

The Unlearning of Incorrect Lexical Entries

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1. Introduction

Temporal adverbials in sentences like (1b) and spatial adverbials in sentences like (1c) are analyzed simply as optional restrictive modifiers introduced by phrase structure rule (2), because these adverbials play no roles in the argument structure of verbs like *eat*, and hence in their subcategorization frames (see Jackendoff (1977:Ch. 4), Jackendoff (1983:50 and 189–191) and Miller and Johnson-Laird (1976:section 2.5.2)):

- (1) a. John ate meat.
b. John ate meat at noon.
c. John ate meat in a restaurant.
- (2) $V'' \rightarrow V' (PP)$
- (3) a. John [_{V''} [_{V'} ate meat]]
b. John [_{V''} [_{V'} ate meat] at noon]
c. John [_{V''} [_{V'} ate meat] in a restaurant]

Under Jackendoff's Conceptual Semantics, the conceptual structures of (3b, c) are represented as (4a, b), where the conceptual constituent [EVENT], which is identical with the reading of (3a), is integrated with the readings of restrictive modifiers according to restrictive modification schema (5) (see Jackendoff (1990:56)):

- (4) a. [_{Event} [EVENT] [_{Place} AT ([_{Time} NOON])]]
b. [_{Event} [EVENT] [_{Place} IN ([_{Thing} A RESTAURANT])]]
- (5) Restrictive modification schema

[Entity₁] → [[Entity₂] X]

where Entity represents ontological categories like [THINGS], [EVENTS], [STATES], and [PLACES]; X is the conceptual structure of a modifier.

[AT NOON] in (4a) specifies the temporal location of the [EVENT] (3a), while

[IN A RESTAURANT] in (4b) describes the spatial location.

Note, however, that temporal and spatial adverbials can also be introduced by phrase structure rule (6) as obligatory V' complements for the lexical head V, as we see below (see Jackendoff (1983:sections 9.2 and 10.1), Jackendoff (1990:72) and Quirk et al. (1985:sections 8.51, 8.84 and 16.24)):

- (6) $V' \rightarrow V PP$
- (7) a. Chaucer [_{V'} lived [_{PP} in the fourteenth century]]
- b. My aunt [_{V'} lives [_{PP} in Shropshire]]
- c. *My aunt lives.

Following the general schema for function-argument conceptual structure (8) (see Jackendoff (1990:24–27)), the readings assigned to (7a, b) are represented as conceptual structures (9a, b), where the adverbials function as place arguments of the state function BE (see Jackendoff (1983:162, 189–191)):

- (8) Function-Argument schema
 $[Entity] \rightarrow [Function (<[Entity_1], <[Entity_2], <[Entity_3]>>>)]$
 where Entity represents ontological categories like [THINGS], [EVENTS], [STATES], and [PLACES]; Entity₂ and Entity₃ correspond to subcategorized phrases and Entity₁ to the subject if there is one.
- (9) a. [_{State} BE ([_{Thing} CHAUCER], [_{Place} IN ([_{Time} THE FOURTEENTH CENTURY])))]
- b. [_{State} BE ([_{Thing} MY AUNT], [_{Place} IN ([_{Thing} SHROPSHIRE])))]

Although the V' complements in (7a, b) are obligatory, there are cases where V' complements are optional (see Jackendoff (1983:section 9.2) and Quirk et al. (1985:sections 8.51 and 16.24)):

- (10) a. Both groups [_{V'} lasted several seasons]
- b. The hot weather won't [_{V'} last]
- (11) a. Bill [_{V'} stayed in the kitchen]
- b. She doesn't know whether to [_{V'} stay] or run

Thus, when children try to parse input sentences involving temporal and spatial adverbials, there are three possibilities that children have to consider. That is, these adverbials can be parsed either as V'' complements or as V' complements, and V' complements are further subdivided into obligatory and optional. Because a clear distinction between V'' and V' complements is often very difficult to make (see Quirk et al. (1985:sections 2.15 and 2.18)), there is a possibility that children as-

sign incorrect structural analyses to input sentences involving these adverbials. If erroneous lexical properties are registered in the lexical entry of the head V based on incorrect parsing, children will have to unlearn such erroneous lexical properties without the help of negative evidence which would directly dictate that unlearning processes should begin (cf. Bowerman (1983, 1987, 1988) and Pinker (1989b:Ch. 1)).

In this paper, I would like to take up temporal *be* existential sentences (hereafter, abbreviated as temporal *be* ESs) like (12a, b) to show that such a learnability problem does arise with respect to temporal adverbials and consider how the problem in question might be solved.

- (12) a. There was a king a long time ago.
- b. There was a little bit of Bakelite before the war, wasn't there?

Temporal *be* ESs, which involve temporal adverbials such as *a long time ago* and *before the war*, could be parsed in the following two ways (13a, b) by utilizing phrase structure rules (14a, b), which are necessary when we parse sentences like (15a, b) as (16a, b), respectively:

- (13) a. There [_V V NP PP]
- b. There [_V V NP] PP
- (14) a. V' → V NP PP
- b. V' → V NP
- (15) a. There lived a king a long time ago.
- b. There are unicorns.
- (16) a. There [_V V NP PP]
- b. There [_V V NP]

Non-existential sentences like (17b) and (18b) below show that when theme arguments denote things like a plumber, the verb *be* can not take temporal adverbials as locations of theme arguments, in contrast to spatial adverbials (see Jackendoff (1990:72), Miller and Johnson-Laird (1976:380) and Quirk et al. (1985:sections 2.15, 8.51 and 15.22)).

- (17) a. The plumber was in the kitchen.
- b. *The plumber was in the morning.
- c. *The plumber was.
- (18) a. I have been in the garden all the time since lunch.
- b. *I have been all the time since lunch.
- c. *I have been.

Note here that we are assuming, following Jackendoff (1983:section 9.2)), that *be* is not a meaningless holder of inflectional features but essentially a verb of location taking a theme and a location argument.

Because negative evidence such as (17b) and (18b), however, is not available for children, input temporal *be* ESs like (12a, b) can be parsed as (19), leading children to erroneously suppose that *be* is a locative verb taking a temporal adverbial as a location argument and has the subcategorization frame (20a) and the lexical conceptual structure (20b):

(19) There [_v be NP PP]

(20) a. _____ NP_j PP_k

b. [_{State} BE ([THING]_j, [PLACE_{Temporal}]_k)]

We cannot rule out (20b) by innate constraints on conceptual structures, because we must allow (20b) as a possible lexical conceptual structure to account for sentences like (21a), where the verb *live* located a hermit at a certain point on a time line, namely a long time ago, parallel to that in (21b), which located an old man at the edge of the forest:

(21) a. There lived a hermit a long time ago.

b. There lived an old man at the edge of the forest.

From input sentences like (21a), children get (20) as correct lexical properties for *live* when they are parsed as (22):

(22) There [_v V NP PP]

Because children attain (20) by utilizing positive evidence like (21a), input sentences like (12a, b) would lead children to erroneously suppose that *be* also has (20).

On the other hand, the correct structural analysis (23) can be obtained when *be* with the lexical properties (24a, b) is acquired based on ontological *be* ESs like (25a-c) and children recognize that *be* with (24a, b) is also used in temporal *be* ESs like (26).

(23) There [_v be NP] PP

(24) a. _____ NP_j

b. [_{State} BE ([THING]_j, [PLACE_{Spatial}]_k)]

(25) a. There are unicorns.

b. There are many people for whom cleverness is all.

c. There are no six-legged cats.

(26) Once upon a time there was a princess.

Because ontological *be* ESs express no specific spatial locations of things, leaving the spatial [PLACE] argument of the locative verb *be* totally unspecified, let us suppose that *be* used in such *be* ESs lexicalizes the spatial [PLACE] argument and hence takes no PP complement corresponding to the spatial [PLACE] argument, as shown in (24) (cf. Jackendoff (1983:section 9.5)).

Ontological *be* ESs contrast with elliptical *be* ESs we find in such discourse as (27), quoted from Lumsden (1988:230–231):

(27) A: What’s the country like around Lausanne?

B: There are mountains.

The elliptical *be* ES in (27) is interpreted as asserting the existence of mountains around Lausanne, having the same reading as spatial *be* ES (28), and therefore we assume that *be* with the lexical properties (29a, b), which is used in spatial *be* ESs like (28), is also employed in such elliptical *be* ESs where spatial PPs happen to be omitted.

(28) There are mountains around Lausanne.

(29) a. _____ NP_j PP_k

b. [_{State} BE ([THING]_j, [PLACE_{Spatial}]_k)]

Although the temporal PP in (23) functions as a restrictive modifier, (23) can be used as a locative sentence, as illustrated by the following discourse (30):

(30) A: You mean there’s a mark on the film.

B: There’s a mark on the film. There’s a red mark when you get to the end.

A: [m] (the sound of “m”) (LL-1-7 1494–1498)¹

In (30), speaker B first specifies the location of a mark by means of the spatial adverbial *on the film* and next, by the temporal adverbial *when you get to the end*. Thus, temporal *be* ESs with the structure (23) function as locative sentences, parallel to spatial *be* ESs.

It is clear from our discussion so far that temporal *be* ESs are ambiguously parsed either as (19) or (23) and that both (19) and (23) can be used felicitously in the same context where we try to locate things in terms of temporal adverbials. Then multiple lexical entries involving (20) and (24) for the verb *be* can be both registered in children’s lexicon.

Now we have to ask why (24) is incorporated into the lexical entry for *be* as a permanent part and why (20) will eventually fade from long-term memory, in spite of the fact that both are acquired on the basis of positive evidence. The present

case is different from widely discussed cases of overgeneralization like *broken* and *foots* which children create, following the acquired regular patterns of inflection, in the absence of positive evidence supporting their own over-regularized forms.

In this section, we have pointed out the possibility that an incorrect lexical entry could be registered in children's lexicon during the acquisition process of temporal *be* ESs. In the following sections, I would like to examine whether our scenario accords with developmental data and consider how the unlearning process in question is implemented.

2. The Developmental Data

In order to empirically prove the possibility that an incorrect lexical entry of the verb *be* might be registered in the acquisition process of temporal *be* ESs, I have examined longitudinal data of children's spontaneous speech stored in the CHILDES (Child Language Data Exchange System) database, compiled by the research team led by Brian MacWhinney, Carnegie Mellon University (see MacWhinney (1995), MacWhinney and Snow (1990)). Spatial adverbials are initially used by children in *be* sentences to describe the locations of concrete objects (see Bloom (1973), Bloom et al. (1975), Braine (1976) and Brown (1973)):

- (31) a. Eve Age (1;11.00)² It's on the table. (it = a cup)
 (/BROWN/EVE/EVE12.CHA 1706)
 b. Nina Age (2;00.24) He's he's in the living room.
 (/SUPPES/NINA07.CHA: 1521)
 c. Peter Age (2;00.10) Where's the screw, xxx.³
 (/BLOOM70/PETER/PETER06.CHA:1424)

Be sentences in (31) show that children have already known that *be* functions as a locative verb taking a theme and a spatial place argument:

- (32) a. _____ PP_k
 b. [_{State}BE ([THING]_i, [PLACE_{Spatial}]_k)]

In the lexical conceptual structure (32b), the [THING] argument is coindexed with the subject NP (cf. Jackendoff (1990:45)).

At this developmental stage, spatial adverbials are also used by children as restrictive modifiers:

- (33) a. Nina Age (1;11.24) Mommy works there.

(/SUPPES/NINA02.CHA: 460)

- b. Peter Age (2;00.07) Baby's crying upstairs.

(/BLOOM70/PETER/PETER07.CHA:3085)

Sentences in (33) suggest that phrase structure rule (34) introducing a restrictive modifier and the corresponding conceptual formation rule (35) for integrating the reading of a restrictive modifier are also available for children at this stage.

(34) $V'' \rightarrow V' (PP)$

(35) $[EVENT] \rightarrow [_{Event} [EVENT] [PLACE_{Spatial}]]$

Then after the development of sentences like (31a-c) and (33a-b), the first occurrence of a spatial *be* ES is observed in children's spontaneous speech:

- (36) a. Eve Age (2;02.00) There's a banana there.

(/BROWN/EVE/EVE17.CHA:337)

- b. Nina Age (2;02.06) There's a bear [= baby] monkey up a tree.

(/SUPPES/NINA13.CHA:435)

- c. Peter Age (2;02.13) There is a wheel in there.

(/BLOOM70/PETER/PETER09.CHA: 2125)

- d. Ross Age (2;10.10) There's a car up in the air.

(/MACWHIN/ROSS/ROSS26.CHA: 452)

Since children's spatial *be* ESs involve concrete NPs, as illustrated in (36), let us assume that *be* in such spatial *be* ESs has the lexical properties (29a, b), repeated here as (37a, b):

(37) a. _____ $NP_j PP_k$

b. $[_{State} BE ([THING]_j, [PLACE_{Spatial}]_k)]$

As in the adult case of (27) discussed in section 1, we are assuming here that children's *be* ESs of the form (38) in discourse like (39a-b) are elliptical spatial *be* ESs where spatial adverbials happen to be omitted, because they are recoverable from the preceding linguistic context.

(38) There *be* NP.

(39) a. Adam Age (3;07.00)

Adam: What I saw on television?

Mother: In the water this morning.

Adam: Dere's a whale.

(/BROWN/ADAM/ADAM34.CHA: 642–644)

- b. Peter Age (2;02.13) There's a wheel in there. There's a wheel.

(/BLOOM70/PETER/PETER09.CHA: 2125)

This means that *be* with the lexical properties (37a, b) is also used in children's elliptical spatial *be* ESs.

Ontological *be* ESs like (40), which express the absolute existence of things, must be distinguished from elliptical spatial *be* ESs.

(40) There are unicorns.

As observed in section 1, *be* with the lexical properties (24a, b), repeated here as (41a, b), is used in ontological *be* ESs.

- (41) a. _____ NP_{*j*}
 b. [_{State} BE ([THING]_{*j*}, [PLACE_{Spatial}])]

Because we have found no tokens of ontological *be* ESs at the early stage of development we are examining, we suppose that children at this stage have not yet acquired *be* with (41). The later acquisition of (41) might follow from our assumption that (41) is obtained by applying lexicalization of the [PLACE] argument to already acquired (37), and that this lexicalization is triggered by the recognition by children that ontological *be* ESs express the absolute existence of things, abstracted from specific spatial locations.

Approximately at this stage, the verb *live* is also found to co-occur with a spatial adverbial:

- (42) a. Abe Age (2;05.20) Walruses live in the zoo.
 (/KUCZAJ/ABE07.CHA:49)
 b. Adam Age (2;07.14) (S)now⁴ plow live in Boston?
 (/BROWN/ADAM/ADAM10.CHA: 1691)
 c. Eve Age (2;02.00) He lives up Emerson Hall.
 (/BROWN/EVE/EVE18.CHA:333)
 d. Nina Age (2;02.06) You, you dogs live here.
 (/SUPPES/NINA13.CHA:211)
 e. Peter Age (2;04.14) Where's Mommy live?
 (/BLOOM70/PETER/PETER12.CHA:1479)
 f. Ross Age (2;09.00) She lives on the moon.
 (/MACWHIN/ROSS/ROSS25.CHA: 354)

Live in (42a-f) shares with *be* the lexical properties (32a, b).

With respect to temporal adverbials, children initially use them in intransitive and transitive verb constructions (43a, b) as restrictive modifiers to locate events:

- (43) a. NP [_{V'} [_{V'} V (PP)] PP] (intransitive verb construction)
 b. NP [_{V'} [_{V'} V NP] PP] (transitive verb construction)

- (44) a. Adam Age (2;03.04) Howe stay (to)night?
 (/BROWN/ADAM/ADAM01.CHA:1337)
 b. Eve Age (1;10.00) Cromer come on Wednesday.
 (/BROWN/EVE/EVE10.CHA:521)
 c. Nina Age (2;02.28) I sleep last night.
 (/SUPPES/NINA15.CHA:208)
 d. Peter Age (2;01.00) Go to zoo tomorrow.
 (/BLOOM70/PETER/PETER07.CHA:3528)
 e. Ross Age (2;08.16) I brokeed the door yesterday.
 (/MACWHIN/ROSS/ROSS24.CHA:516)

The readings assigned to these sentences are described in terms of conceptual formation rule (45), where the temporal location of an event is defined as the particular moment at which the event occurs (see Jackendoff (1983:189), Miller and Johnson-Laird (1976:section 2.5)).

$$(45) [\text{EVENT}] \rightarrow [\text{Event} [\text{EVENT}] [\text{PLACE}_{\text{Temporal}}]]$$

Then children begin to use temporal adverbials as restrictive modifiers in stative *be* sentences like (46a-c):

- (46) a. Adam Age (3;04.01) I am the monster now.
 (/BROWN/ADAM/ADAM28.CHA 1679)
 b. Eve Age (1;12.00) Now it's empty.
 (/BROWN/EVE/EVE13.CHA 755)
 c. Peter Age (2;09.15) Now it's out of the mouth. (after Peter spits penny out)
 (/BLOOM70/PETER/PETER18.CHA:2152)
 c. Ross Age (2;09.21) I be a little baby when I used to play with these?
 (/MACWHIN/ROSS/ROSS27.CHA: 1103)

Thus, in addition to [EVENTS], [STATES] can also be described in terms of time of occurrence:

$$(47) [\text{STATE}] \rightarrow [\text{State} [\text{STATE}] [\text{PLACE}_{\text{Temporal}}]]$$

After this initial stage, temporal adverbials begin to be used in *be* ESs. We have found that the first token of the temporal *be* ES (b) in (48)–(54) occurs later than that of the spatial *be* ES (a) in (48)–(54):

- (48) a. Abe Age (2;06.14) Uhhuh there's dust in my eyes.
 (/KUCZAJ/ABE015.CHA:22)

- b. Abe Age (3;03.18) Once there was a man and he had a crocodile.
(/KUCZAJ/ABE087.CHA: 11)
- (49) a. Adam Age (3;02.00) Dere's some meat in there.
(/BROWN/ADAM/ADAM24.CHA: 932)
- b. Adam Age (2;03.04)-Age (4;10.00) No tokens
- (50) a. Eve Age (2;03.00) There's a banana there.
(/BROWN/EVE/EVE05.CHA:1689)
- b. Eve Age (1;06.00)-Age (2;03.00) No tokens
- (51) a. Nina Age (2;02.06) There's a bear [= baby] monkey up a tree.
(/SUPPES/NINA13.CHA:435)
- b. Nina Age (3;03.08) Once upon a time there was a three many
pinocchios and they had a great time.
(/SUPPES/NINA55.CHA:189-190)
- (52) a. Peter Age (2;02.13) There is a wheel in there.
(/BLOOM70/PETER/PETER09.CHA: 2125)
- b. Peter Age (1;09.07)-Age (3;01.21) No tokens
- (53) a. Ross Age (2;10.10) There's a car up in the air.
(/MACWHIN/ROSS/ROSS26.CHA: 452)
- b. Ross Age (3;00.16) Once upon a time there was a tiger and he went
yah yah.
(/MACHWHIN/ROSS/ROSS33.CHA: 508)
- (54) a. Shem Age (2;04.04) Outside outside there's blocks.
(/CLARK/SHEM07.CHA: 575)
- b. Shem Age (2;07.18) An there was rice yesterday.
(/CLARK/SHEM18.CHA: 522)

It follows from these developmental data that the temporal *be* ES is not acquired before other constructions involving spatial and temporal adverbials which we have discussed above.

After the development of temporal *be* ESs, sentences like (55a, b) involving *live* and temporal adverbials begin to be used:

- (55) a. Ross Age (5;04.20) He lived many years ago with his hand
still hooked.
(/MACWHIN/ROSS/ROSS60.CHA: 174)
- b. Ross Age (5;07.13) Well I thought that um dinosaurs lived
at the same age of cavemen.

(/MACWHIN/BOYS63.CHA 1474)

Live in sentences like (55a, b) is associated with the lexical conceptual structure (56):

- (56) [_{State} BE ([THING], [PLACE_{Temporal}])]

Thus before the development of the temporal *be* ES, children's grammar G_i contains at least the following phrase structure rules and multiple lexical entries of *be* characterized by (58) and (59):

- (57) a. $S \rightarrow NP V''$
 b. $V'' \rightarrow V' (PP)$
 c. $V' \rightarrow V (NP) (PP)$
- (58) a. _____ PP_k
 b. [_{State} BE ([THING]_i, [PLACE_{Spatial}]_k)]
- (59) a. _____ NP_j PP_k
 b. [_{State} BE ([THING]_j, [PLACE_{Spatial}]_k)]

Let us consider how children parse input temporal *be* ES (60) by utilizing the already acquired phrase structure rules (57a-c) and the subcategorization frames (58a) and (59a) for the verb *be* in G_i (cf. Berwick and Weinberg (1984:152 and 156)).

- (60) There be NP PP.

Because the subcategorization frame (59a) matches the post-copular string NP PP, the input string (60) is successfully parsed as (61):

- (61) [_S [_{NP} there] [_{V''} [_{V'} be NP PP]]]

Note, however, that the place argument in (59b), which is associated with (59a), is marked as spatial. Since the place argument in (59b) is not fully compatible with the reading of the temporal PP in (61), the parsing (61) leads to the setting up of a new lexical conceptual structure associated with the subcategorization frame NP PP:

- (62) a. _____ NP_j PP_k
 b. [_{State} BE ([THING]_j, [PLACE_{Temporal}]_k)]

Thus by utilizing the already available (59a), the incorrect lexical properties (62a, b) will be registered in G_{i+1} during the acquisition process of the temporal *be* ES and hence the learnability problem pointed out in section 1 will occur.

In contrast to *be*, the parallel acquisition process results in a correct lexical entry in the case of *live*. *Live* in sentences like (42f), repeated here as (63), is analyzed as having the lexical properties (64a, b):

- (63) Ross Age (2;09.00) She lives on the moon.

(/MACWHIN/ROSS/ROSS25.CHA: 354)

- (64) a. _____ PP_k
 b. [_{State} BE ([THING]_i, [PLACE_{Spatial}]_k)]

After (64) is acquired, the additional lexical entry for the verb *live* involving (65a, b) is introduced into children's lexicon, based on sentences like (66):

- (65) a. _____ PP_k
 b. [_{State} BE ([THING]_i, [PLACE_{Temporal}]_k)]

(66) Chaucer lived in the fourteenth century.

The same mechanism will bring about the acquisition of the incorrect lexical properties (62a, b) in the case of the verb *be*.

The possibility that *be* can be erroneously associated with lexical conceptual structure (67) is confirmed by *be* sentences we find in discourse like (68).

- (67) [_{State} BE ([THING], [PLACE_{Temporal}])]
 (68) Eve Age (2;01.00)

Mother: They won't be here on Saturday.

Eve: They xxx be on Wednesday.

Mother: On Wednesday. That's today. Today's Wednesday.

Eve: Sue, they'll be on a fortnight.

(/BROWN/EVE/EVE15.CHA:1150–1154)

3. Unlearning Processes

As observed in section 2, after *be* involving (62a, b) is erroneously acquired, *be* with (24a, b), repeated here as (69a, b), is incorporated in G_{i+2} on grounds of ontological *be* ESs:

- (62) a. _____ NP_j PP_k
 b. [_{State} BE ([THING]_j, [PLACE_{Temporal}]_k)]
 (69) a. _____ NP_j
 b. [_{State} BE ([THING]_j, [PLACE_{Spatial}])]

Although both (62) and (69) are compatible with temporal *be* ESs, they differ in their choice of locations of things. In (62b), time is selected as a location of a thing, while in (69b) a thing is located in physical space.

According to Jackendoff's TRH (Thematic Relation Hypothesis) (see Jackendoff (1983:Ch. 10)), all [EVENTS] and [STATES] are characterized in terms of a theme

and its location which are originally used for the conceptualization of space. Although TRH is an innate organizational constraint on possible sentential and lexical conceptual structures, applying to all semantic fields in all languages, TRH itself does not specify what sort of entities may appear as a theme and a location in each semantic field. Thus children have to learn the definition of a location in each semantic field and fix values of a theme parameter when children acquire the language spoken in their surrounding environment.

Under TRH, there is a question as to whether every possible selection of a theme parameter in a particular semantic field enjoys equal status. For example, we normally locate a thing in the spatial field, as in (70), but rarely locate time and a property in physical space, as illustrated by the sentences in (71) and (72) quoted from (Clark (1973:50) and Jackendoff (1983:205)):

(70) The rug was on the floor.

(71) a. Five o'clock came up on us before we knew it.

b. Noon crept up on us.

(72) a. Darkness descended on us.

b. Redness suffused his face.

And only sentences like (70) appear early in language development, as we have observed in section 2:

(73) Eve Age (1;11.00) It's on the table. (it = a cup)

(/BROWN/EVE/EVE12.CHA 1706)

On the other hand, we commonly locate an event in the temporal field, as illustrated by (74a-c), but a thing located in time is found only in some isolated cases like (75a, b), which have the following conceptual structures (76a, b), respectively (see Quirk et al. (1985:sections 8.51, 8.75, 8.76, and 16.24)):

(74) a. John ate meat at noon.

b. The party will be at nine.

c. Lunch will be in ten minutes.

(75) a. Chaucer lived in the fourteenth century.

b. He expected Amy next week.

(76) a. [BE ([CHAUCER], [IN THE FOURTEENTH CENTURY])]

b. [EXPECT ([HE], [BE ([AMY], [NEXT WEEK])])]

And children initially locate only events in the temporal field, as observed in section 2:

(77) Eve Age (1;10.00) Cromer come on Wednesday.

(/BROWN/EVE/EVE10.CHA:521)

Let us, therefore, suppose that theme parameter settings are subject to markedness and that all other things being equal, the selection of unmarked parameters occurs earlier than that of marked parameters in the same semantic field, because unmarked parameter values require no relevant evidence and hence are always selected, but the marked theme selection is made only when input sentences require such selection. Then it follows from our observations above that the selection of [THINGS] as themes in the spatial field is unmarked, while in the temporal field, [THINGS] are selected as marked themes.

With these background assumptions, let us consider how children get rid of (62) and retain (69). Because the subcategorization frames (62a) and (69a) both match the post-copular string in temporal *be* ES (78) and hence lead to successful syntactic parsings (79a, b), respectively, (62) and (69) are indistinguishable in terms of the proper matching of an input string against the subcategorization information.

(78) There *be* NP PP.

(79) a. There [_v *be* NP PP]

b. There [_v *be* NP] PP

The two lexical entries for the verb *be*, however, differ in the markedness of their lexical conceptual structures (62b) and (69b). With respect to theme parameter settings, a marked value is selected in (62b), while (69b) involves an unmarked theme. Because conceptual structure is a level of mental representation which reflects how we construe the world, markedness at this level corresponds to how easily we grasp possible human lexical concepts. That is to say, a lexical entry with an easily understandable lexical conceptual structure is readily accessible for children. Thus, the difference in markedness among lexical conceptual structures of multiple lexical entries is brought into play when the human sentence processing device (i.e. parser) tries to resolve ambiguity in such a multiple lexical choice situation we are discussing (cf. Crain and Wexler (1999:393)). To implement this notion of markedness in children's language acquisition device, the parser is required to demand access to a lexical entry with an unmarked lexical conceptual structure when it encounters a verb with multiple subcategorization frames, all of them matching with an incoming input sentence. If the parser prefers to access an unmarked lexical entry to resolve lexical ambiguity in such a situation, there is no chance of accessing *be* with (62) as far as (78) is concerned because the parsing involving the access of unmarked (69) is successful and the resultant reading assigned to (78) is

suitable for the context or situation where (78) is uttered so that no further attempt is necessary. Since (62) has no motivating evidence other than (78), the marked lexical entry of *be* involving (62) is never accessed for the processing of input sentences, after the alternative lexical entry of *be* with (69) is introduced into G_{i+2} . Thus the marked lexical entry in question, once introduced into G_{i+1} , will eventually fade away from long-term memory because of the subsequent inaccessibility and will be expunged permanently from children's lexicon without the help of direct negative evidence (see Fodor and Crain (1987:50)).

Footnotes

¹ LL is an abbreviation of the London-Lund Corpus of Spoken English.

² Ages are given in the form of years;months.days as in 01;09.07 for 1 year, 9 months, and 7 days.

³ The symbol xxx is used in CHILDES to represent an unintelligible word-like string.

⁴ Parentheses are used in CHILDES to represent missing segments of a word.

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