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The development of hypothetical reference in the speech of young children*

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ABSTRACT

The data obtained in two investigations (one a longitudinal/cross-sectional naturalistic study, the other a quasi-experimental study) demonstrate that preschool age children have the capacity for hypothetical reference. However, the data also indicate that this capacity for hypothetical reference operates within certain constraints, particularly early in the preschool years. Specifically, future hypothetical reference is an earlier acquisition than past hypothetical reference; reference to single hypothetical events appears sometime prior to reference to sequences of hypothetical events; and accuracy is better in self-initiated than other-initiated hypothetical reference. The implications of these findings are discussed.

INTRODUCTION

One of the most useful and unique characteristics of human language is that of allowing its users to produce and comprehend reference to non-present objects and events. Reference to non-present happenings can be classified in terms of six broad categories: (1) PAST ACTUALITY – speaker believes event which is referred to actually occurred. (2) PAST OPEN POSSIBILITY – speaker believes event which is referred to may have occurred but views opposite possibility to be great enough to prohibit a statement proclaiming that the event did occur. (3) PAST HYPOTHETICAL – speaker acknowledges possibility that event which is referred to could have occurred but reference is based on the assumption that the event did not occur. (4) FUTURE PREDICTION – speaker believes event which is referred to will occur. (5) FUTURE OPEN POSSIBILITY – speaker believes event which is referred to may occur but also believes that the opposite possibility is great enough to prohibit a prediction that the event will occur. (6) FUTURE HYPOTHETICAL – speaker acknowledges possibility that the event being referred to may occur but reference is based on the assumption that the event will not occur. These six categories are exhaustive in that all reference to non-present events involves at least one of these reference categories. Although the categories are not

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defined here in terms of formal linguistic criteria, the categories do have psychological significance in that each type of reference involves different beliefs concerning the occurrence or nonoccurrence of the event(s) in question. The concern of the present paper is with the development of the child's cognitive/linguistic ability to engage in hypothetical reference, a subtype of the child's developing ability to refer to non-present objects and occurrences. It would appear that the two categories of hypothetical reference are cognitively more complex than the other types of past and future reference, since hypothetical reference involves contrasts and relations the other non-present reference types do not. In hypothetical reference one contrasts (implicitly or explicitly) an unactual event (the hypothetical event) with an actual event and may relate the hypothetical event to another hypothetical event or an actual event. Given these circumstances, one might expect the ability to produce and comprehend hypothetical reference to be a relatively late acquisition, a possibility given greater credence by previous research on cognitive development. Young preschool children have been found to lack the ability to decenter temporally (Cromer 1968, 1971, Piaget 1969), an inability which precludes hypothetical reference, since the child must be able to decenter temporally in order to take account of varying relationships in time from different points of view (cf. Bates 1976). Cromer (1968, 1971) found that the ability to decenter temporally began to emerge at approximately 4;6, and so one might expect hypothetical reference to emerge only after this age. (However, Kuczaj 1977, and Slobin 1966, found aspects of hypothetical reference to emerge in children younger than 4;6.)

Piaget (1955) also observed a phenomenon in preschool children's speech which he referred to as JUXTAPOSITION. Juxtaposition in speech is thought to occur because the child does not concern himself with the temporal and causal relations between events. In juxtaposition, the child emphasizes the events *qua* events and ignores the temporal and/or causal relations between the events (cf. Flavell 1963). Other research, however, has found that the preschool child does concern himself with the temporal relations which hold among events to the extent that when children begin to temporally order events, they refer to the events in the order in which they actually occurred (Clark 1973). Moreover, preschool children appear to find it difficult to describe the correct temporal order of two events when asked to begin with the event which occurred last (Corrigan 1975, Ferriero & Sinclair 1971). Regarding hypothetical reference, it would be interesting to know whether children exhibit juxtaposition or the order of occurrence phenomenon when they begin to refer to two or more related hypothetical events.

The above suggests that hypothetical reference will be a late acquisition, and this is precisely what several language acquisition studies have reported. The conditional appears to be a late acquisition (Bates 1976, Cromer 1968, Slobin 1966, 1971; cf. Paris 1975). This late appearance is thought to reflect semantic

rather than syntactic difficulties, as is the late acquisition of the auxiliary *have* ((Cromer 1968). In other words, it is not the syntactic characteristics of the conditional or auxiliary *have* which make them late acquisitions, but rather the initial absence of the cognitive abilities which allow one to comprehend the meanings expressed by the linguistic forms (cf. Cromer 1974, Slobin 1973). It should be noted that the 'late' acquisition of the conditional (and auxiliary *have*) is relative to the rapid acquisition of other linguistic forms. Slobin (1966) reported that children learning Russian as a first language began to use the conditional towards the end of their third year. Cromer (1968) found that two English-speaking children began to use hypothetical reference at 4;6, while Kuczaj (1977) found evidence of hypothetical reference (including conditionals) in the speech of some, but not all, two- and three-year-olds.

Although there is some evidence that preschool children can engage in hypothetical reference, their skills in this regard are probably quite limited. Piaget has suggested that the thinking of pre-adolescent children is intrapropositional, i.e. confined to a single proposition. According to Piaget, it is not until the formal operational period that interpropositional thinking becomes available (cf. Flavell 1977). Thus one might expect children who have not yet achieved formal operational thought to engage in hypothetical reference to isolated events, and children who have attained formal operational thought to engage in reference to multiple hypothetical events and the relations between these events. However, several investigators have reported evidence which implies that the thinking of the non-formal operational child is not necessarily intrapropositional but instead interpropositional, at least in certain contexts. Amidon (1976) found an improvement in the 5- to 9-year-old age range in understanding of sentences which express temporal or conditional relations, such sentences being interpropositional in nature. Meyer (1977) reported data which suggest that children older than six years were usually able to respond to counterfactual conditionals appropriately. Hill (1961) reported that 6- to 8-year-old children were capable of hypothetical reasoning involving more than one proposition, while Donaldson (1963) reported that five-year-olds were capable of deductive reasoning at the verbal level. Children who have not yet attained the formal operational level, then, appear to be capable of interpropositional thought, at least in so far as interpreting conditional sentences in terms of logical consequence is concerned, though there is disagreement as to the age at which this ability becomes evident. Hill's work suggests that 6- to 8-year-olds have this capability, while O'Brien & Shapiro (1968) reported that 6- to 8-year-olds have difficulty in recognizing invalid conclusions. Roberge & Paulus (1971) found improvement in conditional reasoning between the sixth and eighth grade, which in conjunction with the work of O'Brien & Shapiro suggests that even if 6- to 8-year-olds are able to comprehend and produce conditional sentences, this ability continues to develop for some time.

To sum up, the present paper is concerned with the following matters: (1) The global problem of the development of hypothetical reference skills. (2) Whether pre-school children are capable of reference to related hypothetical events or just isolated hypothetical events. (3) Whether children exhibit juxtaposition or an order of occurrence strategy when they begin to refer to the relations between related hypothetical events. The data of concern come from both a longitudinal/cross-sectional naturalistic study and a quasi-experimental study. The naturalistic and quasi-experimental studies will be presented in unison rather than successively, since the results of the two studies are compatible and we feel that combined presentation will eliminate unnecessary repetition. The method of each study will be presented, followed by a presentation of the results, and finally by a discussion of the results.

METHOD

Study 1

Subjects. Fifteen children formed the sample of this study. Fourteen of the children (five females, nine males) formed a cross-sectional sample, covering the age range from 2;6 to 5;6, such that two children were observed at each 6-month interval. The remaining child (Abe, the oldest son of the first investigator) provided longitudinal information, participating in the study from 2;5 to 5;6.

Procedure. Approximately one hour of Abe's spontaneous speech in his home environment was recorded each week (two 0·5-hour sessions per week) from 2;4 to 4;1, with 0·5 hour of spontaneous speech being recorded each week from 4;1 to 5;1. From 5;1 to 5;6, the investigation became more of a diary-type study than a systematic sampling investigation. One hour of spontaneous speech per week for six consecutive weeks was obtained for each child in the cross-sectional sample. Each hour of speech was transcribed by the investigator the same week it was recorded. To ensure that the transcribing of the speech samples was accurate, reliability scores were obtained by having another rater transcribe randomly selected 250-morpheme-long segments (child's speech) of the first and sixth tapes obtained from each child in the cross-sectional sample; these transcriptions were then compared to those of the investigator. For Abe's tapes, reliability scores were obtained at various intervals. The reliability scores were quite high (from 90·4 to 100% agreement). The speech samples differ from those collected by other investigators in one important respect. The parents of each child were instructed to ask their child hypothetical questions whenever the situation permitted.

Mean length of utterance. Based on the procedures outlined in Brown (1973), the mean length of utterance (MLU) was calculated for each child. Table 1 reports the MLUs of the children in Study 1.

TABLE 1. *Average mean length of utterance for each child in the cross-sectional sample and for Abe at six month intervals*

Age	MLU		
2;6	Abe 3·34	M.A. 2·94	N.E. 3·62
3;0	Abe 3·86	I.B. 4·64	D.N. 3·05
3;6	Abe 5·86	H.K. 4·03	V.Q. 4·23
4;0	Abe 4·79	K.M. 5·02	G.D. 4·24
4;6	Abe 5·36	F.Y. 4·66	L.R. 4·53
5;0	Abe 4·99	A.B. 4·08	H.L. 4·95
5;6	—	J.W. 5·13	C.P. 4·97

Study 2

Subjects. 75 children (40 females, 35 males) ranging in age from 3;0 to 7;9 participated in Study 2. This sample consisted of 15 3-year-olds, 15 4-year-olds, 15 5-year-olds, 15 6-year-olds, and 15 7-year-olds.

Procedure. Each child was tested individually The child was initially asked to tell the experimenter a story about a lion. During this phase, the experimenter avoided using hypothetical terms, instead using prompts such as *What happened next?* and *and then what happened?* to encourage the child to continue with his story. Following this, the experimenter read one of a set of three very short stories to the child, and then immediately asked the child factual, future hypothetical and past hypothetical questions about the story. This procedure was then repeated for the remaining two stories. Since the questions asked depended in part on the child's previous answers, no two children were asked an identical set of questions. Nonetheless, the technique was valuable in that it elicited a considerable amount of hypothetical reference attempts by the children. The entire procedure was recorded on a portable tape recorder and later transcribed by the investigator who had been present during testing.

Scoring. The speech samples from Study 1 and the children's answers from Study 2 were analyzed for the following:

(1) IMPLICIT hypothetical reference – defined as the omission of certain necessary hypothetical forms. In future hypothetical reference, the crucial forms were the modal auxiliary *would* and conditional *if*. In past hypothetical reference, the crucial forms were conditional *if*, modal auxiliary *would*, auxiliary *have* and a properly tensed main verb (for the purposes of the present investigation, a past tense verb form such as *fell* or *falled* was considered a properly tensed main verb in the context of past hypothetical reference, so the error of concern here involved the use of an untensed main verb form rather than the inappropriate use of a past tense form as a past participle).

(2) EXPLICIT hypothetical reference – defined as the use of some at least quasi-appropriate form in hypothetical reference attempts, although the form

used need not be the most appropriate form. Future hypothetical reference attempts using appropriate forms were those using modal auxiliaries *would*, *could* or *might* (and *if* in conditional contexts) while past hypothetical reference attempts using appropriate forms were those using the above forms and auxiliary *have* and a properly tensed main verb (see above for definition of properly tensed main verb for the purpose of scoring here). Future hypothetical reference attempts using quasi-appropriate forms were those using modal auxiliaries *will* and *can* while past hypothetical reference attempts using quasi-appropriate forms were those involving modal auxiliaries *would*, *will*, *can*, *could*, *should*, or *might* and a tensed main verb without the corresponding use of auxiliary *have*. Examples of explicit hypothetical reference attempts utilizing quasi-appropriate and appropriate hypothetical forms are given below.

(3) Reference to isolated hypothetical events.

(4) Reference to sequences of related hypothetical events.

(5) Reference to past hypothetical events.

(6) Reference to future hypothetical events.

(7) Self-initiated hypothetical reference – defined as those reference attempts the child initiated.

(8) Other-initiated hypothetical reference – defined as those reference attempts the child produced in response to another's question or comment. The latter two categories were used only in the scoring of the speech samples obtained in Study 1 since the hypothetical reference attempts by the children in Study 2 were almost always of the other-initiated variety.

The above analyses excluded children's 'don't know' responses and irrelevant responses to hypothetical questions. An example of an irrelevant response is the following:

(1)

Adult	*Child*
What if you didn't grow up? What if you stopped growing up and grew out sideways and just got wider and wider?	I'm gonna be hay-dittle-dittle in the moon. I wanta be hey-dittle-dittle the cow. I'm gonna be hey-dittle-dittle in the sun. (A.K. 2; 10)

Reliability scores were obtained for the scoring by having a rater score 300 relevant utterances from Study 1 and Study 2 and comparing these ratings with those of the principal rater of Study 1 and the principal rater of Study 2. In only seven cases was there a difference in the raters' scoring of an utterance, demonstrating that the scoring of the speech samples was quite reliable.

Results

Implicit vs. explicit hypothetical reference

The results demonstrate that there is a developmental shift during the preschool years from implicit to explicit hypothetical reference, as shown in Tables 2, 3,

and 4. It is difficult, of course, to demonstrate that the children engaging in implicit hypothetical reference were in fact engaging in hypothetical reference since the implicit hypothetical reference attempts by definition lack the forms which denote hypothetical reference. However, the implicit hypothetical reference attempts differ from 'don't know' answers and irrelevant answers as well as from the explicit hypothetical reference attempts, as the following example of implicit hypothetical reference illustrates.

(2)

Adult	*Child*
What would happen if you fell out of an airplane?	I fall and fall and fall. (I.B. 3;2)

When children first begin to make explicit hypothetical reference, they tend to use inappropriate forms and only later learn to use newly acquired appropriate

TABLE 2. *Percentage of time Abe engaged in various types of hypothetical references*

Age	Implicit	Explicit	Past	Future	Self-initiated	Other-initiated
2;5	0	0	0	0	0	0
2;6	0	0	0	0	0	0
2;7	100	0	0	100	0	100
2;8	100	0	0	100	0	100
2;9	68·4	31·6	0	100	0	100
2;10	52·8	47·2	0	100	0	100
2;11	61·1	38·9	0	100	0	100
3;0	93·9	6·1	0	100	0	100
3;1	100	0	0	100	0	100
3;2	40·4	59·6	0	100	0	100
3;3	33·8	66·2	2·6	97·4	0	100
3;4	20·5	79·5	0·9	99·1	0	100
3;5	28·9	71·1	6·6	93·4	0	100
3;6	14·9	85·1	7·7	92·3	0	100
3;7	14·3	85·7	0	100	0	100
3;8	12·8	87·2	15·8	84·2	16·6	83·4
3;9	12·9	87·1	7·7	92·3	12·8	87·2
4;0	0	100	0	100	0	100
4;1	2·1	97·9	7·1	92·9	17·3	82·7
4;2	4·4	95·6	1·7	98·3	14·9	85·1
4;3	2·8	97·2	23·9	76·1	8·4	91·6
4;4	0	100	14·3	85·7	22·5	77·5
4;5	4·8	95·2	7·8	92·2	0	100
4;6	0	100	6·5	93·5	13·4	86·6
4;7	0	100	12·2	87·8	6·1	93·9
4;8	0	100	17·7	82·3	9·4	90·6
4;9	4·2	95·8	28·4	71·6	25·7	74·3
4;10	5·9	94·1	37·1	62·9	6·3	93·7
4;11	1·2	98·8	13·5	86·5	11·8	88·2
5;0	0·7	99·3	31·6	68·4	7·4	92·6

TABLE 3. *Percentage of time the 14 children in the cross-sectional sample in study 1 engaged in various types of hypothetical reference*

Subject	Implicit	Explicit	Past	Future	Self-initiated	Other-initiated
N.E.	0	0	0	0	0	0
M.Z.	0	0	0	0	0	0
I.B.	13·7	86·3	0	100	0	100
D.N.	47·4	52·6	0	100	0	100
H.K.	2·5	97·5	1·3	98·7	0	100
V.Q.	6·1	93·9	4·4	95·6	2·8	97·2
G.D.	0	100	17·8	82·2	7·0	93·0
K.M.	0	100	8·9	91·1	13·4	86·6
F.Y.	1·4	98·6	2·6	97·4	2·1	97·9
L.R.	3·3	96·7	11·3	88·7	4·6	95·4
A.B.	1·9	98·1	0	100	0	100
H.L.	0	100	6·1	93·9	0	100
J.W.	0	100	16·7	83·3	6·5	93·5
C.P.	0	100	18·8	81·2	4·3	95·7

TABLE 4. *Percentage of time children in each age group in study 2 engaged in implicit and explicit hypothetical reference*

Age group (in years)	Implicit	Explicit
3	37·8	62·2
4	17·1	82·9
5	6·4	93·6
6	1·5	98·5
7	1·8	98·2

forms. The following are examples of children using inappropriate forms in their hypothetical reference attempts.

	Adult	*Child*
(3)	What would happen if the girl didn't want her ears pierced?	Then she won't get pierced ears. Or she will cry (V.Q. 3 ; 7)
(4)	Who would fix your breakfast if I slept as late as Daddy?	Nobody will. I'll just watch T.V. if you would sleep so late. (H.K. 3 ; 6).

Reference to isolated hypothetical events vs. sequences of hypothetical events

Initially, children tend to refer to isolated hypothetical events rather than to sequences of hypothetical events, as shown in Tables 5, 6, and 7. When children do begin to refer to sequences of related hypothetical events, their attempts lack internal consistency with respect to 'hypotheticalness'. It is only considerably

TABLE 5. *Age at which Abe first made explicit reference to various hypothetical reference categories*

Category	Other-initiated	Self-initiated
Future (isolated)	2;9	3;8
Past (isolated)	3;3	3;11
Future (sequence)[a]	3;0	3;8
Past (sequence)[a]	3;8	4;10

[a] Sequences need not have been internally consistent.

TABLE 6. *Hypothetical reference types engaged in by the 14 children in the cross-sectional sample. (I = isolated, S = sequences)*

	Other-initiated				Self-initiated			
Subject	Future (I)	Past (I)	Future (S)	Past (S)	Future (I)	Past (I)	Future (S)	Past (S)
N.E.	−	−	−	−	−	−	−	−
M.Z.	−	−	−	−	−	−	−	−
I.B.	+	−	−	−	−	−	−	−
D.N.	+	−	−	−	−	−	−	−
H.K.	+	+	+	+	+	−	−	−
V.Q.	+	+	+	−	+	−	−	−
G.D.	+	+	+	+	+	+	+	−
K.M.	+	+	+	−	+	+	−	−
F.Y.	+	+	+	−	+	+	−	−
L.R.	+	+	+	−	−	−	−	−
A.B.	+	−	−	−	−	−	−	−
H.L.	+	+	+	+	+	−	+	+
J.W.	+	+	+	+	+	+	+	+
C.P.	+	+	+	+	+	+	+	+

TABLE 7. *Number of children in study 2 who engaged in various types of hypothetical reference*

Age group (in years)	Non-hypothetical reference story (about lion)		Hypothetical reference stories			
	Future	Past	Future (I)	Past (I)	Future (S)	Past (S)
3	0	13	12	2	1	0
4	3	11	14	7	5	2
5	6	9	15	11	7	2
6	4	11	15	14	10	6
7	4	11	15	13	6	3

later that children begin to produce internally consistent hypothetical sequences. The following are examples of inconsistent hypothetical reference sequences:

(5)

Adult	*Child*
We can't have a real horse here.	How come?
Where would we put him?	We would put him outside with a leash and he won't run away.
What would you do with a horse?	I would ride it.
What else?	Not a cow.
Not a cow. What else would you do with a horse?	And I would say giddyup horse and he would go whee-ee.
Who would clean up the horse's mess?	You.
No.	Mommy and I would.
You would.	Mommy and I would.
Who would have to feed the horse?	I would get some hay. I will get some water and some hay and he will drink the water and he will eat the hay. And I will get some straw and he will eat the straw. (A.K. 3 ; 7)

(6)

Adult	*Child*
What do you think would happen if the children were naughty?	They will sneak in their room and get something out. That would wake the mommy up.
What would happen then?	Then they will have to get spanked.
Why would they get spanked?	'Cos then she'll tie them up.
Why would she do that?	She wants to sleep. But the children would get unloose and sneak out of their room. They would sneak out of their room. Sneak out of the house.
Where would they go?	They will go to their friend's house. And stay with their Mommies. They'll sleep. They would sleep and get breakfast.
When would they get breakfast?	They wake up.
What if they didn't get breakfast when they woke up?	They would cry. And a police would come and then they'll get breakfast (J.E. 5 ; 4).

The following are examples of consistent hypothetical reference sequences:[1]

[1] Even when children begin to produce some consistent hypothetical sequences, they do not consistently produce accurate hypothetical sequences. For children who occasionally produce consistent hypothetical sequences, the longer the hypothetical sequence, the less likely that the child's reference will be consistent across the entire sequence.

	Adult	*Child*
(7)	What would happen if people were fish?	Then if a whale came, they would get eated. But if they hided, the whale maybe couldn't find 'em. And, then they wouldn't get eated. (L.R. 4; 8)
(8)	What would have happened if the children would have been quiet?	Nothing.
	Why?	'Cos the mother would have sleeped.
	What would have happened then?	Everybody would have sleeped. And the mother would have sleeped longer.
	What would they have done after they all woke up?	I don't know. I guess eat breakfast. (L.Y. 6; 4)

The above examples illustrate another finding as well as the difference between consistent and inconsistent hypothetical sequences, namely that there were very few instances of juxtaposition in the children's hypothetical reference, perhaps because of the relatively late age at which hypothetical reference emerges. Nonetheless, the results demonstrate that there is little juxtaposition in the speech of pre-school children, at least with regard to hypothetical reference. There was more support for an order of occurrence strategy,[2] particularly in the reference attempts by the younger children. However, even these children did not strictly adhere to an order of occurrence strategy when referring to sequences of hypothetical events, suggesting that the strategy reflects a strong tendency rather than an absolute predisposition.

Past vs. future hypothetical reference

Reference to future hypothetical events appears to be an earlier acquisition than reference to past hypothetical events. Moreover, children appear to be much more likely to engage in reference to future hypothetical events than in reference to past hypothetical events, although this disparity diminishes with increasing age, as shown in Tables 2, 3, and 5. (The information provided in these tables concerning past and future hypothetical reference excludes utterances such as *what if you were a bird?* which are not clearly past or future reference.)

Children made two types of errors in their responses to past hypothetical questions. One error-type consisted of the omission of auxiliary *have* and the use of a past tense main verb form, indicating that the children were attempting

[2] The order of occurrence strategy does not refer to the actual order of occurrence of the hypothetical events, since such events have not occurred and will not occur. Here, then, order of occurrence refers to the projected temporal sequence of hypothetical events rather than to the actual order of experienced events.

past tense reference. The other error-type consisted of the child responding to a past hypothetical question with a future hypothetical form. This is another illustration of the developmental superiority of future hypothetical reference, particularly since no child ever responded to a future hypothetical question with a past hypothetical form. Examples of these two types of errors include:[3]

(9)	*Adult*	*Child*
	What would have happened if that butterfly would have sat on your nose?	Then what if he sat on my head?
	What would you have done then?	I would be not angry. I would be happy. (A.K. 3 ; 8)

(10)	*Adult*	*Child*
	Why would he have been scared of a canary?	'Cos the canary would bited him. (H.K. 3 ; 6)

Self-initiated vs. other-initiated hypothetical reference

As shown in Tables 2 and 3, other-initiated hypothetical reference occurred much more often than self-initiated hypothetical reference in the spontaneous speech samples. This difference is not surprising, considering that the parents were instructed to ask their children hypothetical questions whenever the situation permitted. As shown in Tables 5 and 6, each of four hypothetical reference categories (reference to an isolated past hypothetical event, reference to an isolated future hypothetical event, reference to a sequence of related past hypothetical events, and reference to a sequence of related future hypothetical events) appeared in an other-initiated context earlier than in a self-initiated context, a finding perhaps also related to the amount of other-initiated hypothetical reference which permeated the speech samples. However, the most interesting difference between self-initiated and other-initiated hypothetical reference concerned accuracy. Children were consistently more accurate (i.e. used appropriate obligatory forms) when they initiated the reference to a hypothetical event than when they responded to a hypothetical query. This was true for both past and future hypothetical reference, as the following examples illustrate:

(11)	*Adult*	*Child*
	Other-initiated	
	What would have happened if they couldn't have found any water?	They gotted a hose.

[3] The children making the errors in past hypothetical reference in the examples usually produced correct future hypothetical reference forms, particularly in so far as reference to isolated hypothetical events is concerned.

Oh. What would have happened if the hose had broken?	Then they would have a short hose.
Do you think they would have had trouble putting the fire out with a short hose?	Yeah. They would have to say 'Come here, fire. Come here, fire'.
Why would they say that?	Because the hose, because a broked hose wouldn't reach the fire.
Oh. Do you think the fire would listen?	No. Fires aren't alive, silly. (A.K. 3; 11)

((12) *Self-initiated*

If you would have eated all that turkey, your tummy would have kersploded. (A.K. 3; 11)

((13) *Adult* *Child*

Other-initiated

What would you do if you were a girl and not a boy?	I would cry. I won't play with dolls. I would be a girl forest ranger.
Why?	'Cos.
Why wouldn't you play with dolls?	'Cos forest rangers would laugh. I'll just put out fires and stuff. (H.L. 5; 1)

((14) *Self-initiated*

	What if you were the Easter Bunny?
I don't know. What?	Then I'd be the Green Giant. And I would step on you.
I wouldn't like that.	After I stepped on you, I'd take you to the doctor. He would fix you all up. (H.L. 5; 1)

DISCUSSION

In the following discussion, we offer a speculative account for each of four developmental patterns: (1) the early use of inappropriate forms in children's hypothetical reference attempts, (2) the developmental superiority of future hypothetical reference, (3) children's initial tendency to refer to isolated hypothetical events but not sequences of related hypothetical references, and (4) children's higher degree of accuracy in self-initiated than in other-initiated hypothetical reference.

Use of inappropriate forms

Children's early use of inappropriate forms in hypothetical reference supports one of the two form/function hypotheses put forth by a number of theorists (Cassirer 1955, Cromer 1968, 1974, Slobin 1973, Werner & Kaplan 1963), namely that newly acquired functions (meanings) are first expressed by previously

acquired forms (new meanings are first expressed by old forms). However, the support for this hypothesis is not unequivocal. Abe used *would* in his earliest hypothetical reference attempts, this being a case of a new form being used to refer to a new meaning. However, Abe also used old forms in his early (and later) attempts at hypothetical reference (cf. Kuczaj 1977). Interestingly, some inappropriate old forms were excluded from hypothetical reference before others. For example, Abe last used *gonna* to make hypothetical reference at age 2; 10, but inappropriately used *will* to make hypothetical reference until age 4; 8, a difference likely due to *will* bearing a greater similarity than *gonna* to *would*. Although *will*, *would*, and *gonna* are semantically similar, *will* and *would* both appear in sentence-initial position in yes-no questions, while *gonna* does not (**gonna you go to the store?*). *Will* and *would* also appear in the position immediately following the *wh*-word in *wh*-questions, but *gonna* does not (**why gonna you eat that?*). Children rarely, if at all, inappropriately place *gonna* in a modal auxiliary position in interrogatives, which suggests that they do apprehend a difference between *gonna* and *will/would*.

Future vs. Past

Future hypothetical reference was an earlier and apparently easier acquisition than past hypothetical reference, since even after children began to produce past hypothetical reference, they continued to make more future than past hypothetical reference. This finding is *not* due to the greater syntactic complexity of the past hypothetical form. Abe was competent with *Modal auxiliary+have+past participle* (*M have Ved*) declarative forms at age 3; 4 (his first production of such a form was at age 2; 9, *we should have gotted some for you*), more than a year before he consistently used these forms in past hypothetical reference. Moreover, five of the children in the cross-sectional sample in Study 1 who exhibited difficulty with past hypothetical reference were competent with *M have Ved* declarative forms (Kuczaj & Maratsos, in preparation). Thus, the late emergence of past hypotheticals is not due to syntactic factors alone, a finding consistent with those reported by Bates (1976), Cromer (1974), and Slobin (1973).

Temporal referencing skills *per se* also cannot account for the earlier acquisition of future hypothetical reference. The children in Study 1 engaged in more past reference than future reference except for hypothetical reference (Kuczaj, in preparation). Also, the children in Study 2 responded much more often with past tense stories than future tense stories when asked to tell a (non-hypothetical) story about a lion.

Since syntactic complexity and temporal referencing skills cannot account for the later emergence of past hypotheticals than future hypotheticals, this developmental sequence must be due to the greater difficulty of thinking about past hypotheticals than future hypotheticals. Although neither past nor future events are present at the time at which the speaker refers to them, past events

differ from future events in that actual past events did occur at some past time while future events have not yet occurred at any time. The child may find it more difficult to deal with past hypothetical events than future hypothetical events because the child experiences more difficulty in contrasting 'what could have happened but did not' (hypothetical) with 'what did happen' (actual) than in contrasting 'what could happen' (hypothetical) with 'what will happen' (prediction). In past hypotheticals, one contrasts unactual and actual events, while in future hypotheticals, one contrasts two different types (hypothetical vs. predicted occurrence) of unactual events, and it may be that the child finds the latter contrast easier than the former.

Late emergence of reference to hypothetical sequences

It is likely that the late emergence of reference to related hypothetical events as compared to reference to isolated hypothetical events (and the finding that children's early attempts to refer to hypothetical sequences are internally inconsistent) reflects the difficulty children have in relating propositions, which in turn may reflect the young child's inability to decenter his thought (Bates 1976, Cromer 1968, 1971), a notion which gains support from the finding that the more events involved in a particular hypothetical sequence, the more likely the child would be inconsistent. However, the child's inability to decenter his thinking cannot completely account for this finding since many of the children in Study 1 who exhibited difficulty in being consistent in their reference attempts concerning sequences of hypothetical events did not exhibit a lack of consistency when referring to sequences of actual past events or expected future events (Kuczaj, in preparation). At any rate, the results demonstrate that pre-school children are capable of at least some degree of interpropositional thinking, which is consistent with the findings of Donaldson (1963), Hill (1961), and Meyer (1977). Apparently, the difficulty lies in marking and maintaining hypothetical reference throughout a sequence of related hypothetical events, not just with relating events *per se*. Also, consistent future hypothetical sequences were an earlier acquisition than consistent past hypothetical sequences, demonstrating once again the greater difficulty of past than future hypotheticals. (It should be noted that adults are not always consistent in their reference to sequences of related hypothetical events. For instance, the adult in the example concerning the fire hose on p. 574 changes from past hypothetical reference to future hypothetical reference, this being an error frequently observed in the children's reference attempts.)

Self-initiated vs. other-initiated hypothetical reference

Children's greater accuracy in self-initiated than other-initiated hypothetical reference reflects the differences involved in establishing the deixes and presuppositions of an utterance and comprehending the deixes and presuppositions

of another's utterance. In self-initiated hypothetical reference, the speaker (in this case, the child) establishes the hypothetical framework (deixes and presuppositions), while in other-initiated hypothetical reference the listener must pick up the hypothetical framework. The data suggest that children have more difficulty in picking up the hypothetical framework than they do in establishing the hypothetical framework, particularly insofar as past hypotheticals are concerned. If so, it is likely that comprehension tasks underestimate a child's knowledge of hypotheticals, particularly his productive control of hypothetical forms.

Relation of other acquisitions to acquisition of hypothetical reference

We are currently examining the speech samples obtained in Study 1 in order to specify more clearly the relations between the acquisition of hypothetical reference and the acquisition of the ability to make reference to pretending, hoping, wishing, knowing, thinking, guessing, and other mental states/activities, the acquisition of the ability to acknowledge possibilities and uncertainty of conditions, the acquisition of temporal referencing skills and temporal concepts, and the acquisition of the ability to correctly refer to the relations which hold between two or more events. The partial analyses which have been done to this point suggest that hypothetical reference is a later acquisition than any of the other acquisitions of concern (cf. Kuczaj 1977) and so it is possible that the above acquisitions are prerequisites for the ontogenesis of hypothetical reference.

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