, however, has problems. Sentence 4c is
clearly ungrammatical, but sentence 4d is grammatical if the
omitted undergoer is construed as meaning something like *a meal*.
Sentence 5 makes this construal clearer, and is a grammatical
sentence.

  5. We stopped at a McDonald's, ate in five minutes,
     and were back on the road again.

It would seem that the predicate type of eat in its surface
intransitive form is dependent on the interpretation of the
missing element.

     This brings us to the second problem, one which I think has
real implications for acquisition, the relationship between the
discourse-pragmatic status of the missing undergoer and predicate
type. Consider the specificity of the implied undergoer in the
surface intransitive form. Specificity refers to whether a
speaker believes that they know the actual identity of the
referent of an NP (Kuno 1973:39-40). In the surface intransitive
form, the status of the implicit undergoers of *shave* and *win*
types verbs is specific. The absurdity of the non-specific
reading is reflected in the unacceptability of sentences 6a and
6b.

  6a. *When I peeked into John's room he was dressing,
      now I wonder whom he was dressing.

  6b. *When I turned on the T.V. the Mets were winning,
      now I wonder what they were winning.

In contrast, with *read* type verbs the identity of the referent of the missing undergoer can be non-specific, literally unkown to the speaker. As a result the sentences in 7 make sense.

    7a. When I peeked into John's room he was reading,
        now I wonder what he was reading.

    7b. I saw John eating, but I don't know what he was eating.

Consider how discourse-pragmatics control the use of the alternate argument structures. The surface intransitive form of the *shave* type verbs and the *win* type verbs can be used when the reference for the undergoer is given in discourse or presupposed, as can be seen in 8 and 9.

    8. A. How did the game turn out?
       B. The Royals won / lost.

    9. A. Can you be ready in an hour?
       B. Sure, all I have to do is shave.

The discourse contexts licensing *read* type verbs are radically different from those for the *win* and *shave* type verbs. For *read* type verbs undergoer omission is permissable when the identity of the referent for the missing undergoer is either unknown or a matter of indifference, what Fillmore (1986) termed the Indefinite Null Complement. Compare the dialogue in 8 with the dialogue in 10. The omitted undergoer with *win* in 8B is permissable because it is the topic of the question - response pair. The omitted undergoer is extremely odd with *eat* in 10B precisely because it is the topic of the question - response pair.

    10. A: What happened to my sandwich?
        B: *The dog ate.

As Fillmore points out, the INC "is markedly indefinite...it is obligatorily disjoint in reference with anything saliently present in the pragmatic context" (1986:97). In dialogue 11 the surface intransitive form of *eat* sounds weird because the conversations call for the maintainence of a definite undergoer referent. The INC would have to be disjoint in reference, and so throws the conversation out of kilter.

    11. A: Did you eat your peas?
        B: *Yes I ate.

In contrast, dialogue 12 is quite natural. When speaker A first uses the surface intransitive form of the verb *eat*, the speaker is expressing a desire to satisfy hunger. The actual identity of what is to be eaten is a matter of indifference.

        12. A: I'm starved, let's eat.
            B: What would you like to eat?
            A: Doesn't matter, anything, I'm just so hungry.

        To summarize, the main problem with saying that undergoer
omission reflects a semantic transformation is that it ignores
the discourse-pragmatic licensing of undergoer omission. For the
read type verbs the alternation typically does reflect a semantic
difference between accomplishment predicates and activity
predicates. However, the omitted undergoer of the *read* type
verbs concomitantly has a special discourse-pragmatic status.   In
short, the Aktionsart of the surface intransitive form is
intimately, if not inseparably bound up with the interpetation of
the omitted undergoer. This paper examines the acquisition of one
INC taking verb, *eat*.

SUBJECTS AND DATA

        The subjects were 40 children from the Kansas City area.
(Hart & Risley 1989). The children were audiotaped at home for an
hour every month from 1;0 to 3;0. Fifteen of the children were
black, 25 white, 18 were boys, 22 were girls. The average income
of the families was $28,000 (range $4,000-$68,000). The first
language of all the children was English.

        The transcripts made from these audiotapes are composed of
utterances, at minimum one isolated interjection and at maximum a
grammatical sentence. The utterances were grouped into episodes
and turns. An episode boundary was defined as a five second or
longer gap between utterances. A turn was defined as an
uninterrupted string of utterances by one speaker that fell
within a single episode.

        A reliability check was performed for 180 one hour tapes,
four for every child, two from the first year and two from the
second year of observation. A second observer checked every
word, utterance and episode boundary in the transcript. In these
180 hours of audiotape, there was an average 98% confirmation
rate for words, utterances and episode boundaries (range 97-99%).

        The MLU for each monthly sample was calculated following
procedures outlined in Brown (1973:54). A lexicon was compiled
containing every word on the audiotapes and the date of the
word's first appearance in each child's lexicon.

METHODS

        The verb *eat* was chosen for this study because (1) according

to the adult grammar *eat* takes the INC, and (2) all 40 children used this verb. No other INC taking verb was used as early, and with such frequency. Examples of *eat up* were not used in this study, since the INC is not permissable with *eat up* in the adult grammar.

Sentences with the verb *eat* that were clearly not spontaneous were eliminated. This included immediate word for word imitations, the child's own self-repetitions and parts of poems or routines. Sentences used in the analyses were all completely comprehensible.

The children's sentences were coded for the presence of an overt undergoer. Food items and meal names were assumed to be undergoers. Demonstratives, anaphoric pronouns and quantifiers found in post-verb position were also automatically coded as an undergoers.

Two contrasting discourse contexts were defined, a context in which the undergoer was expected (Undergoer Expected context), and another which was open to undergoer omission (Open context). The contrast in discourse context was applied only to Response Sentences, that is, children's sentences which responded to another speaker's immediately prior utterance within a single episode Sentences that either initiated an episode or continued a child's turn were not coded for discourse context.

The Undergoer Expected context was defined by characteristics of what was said in the preceeding discourse. Contexts were considered Undergoer Expected if, in the preceeding discourse, either the interlocutor or child produced an utterance containing either of the following two criteria: (1) the verb *eat* with an overt undergoer NP, or (2) a food item or meal name NP.

The two criteria for the Undergoer Expected context had to be found within a delimited stretch of discourse preceeding a child's response sentence. Preceeding discourse was divided into two sections: (1) the immediately prior interlocutor turn (prior turn), and (2) an extended segment of discourse (extended segment). Examples 13 and 14 were classified as a Undergoer Expected Context because at least one of the criteria was found in the prior turn (P = parent, C = child).

13. Child 22 (2;6, CVL = 145, MLU = 2.76)

     P: Oh I want something to eat.
     C: Eat that!

14.   Child 35 (2;7, CVL = 123, MLU = 2.71)

      P: We got whole lot of bacon.
      C: Can I eat it?

If neither of the two criteria were found in the prior turn,
the search for the criteria proceeded into the extended segment
of preceeding discourse. The extended segment ended with the
prior turn and began at an initiation point. The initiation point
was a lexical, inanimate NP. This initiation point was chosen for
two reasons. First, the conventional undergoer of *eat* is a food
item, always a lexical inanimate NP. Second, lexical NPs are
discourse prominent, that is, they can be focal or contrastive,
whereas unstressed anaphors cannot be focal or contrastive
(Lambrecht 1987; Chafe 1976). When the most recently lexicalized
inanimate NP in a conversation is a food item, it is reasonable
to assume that the item has some discourse prominence. Example 15
was classified as Undergoer Expected because a food item was the
initiation point of the extended segment.

15.   Child 28 (2;11, CVL = 258, MLU = 3.41)

      P: Does that look like a candycane?   < extended
      C: Yeah.   .   segment
      P: Yeah.
      C: Here.
      P: It does.   < prior
      C: Eat it.   turn
      P: You can eat it,
         but it won't taste very good.

If the initiation point was formed by a lexical, inanimate NP
that was not a food item or meal name, the context was coded as
Open, as in example 16 ((---) = unintelligible segment of
speech). If there was no full lexical, inanimate NP between the
prior turn and the preceeding episode boundary, then the context
was classified as Open by default.

16.   Child 25 (2;11, CVL = 170, MLU = 3.53)

      C: Goldilock have that spoon.   < extended
      P: Goldilock.   segment
      C: That's the mother's.
      P: Now what (---).
      C: I don't know.
      P: You don't know?   < prior
      C: Her wanna eat.   turn

Cumulative verb lexicon (CVL) was used as a general measure
of linguistic development. CVL was chosen over MLU, which was
also calculated for every sample, because CVL is cumulative with

age, while MLU is not. Five CVL levels were used: CVL < 75 verb
types, CVL => 75 < 150 verb types, CVL => 150 < 225 verb types,
CVL => 225 < 300 verb types, and CVL => 300 verb types.

RESULTS

A total of 1276 sentences spoken by the children with the
verb *eat* were analyzed. Table 1 presents the five CVL levels,
the number of *eat* sentences produced at each level, as well as
the average MLU at each CVL level.

TABLE 1

Frequency of *Eat* Sentences
Across Five Levels of Cumulative Verb Lexicon Size (CVL)

CVL Levels	Average Age	Average MLU	Total Sentences	Average Sentences Per Child
<= 75	1;10	1.60	180 (N=34)	5
> 75 <= 150	2;3	2.40	315 (N=37)	9
> 150 <= 225	2;6	3.05	327 (N=35)	9
> 225 <= 300	2;8	3.56	205 (N=26)	8
> 300	2;9	3.86	249 (N=15)	17

Table 2 presents the rate of undergoer omission at each CVL
level. The data presented in Table 2 were pooled across
children. It is not surprising that, as CVL size increased the
percentage of sentences without overt undergoers decreased. CVL
is correlated with MLU, so that as the children were able to say
more in an utterance, the rate of undergoer omission decreased.

TABLE 2

<u>Frequency</u> <u>and</u> <u>Rate</u> <u>of</u> <u>Undergoer</u> <u>Omission</u>
<u>Across</u> <u>Five</u> <u>Levels</u> <u>of</u> <u>Cumulative</u> <u>Verb</u> <u>Lexicon</u> <u>Size</u> <u>(CVL)</u>

CVL Levels	Total Sentences	Sentences without Undergoer	Percent of Total
<= 75	180 (N=34)	129 (N=30)	72%
> 75 <= 150	315 (N=37)	114 (N=30)	36%
> 150 <= 225	327 (N=35)	101 (N=26)	31%
> 225 <= 300	205 (N=26)	45 (N=20)	22%
> 300	249 · (N=15)	50 (N=11)	20%

Table 3 presents the frequency and rate of undergoer
omission for response sentences, further divided into Undergoer
Expected and Open contexts. These frequencies are of pooled data.
As a hedge against inflation of these frequencies by individual
children, children who contributed over 20% of the response
sentences at any single CVL level were dropped from the analysis.
Only one child was dropped, #39, from the highest CVL level (CVL
> 300). The undergoer omission rate was closest across discourse
conditions at the lowest CVL level (CVL <= 75): 66% in the
Undergoer Expected context and 70% in the Open context. At the
next highest CVL level (CVL > 75 <= 150), there is a noticeably
greater difference in the omission rate across contexts; 26% in
the Undergoer Expected context and 45% in the Open contexts. By
the fifth and highest CVL level (CVL > 300), the omission rate in
the Undergoer Expected condition is 2%, while in the Open
condition, the omission rate is 30%. These data indicate that,
as the children advanced linguistically, the association between
discourse context and undergoer omission became noticeably
stronger.

TABLE 3

Frequency and Rate of Undergoer Omission
in Conversational Responses Only

CVL Levels	Discourse Context			
	Undergoer Expected		Open	
	+ U	- U	+ U	- U
<= 75	12 (34%) (N=9)	23 (66%) (N=16)	16 (30%) (N=11)	37 (70%) (N=19)
> 75 <= 150	53 (74%) (N=24)	19 (26%) (N=11)	51 (55%) (N=23)	42 (45%) (N=20)
> 150 <= 225	61 (73%) (N=21)	23 (27%) (N=11)	33 (60%) (N=16)	22 (40%) (N=11)
> 225 <=300	66 (90%) (N=17)	7 (10%) (N=5)	23 (62%) (N=14)	14 (38%) (N=10)
> 300	51 (98%) (N=12)	1 (2%) (N=1)	16 (51%) (N=10)	7 (30%) (N=5)

Note. + U = with overt undergoer, - U = missing overt
undergoer.

As one might expect, the children's sentences without
undergoers in Undergoer Expected contexts sounded strange.
Dialogues 17-19 provide examples.

17. Child 31 (2;6, CVL 103, MLU 1.97)
     (P has just opened a bag of popcorn)

     P: Popcorn.
     C: I eat.
     P: You gonna save some for your dad?

18. Child 11 (2;7, CVL 161, MLU 3.21)
    (Talking about a pencil)

    P: Well I see you already ate the eraser off of it.
        That's one of the first things you hadta do.
    C: I eat. (4X)
    P: I know you ate the eraser, so you don't need a
        candy bar now.

19. Child 28 (2;2, CVL 93, MLU 2.66)

    P: I've gotta put this chocolate in there too.
    C: There mom chocolate in.
    P: Uhhuh.
    C: Eat mom.
    P: Oh, eating it already, huh?

To study developmental trends within individual children, it
was decided that children would be compared across the transition
from the third to fourth CVL levels, CVL = 225. As a hedge
against sampling error individual children were considered only
if they produced at least four *eat* sentences in both the
Undergoer Expected and Open contexts at both above and below CVL
= 225. Only four children provided enough data for this
analysis. Their data is presented in Table 4 and summarized in
Table 5.

TABLE 4

<u>Frequency</u> <u>of</u> <u>Undergoer</u> <u>Omission</u>
<u>in</u> <u>Conversational</u> <u>Responses</u> <u>Before</u> <u>and</u> <u>After</u> <u>CVL</u> = 225.*

	CVL Period						
	< 225				=> 225		
	Discourse Context				Discourse Context		
	Undergoer Expected		Open		Undergoer Expected		Open
ID	+ U	- U	+ U	- U	+ U	- U	+ U	- U
#2	5	2	--	5	5	--	4	4
#6	13	3	7	1	13	--	3	1
#28	14	7	8	2	16	--	4	1
#32	9	3	4	1	16	1	3	1

*Children were selected only if they produced four or more
sentences in both discourse conditions in both CVL periods.
<u>Note</u>. + U = with overt undergoer, - U = missing overt
undergoer.

TABLE 5

<u>Mean</u> <u>and</u> <u>Range</u> <u>of</u> <u>the</u> <u>Undergoer</u> <u>Omission</u> <u>Rate</u>
<u>Across</u> <u>Discourse</u> <u>Contexts,</u> <u>Before</u> <u>and</u> <u>After</u> <u>CVL</u> 225

	Rate of Undergoer Omission	
	CVL < 225	CVL => 225
Discourse Context	Mean Range	Mean Range
Undergoer Expected	27% (19-33%)	2% (0-6%)
Open	39% (14-100%)	30% (25-50%)

<u>Note</u>. These are the means and ranges from the
data presented in Table 4.

Across the transition of CVL = 225, the mean undergoer
omission rate in the Undergoer Expected condition for these four
children, fell from 27% to 2%. The undergoer omission rate also
fell in the Open condition, but not as dramatically from 39%. to
30%. Moreover, variability decreased across the transition of
CVL = 225. When the CVL size did not exceed 225 the range of
undergoer omission rates in the Undergoer Expected condition (19-
33%) was contained within the range of omission rates in the Open
condition (14-100%). When the CVL size exceeded 225, the range
of undergoer omission rates in the two conditions do not overlap.
These longitudinal data from individual children, are congruent
with the pooled data and provide additional evidence that
undergoer omission was pragmatically controlled for the advanced
children in this sample.

DISCUSSION

The advanced children in this sample showed a marked
tendency to omitted the undergoer of the verb *eat* in the Open
discourse context. These are contexts in which the preceeding
conversation was unrelated to "eating something specific", or in
which food items and meal names were not discourse prominent. It
was also found that these advanced children almost always
produced *eat* with an overt undergoer in what we have termed

Undergoer Expected discourse contexts. The expectation that an undergoer would be overt in the sentences of the Undergoer Expected Context was based on Fillmore's insight that the INC was obligatorily disjoint in reference to any potential patient of the predicate *eat* that was saliently present in the pragmatic context.

These data indicate that, as children acquire the different argument structures of the verb *eat*, they become aware of the pragmatic licensing of the alternation. At very least, these data implicate the role of discourse tracking in the acquisition of the argument structure alternation of the verb *eat*. That is, the advanced children in this study were maintaining a register of the prominent NPs and predicates in discourse, and using this information to motivate the use of the argument structure alternation allowable with the verb *eat*. Moreover, these data suggest that discourse-pragmatic information is part of the child's representation of this argument structure alternation. Just how this information might be represented remains a subject for future research.

NOTES

1. This research was supported by a grant (HD 03144) from the National Institute of Child Health and Human Development to the Bureau of Child Research and the Department of Human Development of the University of Kansas. The author would like to thank Charles Fillmore, Pamela Hadley, Betty Hart and Robert Van Valin for comments and criticism. The author also thanks Maxine Preuitt of the Juniper Gardens Language Project for help in coding the data.

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