

Reanalysis of Children's Two-Word Utterances: A Minimalist Perspective[†]

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ABSTRACT

The present study attempts to show that a new picture of the early stages of development will emerge if the formal properties of Merge ('concatenation,' 'projection,' and 'recursiveness') are separately taken into consideration. In particular, the study first reanalyzes the acquisition corpora of two-word utterances by three children in Braine (1963) and demonstrate that most of the data fail to exhibit endocentricity in structure. Then it is suggested that the operation Merge should undergo the maturational process. At the earliest stage of syntactic development only one of the formal properties of Merge 'concatenation' is available to the child, and then at the later stages the other formal properties 'projection' and 'recursiveness' enter in development so that the child can form indefinitely larger and more complex structures just as the adult can do.

Key words: phrase structure acquisition, two-word utterances, Merge, concatenation, projection, recursiveness, maturation

1. Introduction

The earliest stages of language development have usually been characterized in terms of the length of utterances as the stages of 'one-word utterances,' 'two-word utterances,' and 'multiword utterances' in acquisition literature. One of the issues about the earliest stages is whether children's one-word utterances, two-word utterances, etc. reflect the structures similar to those in the adult grammar. To cite just a few contrasting proposals, Powers (2001) claims that the child grammar is similar to the adult grammar after examining children's utterances in the framework of Minimalist Program while Braine (1963) proposes that two-word utterances are characterized in terms of the notions totally different from those in the adult grammar. Radford (1990) claims that the

child starts with non-adultlike lexical-thematic stage (at around the age of 20 months ($\pm 20\%$)) and enters the adultlike functional-nonthematic stage (at around 24 months ($\pm 20\%$)) in accordance with the maturational theory proposed by Borer and Wexler (1987).

Every linguistic student admits that sentences and phrases in human language (i.e. in the adult grammar) have hierarchical structures (called phrase structures). Several different claims have been proposed to account for phrase structures in generative tradition, from phrase structure rules in the standard theory (Chomsky (1965)), X' theory in the principles-and-parameters theory (Chomsky (1981)), to the operation Merge in the Minimalist Program (Chomsky (1995), see Fukui (2000) for a review of studies of phrase structure). Merge is

the fundamental operation to build up phrase structures by combining two syntactic objects to form a larger syntactic object. Merge is usually considered to be an unanalyzed operation. Fukui (2004), however, suggests that a different way of explanation for some types of aphasia should emerge if the operation Merge is decomposed into some formal properties. The formal properties of Merge are: (i) to combine two syntactic objects ('concatenation'), (ii) to project the property of either one of the two syntactic objects combined ('projection'), and (iii) to apply repeatedly ('recursiveness').

Specifically Fukui proposes a hypothesis that 'recursiveness' (along with another property 'projection') should be damaged in Broca's aphasia or agrammatism. In other words, he proposes that some type of aphasia should be caused by problems in linguistic competence not by performance factors as have been often claimed if the formal properties of Merge are separately taken into consideration. In acquisition literature also, Merge has been considered as a whole to account for phrase structure acquisition without paying attention to each of these formal properties separately.

In this study we try to show that a new picture of the early stages of development will emerge if the formal properties (i)-(iii) of Merge are separately taken into consideration. In particular, we will reanalyze the acquisition corpora of two-word utterances by three children collected by Braine (1963) and demonstrate that most of the data fail to exhibit structural

endocentricity. We then suggest that the operation Merge should undergo the maturational process: At the earliest stage of syntactic development, only one of the formal properties of Merge 'concatenation' is on line and available to the child, then at the later stages the other formal properties of Merge 'projection' and 'recursiveness' enter in development so that the child can form indefinitely larger and more complex structures.

2. Reanalysis of two-word utterances in Braine (1963)

Braine (1963) analyzes the first word combinations produced by three children, Gregory, Andrew, and Steven. The corpora were collected from about the age of 18 months, when the child had an estimated vocabulary of 10-20 words but had not yet uttered any word combinations. Two of the children produced their first word combinations at the age of 19 months and the other one at the age of 20 months¹. The corpora for his analysis consist of word combinations uttered during the first four or five months (called the 'first phase' by Braine), the first month being defined by Braine as the month in which the first word combination was produced. Braine states (p. 2) that 'In each child the number of different word combinations at first increased slowly and then showed a *sudden upsurge* around the fifth or sixth month.' [italics by KIH] The phenomenon is also referred to as 'syntax spurt' (Radford

(1990)). Thus, the cumulative number of Gregory's different word combinations from the first month on is as shown in (1).

(1)	14,	24,	54,	89,	350,	1400,	2500+,	...
	↑				↑			
	first month				fifth month			
	vocabulary spurt				syntax spurt			

He furthermore points out that 'In each child the upsurge in the number of different word combinations in the fifth and sixth months was accompanied by a marked increase in the structural complexity of utterances.' The two characteristics, the sudden upsurge in the number and the marked increase in the structural complexity, will be discussed later in section 3.

Braine analyzes the word combinations in terms of the distributional properties of the words and proposes the pivot grammar², in which children's first word combinations consist of 'pivots' and X-class (later called 'open class'). Pivots are a small number of words that occur in a fixed position (only in the first position or in the second position) and occur frequently. The X class is a class that has many members occurring freely in any position and only in one or two combinations.

The present study will reanalyze the corpora by the three children in Braine (1963) in terms of the formal characteristics of Merge. What 'concatenation,' one of the formal characteristics of Merge, does is to combine two syntactic objects. 'Projection,' another formal characteristic, forms a

larger syntactic object by projecting the property of either one of the component syntactic objects. It is this projection that makes endocentric structures emerging. If the child employs the projection, the resulting combination will exhibit an endocentric structure. Specifically the study will examine if the word combinations by the three children show the endocentric property or not in the following subsections. A third characteristic, 'recursiveness,' ensures that Merge applies repeatedly (i.e., recursively). Hence once the child can apply Merge recursively, the complexity of his utterances increases indefinitely.

2.1. Gregory's word combinations

Braine reports that the number of Gregory's word combinations during the first four months is 89: 64 Pivot + X (PX) sequences, 5 X + Pivot (XP) sequences, and 20 unspecified sequences. 36 out of 89 combinations are actually illustrated in his paper, including four examples from 31 **byebye** + X combinations, three from **see** + X combinations, and five from unspecified sequences. The PX sequences are given in (2a-i). The XP and Unspecified sequences are shown respectively in (3) and (4).

- (2)a. **byebye**³ plane, **byebye** man, **byebye** hot, **byebye** celery, 27 other **byebye** + X
- b. **see** boy, **see** sock, **see** hot, 11 other **see** + X
- c. **allgone** shoe, **allgone** vitamins, **allgone** egg, **allgone** lettuce, **allgone**

watch

- d. **big** boss, **big** boat, **big** bus
 - e. **my** mommy, **my** daddy, **my** milk
 - f. **pretty** boat, **pretty** fan
 - g. **more** taxi, **more** melon
 - h. **hi** plane, **hi** mommy
 - i. **nightnight** office, **nightnight** boat
- PX sequences (64)

(3) do **it**, push **it**, close **it**, buzz **it**, move **it**
 XP sequences (5)

(4) mommy sleep, milk cup, ohmy see,
 hi howareyou⁴, mail man, 15 other
 unspecified sequences
 Unspecified sequences (20)

Do the word combinations given above exhibit the endocentric structures? It is safe to say that 31 *byebye* + X, five *allgone* + X, two *hi* + X, and two *nightnight* + X, *see hot*, *mommy sleep*⁵, *ohmy see*, *hi howareyou*, i.e. 44 word combinations in total, are not endocentric in structure. Braine refers to *mail man* as an English compound word, which implies that this word combination is not a syntactically endocentric structure. The combination *milk cup* might also be considered as a compound word, but Braine identifies it as an unspecified sequence. In either way, however, *milk cup* is not endocentric. With *mail man* and *milk cup* included, the number of non-endocentric sequences increases up to 46. The other sequences given in (2b), (2d-g), and (3), 17 in total, appear to be endocentric in structure. 46 out of 63 word sequences, i.e. about 73% of

Gregory's earliest word combinations, are NOT endocentric.

2.2. Andrew's word combinations

The number of Andrew's word combinations during the first five months is 102: 52 PX sequences, 21 XP sequences, and 29 Unspecified sequences. In Andrew's case, all of the 102 utterances are listed in Braine's Table 2 (p. 5). The PX, the XP, and Unspecified sequences are respectively illustrated in (5a-g), (6a-d), and (7) below.

- (5)a. **all** broke, **all** buttoned, **all** clean, **all** done, **all** dressed, **all** dry, **all** fix, **all** gone, **all** messy, **all** shut, **all** through, **all** wet
 - b. **I** see, **I** shut, **I** sit
 - c. **see** baby, **see** pretty, **see** train
 - d. **other** bib, **other** bread, **other** milk, **other** pants, **other** part, **other** piece, **other** pocket, **other** shirt, **other** shoe, **other** side
 - e. **no** bed, **no** down ('Don't put me down.'⁶), **no** fix, **no** home, **no** mama ('I don't want to go to mama. '), **no** more, **no** pee, **no** plug, no water, **no** wet ('I'm not wet.')
 - f. **more** car ('Drive around some **more**.'), **more** cereal, **more** cookie, **more** fish, **more** high ('There's more up there. '), **more** hot, **more** read, **more** sing, **more** toast, **more** walk
 - g. **hi** Calico, **hi** mama, **hi** papa
- PX sequences (52)

(6)a. boot **off**, light **off**, pants **off**, shirt **off**, shoe **off**, water **off**

- b. airplane **by** ('A plane is flying past.').
siren **by**
- c. mail **come**, mama **come**
- d.⁷ clock on **there**, up on **there**, hot in **there**, milk in **there**, light up **there**, fall down **there**, kitty down **there**, more down **there**, sit down **there**, cover down **there**, other cover down **there**

XP sequences (21)

- (7) airplane all gone, Calico all gone, Calico all done 'Said after the death of Calico the cat.', salt all shut, all done milk, all done now, all gone juice, all gone outside 'said when the door is shut: 'The outside is all gone.', all gone pacifier, byebye back, byebye Calico, byebye car, byebye papa, Calico byebye, papa byebye, what's that⁸, what's this, mail man, mail car, our car, our door, papa away, look at this, outside more, pants change, dry pants, off bib, down there, up on there some more

Unspecified sequences (29)

It is easy to see that 75 word combinations in total are non-endocentric utterances: 12 **all** + X in (5a), three **I** + X in (5b), one sequence **see pretty** in (5c), nine **no** + X (excluding *no more*⁹) in (5e), six sequences **more car**, **more high**, **more hot**, **more read**, **more sing**, **more walk** from (5f), three **hi** + X in (5g), six X + **off** in (6a), two X + **by** in (6b), two X + **come** in (6c), nine X + **there**¹⁰ in (6d), and twenty-two word combinations from unspecified sequences

in (7). The sequences *mail man* and *mail car* can be English compound words just as Gregory's *mail man*. Including these two, the number of non-endocentric utterances will result in 77. The remaining 27 (or 25 with *mail man* and *mail car* excluded) word combinations appear to be endocentric in structure. 77 out of 102 word combinations, i.e. about 75% of Andrew's earliest word combinations, are NOT endocentric.

One remark is in order here. Examining the word combinations in (7), we notice that both the word order X + *all gone* and its reverse order *all gone* + X are employed. The same thing can be said with the sequences X + *all done* and *all done* + X, *byebye* + X and X + *byebye*, *off* + X and X + **off** (the former is considered an unspecified sequence though the latter is classified as XP sequence by Braine and the examples are given in (6a)). This fact gives us another piece of evidence that shows that Andrew in his first five months treat two words on a par and just concatenate the two words with no fixed order. He cannot yet project one of the two words to form a larger syntactic object.

2.3. Steven's word combinations

Now turning to Steven's word combinations during his fourth and fifth month¹¹, the number of his word combinations is 82: 63 PX sequences, 3 XP sequences, and 16 unspecified sentences. Braine's Table 3 (p. 7) also lists up all of the 82 utterances in Steven's case. The PX, the XP, and Unspecified sequences are respectively illustrated in (8a-j), (9), and (10).

- (8)a. **want** baby, **want** car, **want** do¹²,
want get, **want** glasses, **want** head,
want high ('Put it up there. '), **want**
horsie, **want** jeep, **want** more, **want**
page, **want** pon ('Put on' or 'up on'
or both.), **want** purse, **want** ride,
want up, **want** byebye car¹³
- b. **get** ball, **get** Betty, **get** doll
- c. **see** ball, **see** doll, **see** record, **see**
Stevie
- d. **whoa** cards ('The cards are falling. '),
whoa jeep
- e. **it** ball, **it** bang, **it** checker, **it** daddy,
it Dennis, **it** doggie, **it** doll, **it** fall, **it**
horsie, **it** Kathy, **it** Lucy, **it** record, **it**
shock, **it** truck
- f. **there** ball, **there** book, **there** doggie,
there doll, **there** high ('It's up there. '),
there momma, **there** record, **there**
trunk, **there** byebye car, **there** daddy
truck, **there** momma truck
- g. **that** box, **that** Dennis, **that** doll, **that**
Tommy, **that** truck
- h. **here** bed, **here** checker, **here** doll,
here truck,
- i. **more** ball, **more** book¹⁴
- j. **beeppeep** bang ('The car that goes
"beeppeep" is falling. '), **beeppeep**
car

PX sequences (63)

- (9) bunny do, daddy do, momma do
XP sequences (3)

- (10) bunny do sleep, Lucy do fun, want
do pon ('I want (you) to put (the
jeep) on top. '), want drive car, baby
doll, Betty pon, byebye car, Candy

say, find bear, pon baby, pon Betty,
sleepy bed, eat breakfast, two
checker, Betty byebye car, Lucy
shutup Lucy shutup Lucy

Unspecified sequences (16)

There are again many non-endocentric
word combinations found in Steven's
corpus just as in Gregory's and Andrew's.
We can easily observe that 55 word
combinations in total are non-endocentric:
seven sequences *want do*, *want get*, *want*
high, *want pon*, *want ride*, *want up*, *want*
byebye car from *want* + X in (8a), two
whoa + X in (8d), 14 *it* + X in (8e), 11
there + X in (8f), five *that* + X in (8g)¹⁵,
four *here* + X in (8h), two *beeppeep* + X in
(8j), and ten word combinations from
unspecified sequences in (10). The
sequence *baby doll* from the unspecified
category can be an English compound
word. If our conjecture is correct, then
the number of non-endocentric utterances
will increase up to 56. The remaining 27
(or 26 with *baby doll* excluded) word
combinations appear to be endocentric in
structure. 56 out of 82 word sequences,
i.e. about 68% of Steven's earliest word
combinations, are NOT endocentric.

One characteristic about Steven's
corpora should be mentioned. Braine
points out that Steven did not speak as
clearly as Gregory and Andrew, which led
Braine to choose two different ways to
collect utterances. The utterances by
Gregory and Andrew were written down
by their parents at the time when they
were produced while those by Steven were

tape-recorded. Braine states (p. 6) that 'Table 3 lists Steven's *identifiable* word combinations' [italics by KIH] Thus we find such words unique to Steven (not found in the other two children nor found in the adult's speech) as *pon* occurring in *want pon*, *want do pon*, *Betty pon*, *pon baby*, *pon Betty* and *whoa* occurring in *whoa cards*, *whoa jeep*.

As in Andrew's corpora in section 2.2, the free word order is also observed in Steven's though to a lesser degree. Both X + *pon* and *pon* + X orders are found. The word *do* occurs as a pivot (X + *do*) in (9) but appears at the second position of some such utterances in (10) as *bunny do sleep*, *Lucy do fun*, *want do pon*. These cases suggest that what Steven does is just to combine two (or more) words but not to project the property of one of the words to form a larger structure.

3. Discussion on the corpora by the three children

The corpora by the three children reported in section 2 are summarized in Table 1

below.

In a nutshell, two thirds or three quarters of the children's earliest word combinations are not endocentric. Comparing Gregory's and Andrew's corpora with Steven's, we immediately notice a difference: The rate of the word combinations that are not endocentric is larger in Gregory's and Andrew's corpora (about 73-75%) than in Steven's (about 68%). In other words, more endocentric utterances are found in Steven's corpora than in Gregory's and Andrew's. This may be due to the nature of the corpora. As described in section 2.3, Steven's utterances were not written down by his parents but tape recorded in twelve play sessions during the fourth and fifth months, i.e. only the last two months of the first phase. However, Gregory's and Andrew's corpora range over the entire first phase, from the first to the fourth month in Gregory's and from the first to the fifth month in Andrew's. Thus Steven's corpus might reflect a more advanced stage than Gregory's and Andrew's. A piece of evidence that Steven is at a more advanced

Table 1
The corpora by Gregory, Andrew, and Steven

	Gregory	Andrew	Steven
Age range under investigation (months) ¹⁶	19 or 20-23 or 24	19 or 20-24 or 25	19 or 20-24 or 25
No. of PX sequences	64	52	63
No. of XP sequences	5	21	3
No. of Unspecified sequences	20	29	16
TOTAL	89	102	82
Percentages of non-endocentric utterances	73%	75%	68%

stage is found in the number of three- or multi-word utterances in the corpora. No three-word utterances are found in Gregory's corpus and only three multi-word utterances (only 2.9% of the corpus) are observed in Andrew's corpus (*salt all shut, look at this, up on there some more*).¹⁷ In contrast, Steven's corpus contains ten multi-word utterances (12.2% of the corpus, mostly three-word utterances), *want byebye car, there byebye car, there daddy truck, there momma truck, bunny do sleep, Lucy do fun, want do pon, want drive car, Betty byebye car, Lucy shutup Lucy shutup Lucy*. These multi-word utterances might contain internal structures, suggesting a possibility that Steven is in transition to a more advanced stage where projection and recursiveness are operative.

Another point to be discussed is the nature of such word combinations as *mommy sleep, all broke, all messy, I sit, light off, mail come, clock on there, airplane all gone, it Kathy, it doggie, there ball, that Dennis, here bed, bunny do, Lucy do fun*. As pointed out in note 5, at a first glance it seems that these combinations put on the appearance of a full sentence. Notice, however, that in the adult grammar sentences are characterized by the emergence of functional categories such as INFL or COMP. The question we should ask now is: Do the seeming child's sentences really contain the functional categories? Hyams' (1992) study is relevant to this point. Hyams examines a variety of cross-linguistic data ranging over Italian,

French, English, German, Dutch, Sweden, and Icelandic during the early stages of language development. She concludes (p. 392) that 'we find evidence for functional categories at a relatively early stage of development. Most of the data ... are about 2 to 2 1/2 years, ...' That is, the emergence of functional categories is observed about 24 to 30 months, much later stages of development than those examined in the present study. In her concluding remarks, Hyams correctly points out that a great deal of individual variation is found with respect to age. Thus it is better to look at her evidence in terms of another measure MLU (=the mean length of utterances). The MLU of the data Hyams examines falls between 3.75 and 6.25. Recall that the MLU of the three children in the present study is approximately 2. The two measures age and MLU clearly show that Hyams evidence falls under a more advanced stage than the stage in this study. It is safely said that the stage Hyams deals with is the one after syntax spurt and that her evidence reflects much more complex structures, in particular, the emergence of functional categories, which leads us to conclude that the seeming sentences by the three children lack functional categories and do not exhibit the status of a full sentence.

4. Concluding remarks

The corpora under investigation consist of the first word combinations (mostly two-word utterances) by the three children

Gregory, Andrew, and Steven during their first four and five months (the first month being defined by Braine as the month in which the first word combination was uttered) provided in Braine (1963). The corpora have been reanalyzed in terms of formal characteristics of Merge, 'concatenation,' 'projection,' and 'recursiveness.' 'Concatenation' just combines two syntactic objects (words in the case of a two-word utterance) but no others, hence the resulting sequence has no internal structure. 'Projection' forms a larger syntactic object by projecting the property of either one of the component syntactic objects. It is this 'projection' that makes endocentric structures emerging. Furthermore, if Merge can apply recursively, more and more complex structures become available.

The reanalysis in the present study has demonstrated that most of two-word utterances, i.e. two thirds or three quarters of the corpora depending on the child, are NOT endocentric. The result along with the fact that free word order is observed in some utterances leads us to conclude that the child does not employ 'projection' (let alone 'recursiveness') at his earliest stage of word combination. Furthermore, Steven, one third of whose corpus exhibits endocentricity in structure, might be in transition from the stage in which only 'concatenation' is available to the next and more advanced stage in which 'projection' enters in his competence. At this point of discussion we turn our attention to the two characteristics that

Braine has pointed out and we have briefly touched in the beginning of section 2; the sudden upsurge in the number and the marked increase in the structural complexity observed at the fifth and sixth months of the three children (at the beginning of 'syntax spurt' in Radford (1990)). This is in accord with Hyams' (1992) finding that functional categories such as INFL and COMP emerge in the child's grammar about 24 to 30 months. The emergence of functional categories is one of the factors that characterize complex structures. Therefore her evidence leads us to conclude that 'projection' and 'recursiveness' enter in syntactic development around 24 to 30 months.

What we have obtained in the reanalysis together with a phenomenon 'syntax spurt' strongly suggests two things. (i) Merge undergoes maturation. At first only 'concatenation' is available to the child, and at the next developmental stage 'projection' and 'recursiveness' enter in development. (ii) Two-word utterances reflect the child's linguistic competence at his earliest syntactic development different from the adult's. Some acquisition researchers have claimed that two-word utterances are produced because of some performance factors though the child at the stage of two-word utterances has a full competence. In short, we suggest a competence-based account for the child's two-word utterances in opposition to a performance account.

Finally we will point out some directions to take in the future research agenda. One

direction is toward a cross-linguistic study. The present study has analyzed English corpora by three children. We need data more in variety and more in quantity to draw a firmer conclusion. Another direction to take is to examine corpora more closely. Braine (1963) analyzes his corpora by the three children by putting all the utterances before 'syntax spurt' all together. It has been pointed out above that Steven might be in transition to a more advanced stage of syntax spurt based on the observation that Steven's corpora exhibit more endocentric structures than Gregory's and Steven's. This might reflect the nature of the corpora under investigation. Recall that Steven's corpora consist of the utterances recorded during the fourth and fifth months, the last two months of the first phase while Gregory's and Andrew's corpora include the utterances from the first to fourth or five months. The examination of the utterances from the last two months of the first phase of Gregory and Andrew might exhibit the same tendency as Steven's. Closer look at the utterances month by month will bring us a stronger support for our maturational view of phrase structure acquisition.

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Notes

- 1 It is interesting to note that the phenomenon called 'vocabulary spurt' starts around the age of 20 months (see Radford (1990)). Radford states (p. 274) that 'a number of studies ... have reported that the rate of acquisition of vocabulary items undergoes a sudden rapid increase at around the age of 20 months.'
- 2 For a critical review of the pivot grammar, see Brown (1973).
- 3 The bold typed words in the examples stand for pivots.
- 4 The word sequences without no word boundary such as *ohmy* and *howareyou* show that these are unanalyzed wholes to Gregory.
- 5 The combination *mommy sleep* appears to be a full sentence, and hence it might be endocentric. These seeming sentences will be discussed later in section 3.
- 6 A paraphrase of the child word combination recorded by the parents is given in parentheses.
- 7 Braine considers *there* in (6d) to be a pivot and states (p. 6) that a word combination in (6d) is 'a phrase which itself has internal positional structure (*there*, preceded by *down*, *in*, *on*, or *up*)'. There might be another possibility that *onthere*, *inthere*, and *downthere* are unanalyzed wholes because almost all the utterances Andrew produced at this stage are two-word utterances.

- 8 Klima and Bellugi (1966) examined the naturalistic speech by three preschool children (Adam, Eve, Sarah) and reported the developmental stages of *wh*-questions: Period 1 (the average age range 2;0-2;4), Period 2 (the average age range 2;4-2;7), and Period 3 (the average age range 2;7-2;10). Period 1 is characterized by the use of routines such as *what's that?* and *what's this?*. Although Braine does not state the exact age range of Andrew under investigation, we can safely estimate his age range from 19 or 20 months to 24 or 25 months, which leads us to conclude that Andrew falls in pre-Period 1 in Klima and Bellugi's terms. Thus Andrew's sequences *what's that* and *what's this* are better analyzed as routines, i.e. single-word like utterances.
- 9 The word combination *no more* might be a non-endocentric utterance.
- 10 Most of the utterances in (6d) are three-word utterances and one of them is a four-word utterance. Thus X stands for not a single word but the rest of the utterance without the pivot.
- 11 Braine states (p. 6) in the text that 'Table 3 lists Steven's identifiable word combinations, recorded in twelve play sessions during the *fourth and fifth* months.' [italics by KIH] However, the title of Table 3 is 'Steven's word combinations, tape-recorded sample at end of *fourth* month.' [italics by KIH] I conjecture that the statement in the text is correct and the title of Table 3 has a typographical error, that is, 'the fourth month' in the title should be 'the fifth month.'
- 12 Braine considers the sequence *want do* a pivotal construction with *want* as a pivot but he somehow hesitates to put it under the *want* + X construction. He suggests another possibility that *want do* falls under the X + *do* construction. We put it under the *want* + X construction following Braine's decision.
- 13 This utterance is considered to be a non-endocentric sequence because it is hard to interpret the sequence without a paraphrase by the parents (note that there is no paraphrase with this particular utterance). If it were an endocentric sequence, i.e. a structure formed by projecting the property of one of the three component words (*want*, *byebye*, and *car*), we would have no difficulty to interpret it.
- 14 These two utterances might be non-endocentric depending on their interpretations. We are not sure of their interpretations without paraphrases by the parents. Hence we tentatively classify them into endocentric sequences.
- 15 Among the *that* + X in (8g), *that box*, *that doll*, *that truck* appear to constitute noun phrases and hence they might be endocentric in structure. However, in Braine (1963) they are listed along with *that Dennis* and *that Tommy*. The latter two combinations are most likely to be interpreted as 'that is Dennis' and 'that is Tommy' respectively. Our guess is that the former three have similar interpretations though we are not sure of it because Braine does not put a paraphrase to these *that* + X combinations. If our guess is correct, the *that* + X sequences will be classified as non-endocentric.
- 16 Braine (1963) does not specify the exact age range of the three children under investigation. The age ranges given in Table 1 is inferred from what Braine has described in the text.
- 17 Notice that 11 X + *there* sequences are analyzed as two-word utterances in this study as pointed out in note 7 though Braine considers them three-word utterances.

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