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The development of infinitives by three, four, and five-year-old children

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THE DEVELOPMENT OF INFINITIVES BY THREE, FOUR, AND FIVE YEAR-OLD CHILDREN

by

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ABSTRACT

THE DEVELOPMENT OF INFINITIVES BY THREE, FOUR, AND FIVE YEAR-OLD CHILDREN

by

Sarita Eisenberg

The present study investigated children's knowledge of infinitival complements with respect to control and knowledge of subcategorization constraints for object Noun Phrases and complementizers. The experimental tasks included a story completion task designed to elicit productions of infinitival complements; an act-out comprehension task; and a grammaticality judgment task. Twenty-seven children between the ages of 3 years; 7 months and 5 years; 4 months participated in the study.

The production task proved to be successful in eliciting infinitival complements. Children varied in their willingness to produce an infinitival complement with an unfamiliar matrix verb. The children were generally conservative in their use of object NPs. No child produced an object NP with a matrix verb not subcategorized for object NPs. In contrast, there were [Noun-Verb-to-Verb] productions with matrix verbs that require object NPs by four of the younger children with the familiar verb tell and by children of all ages with

the unfamiliar verb force. For complements were produced mainly by the older children and were used with matrix verbs not subcategorized for the for complementizer.

With respect to the referent of PRO, the subject of the complement clause, fifteen children allowed arbitrary reference on [NVtoV] sentences with at least one matrix verb that would require subject control in adult English. Fifteen children allowed either mentioned NP to be the antecedant of the complement subject in [NVNtoV] sentences with at least one matrix verb. Six of these children allowed either antecedant with want-type verbs and, therefore, showed overgeneralization of an analysis involving a PRO complement subject to verbs that require a lexical complement subject in adult English. There were also three children identified who did not use control principles to interpret the complement subject. These latter three children allowed arbitrary reference for PRO on [NVtoV] sentences and only produced [NVNtoV] sentences with a lexical complement subject.

These results were related to overgeneralization and verb-specific learning as processes in language acquisition. The relevance of both linguisitic theory and empirical data in the study of language acquisition was discussed. The adequacy of act-out comprehension tasks for studying children's knowledge of language was questioned.

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On a more personal note, I am deeply grateful to my husband for his encouragement and for the degree of respect and pride which he has shown for me. I dedicate this thesis, with love, to him.

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CHAPTER ONE

OVERVIEW

1. Introduction

The process of language acquisition encompasses change in a variety of domains including cognition, pragmatics, speech-motor control, to name but a few. The ultimate goal of research in language acquisition is to account for development within each of the separate domains as well as for the interactions among domains. We are far from such a theory at present. The current paper is limited in focus to development in the single domain of syntax.

Syntactic development has been roughly divided into stages with each stage representing some major aspect of syntax that is the focus of that stage (Brown, 1973). Brown's earlier stages, including semantic relations, grammatical morphology, and sentence types have been widely studied. Brown's fourth stage, the development of complex syntax has recieved much less attention.

The current project was designed to investigate the development of one type of complex sentence that contains an infinitival complement. Complex sentences are structures in which one or more simple sentences are embedded within a matrix sentence. In complement

constructions, the embedded sentence functions in some syntactic role, for instance the direct object as in (1) and (2), thus substituting for a simple nominal. Infinitival complements, such as the sentences in (1), contain an untensed complement verb preceded by the infinitive marker to. Finite complements, as in (2), contain a tensed complement verb.

(1a) John tried to leave.
(b) John wanted (for) Bill to leave.
(c) John told Bill when to leave.

(2a) John said (that) Bill had left.
(b) John knew what Bill wanted.

2. Subcategorization for Complement Type

The type of complement that can occur with a particular verb is an idiosyncratic property of that verb. This information is lexically specified for all verbs, each being subcategorized for the types of sister constituents they permit. Since both the matrix verb and the complement, either tensed or infinite, are immediately dominated by the same VP node, the matrix verb is subcategorized for complement type. Want can take an infinitival complement but not a tensed complement; see can take a tensed complement but not an infinitival complement; and tell can take both tensed and infinitival complements. The sentences in (3) are examples of this.

(3a) Bob wants John to smile.
(b) *Bob wants that John smiles.
(c) *Bob sees John to smile.
(d) Bob sees that John smiles.

(e) Bob tells John to smile.
(f) Bob tells Mary that John smiles.

Verbs are also subcategorized for choice of complementizer, e.g. for, that, or a null complementizer. Tensed complements can be headed by either the overt complementizer that or a null complementizer; all verbs subcategorized for tensed complements can take these complementizers. All verbs that take infinitives allow the infinitives to be headed by a null complementizer; only some infinitive-taking verbs allow the infinitive to be headed by the complementizer, for. As shown in (4), want optionally allows the complementizer for whereas tell does not.

(4a) Bob wants (for) John to smile.
(b) *Bob tells Mary for John to smile.

Verbs like want are, however, only subcategorized for the for complementizer if there is a lexical subject in the complement clause. They also appear in structures such as (5a), in which the infinitive must be headed by a null complementizer as is the case for verbs like try in sentence (5c). The for complementizer cannot appear with a null subject (in most dialects of English) so sentences such as (5b) and (5d) are not grammatical.

(5a) Bob wants to smile.
(b) *Bob wants for to smile.
(c) Bob tries to smile.
(d) *Bob tries for to smile.

3. Linguistic Analysis of Infinitives

The present author assumes Chomsky's (1981) proposal that infinitives are clausal in structure, as shown in (6).

(6) I want [[PRO [(to)] [go]]]
S' S INFL VP

According to this analysis, the complement clause is a constituent of S', whose expansion is [COMP S]. For the infinitive in (6), the COMP constituent of S' is empty. The expansion of S is [NP INFL VP], with NP realized as a phonetically null subject, PRO, and the infinitive marker, to, being a constituent of INFL. This is in contrast to (7), in which the infinitive is analyzed as phrasal in structure (cf. Bresnan, 1978). In this latter analysis, there is no underlying grammatical subject and the infinitive marker is a complementizer within VP'.

(7) I want [[(to)] [go]]
VP' COMP VP

Hyams (1985) has argued for a clausal structure for infinitives in child grammars, consistent with Chomsky's proposals for adult grammar, and has presented acquisition data in support of this claim. She notes that infinitival complements emerge in child language at about the same time as tensed complements. If both complement types are analyzed as clausal, this simultaneous emergence can be explained as reflecting the acquisition of a general rule for recurrance as in (8),

with S′ realized as either [+/- tense], [+/-WH] depending on properties of the matrix verb.

(8) VP ---> V S′

If infinitives are analyzed as phrasal and tensed complements analyzed as clausal, this co-emergence is unexplained.

The differences between the two analyses can be seen with the infinitival sentences in (9), both of which have the surface form of [NP-V-NP-to-V].

(9a) Bob tells John to go.
(b) Bob wants John to go.

The phrasal analysis, as proposed by Bresnan (1978), would analyze these two sentences as identical grammatically but would differentiate between them logically. Both of these sentences would be analyzed as having a grammatical object, as in (10).

(10a) Bob tells [John] [to go]
NP VP
(b) Bob wants [John] [to go]
NP VP

In the (a) sentence, John serves as both the logical object of the matrix verb tell and as the logical subject of the infinitival verb phrase. In the (b) sentence, John only serves the logical function of subject of the infinitival phrase.

The clausal analysis treats these two sentences very differently, as shown in (11).

(11a) Bob tells [John$_i$] [PRO$_i$ to go]
NP S
(b) Bob wants [John to go]
S

In (11a), John serves as direct object of the matrix verb and as the antecedant for the phonetically null complement subject, PRO. In (11b), John serves as the lexical subject for the infinitival complement.

The structure in (11b) represents an exception to a general pattern across languages. Chomsky (1981) has proposed that for complements must take a lexical subject. He has also proposed that the for complementizer may be optionally deleted, as shown in (12).

(12a) I want (for) John to go.
(b) I want John to go.

According to this analysis, the underlying structure of sentences such as (9b) and (10b) above involve a for complementizer that has undergone deletion.

Based on this analysis, Hyams (1985) discusses two predictions. A narrow prediction is that children will not produce sentences such as those in (9b) and (10b), in which want takes a complement with an explicit lexical subject, until they show evidence of knowing that want takes a for complementizer. As reported by Bloom, Tackeff, & Lahey (1984), however, for complements are rare or non-occurring at 3 years of age, when lexical subjects are emerging. A broader prediction is that children will not produce lexical subjects of infinitives until they produce any overt lexical complementizers, such as that as well as for. In support of this latter prediction, Hyams notes that lexical complementizers

emerge in child language at age 3 years, at the same age as lexical subjects. In the present study, sentences with for and that complements were included in a judgment task to test these hypotheses.

4. Core and Peripheral Properties of Grammar

Hyams (1985) argues for a modular theory of grammar in which components of the grammar emerge at different times. She claims that "core" aspects of complementation, such as the clausal structure of complements, are general properties and will be learned early. "Peripheral" aspects of complementation relate to idiosyncratic properties of specific verbs. These peripheral aspects require more exposure to data and take longer to learn than the core aspects. Complementizer choice and the exceptional structure of infinitives with the verb want are examples of peripheral aspects of complementation.

Hyams claims that the peripheral aspects are "strongly data-driven"; that is, they are learned from hearing the particular structures. She further claims that, because of the dependence on positive evidence for learning these aspects, children will not make over-generalization errors and produce ungrammatical sentences that they have not heard. As an example, she suggests that children will not overgeneralize complementizer choice and make errors such as those in (13).

(13a) @*I tried for John to go.
(b) @*I want that John go.

5. Control

Some sentences, such as the infinitives in (14) and (15), have complements with a phonetically null subject, PRO.

(14a) John tries to leave.
(b) $John_i$ tries [PRO_i to leave].
(15a) John tells Mary to leave.
(b) John tells $Mary_i$ [PRO_i to leave].

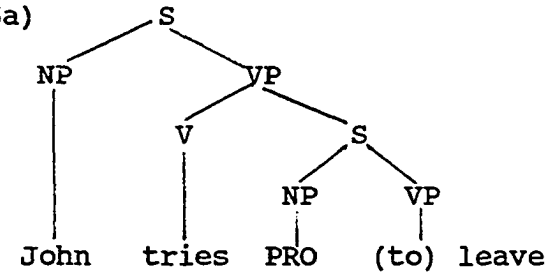
The controller of PRO is determined by a rule which coindexes PRO with the controlling NP.

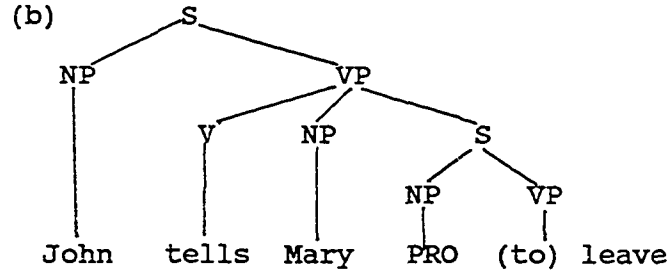
Goodluck (1981) has discussed the notion of c(onstituent)-command, a constraint on the possible NPs that can be coindexed with, and thus control, PRO. A possible controller of PRO must c-command that NP node. C-command is defined as follows:

> Node A c-commands node B if the first branching node that dominates A also dominates B and if neither A or B dominate each other.

The trees in (16) illustrate the c-command principle:

(16a)





In (16a) the complement NP node is c-commanded by the the NP John; John is thus a possible controller of PRO and, in fact, this sentence is interpreted to mean that John is doing the leaving. The infinitival complement in (16a) is subject-controlled since the sentence subject controls PRO.

In (16b) the complement NP node is c-comanded by both the NP John and the NP Mary. Either of these NPs could be a possible controller for PRO according to the c-command constraint as defined above. However, this sentence is not ambiguous to English speakers; rather the direct object NP Mary is interpreted as the one doing the leaving. The best formulation of the rule for control of PRO seems to be that the controller is the closest c-commanding NP (with some exceptions). The infinitival complement in (16b) is object-controlled since the direct object NP serves as the controller of PRO.

For both of these infinitival complements, the subject of the complement clause must be coindexed with an NP within the matrix clause. Goodluck (1981) terms these obligatory-control complements and distinguishes

them from free-control complements which do not require the complement subject to be coreferential with an NP of the matrix clause.

In this report, this latter complement type is considered to involve arbitrary reference and not to involve control properties for determining an antecedant for PRO. The sentence in (17) is an example.

(17a) To swim is fun.
(b) [PRO to swim] is fun.

Arbitrary reference means that the referent for PRO is not constrained to a sentence-internal NP by a rule for control but may be any referent. Generally, this would include NPs mentioned in the sentence as well as non-mentioned referents.

Infinitival complements attached to verbs like want, as in sentence (11b) above and repeated below in (18), are not control structures. In such a sentence, the subject of the complement clause is a lexical NP. There is therefore no PRO form to interpret based on rules for control.

(18) Bob wants [John to go]

6. Properties of Specific Matrix Verbs

The present study included verbs that have different properties regarding subcategorization and control. All of the matrix verbs included in the present study were subcategorized for infinitival complements; verbs differed according to whether they were subcategorized

for some other complement type such as tensed or participial complements. Matrix verbs also differed according to whether they were subcategorized for object NPs. With regard to control properties, matrix verbs varied according to whether they required obligatory control or allowed arbitrary reference. Obligatory control verbs could be object-controlled, subject controlled, or allow both object and subject control.

The sentences below indicate possible sentence frames (sf) for infinitives according to the possibilities for taking a direct object in the matrix clause and for reference and control properties.

(sf1) NP_i-V-[NP_j-to-VP]
The coach wanted the girl to join the team.

(sf2) NP_i-V-[PRO_i-to-VP]
The boy tried to clean up the mess.

(sf3) NP_i-V-(NP_j)-[PRO_i-to-VP]
The waitor promised the patron to bring the food.

(sf4) NP_i-V-NP_j-[PRO_j-to-VP]
The teacher told the class to start the test.

(sf5) NP_i-V-[PRO_j-to-VP]
The mother said to play outside.

Sentence frame (1) is not a control structure but has a lexical complement subject. In this sentence, the entire complement sentence functions as the direct object of the matrix verb.

The remaining sentences have the non-lexical PRO as their complement subject. Sentence frames (2)-(4) are

obligatory control structures; as stated in section 4 above, the antecedant for PRO must be sentence internal. Sentence frame (5) allows arbitrary reference; reference for PRO is some entity not mentioned in the sentence.

Of the obligatory control sentences, (sf2) and (sf3) involve subject control of PRO and (sf4) is object controlled. Sentence frame (2) obligatorily has no direct object NP in the matrix clause. In (sf4), the matrix direct object is obligatory and must be the antecedant of PRO; in (sf3), the matrix object is optional and the antecedant for PRO is the matrix subject.

For the present study, infinitive-taking verbs were divided into six groups according to the combinations of these sentence frames that the verb can enter into. Table 1 shows this. Verbs like want can be used in (sf1) and (sf2). Verbs such as tell require a direct object and can only appear in (sf4). Verbs like try are limited to (sf2). Promise type verbs take an optional direct object that is interpreted as in (sf3). Ask type verbs can also appear with an optional direct object, which yields the (sf3) interpretation; they can also appear in the (sf4) structure that takes an obligatory direct object. Ask sentences with a direct object NP are, therefore, ambiguous. Finally, the verb say can only appear in the sentence form in (sf5). Stimuli were generated to include matrix verbs from each

of these groups. In this way, the developing knowledge of subcategorization and control both for infinitives in general and for specific verbs could be investigated.

7. Methodological Considerations

To obtain information about language from an adult, the linguist elicits judgments about linguistic phenomena such as grammaticality or ambiguity. The assumption is that these data directly represent the speaker's linguistic competence and that data from production or comprehension of sentences less directly represents this linguistic competence. Productions are subject to performance errors and are incomplete as speakers use relatively few of the possible constructions of their language. The behavior of comprehension also incompletely represents linguistic competence as it generates a single interpretation of a sentence that is consistent with the situation and not all possible interpretations of a particular sentence. Judgment data can provide information about infrequently used structures, about structures that are ungrammatical in a language, and about alternate interpretations of structures.

In the child language research, the primary data sources have been production data obtained through naturalistic sampling from children under three years of age and data from comprehension experiments using subjects older than three. Inferences about the

children's knowledge of language are based on regularities in the data for individual children and across children. Judgment data have been largely unavailable. The majority of studies that have attempted to elicit judgments from children younger than age five have not been successful. One exception to this is a recent study by McDaniels & Cairns (1987). In this study, children as young as 3;8 demonstrated an ability to make judgments about both well-formedness and coreference.

In the current project, the assumption was made that a single grammar underlies both production and comprehension and that these language performances can provide data about this underlying linguistic knowledge. In fact, this assumption is basic to the current endeavor. I make the claim that consistent patterns of response can be distinguished from random performance errors and that these consistent patterns reflect what the child knows about language. This effort to seek regularities in the data was enhanced by standardizing the situational contexts for eliciting the language behaviors. Doing this enabled me to look for regularities in what the children did not do as well as in what they did do. Additionally, the chance of determining what the children know about language was increased through the eliciting of judgments in addition to sampling linguistic behavior for both production and

comprehension. The design of the project included experimental tasks to elicit productions, comprehension responses, and judgments of sentences containing infinitives.

The project involved elicited productions from children rather than relying on the collection of spontaneous utterances. Elicited production has not been used extensively in studies of language production. Relying on spontaneous production of a specific utterance type is, however, time consuming and yields an incomplete estimate of a child's linguistic repertiore. Bloom, et. al. (1984) observed four children between the ages of 19 and 36 months and reported that production of infinitival constructions begins for some children at 22 months. A total of 78,986 utterances were collected from the children. Of these utterances, only 3,798, or 4.8%, were infinitives.

In order to elicit productions of sentences containing infinitives, a situational context was created which would lead the child to produce the desired sentence form. A story completion format was used. A similar procedure was used by Bliss, Allen, & Wrasse (1977) with children aged 4 to 7 years for a variety of sentence forms, including infinitival complements. In the current study, additional contextual support was provided by the examiner's acting out the story context with dolls while presenting the story.

Bloom (1974; and Lahey, 1978) has pointed out that both production and comprehension take place within a situational context. This allows the child to employ real world knowledge of the ongoing event in formulating an utterance based on that event and in interpreting the utterances of others about that event. Experimental tests of comprehension have, however, eliminated all contextual information in order to force the child to rely on linguistic knowledge in interpreting the utterance. This places heavy cognitive demands on the child, which may interfere with her utilization of the linguistic information and lead her to base her interpretation on a guessing strategy. In the current study, contextual support was given for the comprehension task in order to make it more like the production task. That is, the child was provided with situational information which provided motivation for the actions coded within the utterance while having only the linguistic information of the sentence itself on which to base the determination of the grammatical relations within the utterance.

The judgment task was included in order to determine whether children would accept as consistent with their grammar sentence forms that are ungrammatical for adults. The children's judgments were compared to their productions to investigate whether children would accept sentence forms that they had not produced and whether children would reject sentences that they had produced.

As mentioned above, the majority of judgment tasks have not been successful in eliciting well-formedness judgments from young children. These tasks, however, like the experimental comprehension tasks, have eliminated all contextual support. A possible way to lower the age at which children can handle a judgment task might be to reduce the cognitive demands by supplying situational information about the actions coded by the sentence.

8. An Overview of the Study

The current study investigated children's developing knowledge of infinitival complements. This sentence form was sampled in experimental tasks of production, comprehension, and grammaticality judgments. Crucial to the study was the development of a procedure for eliciting productions of infinitival complements.

Matrix verbs are subcategorized for complement type and choice of complementizer. There are also verb specific properties relating to control and reference. The study sampled across groups of verbs that differed with respect to these verb specific properties of subcategorization and control. In this way, I hoped to obtain information about verb specific learning as well as to investigate the general pattern of infinitives in development.

In the sections above were discussed several predictions about the development of infinitives that

were based on a particular theory of grammar that differentiated between core and peripheral aspects. Specifically, the current project sought support for the prediction that peripheral aspects of grammar, such as infinitives with lexical subjects and complementizer choice, would be later developments and would be learned in an error-free manner.

Finally, the current project aimed to investigate the child's developing knowledge of control for one particular complex sentence form, the infinitival complement.

The present paper reviews previous studies on the development of complementation in production and in comprehension and on the development of control. A plan of study is then presented that includes experimental tasks to elicit productions, test comprehension, and obtain judgments of infinitival complements as well as judgments of some sentences with tensed complements.

CHAPTER TWO

BACKGROUND

1. Production Studies of Complement Development

The first complex constructions to appear in the child's speech are complements serving a direct object function. These object complements begin to appear in the child's speech at about two years of age, when the child is commonly producing four word utterances (Limber, 1973). Thereafter, Limber (1973) claims, the child will produce matrix verbs with object complements within one month of using that verb in any construction.

The earliest complement constructions are highly constrained. They involve few matrix verbs, primarily want and go and, less often, got and have, which appear to function as modal verbs (Bloom, et al., 1984). In addition, the subject of the complement verb is not expressed and is coreferential with the subject of the matrix sentence (Bloom, et al., 1984; Limber, 1973). The sentences in (1) are examples from Bloom, et al. (1984).

(1a) I gonna get it.
(b) I want open it.

Children first begin to express a complement subject shortly after producing these first object complements. Limber (1973) divided matrix verbs used during the first

half of the third year into two classes, a "want" class and a "watch" class, based on structural properties of the complement clause. The latter "watch" class of verbs, including watch, see, and lookit, all require an explicit complement subject that is not coreferential with the sentence subject to be grammatical. Apparently, children do not violate this subcategorization constraint when they first use these verbs with complements as in the sentences in (2) from Limber (1973).

(2a) I see you sit down.
(b) Watch me draw circles.
(c) Lookit a boy play ball.

Verbs in the "want" class, including want, need, and like, do not require a stated complement subject in order to be grammatical but take complements with an anaphoric subject, PRO, that is coreferential to the sentence subject, as in (3).

(3) I_i want PRO_i to go home.

Of this class of verbs, only want was produced with a non-coreferential complement subject as in (4) (Limber, 1973).

(4) I don't want you read that book.

Other verbs used during this period include let's, ask, tell, and make, say and go to express direct speech and noises, and the modal s'posed to. Thus, by age 2;5, children are attaching complements to a small set of non-modal matrix verbs.

At about 2 years; 3 months, children start to produce sentence complements, as in the sample sentences in (5) from Bloom, Rispoli, Gartner, & Hafitz, (1987),

(5a) I think the children go to bed.
(b) I see two bus come here.
(c) Look my truck got a top.

and WH-complements, embedded complements introduced by a WH word. These latter include WH-adverbials expressing place and manner and question word complements as in the examples in (6) (Bloom, et al., 1987).

(6a) Know what the other ones do?
(b) I'll see where it is.

Also first appearing at this time are subordinate constructions with the subordinating conjunctions if, so, because, and when as in the example in (7) from Bloom, et al. (1987).

(7) See if it can make some sound.

Infinitival sentences in which the subject of the complement verb was not coreferential with the subject of the main verb appeared after the children were producing non-coreferential subjects in tensed complements and WH-complements (Bloom, et al., 1987) The exception to this order of emergence was one child who produced infinitval complements attached to want but without the infinitive marker to.

Bloom, Tackeff, & Lahey (1984) report that all four children in their study produced infinitival sentences with a noun phrase intervening between the matrix and complement verbs around the age of 29 months. The

sentences in (8) and (9) are examples from Bloom, et al. (1984).

(8) I want Mommy get it.
(9a) I'll help you to find the buttons.
(b) I'll help you$_i$ PRO$_i$ to find the buttons.

As discussed in section 2 of the overview, these sentences are different in structure. In (8), the complement sentence includes an explicit lexical subject, Mommy. In (9), the noun phrase, you, intervening between the matrix and complement verbs is the object of the main verb and serves as the antecedant of the anaphoric complement subject, PRO. Menyuk (1969), in her study of 3 to 7 year-old children, reported that infinitival complements appeared in sentences with nominal objects, but only with the restriction that the object serve as the antecedant of the complement subject. Even these older children apparently did not allow subject control of a PRO complement subject for sentences with an object NP.

Children initially attached sentence complements without a connective as in the examples in (10) (Bloom, Lahey, Hood, Lifter, & Feiss, 1980).

(10a) See Mommy busy.
(b) Tell him wake up.
(c) I want man stand up.

This included omission of the infinitive marker to, as in (10b) and (10c). Marked infinitives appeared at about 25 months (Bloom, et al., 1984; Limber,1973), about one month after object complements, such as the utterance

with the verb watch in (2b) above, are first produced (Limber, 1973). By the time MLU reaches 3.5, between 2 and 1/2 and 3 years of age, children are producing to in 75% of their infinitives. Menyuk (1969) indicates that children continue to omit the infinitive marker inconsistently throughout the nursery school years.

Initially, tensed complements also lack an explicit complementizer. It is not until close to age 3 years that children even produce the complementizer that and use of this complementizer does not become productive during this time period (Bloom, et al., 1980).

Menyuk (1969) noted that children did not over-generalize the infinitive marker to matrix verbs taking what she and Limber call "unmarked infinitives". Thus, both of the sentences in (11) appeared in the language samples but only sentence (12a) was produced. (@ indicates an unattested utterance.)

(11a) Help me set the table.
(b) Help me to set the table.
(12a) He watches him put the paint on.
(b) @*He watches him to put the paint on.

Infinitives with for complementizers first appeared at close to 3 years of age and remained rare (Bloom, et al., 1984). Most of the utterances containing for were copular constructions with adjectives as in (13);

(13) It's hard for you to eat your thing.

and this use of for could have been a preposition rather than a complementizer. Other than these copular

constructions, these authors observed only one for complement.

Missing from the productive repertoires of young children are sentential subjects, participial object complements, and adverbials involving time. Lee (1974) gathered normative data on children aged 2 to 7 years. The children in her sample never produced infinitival subjects such as (14a), although they did produce sentences such as (14b).

(14a) @To swim is fun.
(b) It is fun to swim

Menyuk (1969) reported that only 43% of the 3 to 7 year-old children in her study produced participial forms. Only the older children in Lee's normative group produced participial complements. Infinitival subjects and participial complements thus appear to be later developments.

These production studies raised several questions of concern to the present study. The young children in Limber's (1973) study only produced infinitives with an intervening NP (Bloom, et al.'s terminology) as shown in (15) -- that is, with a second NP that is not coreferential with the sentence subject -- with the matrix verb <u>want</u>.

(15) NPi-V-NPj-to-VP

Based on this, Limber (1973) makes the strong claim that <u>want</u> serves as the prototype for production of infinitives with other verbs. This claim is in

contradiction to Hyams' prediction, presented above in section 3 of the overview, that infinitives attached to verbs like want should be a later development based on their exceptional structure (Hyams, 1985).

The study, therefore, included verbs like want and verbs like tell, as described in section 5 of the overview and in Table 1. If Limber's (1973) claim is correct, infinitives with lexical subjects attached to the matrix verb want would be expected to appear prior to object-controlled infinitives attached to tell. If Hyams' (1985) claim is correct, the reverse would be expected.

The study was concerned, as well, with several possible overgeneralization errors. The studies by Limber (1973) and Bloom, et al. (1984) report no productions of an explicit complement subject in sentences in which the complement subject would be coreferential with the matrix subject. Children did produce sentences like (16) but they did not produce sentences like the ones in (17) that would violate Chomsky's binding conditions (Chomsky, 1981).

(16) I_i want PRO_i to read the book.
(17a) @*I_i want me_i to read the book.
(b) @*I_i want $Sarah_i$ to read the book.
(c) @*$Sarah_i$ wants $Sarah_i$ to read the book.

The lack of sentences of this form may be merely a gap in the data. The current study included sentences like (17c) in the judgment task to confirm that the absence of

sentences of this form was due to a structural constraint operating in the children's language.

Another possible overgeneralization error involved subcategorization for NP objects and for infinitives with lexical subjects. As discussed above in section 1 of the overview, subcategorization information is an idiosyncratic property of the verb. Consistent with Hyams' classification of verb-specific propeties as peripheral (Hyams, 1985), it was expected that children would proceed cautiously and would not overgeneralize either NP objects or infinitives with lexical subjects to matrix verbs that could not take these forms. To test this, matrix verbs were selected with a variety of characteristics relative to subcategorization (see Table 1) and grammaticality judgments were included as well as opportunities for production.

2. Comprehension Studies of Infinitival Complements

In 1969, C. Chomsky first demonstrated that children between the ages of 5 and 10 years had not fully mastered the syntax of their language. Among the sentence types that she tested were infinitival object complements attached to the matrix verbs ask, tell, and promise. Sentences (18)-(20) are examples of her experimental sentences.

(18a) Bozo asks to go first in line.
(b) Bozo asks Mickey to go first in line.
(19) Bozo tells Mickey to go first in line.
(20) Bozo promises Mickey to go first in line.

Chomsky (1969) was concerned with how children assign grammatical relations within the complement clause. Children responded by selecting the object NP, Mickey, to act out the complement clause for sentence (18b), (19), and (20). Based on these responses, Chomsky described an early strategy, the minimal distance principle (MDP), for children's determining the antecedant of the non-specified complement subject based on the ordering of surface structure constituents. According to the MDP, the antecedant of the complement subject will be the noun phrase that most closely precedes the complement verb. Thus, children would select the sentence subject, Bozo, as the antecedant in (18a); but they would select the object NP, Mickey, as the antecedant in sentences (18b), (19), and (20). This response pattern would, therefore, lead to a correct interpretation for the ask sentence in (18a), a correct and unambiguous interpretation for the ask sentence in (18b) as well as for the tell sentence in (19), and an incorrect interpretation for the promise sentence in (20).

Chomsky (1969) postulated further stages through which children develop in learning the correct assignment of grammatical relations for the antecedant verbs tell and promise. The next stage following uniform application of the MDP, according to Chomsky, is a transitional one. At this point, the child learns that

there are exceptions to the MDP but does not know which cases are the exceptions. Consequently, the unifirm response pattern breaks down and the child shows mixed assignment of either noun phrase as antecedant of the complement subject. Performance at this stage is, therefore, worse for the tell sentence and improved for the promise sentence.

In the third stage, the uncertainty regarding the application of the MDP is reduced. Children at this stage once again select the second noun phrase as antecedant of the complement subject for the tell sentence and continue to randomly assign the two noun phrases as antecedant for the promise sentences. Finally, in a fourth stage, children learn that interpretation of promise sentences is an exception to the MDP. At this point, they correctly choose the sentence subject as the antecedant of the complement subject in sentence (20) while selecting the second noun as antecedant for the sentence in (19).

Additional data on the developing comprehension of infinitival object complements by younger 3 to 5 year-old children is provided in a study by Tavakolian (1977; 1981). Tavakolian contrasted children's responses to infinitival complements attached to the verbs tell and promise. Sample sentences from her study are given in (21) below.

(21a) The lion tells the pig to stand on the horse.
(b) The lion promises the pig to jump over the horse.

Eight of the children in the Tavakolian study responded to both tell and promise sentences by choosing the first noun phrase, the lion, as the subject of the complement clause. This would yield a correct interpretation of (21b) and an incorrect interpretation of (21a). She termed this response pattern the conjoined clause analysis, and suggested that children parse the sentences as in (22) into two simple sentences with the first [NP-V-NP] sequence grouped together and the remaining [V-NP] forming a clause with a phonologically null subject whose antecedant is coreferential with the subject of the first clause.

(22) S[S[NP V NP] S[Δ to V NP]]

Of the eight children showing this response pattern, four were in the 3 year-old group with the remaining four split between the 4 and 5 year-olds.

Eight other children selected the second noun phrase, the pig, as the complement subject for both tell and promise sentences consistent with the minimal distance principle. This leads to correct interpretation of (21a) with an incorrect interpretation of the (21b) sentence; that is, a reversal of the earlier interpretation pattern. Of these eight children, only two were in the 3 year-old group with the remaining six split between the 4 and 5 year-olds.

Only five children gave a correct choice of antecedant for both the tell and promise sentences. Three of these children were 5 year-olds. There was some tendency for response pattern to change with age from selection of the first noun by 3 year-olds, to selection of the second noun by 4 and 5 year-olds, to differential selection dependent on the matrix verb by some 5 year-olds. However, this difference was not statistically significant.

Tavakolian (1977) further noted that the 3 and 4 year-old children did not differentiate selection of the antecedant based on the matrix verb. Three year-olds as a group gave responses to both tell and promise sentences that were equally divided between selection of the first and second noun as antecedant of the complement subject; four year-olds as a group were slightly more likely to select the second noun as antecedant of the complement subject, particularly for the tell sentences. In contrast, the five year-olds showed significant differences in their interpretations of the tell and promise sentences. Although showing mixed assignment of the complement subject for both verbs, they tended to select the second noun more often in response to tell (71% of responses) and the first noun more often in response to promise sentences (61% of responses).

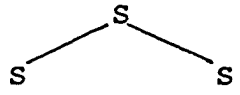
Tavakolian's results (Tavakolian, 1977; 1981) are thus consistent with Chomsky's (Chomsky, 1969) in

suggesting that children have linguistic strategies for determining the grammatical relations within a sentence based on the linear ordering of constituents. Both authors report uniform use of one strategy, the MDP, followed by a transitional period in which this uniform response pattern breaks down. Tavakolian's results add to those of Chomsky by suggesting an earlier development characterized by selection of the first noun as antecedant for the missing complement subject.

3. Structural Knowledge of Complement Sentences

The conjoined clause strategy suggested by Tavakolian (1977; 1981) is not merely an interpretative strategy for determining an antecedant for the missing complement subject. It is a claim about how these sentences are analyzed in child grammar. Tavakolian argues that children's interpretations are not based on a non-structural strategy, such as selecting the first noun as the subject of all other verbs, but are based on a structural analysis of the sentence. According to her hypothesis, young children analyze multiclause sentences by linking each constituent simple sentence to a sentence node as shown in (23).

(23)



She further suggests that the missing NPs are interpreted as being coreferential with the subject of the first clause.

In addition to the data on complements, Tavakolian (1977; 1981) presents data on interpretation of relative clauses, such as the (a) sentences in (24)- (27), which differ according to the role of the head NP and the relativized NP as subject or object of their respective clauses. Her proposed structural analysis for each sentence type is indicated in (b).

(24a) SS: The sheep that jumps over the rabbit stands on the lion.
(b) S[S[NPi-that-V-NP] S[△i-V-NP]]

(25a) OS: The duck stands on the lion that bumps into the pig.
(b) S[S[NPi-V-NP] THAT S[△i-V-NP]]

(26a) SO: The lion that the horse kisses knocks down the duck.
(b1) S[S[NPi-that-NP-V] S[△i-V-NP]]
(b2) S[S[NP-that-NPi-V] S[△i-V-NP]]

(27a) OO: The horse hits the sheep that the duck kisses.
(b) S[S[NPi-V-NPj] that S[NP-V-△i/j]]

The majority of responses was consistent with the conjoined clause analysis. The most common response to the SS and OS relatives was selection of the sentence subject as the subject of both clauses; the next most common response was to select the sentence subject as subject of the first clause and the second noun as the subject of the second clause. This response pattern resulted in a high proportion of correct interpretations on the SS relatives. Yet this type of relative is rarely produced by 7 year-olds (Menyuk, 1969). Tavakolian (1977; 1981) concludes, therefore, that it was more likely that children based their interpretation on a

conjoined clause analysis than on analyzing the sentence as a relative clause.

There were also children who selected the sentence subject as the subject for both clauses on OO and SO relatives. On OO relatives, the majority of children tended to (correctly) select the third NP as the subject of the relative clause and either of the two remaining NPs as the object of that clause. On SO relatives, children tended to (correctly) select the second noun as the subject of the main clause; only some of these children also selected the second noun as the subject of the relative clause.

Tavakolian (1977; 1981) concludes that the conjoined clause analysis, which led to a correct interpretation for the SS relatives, was the only interpretation pattern shown across all four relative clause types. She further concludes that this rule for iteration of simple sentences is developmentally prior to embedding which involves attachment of a sentence to a VP or S node. A similar claim for the earlier development of iteration before embedding has been made by Menyuk (1969) based on her production data.

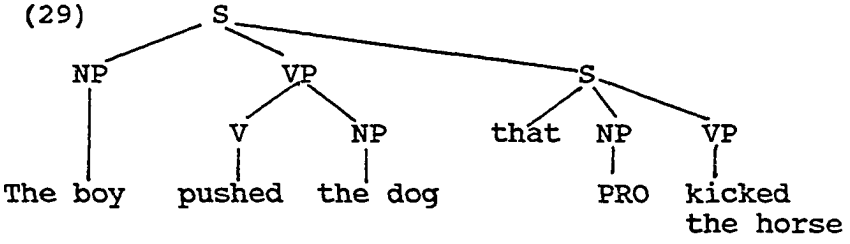
Solan & Roeper (1978) claim that children first learn S-attachment prior to VP-attachment for embedding. These authors studied children's errors on object relative clauses in sentences with the verbs put and push. Examples of their sentences are given in (28).

(28a) The boy pushed the dog that kicked the horse.
(b) The boy put the dog that kicked the horse in the barn.

Children made errors on the push sentence of making the boy, the sentence subject, do the kicking. On the put sentence, they did not make this error but instead were unable to determine who should do the kicking.

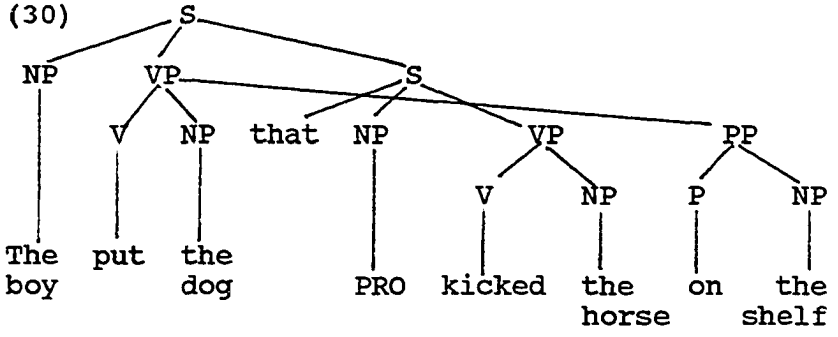
Solan & Roeper (1978) attribute the errors on the push sentences to S-attachment of the relative clause, as in (29).

(29)



On the put sentences, however, S-attachment would violate the no-tangle constraint. This is shown in (30).

(30)



Children who had demonstrated knowledge that put is subcategorized for a direct object did not make the error on the put sentence of having the relative clause modify the sentence subject. Instead, they chose not to interpret the relative clause. Solan & Roeper (1978)

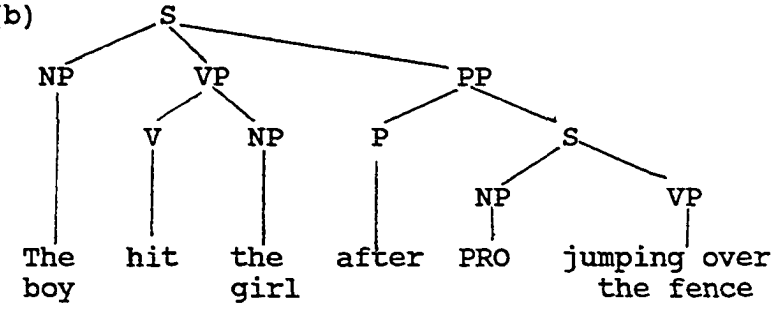
attribute this error to failure to attach the relative clause rather than violate a structural constraint.

Solan & Roeper (1978) conclude that these children are at an early stage for embedding in which they can only attach sentential complements (their words) to the highest node. They follow this pattern, however, only when it is not blocked by some structural constraint. In this latter case, the children are unable to interpret the relative clause because they do not have the option of attaching it to the VP node. These authors conclude that VP attachment is a later stage and that at this stage children can make use of the MDP as a strategy for interpreting the missing subject.

Hsu (1981; Hsu, Cairns, & Fiengo, 1985) proposed developmental stages of structural knowledge and interpretation of PRO for S-attached adjunct structures such as the sentence in (31) as well as for infinitival complements such as the sentence in (32).

(31). The boy hits the girl after jumping over the fence.

(b)



(32) The lion tells the pig to stand on the horse.

The first stage, termed the "subject-oriented strategy", involved use of a non-structural strategy of selecting the sentence subject as the subject of all verbs. A second stage, termed "object-oriented grammar", involved selection of the matrix object as the subject of the adjunct clause. Some of these children may have been using a strategy such as the minimal distance principle, since they selected the object NP even when it would be blocked by the c-command constraint. Other children in this group appeared to be basing their interpretations on structurally based principles of control. Hsu suggests that these children are overgeneralizing VP attachment to adjunct clauses and are then applying the c-command constraint to determine the controller of PRO.

A third stage, termed "mixed subject-object grammars", is a transitional stage in which children variably attach adjuncts to either the S or VP node. In the latter two stages, "approaching adult" and "adult" grammars, children have learned correct attachment.

The current study did not attempt to investigate children's structural analysis of infinitival complements with regards to coordination versus VP attachment of the complement. The issue is, however, not irrelevant to this study as the current project addressed children's knowledge of subcategorization constraints. As mentioned in section 1 of the overview, these constraints operate on sister constituents to the matrix verb. If children

either analyze sentences with infinitival complements as coordinated structures or if they analyze infinitives as S-attached adjuncts, then the infinitive clause would not be a constituent of the verb phrase. Subcategorization constraints would not, therefore, apply.

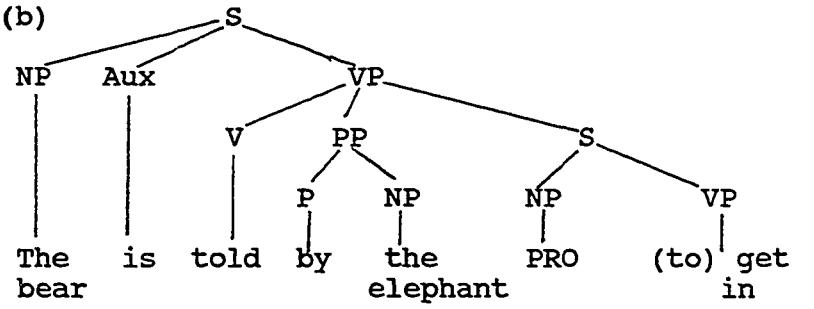
4. Development of Control

A study by Maratsos (1974) addressed the issue of whether children base their interpretations of complement structures on the principle of c-command. Maratsos compared interpretations of passive infinitives with the matrix verbs tell and ask to interpretations of active sentences with tell, ask, and promise. Examples of sentences with tell are given in (33) and (34).

(33) The monkey tells the dog to jump off.

(34a) The bear is told by the elephant to get in.

(b)



The 4 and 5 year-old subjects consistently selected the matrix object NP, the dog, as the complement verb actor in sentence (34a); but they selected the matrix subject NP, the bear, as the complement verb actor for the passive sentence in (34b). This latter response would not be consistent with the minimal distance principle.

Of interest here is that the prepositional by-phrase blocks c-command of the PRO complement subject by the closest NP, the elephant. The children selected the only c-commanding NP, the bear, as the antecedant of PRO.

Another study by Goodluck (1981) included interpretations of both active and passive infinitives with the matrix verbs tell and ask. Goodluck also found that 4 year-old children selected the matrix object as complememt verb actor for active infinitives but selected the matrix subject as complement verb actor for passive infinitives. She related this response pattern to principles of control and knowledge of the c-command constraint on control. As discussed above, tell is an obligatory control complement so that the complement subject must be controlled by an NP of the matrix clause. Apparently by age 4 years, children have learned that the matrix object NP is the obligatory controller of PRO. In passive infinitives such as (34), however, the matrix object is blocked from controlling PRO by the c-command constraint. By age 4 years, children show knowledge of this constraint and select the matrix object as the controller of PRO.

At this point in development, children seem to be operating under a constraint that limits the referant for the complement verb actor to an NP within the matrix clause. Most infinitival complements involve obligatory control; the exception to this would be a verb like say,

which has not been included in prior studies. Maratsos (1974) investigated whether children could be induced to select a non-mentioned actor to perform the complement verb action. He presented infinitives of the form [Noun-Verb-to-Verb] with the matrix verbs ask and tell, as in (35), to 12 children aged 4 and 1/2 to 5 and 1/2 years of age. (The sentences with tell were thus ungrammatical.)

(35a) John asks to sit down.
(b) *Susie tells to get in the truck.

The children consistently selected the matrix subject as complement verb actor for the ask sentences; that is, they knew that these sentences involved obligatory subject control. The responses to the tell sentences varied among the subjects. Eight of the children selected a non-mentioned NP as complement verb actor; three of the children selected the matrix subject as complement verb actor; the remaining child gave mixed responses.

It is not clear from Maratsos' study (Maratsos, 1974) what children thought about the tell sentences. They may have accepted these sentences as grammatical or they may have known that the sentences were ungrammatical and still have attempted to interpret them in response to the examiner's request.

Studies of sentences of the form "John is easy to see" show a shift in children's selection of a sentence internal NP to selection of a non-mentioned referent for

a misssing complement subject. Chomsky (1969) included sentence (36) as an example of a sentence in which underlying grammatical relations are not explicit in surface structure.

(36a) The doll is easy to see.
(b) The doll$_i$ is easy S[PRO$_j$ to see e$_i$]

In this sentence, the doll is the surface subject of the matrix sentence, but has the grammatical role of direct object for the complement sentence.

Chomsky (1969) presented a blindfolded doll to each child. She first asked the child, "Is the doll easy to see or hard to see?" and then requested the child to "make the doll easy/hard to see". Using this procedure, she found that 5 year-olds misinterpreted the sentence and selected the doll, the surface subject, as the referent for the complement subject; that is, they responded that the doll was "hard to see" and made the doll do the seeing by removing the blindfold. Children aged 6, 7, and 8 years gave mixed responses involving either the sentence subject or a non-mentioned noun as referent for the complement subject. Not until 9 years of age did all children correctly interpret the sentence with an outside noun doing the complement verb action.

Cromer (1970) further studied the interpretation of this sentence type by children aged 5;3 to 7;5. He included two types of adjectives: S-type adjectives like glad for which the complement subject is coreferential with the sentence subject as in sentence (37); and O-

type adjectives like easy for which the complement subject is not coreferential with the sentence subject as in sentence (38).

(37a) The wolf is glad to bite.
(b) The wolf$_i$ is glad S[PRO$_i$ to bite PRO$_j$]

(38a) The wolf is easy to bite.
(b) The wolf$_i$ is easy S[PRO$_j$ to bite PRO$_i$]

Cromer (1970) identified three groups of children, which he interpreted as representing successive developmental stages. The first group of "primitive rule users" consistently selected the mentioned animal, the wolf, as the one doing the biting. That is, they employed a strategy based on the surface ordering of constituents and selected the sentence subject as the antecedant of the complement subject.

A second group of "intermediate" children showed mixed responses to the O-type adjectives, randomly selecting either the mentioned noun or an outside noun as the referent of the complement subject. As did Chomsky (1969), Cromer (1970) interpreted this response as revealing uncertainty arising from having learned that the early rule has exceptions but not knowing when the earlier rule does not apply. These children were, however, cautious about breaking the "primitive rule" as evidenced by their making few errors on S-type adjectives.

Finally, a third group of children, the "passers", correctly and differentially interpreted the two

sentences. These children selected the wolf as the complement subject of sentence (36) and an outside agent as the subject of sentence (37). Cromer (1970) concludes that these children had knowledge of the correct underlying structures associated with each adjective.

Cromer (1970) analyzed these response patterns according to mental age on the Peaboby Picture Vocabulary Test. All of the children identified as "primitive rule users" had scored a mental age of less than or equal to 5;7. All of the children classified as "passers" scored a mental age of at least 6;8. The "intermediate" group showed the most variability in mental age score; ten had scored no more than 5;7 (as did the "primitive rule users") with the remaining eight scoring a mental age between 5;9 and 6;6 (less than the lowest scoring child classified as a "passer").

Further studies of the "John is easy to see" sentence type have reported lower ages than did Cromer (1970) for interpretations involving selection of a non-mentioned referant to act out the complement verb. Fabian-Kraus & Ammon (1980) investigated interpretations of this sentence type for O-type adjectives such as easy. In their study, 4 year-old children gave mixed responses to the sentences of selecting either the mentioned NP or a non-mentioned referant; the 5 and 6 year-olds correctly interpreted these sentences by consistently selecting a non-mentioned referant. It appears that even

the 4 year-old children allowed arbitrary reference for PRO.

In the previously cited studies by Hsu and her co-workers (Hsu, 1981; Hsu, et al., 1985), children manifested responses in which a non-mentioned referent was selected to act out the complement verb only in the approaching adult grammars. These children gave outside noun phrase responses to sentential subject sentences such as (39) for which the c-command constraint was not applicable.

(39) To have to push the lion scares the bear.

McDaniel, Cairns, & Hsu (1987) present evidence that very young children lack control. They presented the sentences in (40) and (41) to children aged 3;9 to 5;4.

(40) Grover tells Bert to jump over the gate.
(41) Grover touches Bert before jumping over the gate.

For the infinitival complement in sentence (40), two children allowed free reference; that is, they said that anyone could do the complement verb action. For the adjunct structure in (41), these same two children and three other children allowed free reference. All five of these children acted out these sentences by having the object NP perform the complement verb action; that is, they apparently preferred this interpretation.

McDaniel, et al. (1987) argue against the claim that linear strategies determine the controller of PRO. Instead, they suggest that these children, whose

interpretations would violate the c-command constraint on control, actually lack knowledge of control in these structures. Following Tavakolian (1977; 1981), these authors suggest that the children are analyzing the sentences as coordinate rather than subordinate structures. The c-command principle can, therefore, not be applied. The children respond to the experimental comprehension task by utilizing a strategy of selecting one of the mentioned NPs, either the subject NP, the object NP, or a mixed response. McDaniel, et al., (1987) further hypothesize that when children develop subordination, they follow the c-command constraint on control and do not violate this principle. Subordination seems to develop for complement clauses prior to developing for adjunct clauses.

McDaniel, et al., (1987) hypothesize four developmental stages for interpreting PRO. In stage (a), children do not use control for either complements or adjuncts and use a strategy for the experimental comprehension task; the mean age for these children was 4;1. In stage (b), children apply control to complements and adjuncts. They attach adjuncts as well as complements to the VP and select the object as controller of PRO for both structures in accordance with the c-command constraint on control. The mean age of these children was 4;8. Stage (c), with a mean age of 5;3, involved application of control with variable attachment

of adjuncts to the VP or S node; these children showed a mixed response to adjuncts of selecting either the subject or object as controller of PRO. Finally, at stage (d), there was correct attachment of adjuncts to the S node and use of principles of control to select the subject as controller of PRO. Only the three oldest children in the study gave responses consistent with this stage.

The present study investigated the development of control in complement clauses across a variety of matrix verbs that varied in their control properties. The study included one verb, say, that requires free reference as well as including matrix verbs that require obligatory control of the complement subject. Obligatory control structures included both subject and object controlled complements.

5. Overgeneralization in Language Learning

The phenomenon of overgeneralization has been well attested in the literature on language acquisition. One common example is the overgeneralization of the past tense marker -ed to irregular verbs leading to productions such as putted and eated. Children learn a rule for past tense marking and apply this rule across verbs rather than learning to mark past tense verb by verb. Additional evidence for the strength of this rule learning is seen in the abandonment of previously used irregular past tense forms (Brown, 1973).

Bowerman (1983) reported overgeneralizations of syntactic rules to exceptional verbs. These included dative movement, as in (42),

(42) *I said her no.

passivization, as in (43),

(43) *I don't like being falled down on.

and formation of lexical causatives, as in (44).

(44) *Do you want to see us disappear our heads?

Bowerman (1983) further notes that the overgeneralizations primarily occurred with frequently used, familiar verbs.

We would like to know how widespread a strategy overgeneralization is in language learning. That is, we would like to know whether rule learning and overgeneralization are used as a general mechanism for language learning or whether this process is limited to particular aspects of language. Overgeneralization has been reported in the learning of word meanings (Bloom, 1970), grammatical morphology (Brown, 1973), and syntactic rules (Bowerman, 1973). In the previously mentioned studies of infinitive development, there was evidence that children overgeneralize rules for interpreting the complement subject (Chomsky, 1969; Tavakolian, 1977). Tavakolian (1977) has also hypothesized that children overgeneralize an earlier acquired structural analysis for conjoining clauses to more complex syntactic forms.

As discussed above in section 3 of the overview, Hyams (1985) has differentiated between core and peripheral properties of grammar. Peripheral aspects are dependent on lexical properties of specific verbs and are therefore idiosyncratic to those particular verbs. Included within the peripheral aspects of grammar are aspects of subcategorization including infinitives with lexical subjects and complementizer choice. Hyams (1985) predicts that these aspects should be learned verb by verb in an error-free manner, that is with no errors of overgeneralization.

The phenomenon of overgeneralization presents a problem in language acquisition. The problem is that, once a child has inferred a generalized pattern and applied that pattern across verbs, it is not clear how the child can learn that the pattern has exceptions and identify these exceptions. The problem arises because the child does not recieve negative evidence about what constitutes ungrammatical sentences.

The lack of negative evidence for the language learner was first demonstrated in a study by Brown and his co-workers (Brown, Cazden, and Bellugi, 1968; Brown and Hanlon, 1970). These authors observed that parental approval and disapproval of children's utterances was not contingent on syntactic correctness, but related instead to truthfulness and semantic correctness. Children recieved approval for utterances that were ungrammatical

but truthful; and the mothers showed no difficulty in comprehending the ungrammatical utterances. As an example, Brown, et al., (1968) report the contingent response of "That's right" by Eve's mother after Eve had produced the ungrammatical sentence "He a girl" to convey that her mother was a girl. Conversely, Brown, et al., (1968) observed parental disapproval for grammatical utterances which were factually incorrect. As an example, they cite disapproval by Adam's mother in response to his saying "Walt Disney comes on on Wednesday" because the show was on a different day.

Hirsh-Pasek, Treiman, and Schneiderman (1984) further studied the issue of negative evidence available to the language learner. These authors suggest that more subtle negative feedback than explicit grammaticality judgments may be available to the language learner. Their study specifically investigated mothers' repetitions of the utterances of 2 to 5 year old children. They found that the mothers in their study did respond to ungrammatical utterances by more frequently repeating them than they did grammatical utterances and that the majority of these repetitions involved a correction of the child's error. However, this difference was significant only for the 2 year-olds and not for children aged 3 to 5 years of age. Considering that the utterances of the 2 year-olds would be more likely to show omissions of grammatical morphemes and to

be more blatantly ungrammatical than the utterances of the older children, this study demonstrated that mothers are not particularly sensitive to utterance grammaticality.

In her discussion of the no-negative evidence problem, Bowerman (1973) considers the possibility of subtle cues such as lack of listener comprehension and requests for repetition that might provide negative feedback to the child. She suggests that this feedback source would be insufficiently systematic to direct the child's attention to the overgeneralizations. She further suggests in the following passage that this feedback source would not provide information to the child about what was wrong with the child's utterance:

> Misunderstandings and what?_responses_have a great many causes (e.g., failure to hear, failure to command the necessary presupposed information, etc.). It would be a foolish child indeed who immediately questioned the grammatical correctness of her utterance in the face of such unfocused feedback. Further, even if she did at least at times suspect that the problem lay with her grammar, how would she determine which part of the sentence is the offender, and for what reason? (p. 31)

Bowerman (1983) also considers "indirect" negative evidence involving the non-occurrence in the adult input of forms predicted by the child's grammar. She suggests that this form of evidence may be available to the child for eliminating certain overgeneralizations, for example those involving the formation of lexical causatives as in (44) above. Bowerman (1983) observed that lexical

causatives such as broke and periphrastic causatives such as make disappear occur in different semantic-pragmatic contexts. She suggests that not hearing the expected lexical causative form for the verb disappear in situations involving direct causation while hearing the non-expected contrastive periphrastic form make disappear could lead the child in identifying this exception.

Bowerman (1983) further noted, however, that not all generalizations and exceptions show this complementary distribution pattern for different contexts. This type of indirect negative evidence would therefore not be available for identifying exceptions to all overgeneralizations.

In the absence of negative evidence, the child must use positive evidence to narrow down possible hypotheses about aspects of structure either as a means to avoid overgeneralizing or as a means to undo overgeneralized patterns and learn the exceptions. How children might use these data is not clear.

Most narrowly defined, positive evidence would consist of exposure to a particular linguistic form with a particular verb. Positive evidence of this sort would be insufficiently available for identifying all of the exceptions. More broadly defined, positive evidence would include exposure to evidence that has entailments for some other related aspect of language. For example, Hyams (1983) has suggested that English speaking children

will produce auxiliary and modal verbs only after they have learned that lexical subjects are obligatory. The problem for studying the process of langauge acquisition is to identify the triggering positive evidence.

Pinker, Lebeaux, & Frost (1987) in their investigation of passive acquisition frame the learnability issue by outlining swveral logically possible learning strategies that could be adopted by the language learner for making inferences about rules and their domain of application. One possible learning strategy, which they call "unconstrained productivity", involves the child's developing a rule which can apply productively and generally across a wide range of verbs. In the case of the passive, the child would freely passivize any verb which had been heard in active form in the parental input. A major problem for this strategy is the lack of negative evidence for eliminating exceptions from the domain of application of the rule.

A second possible learning strategy described by Pinker, et al., (1987) involves verb by verb learning based on input specific to each verb. This conservative strategy eliminates the problem of negative evidence since the child makes no generalizations. The problem here concerns productivity since any new instances of rule application must wait until it is heard in the input language. This is particularly problematic for structures that occur rarely in parental input. It is

also the case that adults have the ability to generate a structure with a novel verb; for example, adults can passivize a new verb that they had not previously encountered. An account of language learning would need to consider how children make the transition from an initial conservative learning strategy to later generative use.

Pinker, et al., (1987) suggest a third possible strategy which they call "constrained productivity". In this strategy, the child develops a general pattern but starts with a domain of application that is restricted based on semantic and phonological properties of verbs. Positive evidence from one verb could be used to generalize to application of a pattern to other verbs within a semantic or phonological class. Evidence would also be available to undo overgeneralizations resulting from too broad a domain through observing the semantic and phonologic similarities and differences among verbs. A particular problem for this strategy arises if the child's domain of rule application is too narrow. Accounts of acquisition would have to consider what positive evidence would be necessary to provoke the child to reconsider his initial hypothesis.

It is likely that the language acquisition process involves both conservative and productive learning strategies. Which strategy is used may relate to the particular aspect of language being acquired. That is,

the child may show a conservative approach for certain aspects of language and a productive strategy for other aspects of language.

The work of Bloom and her co-workers (Bloom, et al, 1980; Bloom, et al., 1984; Bloom, et al., 1987) suggests that children take a conservative approach to learning complementation. That is, they learn each complement form, including infinitives, verb by verb and do not make generalizations about applying complement forms across a wide range of verbs. In contrast, Limber (1973) claims that, once a child is commonly producing four-word utterances, the child will use new verbs in complement constructions. Limber (1973) also makes the claim that want serves as the model for infinitival complements so that new verbs would be treated like want. This suggests a productive learning strategy that would lead to overgeneralizations.

The present study investigated several aspects relative to the acquisition of infinitives. Results from previous studies suggested that the development of control would involve the learning of general patterns for interpreting infinitival complements. It was expected that children would show overgeneralization errors by applying the general rules for interpreting complement subjects across matrix verbs.

Two aspects of subcategorization were considered in the present study. These included attachment of nominal

objects to matrix verbs taking infinitives and choice of the complementizer for to head the infinitival complement. Children were expected to proceed cautiously in learning these aspects of grammar. The occurrance of underinclusion errors was therefore anticipated involving not producing nominal objects with verbs subcategorized for object NPs. Furthermore, it was anticipated that no errors would occur involving overgeneralization of these aspects to matrix verbs that could not take a nominal object or a for complementizer.

6. The Study

The present study investigated children's knowledge of infinitival complements. The aim was to ensure that the children's linguistic performance reflected their linguistic knowledge. Infinitives were, therefore, sampled in production, comprehension, and judgment tasks.

One concern of the study was a methodological one. I wanted to develop a procedure for eliciting productions of infinitival complements. I was concerned with the overall success of the task in eliciting this target sentence form and how the likelihood of eliciting infinitives would vary as a function of the specific matrix verb.

I wanted to know if learning proceeds conservatively verb by verb with later induction of a general pattern or if children form an early hypothesis about the general pattern for infinitives and apply this across verbs. If

the former conservative pattern were correct, I would expect children to produce few infinitives with unfamiliar verbs and to make few, if any, overgeneralization errors in producing and accepting sentences with infinitival complements. If the latter learning pattern were correct, I would expect a less cautious approach to infinitives with unfamiliar verbs and more errors.

Specifically I studied two areas of knowledge with respect to infinitive-taking verbs. I investigated both knowledge of control and knowledge of subcategorization constraints for object NPs and complementizers. Consistent with Hyams' claim, I expected no subcategorization errors involving overgeneralization. That is, I expected that subcategorization would be learned conservatively and slowly, verb by verb. However, based on previous studies, I did expect overgeneralization errors on control. I expected that the younger children would be restricted to obligatory reference involving subject control for sentences with only a subject NP and object control for sentences with an object NP in the matrix clause. I also looked for evidence of an early stage in which children do not know control.

I investigated children's knowledge of infinitival complements with lexical subjects. If Hyams' claim (Hyams, 1985), discussed in section 3 of the overview,

were correct, I would expect that children would learn infinitives attached to tell prior to infinitives attached to want. If Limber's claim, (Limber, 1973) discussed in sections 1 and 5 above, were correct, I would expect the converse.

Finally, I wanted to evaluate the status of children's responses on experimental comprehension tasks. Previous research has relied heavily on results of comprehension tasks for inferring children's structural knowledge. However, it is possible that these interpretation responses reflect strategies for coping with a difficult task. Even if these strategies do reflect linguistic knowledge, they may show preferred interpretations in the face of ambiguity. I, therefore, compared responses across the experimental tasks for specific verb types.

In the next chapter, the methodology is described. The results of the experimental tasks are then presented. The presentation of results considers both group data and performances of individual children. The issues outlined above are then discussed in chapter 5.

CHAPTER THREE

METHOD

1. Introduction

The present study investigated children's performance with infinitives on three experimental tasks: elicited production, comprehension, and grammaticality judgments. Within each task, sentences included matrix verbs from each of the six verb types discussed in section 6 of the Overview and listed in Table 1. Two verbs were selected for each verb type where possible. The matrix verbs are listed below. Verbs were selected from the lists of matrix verbs produced by young children in Bloom, et. al (1984) and Limber (1973). Where this was not possible, the verbs are underlined. It was expected that these underlined verbs would be less familiar to the children than were the other verbs, so we planned to insure understanding of these verbs in the course of the experiment..

I. want; like
II. tell; force
III. try; pretend
IV. ask; beg
V. promise; threaten
VI. say

Complement verbs were selected from lists of early verbs found in Bloom (1970) and Bowerman (1973). Only

verbs which could not take sentential complements were considered. There were eight complement verbs. Four of these were transitive and four were intransitive. Intransitive verbs included swim, sleep, fall, and stand up. Transitive verbs included hug, carry, find, and pick up. Each complement verb was used once with each matrix verb class.

Each child was seen four times. A language sample was obtained in an observation session scheduled prior to the experimental tasks. The child was then seen three times for the experimental tasks. The tasks were always administered in the same order: the production task in the second session, the comprehension task in the third session, and the judgment task in the fourth session.

2. Subjects

Subjects included 27 monolingual children ranging in age from 3 years; 7 months to 5 years; 4 months. Each child was currently attending a preschool program in suburban New Jersey. Subjects were divided into four half-year age groups as shown in Table 2. An individual listing of subjects is provided in Appendix A. There were also four adults who completed the production task.

3. Materials

Three dolls were used to act out the stories. The dolls were chosen for their familiarity to young children as judged by parents of three and four year old children.

The dolls include two Sesame Street characters, a Bert and an Ernie doll, and a Mickey Mouse figure.

A set was prepared to provide the scene for the stories. Areas of the set included a bed, a play area with a toy train, a road, and an area with a pool and steps.

4. Procedures

A list of the items for all three experimental tasks is included in Appendix B.

4.1. Production task

There were 30 items on the production task. To provide the context for eliciting the target sentences, stories were generated. Each story consisted of several simple sentences so that the target verb form was not modeled by the experimenter. The experimenter read the story to the child while simultaneously demonstrating the actions in the story. At the end of each story the experimenter started the target sentence by saying the subject noun and the matrix verb; the experimenter then asked the child to finish the story and restarted the target sentence saying only the sentence subject with rising intonation. An example is given in (1) below:

> (1) (Ernie and Mickey sitting; Bert standing, facing them) ERNIE, MICKEY AND BERT ARE PLAYING SCHOOL. BERT IS THE TEACHER. (Raise Ernie's hand) ERNIE RAISES HIS HAND. (Ernie to Bert:) "CAN I STAND UP?" ERNIE WANTS...YOU FINISH IT. ERNIE__^

Following the child's production, the experimenter asked the child to perform the actions in his sentence. This provided a comparison between the child's actual production and the child's intended meaning. The complete set of stories for the production task is given in Appendix C.

Story contexts were developed for each of two possible meanings. In one meaning, the actor of the main verb (the sentence subject) was also intended to be the actor of the complement verb action. These items will be referred to as Ac=Am (that is, the complement verb actor equals the main verb actor). In the example in (1) above, Ernie was the experiencer of the main verb (he wanted something) and was intended to be the agent of the complement verb (to do the standing). In another meaning, the complement verb actor was intended to be someone other than the main verb actor. These items will be referred to as Ac/Am (that is, the complement verb actor does not equal the main verb actor). In the example below in (2), Bert is the experiencer of the main verb (he wanted something) but Mickey was intended to be the agent of the complement verb action (to do the finding):

> (2) (Bert and Mickey standing; put Ernie under steps) ERNIE IS HIDING. (Make Bert look for Ernie) BERT CAN'T FIND ERNIE. (Bert to Mickey:) "PLEASE FIND ERNIE FOR ME." BERT WANTS...YOU FINISH THE STORY. BERT...^

A list of targeted story meanings for the production task items with sample infinitive sentences was privided in Appendix B.

For six of the items, the story created a context for an infinitive that would be ungrammatical in the adult grammar. For example, a story in which the complement verb actor was not intended to be the sentence subject might elicit a try sentence such as *Ernie tries Bert to fall. These items were included to allow for the possibility that the child's grammar would allow sentences that would be ungrammatical to adults. These items are starred (*) in Table 4. Additional items were generated to match these items with grammatical sentence targets. Each matrix verb was thus included in two stories that allowed potentially grammatical infinitival sentence targets.

Each complement verb type, transitive and intransitive, was used in one grammatical target sentence per matrix verb. The same complement verb was used for the matching grammatical and ungrammatical targets.

Prior to hearing the experimental items, each child was tested for vocabulary and trained on the task demands. On the vocabulary probe, the child was tested for the names of the three dolls, and on knowledge of the matrix and complement verbs. The probe for the verbs introduced the child to the act-out response. Any verb

that the child did not know was demonstrated by the examiner. There were five training items to demonstrate to the child the story format and the responses of completing the story and acting out the story ending. The vocabulary probe and instructions for the production task are given in Appendix D.

4.2. Comprehension task

There were 24 items on the comprehension task. To provide contextual support for determining the event within the experimental sentence, a situation was demonstrated and described. The complement verb action was then highlighted by asking the child a who question about that action. Following this question, the experimental sentence was told to the child.

In order to separate the test sentence from the preceding story, a puppet was used to "finish the story". The child was asked to repeat and act out the puppet's sentence. Repetition of the target sentence was included to help the child in achieving a mental representation of the target sentence. An example of an item on the comprehension task is given in (3) below:

> (3) (Bert, Ernie & Mickey sitting by toys)
> BERT, ERNIE AND MICKEY ARE PLAYING. IT'S BEDTIME NOW. (Examiner to Puppet) WHO WILL SLEEP? MICKEY WANTS TO SLEEP.

A complete set of stories for the comprehension task is given in Appendix E.

The comprehension items included two sentence forms, [NP-V-toV] and [NP-V-NP-to-V]. Each matrix verb was included in one sentence of each form. Each complement verb type was used once with each matrix verb. A list of the comprehension task sentences was provided in Appendix B.

Prior to recieving the experimental items, the child was trained for the task. The matrix verbs were reviewed to re-introduce the child to the act out task and to train the child to act out the matrix verbs. There were four training items. For three of the training items, the target sentence was a conjoined sentence with two actions to be performed. The fourth training item was a simple sentence with an indefinite pronoun subject to introduce the child to an ambiguous sentence that allows alternate interpretations.

The instructions and training items for the comprehension task are given in Appendix F.

4.3. Judgment task

There were 21 items on the judgment task. A list of these items was provided in Appendix B. The first 12 items tested the child's acceptance of the sentence forms [NVtoV] and [NVNtoV] for each matrix verb type. Items 13 and 14 tested the child's acceptance of redundant complement subjects. For each of these items, the examiner supplied a context for the event as in the comprehension task with a puppet 'saying' the target

sentence. The child was asked to repeat the sentence and then judge it as "right" or "wrong". These items provided information parallel to the information from the child's performance in production and comprehension. A sample item is given in (4) below.

(4) (Bert & Ernie sitting by toys) BERT AND ERNIE ARE PLAYING. IT'S BEDTIME. WHO WILL SLEEP, HARRY? BERT SAYS ERNIE TO SLEEP.

Judgments of for complements were included in items 15-18. Items 19-21 involved judgments of tensed complements with the complementizer that. As above, a story context was provided with the puppet finishing the story. The child was asked to repeat and then judge each item as 'right' or 'wrong'. The complete set of stories for the judgment task is given in Appendix G.

Prior to administration of the experimental items, four training items and four control items were provided. These items involved simple sentences and demonstrated various possible errors as well as correct sentences. The control items were included to insure that the child would give responses of both 'right' and 'wrong'. The instructions and training items for the judgment task are given in Appendix H.

5. Coding of responses

The language sample was collected during a conversation with the mother and was analyzed using the Developmental Sentence Scoring Analysis (Lee, 1974). The DSS analysis rates sentences on eight categories of

syntactic structure. Within each of these eight categories, types of structures have been delineated and are assigned a weighting according to their developmental appearance. Additionally, each sentence is scored for overall structural accuracy. This latter score helps to account for aspects of structure that are not analysed within the DSS system.

For the present study, the DSS analysis was based on a set of 50 consecutive sentences as suggested by Lee (1974). Children were rated according to their DSS scores. This allowed comparison of performance on the experimental tasks to overall language development as measured with the DSS as well as to chronological age.

Utterances produced on the elicited production task were coded into construction types as follows:

- single clause sentences
- two clause sentences
  - complex constructions
    - infinitival complements
    - tensed complements
    - quotation form utterances
    - participial complements
  - conjoined constructions
    - coordinated sentences
    - subordination

Elicited utterances were also coded for the presence of the lexical complementizers for and that.

Infinitival complements were further coded according to their surface form as [NVtoV] or [NVNtoV]. The acting out of the infinitive sentences was coded according to the actor of the complement clause and according to

whether the selected complement verb actor matched the story.

Only utterances that involved production of the targeted main verb and selection of the targeted actor were included in the group data analysis. Responses on the production task were separated according to whether the child had correctly interpreted the item, an ON-TARGET response, or had incorrectly interpreted the item, an OFF-TARGET response. To be judged as an on-target response, a response had to meet the following two criteria:

a. that the child repeated at least the targeted main verb at the start of his utterance;

b. that the child acted out the story by choosing the actor designated by the story to do the targeted complement action (regardless of whether the child had encoded that action).

Table 3 presents a sample item with examples of on-target and off-target responding for each of the criterion above.

On the comprehension task, the child's interpretation was coded according to the actor chosen for the complement verb. Only utterances which were correctly imitated were included in the group data analysis. A correct imitation involved production of the sentence subject, of the main verb, and of the second noun, if there was one. The complement verb did not have

to be correctly repeated as long as there was a semantically and structurally similar complement verb produced.

Responses to the judgment task were coded according to the correctness of the judgment. Accuracy of response was separately determined for the "right" and "wrong" judgments by the child. The child's correction of the sentence after a judgment of "wrong" was used to check against spurious responding. As with the comprehension task, only items correctly imitated were included in the group data.

CHAPTER FOUR

RESULTS

1. Introduction

In this chapter, the data from the experimental tasks will be presented. A word about the conventions is needed here. Sentences that would be ungrammatical to an adult have been marked with an asterisk (*) preceding the utterance. Sentences that would be grammatical but involve an inappropriate choice of complement verb actor for adult have been marked with an (x) preceeding the utterance. The remaining unmarked utterances would be both grammatical and correct with respect to complement verb actor selection to an adult. The complement verb actor is either underlined or is indicated in parenthesis following the utterance if a non-mentioned actor was selected.

These conventions were instituted to allow comparisons of the data to the assumed end-point of acquisition, the adult grammar. Consistent with these conventions and for ease of exposition, the term "error" was used in cases where the children's responses differed from that demonstrated by or predicted for adults. It was assumed throughout this thesis, however, that the

children's responses were consistent with their grammars and did not represent errors within the child grammars.

Throughout the presentation of results, the data were compared between age age groups. The children were also grouped according to their DSS scores. Comparisons between DSS groups did not show any developmental trends as did the comparisons between age groups. The DSS group comparisons were, therefore, eliminated from the presentation.

2. Production Task Results

Only utterances coded as on-target responses were included in the group data analysis. As stated in section 7 of the methods chapter, to be coded as an on-target response, utterances had to include the targeted main verb and had to be acted out by the targeted actor for the complement verb. Examples of on-target and off-target responses were provided in Table 3.

The overall percentage of on-target responses was 85% (638 responses out of a possible 750 items). This represents an average of 25.5 on-target responses per child out of a possible 30.

2.1. Types of Syntactic Constructions Produced on On-Target Responses

Table 4 lists the types of syntactic constructions and the percentage of each construction type produced in on-target responses for each age group and for the total sample. There were 426 infinitival sentences produced in

on-target responses, accounting for 57% of the total responses and 67% of the on-target responses elicited. The production task was, therefore, successful in eliciting the target construction type.

2.1.1. Relationship of Age to Construction Types Produced

Table 5 shows the mean number per child of each construction type for each age group. Children in age group I produced more single clause utterances than did children in the older age groups. Children in age groups II and III produced more coordinated sentences than did children in age group I, who produced none of this utterance type. Age groups III & IV produced more of each complement type, infinitival and tensed, than did the children in age groups I & II. All of these patterns are consistent with an increase in frequency of use of more complex constructions with age and development.

2.1.2. Construction Types Produced for Each Verb Pair

Want and Like

For both want and like, items with a transitive verb (items P2, find, & P3, carry, from Appendix B) were slightly less likely than items with an intransitive verb (items P1, stand up, & P4, swim, from Appendix B) to be encoded with a complex construction. This effect was entirely due to the production of single clause utterances and coordinated sentences by the two younger age groups on items P2 and s3. Sentences with transitive

verbs would be more complex than sentences with intransitive verbs because they involve an additional noun phrase. The increased difficulty of sentences with multiple noun phrases has been discussed in reviews of comprehension studies of multi-clause constructions (Goodluck & Tavakolian, 1982).

For both verbs the majority of utterances were infinitival complements. If a complex construction was produced, it was always an infinitive for want and usually an infinitive for like. Like was slightly less likely than want to be encoded with an infinitive. Like is also subcategorized for participial complements, and this form accounted for 13% of the utterances produced with like. Samples of an infinitival and participial complement with like are given in (1) and (2).

(1) "Bert likes to carry Mickey."
(2) "Bert likes carrying Mickey."

The low percentage of participial complement production is consistent with other reports (e.g. Menyuk, 1969) that this construction is later developing and infrequent. However, the adults in the present study also produced few participial forms. On the Ac=Am item with like (P2), there were no participial forms produced. On the Ac/Am item (P4), two of the adults produced participial forms embedded within the infinitival complement as in (3).

(3) "Mickey likes to have Ernie in the pool swimming with them."

It may be that this is merely an unpreferred form rather than a later developing one. There were no errors of producing participial complements attached to want.

Force and Tell

Force and tell were not treated alike by the children. The younger children tended to produce single clause utterances with force while producing only multi-verb constructions with tell.

On Ac=Am items in which the complement verb actor was the same as the main clause actor, there was a high percentage of infinitival complements produced with force. These infinitives were ungrammatical as in (4) below.

(4) *"Ernie forces to swim."

In contrast, Ac=Am utterances with tell involved mostly tensed complements with some quotation form utterances and few infinitives. Sample utterances with all three forms are given in (5)-(7).

(5) "Mickey tells Bert that he will pick him up."
(6) *"Mickey tells, 'I'll pick you up, Bert'."
(7) x"Mickey tells Bert to pick him up."

Table 6a shows the percentage of each complex construction type produced with tell according to age group. Two trends were noted on the Ac=Am item. Age group II showed a shift to increased production of infinitives with few tensed complements and no quotation form utterances. These infinitives were ungrammatical

and will be discussed in section 4. Aside from this shift, there was a general age trend towards the adult percentages of producing fewer infinitives (shown by age group IV), more tensed complements (shown by age group IV) and more quotation form utterances (shown by age groups III and IV). Sample items were given above in (5)-(7).

On the Ac/Am item, in which the complement verb actor was different from the main verb actor, the following was noted in Table 6a. Age group III produced only infinitives. For the remaining child groups and for the adults, infinitives were the preferred form but other multi-verb forms were also produced. The two younger age groups as well as the adults produced quotation form utterances as an alternate to production of infinitives; age group IV used tensed complements as an alternate form. Samples of each construction type are given in (8)-(10).

(8) "Ernie tells Bert to go to bed."
(9) "Ernie tells Bert, 'You should go to sleep'."
(10) "Ernie tells Bert that he has to go to bed."

Say

As shown in Table 6b, the most frequently produced complex construction type with say by the younger age groups was infinitival complements. Production of infinitives showed a drop by age group IV with no infinitives produced by the adult group. Age group III

children were equally likely to produce tensed complements as quotation form utterances; children in age groups I and IV produced more tensed complements than quotation form utterances. Only age group II showed a higher percentage of quotation form utterances than tensed complements, as did the adult group. For the adults, quotation form utterances were the preferred sentence type. Samples of all three utterance types are given in (11)-(13).

(11) "Ernie says to hug Mickey." (Bert)
(12) "Ernie says 'Hug Mickey'." (Bert)
(13) "Ernie says Bert should hug Mickey.

Pretend and Try

Try is only subcategorized for infinitival complements, which accounted for all of the complex utterances. Pretend is subcategorized for tensed complements as well as for infinitival complements. As shown in Table 6c, these two forms were produced with equal frequency on Ac=Am items by all age groups except age group II. As did the adults, age group II produced a higher percentage of tensed complements than infinitival complements. On the Ac/Am item, according to Table 6c, the majority of utterances were tensed complements with few infinitives produced by age groups II, III, and IV or by adults. Only age group I produced a slightly higher percentage of infinitives than tensed complements.

Ask and Beg

The younger children produced fewer multiverb constructions with beg than with ask. If a multiverb construction was produced with beg, it was an infinitive.

Infinitival complements were the major construction type produced with ask, but there were also quotation form utterances and subordinate constructions with if. Table 6d shows the relative percentage of each complex construction type produced with ask for each grammatical relation condition for all subjects and for each age group. Infinitives were the preferred form on Ac/Am items. On Ac=Am items, however, the subordinate constructions with if were overall as frequently produced as infinitival complements. There was also an age trend for the children of increasing use of the subordinate construction form and decreasing use of the infinitive form; although adults used the two forms equally frequently.

These results are consistent with there being two interpretations for ask, as suggested by C. Chomsky (1969). One interpretation is for requesting permission to do an action. Many of these utterances would be ask if sentences. Sample utterances are given in (14).

(14a) "Bert asks if he (Bert) can pick him up."
(b) "Bert asks to pick Ernie up and put him into bed."
(c) "Bert asks 'Mickey, can I pick Ernie up?'."

The other interpretation is for politely telling someone to do something. Samples utterances for this meaning are given in (15).

(15a) "Mickey asks Ernie to get his foot up."
(b) "Mickey asks Ernie, 'Sit up'."

Promise and Threaten

Even the oldest children had difficulty encoding the verb threaten in complex utterances. The two younger age groups produced mostly single clause utterances on all items with threaten; the two older age groups had difficulty mostly with the item having a transitive verb. If a multiverb utterance was produced, it was an infinitival complement.

Promise is subcategorized for tensed complements as well as for infinitives. Table 6e shows the percentage of each complex construction type produced with promise for each age group. On the Ac=Am item, the two younger age groups produced mostly infinitives with fewer tensed complements; whereas the two older age groups produced mostly tensed complements with fewer infinitives. The adult group did not continue this trend but produced only infinitival complements with no tensed complements produced. Sample utterances are given in (16).

(16a) "Bert promises to hug Ernie."
(b) "Bert promises he will hug Ernie.

On the Ac/Am item with promise, the majority of utterances were tensed complements with infinitives being

ungrammatical but produced by the younger children. Sample utterances are given in (17).

(17a) x"Ernie promised Mickey to hug Bert."
(b) "Ernie promises that he (Mickey) can hug Bert."

2.2. The Structure of Infinitives Produced on On-Target Responses

2.2.1. Infinitives produced on Ac=Am items

Table 7 shows the major infinitive types and the percentage of each type produced on Ac=Am items.

[Nm-Vm-to-Vc]

The major form of infinitives produced on Ac=Am items was [Nm-Vm-to-Vc] with Nm, the mentioned noun, as the complement verb actor. Examples of grammatical sentences are given in (18)-(21).

(18) "Ernie wants to stand up."
(19) "Bert tries to fall in the pool."
(20) "Bert asks to pick him up."
(21) "Mickey promises to go to sleep."

This form accounted for 92% of the infinitives produced on Ac=Am items and was produced with all main verbs. Of the 208 infinitival complements produced, 81% were grammatical and 19% were ungrammatical. The ungrammatical productions included unallowable sentences with force and tell and errors in selecting the complement verb actor with say. Examples are given in (22)-(24).

(22) *"Mickey tells to pick up Ernie."
(23) *"Ernie forces to go in the water."
(24) x"Bert says to pick up Ernie."

Sentences such as (22) and (23) are unallowable with force and tell because these verbs require a direct object which must control the complement subject position. There were only four infinitives of this form produced with tell, and these were produced by children in age groups I and II. There were 17 of these productions with force and these were produced by children in all age groups.

The [Nm-Vm-to-Vc] sentence form, as in (24), is allowable with say but not with Nm performing the complement verb action. Say is an exception to this general pattern and has the property that the complement subject position is uncontrolled so that an outside non-mentioned actor would do the complement verb action. There were nineteen of these subject selection errors with say by children in all four age groups. These will be further discussed in section 3.5.

[N1-Vm-N2-to-Vc]

The next most common form produced on Ac=Am items was [N1-Vm-N2-to-Vc] with N1 as the complement verb actor. There were 8 productions of this form, accounting for 3% of the infinitives on Ac=Am items. All four grammatical productions of this form occurred with the verbs ask and beg. Examples are given in (25)-(26).

(25) "Bert asks Mickey to hold Ernie."
(26) "Ernie begs Bert to swim."

These grammatical infinitives were produced by children across all the age groups.

Of the four ungrammatical productions, three were produced with tell by children in age groups I and II and one was produced with want by a child in group III. Examples are given in (27)-(28).

(27) x"Mickey tells Bert to pick him up."
(28) x"Ernie wants Bert to stand up."

These ungrammatical utterances involve allowable sentences but incorrect choice of N1 for the complement subject, since both of these verbs would require N2 to be the complement verb actor (although this is based on different structures for the two verbs).

Coindexed nouns

There were only four productions involving a second noun coindexed with the sentence subject. These utterances violate Principle C of Chomsky's binding conditions (Chomsky, 1981), which states that a lexical NP cannot be coindexed with an NP that c-commands it. These utterances were produced by children in age groups II, III, and IV.

Two of these utterances were of the form $[N_i\text{-Vm-}N_i\text{-to-Vc}]$ as in (29) and (30) with the verbs want and threaten.

(29) *"Ernie$_i$ wants Ernie$_i$ to stand up."
(30) *"Bert$_i$ threatens Bert$_i$ to fall."

Another production with threaten, given in (31), involved a direct object and was of the form $[N_i\text{-Vm-}N_j\text{-}N_i\text{-to-Vc}]$.

(31) *"Bert$_i$ threatens Ernie Bert$_i$ to fall."

The remaining production with beg, given in (32), involved a for complement and was of the form [N_i-Vm-for-N_i-to-Vc].

(32) *"Ernie$_i$ begs for Ernie$_i$ to swim."

This sentence form with coindexed lexical NPs was produced rarely in the child utterances but not at all by the adults. Its occurrance was limited to a specific age group from 4;4 to 5;2 and was not found in the samples of younger or older children.

Reflexive pronouns coindexed with the sentence subject

Only two children, one each in age groups II and III, produced sentences involving a reflexive pronoun coindexed with the sentence subject and these sentences occurred with the verbs tell and force and are given in (33) and (34). (Adult subjects only produced this sentence form with force as they did not produce infinitives on the tell item.)

(33) "Ernie$_i$ forces hisself$_i$ to fall into here."

(34) "Mickey$_i$ tells himself$_i$ to go pick him up."

2.2.2. Infinitives produced on Ac/Am items

As shown in Table 8, there were three major infinitive forms produced on Ac/Am items. These three forms combined accounted for 86% of the infinitives produced on Ac/Am items.

[N1-Vm-N2-to-Vc]

The most commonly produced form was [N1-Vm-N2-to-Vc] with N2 as the complement verb actor. This form accounted for 56% of the infinitives produced on Ac/Am items. Of these, 93% were grammatical. Examples of grammatical sentences are given in (35)-(37).

(35) "Bert wants Mickey to find Ernie."
(36) "Ernie tells Bert to sleep."
(37) "Mickey asks Ernie to stand up."

There were no productions of this form with pretend or try and only one with say (and this could have involved an omission of the indirect object marker). The [N1-Vm-N2-to-Vc] form was thus not used with main verbs for which it would be unallowable as in the unattested utterance in (38).

(38) @*Bert tries Mickey to fall.

The [N1-Vm-N2-to-Vc] form was used with all other main verbs. The nine ungrammatical productions involved complement subject selection errors. Most of these occurred with the main verbs promise and threaten, as in (39) and (40), which require the complement subject position to be controlled by the sentence subject, N1, rather than following the general pattern of having N2 be the controller of the complement subject position.

(39) x"Ernie promised Mickey to hug Bert."
(40) x"Mickey threatens Ernie to fall."

The three complement subject selection errors with promise were given by children in age groups I and II. The four errors with threaten were given by children in all four age groups.

There were also two productions of [N1-Vm-N2-to-Vc] with a non-mentioned actor selected as complement verb actor. These occurred with the main verbs force and threaten and were given by children in age groups I and II. The sentences are given in (41) and (42).

(41) x"Mickey forces Ernie to fall into the water." (Bert)
(42) x"Mickey threatens Bert to fall." (Ernie)

In these two sentences, N2 is the direct object of the main verb (obligatory for force) but the complement verb action is performed by a non-mentioned entity.

[Nm-Vm-to-Vc]

The next most commom form produced on Ac/Am items was [Nm-Vm-to-Vc] with a non-mentioned referent as the complement verb actor. This form accounted for 20% of the infinitives produced on Ac/Am items and occurred with every main verb except threaten. 38% of these occurred with say, as in 45, and were grammatical. There were eight unallowable productions with tell and force, as in (43)-(45), produced by children in age groups I, II, and III.

(43) "Mickey says to swim." (Ernie)
(44) *"Bert tells to pick him up." (Ernie)
(45) *"Bert forces to hug Ernie." (Mickey)

These sentences were ungrammatical because these verbs require a direct object NP which must control the complement subject position.

The remaining fifteen [NVtoV] productions involved allowable sentences with selection errors for complement subject and were given by children in all four age groups, although this was somewhat verb dependent. Examples are given in (46)-(49).

(46) x"Bert wants to find Ernie." (Mickey)
(47) x"Ernie tries to fall into the pool." (Bert)
(48) x"Mickey asks to stand up." (Ernie)
(49) x"Ernie promises to hug him." (Mickey)

For complements

11% of the infinitives produced on Ac/Am items were for complements of the form [N1-Vm-for-N2-to-Vc] with N2 as complement verb actor. For complements were produced with all main verbs except pretend and promise, for which for complements would be unallowable. The children did produce 10 for complements with other verbs for which this complement type is also unallowable. These included three ungrammatical utterances with tell, four 4 with force, two with try, and one with threaten. Examples are given in (50)-(53).

(50) *"Mickey forces for him (Bert) to go."
(51) *"Ernie tells for him (Bert) to go to bed."
(52) *"Ernie tries for him (Bert) to fall."
(53) *"Mickey threatens for Ernie to fall."

Grammatical for complements were produced with the

main verbs want (1), like (1), say (3), ask (1), and beg (5). (The number of for complement productions with each verb are given in parentheses.) Examples are given in (54)-(56).

(54) "Bert wants for Mickey to find him."
(55) "Mickey says for Ernie to go in the water."
(56) "Ernie begs for Mickey to carry him."

For complements were, therefore, as frequently produced with verbs for which this complement type is not allowable as they were with verbs subcategorized for for complements.

There was an increase in production of for complements with age. There was only one production of a for complement by a child in age group I. There were three children who showed a tendency to produce for complement, and these three children accounted for 64% of the for complements produced. One of these children was in age group II and the other two children were in group IV.

2.3. The Form of Infinitives Produced with Each Verb

Table 9 gives the percentage of ungrammatical infinitives produced with each matrix verb. In judging an utterance to be ungrammatical with respect to adult grammar, both the form of the utterance and the intended meaning as demonstrated by the acting out of the sentence were considered. Ungrammatical utterances thus included interpretations of a produced sentence that would not be

allowable with that particular sentence form in adult grammar as well as unallowable syntactic forms.

Want

The majority of utterances with want as the matrix verb were grammatical. On Ac=Am items, the major infinitive form was [Nm-Vm-to-Vc] with Nm as the complement verb actor, as in (57).

(57) "Ernie wants to stand up."

On Ac/Am items, the major form produced was [N1-Vm-N2-to-Vc] with N2 as the complement verb actor, as in (58).

(58) "Bert wants Mickey to find Ernie."

There were several types of errors involving complement subject selection made with want as the matrix verb. The two youngest children produced infinitives of the form [Nm-Vm-to-Vc] with an unspecified NP serving as referent for the complement subject, as in (59).

(59) x"Bert wants to find Ernie." (Mickey)

One 4 year-old child produced the [N1-Vm-N2-to-Vc] sentence in (60) with N1 selected as complement verb actor.

(60) x"Ernie wants Bert to stand up."

This latter interpretation is inconsistent with an analysis of the complement structure in which N2 is the lexical subject for the complement verb.

There was also one production of [N_i-Vm-N_i-to-Vc], given as (61), by one of the older subjects in which the

two NPs were coindexed.

(61) *"Ernie$_i$ wants Ernie$_i$ to stand up."

Like

There were no ungrammatical infinitives with like on Ac=Am items, but one-fourth of the infinitives produced on Ac/Am items were ungrammatical.

As with want, there were two children who made the error of producing [Nm-Vc-to-Vc] with a non-mentioned referent performing the complement action as in (62);

(62) x"Mickey likes to swim." (Ernie)

however, the children making this error with like were two of the older children.

There were also two children, one each in age groups II and IV, who produced an indirect object attached to like, as in (63).

(63) *"Mickey likes to Ernie to swim."

Force

Almost all of the infinitives produced on Ac=Am items with force were ungrammatical as were one-fourth of the infinitives produced on Ac/Am items. There were many errors involving sentences without a direct object as well as errors in selecting the complement verb actor.

There were twenty sentences of the form [Nm-Vm-to-Vc] that did not include an object NP. On seventeen of these, the children made the sentence subject act out the

complement verb, as in (64), and these were produced by children in all four age groups.

(64) *"Ernie forces to go in the water."

Only three [Nm-Vm-to-Vc] sentences were produced for which a nonspecified referent was selected to perform the complement verb action, as in (65); these were produced only by children in the three younger age groups, aged 4;6 or younger.

(65) *"Bert forces to hug Ernie." (Mickey)

Overall, children tended to include the direct object on Ac/Am items while producing utterances without a direct object on Ac=Am items. There was one [N1-Vm-N2-to-Vc] sentence produced, given in (66), that involved a non-mentioned referent acting out the complement verb.

(66) x"Mickey forces Ernie to fall into the water." (Bert)

There were no utterances with force in which a child produced a direct object and allowed the sentence subject to act out the complement verb. Except for the one instance cited above in (66), whenever an object NP was produced, that NP was selected to perform the complement verb action.

There were five errors with force involving choice of complementizer. Four children produced sentences with a for complementizer attached to force. One of these productions lacked a lexical subject for the for complementizer. Examples are given in (67) and (68).

(67) *"Mickey forces for him (Bert) to fall into the water."
(68) *"Bert forces for to hug Ernie." (Mickey)

Tell

There were fewer ungrammatical productions with tell than with force, particularly on Ac=Am items. As with force, children made both errors involving lack of a direct object and errors involving complement actor selection. All but one of these errors, however, were produced by children in the younger two age groups.

There were eight productions of ungrammatical [Nm-Vm-to-Vc] sentences. Four of these involved the sentence subject performing the complement verb action, as in (69), and four involved a non-mentioned referent acting out the complement, as in (70).

(69) *"Mickey tells to pick Bert up."
(70) *"Bert tells to pick Mickey up." (Ernie)

There were three children who produced the direct object in the sentence [N1-Vm-N2-to-Vc] and selected the sentence subject to perform the complement verb action, as in (71).

(71) x"Mickey tells Ernie to pick Bert up."

There were thus fewer errors for tell than for force of omitting the direct object on Ac=Am items. There were subjects who produced tell with an object NP but who did not select this NP to perform the complement verb action.

There were three subcategorization errors of attaching for complements to tell, as in (72).

(72) *"Ernie tells for Bert to sleep."

Two of these were produced by one child in group II, the youngest child to produce _for_ complements, and one was produced by a child in group IV who had also produced a _for_ complement with _force_.

Say

Almost all of the infinitives produced with the matrix verb _say_ were of the form [Nm-Vm-to-Vc]. Nineteen of these involved subject selection errors of allowing the sentence subject to perform the complement verb action. _Say_ is an exception to a general pattern of subject control for [NVtoV] infinitives and has the property that the complemnt subject position is uncontrolled so that a non-mentioned actor would perform the complement verb action. Five of the errors occurred on item P11 (listed in Appendix B), as in (73), with three of thee responses being given by children in age group II. Fourteen subject selection errors occurred on item P13 (listed in Appendix B), as in (74), and were produced by children in all age groups with the majority (10) by children in age groups I and II.

(73) x"_Mickey_ says to stand up."
(74) x"_Bert_ says to pick up Ernie."

Of the five children making subject selection errors on item P11, all but one also made the subject selection error on item P13.

This pattern of different complement actor selection on items P11 and P13 reflects the biases built into the

two stories (see Appendix C). Item P11 is highly biased towards a non-mentioned actor's performing the complement verb action whereas item P13 is biased towards the mentioned actor's doing the complement action. The younger children allowed the [NVtoV] form with either the sentence subject or a non-mentioned actor coreferential with the complement subject; and their selection of complement verb actor was labile and influenced by pragmatic context.

There was also one error involving attachment of an object NP to say, given in (75), with the object NP performing the complement verb action.

(75) *"Ernie says Bert to hug Mickey."

Pretend

The only infinitive form produced with pretend was [Nm-Vm-to-Vc]. There were four errors involving allowing a non-mentioned entity to act out the complement verb as in (76).

(76) x"Bert pretends to carry Mickey." (Ernie)

Three of these were produced by children in age group I. There were no productions in which an object NP was produced.

Try

The majority of infinitives with try were of the form [Nm-Vm-to-Vc]. There was only one error of allowing an unspecified referent to act out the complement verb. This sentence, given in (77), was produced by a child in

age group I who had made the same subject selection error with pretend.

(77) x"Ernie tries to fall into the pool." (Bert)

As with pretend, there were no errors of producing an object NP with try. There were, however, two errors involving the production of a for complement with try as in (78).

(78) *"Ernie tries for him (Bert) to fall."

Beg

The main infinitive form on Ac=Am items with beg was the [Nm-Vm-to-Vc] sentence with a few [N1-Vm-N2-to-Vc] sentences, all showing selection of the sentence subject as complement verb actor. On Ac/Am items, the infinitives tended to be of the form [N1-Vm-(for)N_2-to-Vc], both with and without a for complementizer.

There were two errors on [NVtoV] infinitives by children in the older age groups in which the complement verb actor was a non-mentioned entity. An example is given in (79).

(79) x"Ernie begs to carry Bert."

There was one error involving coindexing the subject of the for complement with the sentence subject NP, as in (80).

(80) *"Ernie$_i$ begs for Ernie$_i$ to swim."

Ask

As with beg, the major infinitive form produced with ask on Ac=Am items was [Nm-Vm-to-Vc] with a few [N1-Vm-N2-to-Vc] sentences with the sentence subject performing the complement verb action. On Ac/Am items, children were more likely to produce [NVNtoV] without a for complementizer with ask than with beg.

There were three subject selection errors by children in age groups I and III on [Nm-Vm-to-Vc] sentences involving a non-mentioned NP acting out the complement verb. An example is given in (81).

(81) x"Mickey asks to stand up." (Ernie)

Promise

All infinitives produced on Ac=Am items were of the form [Nm-Vm-to-Vc]. On Ac/Am items, there were few infinitives produced; these included both the [Nm-Vm-to-Vc] form and [N1-Vm-N2-to-Vc] and involved errors in interpreting the complement verb actor.

Subject selection errors with promise were produced only by children aged 4;6 and younger. Two children produced an [Nm-Vm-to-Vc] sentence like that in (82) with a non-mentioned entity to perform the complement verb action.

(82) x"Ernie promises to hug him." (Mickey)

Three children produced [N1-Vm-N2-to-Vc] sentences with N2 as complement verb actor as in (83).

(83) x"Ernie promises Mickey to hug Bert."

There were no [N1-Vm-N2-to-Vc] sentences for which N1 was selected to perform the complement verb action.

Threaten

Few infinitives were produced with the verb threaten. [Nm-Vm-to-Vc] infinitives were only produced on Ac=Am items with the mentioned sentence subject as the complement verb actor. There were no errors of allowing a non-mentioned entity to act out the complement verb.

There were five subject selection errors on [N1-Vm-N2-to-Vc] sentences produced with threaten. Four of these involved selection of N2 to act out the complement verb, as in (84),

(84) x"Mickey threatens Ernie to fall."

and one involved an unspecified referent performing the complement verb action, as in (85).

(85) x"Mickey threatens Bert to fall." (Ernie)

As with promise, there were no [N1-Vm-N2-to-Vc] infinitives with threaten in which N1 was selected to act out the complement verb action.

There were two errors involving coindexing of the sentence subject with a second NP, as in (86) and (87).

(86) *"Bert$_i$ threatens Bert$_i$ to fall."
(87) *"Bert$_i$ threatens Ernie Bert$_i$ to fall."

There were also three errors involving production of a for complement with threaten. An example is given in (88).

(88) *"Bert threatens for Ernie not to push anymore"

2.4. Summary of Production Task Results

On items in which the complement verb actor was the same as the main verb actor (Ac=Am), the major infinitive sentence form was [Nm-Vm-to-Vc] with the sentence subject, Nm, selected to perform the complement verb action. This included productions with the matrix verb say involving subject selection errors. There were few [N1-Vm-N2-to-Vc] sentences with N1 as complement verb actor. There were also a few sentences with coindexed lexical NPs.

On items in which the complement verb actor was different from the main verb actor (Ac/Am), the predominate infinitive form was [N1-Vm-N2-to-Vc] with N2 as complement verb actor. This included productions with the matrix verbs promise and threaten involving subject selection errors. There were no errors of producing the [N1-Vm-N2-to-Vc] sentence form with verbs that cannot take object NPs. On the Ac/Am items, children also produced [Nm-Vm-to-Vc] sentences with a non-mentioned entity performing the complement verb action. This would only be grammatical for the matrix verb say, and this verb did show a higher percentage and number of these infinitives than was produced with any other verb.

There was only one child who made any errors in the complement type produced with a matrix verb. Lindsay,

aged 3;10, produced ungrammatical tensed complements with the matrix verbs force and beg.

Production of infinitives with for complements was limited to the three older age groups (with one exception). There were errors involving choice of a for complementizer for verbs that are not subcategorized for this complementizer.

There were no utterances in which an object NP was produced with a verb that does not take nominal objects. There were many errors of producing sentences without an obligatory object NP, particularly for the verb force, by children in all age groups.

There were many subject selection errors in which [Nm-Vm-to-Vc] sentences were interpreted by having a non-mentioned entity perform the complement verb action. Overall, there were more errors with tell than with want of producing [Nm-Vm-to-Vc] sentences with this outside NP interpretation.

The children produced few [N1-Vm-N2-to-Vc] sentences for which they interpreted N1 as performing the complement verb action. They made the expected error of selecting the object NP to act out the complement verb for the matrix verbs promise and threaten; and they produced no [N1-Vm-N2-to-Vc] sentences with N1 acting out the complement verb for either of these two verbs. Four children did produce [N1-Vm-N2-to-Vc] infinitives with ask or beg and interpret these sentences with either the

sentence subject or the object NP as complement verb actor.

3. Comprehension task results

Comprehension task items were listed in Appendix B. Sentences of the form [NVtoV] and sentences of the form [NVNtoV] are listed separately.

Comprehension responses were only scored if the child had acceptably imitated the target item. There were 31 responses in which a child failed to repeat the target sentence. These repetition failures were only given by children in age groups I and II (with a single exception). Four of them occurred on [NVtoV] sentences and 27 occurred on [NVNtoV] sentences. Items which were most problematic were the _say_ items, which involved _for_ complements, the _threaten_ items, which involved an unfamiliar verb, and the _promise_ items.

3.1. [NVtoV] sentences

Table 10 gives the number of subjects who selected the subject noun or a non-mentioned noun (hereafter termed an outside noun or ONP) to perform the complement verb action on [NVtoV] sentences. Excluding items that involved an unacceptable imitation or that were not acted out, 93% (272/293) of the responses involved selection of the mentioned noun (the sentence subject) as the complement verb actor. This response would be correct for all matrix verbs other than _say_, for which the

complement subject position is uncontrolled and must be an outside noun.

3.1.1. [NVtoV] items for which the selection of the sentence subject as complement verb actor was correct

98% (239/244) of the responses on correctly imitated items involved the correct selection of the sentence subject as complement verb actor. The five incorrect responses of selecting an outside noun as complement verb actor occurred on items with beg (1), ask (3), and threaten (1). (The number of responses is given in parentheses.) These responses were mostly given by children in the two younger age groups (4/5, with the remaining ONP response by a group IV child on the ask item).

3.1.2. Say

As stated above, say takes infinitives for which the complement subject position is uncontrolled. The correct response on the say items would thus involve selection of a non-mentioned actor to perform the complement verb action. The say items elicited the fewest selections of the sentence subject as complement verb actor; but still only 33% (16/49) of the responses involved the correct choice of an outside noun as complement verb actor.

The only age difference that may be present is that age group II showed the fewest ONP responses for say (22% compared to 33%, 37%, and 40% for age groups I, III, and

IV respectively). Only four children, one in each age group, gave ONP responses to both _say_ items.

3.2. [NVNtoV] sentences

Table 11 gives the number of subjects who selected either the subject or second noun on [NVNtoV] sentences. 92% (247/268) of the responses on items correctly imitated involved selection of the second noun as complement verb actor. This response would be correct for all verbs with the exception of _promise_ and _threaten_, for which the complement subject position is controlled by the sentence subject.

3.2.1. [NVNtoV] items for which the selection of the second noun as complement verb actor was correct

93% (210/226) of the responses involved the correct selection of N2 as complement verb actor.

Age groups I and II showed some difficulty in repeating the target sentences. There was one child in group I who correctly repeated only four of the twelve items. If this child is excluded, then responses for both age group I and II involved 14% (25/180) incorrect repetitions. Children in age groups III and IV gave only one incorrect repetition. The two _say_ items with _for_ complements account for twelve of the incorrect repetitions with the _promise_ and _threaten_ items accounting for another 6 incorrect repetitions.

The structure underlying the [NVNtoV] sentences is different for different verbs. Responses to these

different underlying structures will be reported separately.

Want and Like

The structure underlying the [NVNtoV] sentences with want and like involves a lexical subject of the complement, [N1-Vm S[N2-to-Vc]]. On the correctly imitated items, there were six incorrect interpretations of selecting the sentence subject as complement verb actor. This interpretation is not consistent with an analysis of N2 as lexical subject of the complement. Four of these errors occurred on want items and were made by children in age groups II and III. One of these children, in age group II, made the incorrect interpretation with both want and like. The remaining subject selection error was made by a child in age group IV.

There were also three incorrect repetitions of [NVNtoV] sentences with want in which the complement subject was omitted by children in age group I.

Tell and Force

The structure underlying the [NVNtoV] sentences with tell and force involves an object NP and a non-lexical complement subject that is coindexed with the object as in the sentence [N1-Vm-N2 S[PRO2-to-Vc]]. Four percent (4/94) of the responses involved subject selection errors. Four children in age groups I, II, and IV

interpreted the sentences by having N1 perform the complement verb action. Only three sentences were incorrectly imitated and three items were not acted out. The children thus did not seem to find these items difficult to interpret.

Ask and Beg

The structure underlying the [NVNtoV] sentences with ask and beg includes an object NP and a non-lexical complement subject that may be controlled by either the sentence subject or the object NP as in the sentence [N1-Vm-N2 S[PRO-to-Vc]. Most of the responses, 87% (40/46) involved selection of the direct object as complement verb actor as would be the correct response for verbs like tell with an obligatory object NP. Of the six interpretations involving selection of N1 to perform the complement verb action, five were given by children in age group II and over with an age of at least 4;5.

Promise and Threaten

The verbs promise and threaten take infinitives with a non-lexical complement subject that must be coindexed with the sentence subject as in the sentence [N1-Vm-(N2) S[PRO1-to-Vc]]. They can also take an optional object NP but this does not alter the controller of PRO. The correct response to the [NVNtoV] sentences with promise and threaten would involve selection of the sentence subject as complement verb actor. Only 12%

(5/42) of the responses involved the correct interpretation of the sentence subject as complement verb actor. The interpretation errors of selecting the second noun as complement verb actor were made by children in all four age groups. Of the five children who did select the sentence subject as complement verb actor on at least one of these items, four children were in age groups II, III, and IV and were aged 4;4 or older.

Say

As noted above, the younger children had difficulty with repeating the say sentences with for complements. On items correctly imitated, all responses involved selection of the object of the for complementizer as the complement verb actor.

3.3. Summary of Comprehension Task Results

The [NVNtoV] items were harder for the younger children than were the [NVtoV] items, as shown by the much larger number of [NVNtoV] sentences that were not correctly imitated. In particular, children in age group I had considerable difficulty with the for complement item with say. Of the remaining items, the most repetition errors on the [NVNtoV] sentences occurred on the items with promise, threaten, and want. Errors on this latter matrix verb were surprising as this verb has been one of the earliest reported verbs to take infinitival complements of this form.

Complement actor selection was consistent with the general pattern of making the sentence subject perform the complement verb action on [NVtoV] sentences and the second noun perform the complement verb action on [NVNtoV] sentences. There were, however, a large number of outside noun responses on the [NVtoV] sentences with _say_, although the majority of responses to _say_ did conform to the general pattern. As indicated above, this was not related to child age.

There were few selections of the sentence subject to perform the complement verb action on [NVNtoV] sentences. These responses were primarily given by the children in age group II or older. There were incorrect responses of selecting the sentence subject to act out the complement verb on [NVNtoV] infinitives with _tell_ and _force_. More surprising were the selections of the sentence subject as complement verb actor on [NVNtoV] sentences with _want_ and _like_.

3.4. Comparison of the Comprehension and Production Task Responses

The majority of the children's performances were consistent on the two tasks, although there were some children who did give apparently contradictory responses between the tasks. The comparisons of the two tasks for each verb pair are shown in Tables 12 and 13. Table 12 gives the comparisons of [NmVtoV] sentences on the two tasks; Table 13 gives the comparisons of [N1VN2toV]

sentences. Most of the matrix verbs were included in only one item for each grammatical relation condition on the production task or each sentence form on the comprehension task. Responses between the two tasks were therefore compared for each verb type rather than for individual verbs.

Many of the performances between the two tasks were identical; that is, the child selected as complement verb actor on the comprehension task only the referent that acted out the complement verb for the child's production of that form. In such cases, on the [NmVtoV] sentences, the child gave only Nm as complement verb actor on both tasks; and on the [N1VN2toV] sentences, the child gave only N2 as complement verb actor on both tasks.

There were other performances in which arbitrary reference (coded as Arb in Table 12) was allowed such that a non-mentioned entity, as well as a sentence internal NP, could perform the complement verb action. These occurred primarily on the [NmVtoV] sentences. The children selected an ONP referent - in some cases, in addition to selection of Nm - as complement verb actor. There were few performances in which a child allowed arbitrary reference on both tasks. Most of these performances involved arbitrary reference on the production task with a restriction to Nm as complement verb actor on the comprehension task. The current author concluded that these children allowed arbitrary reference

but had a preferred interpretation of having the sentence internal NP as antecedent for the complement subject.

There was only one instance of a child's allowing arbitrary reference on the [N1VN2toV] sentences. Ryan produced an [N1VN2toV] sentence with the matrix verb force for which he had a non-mentioned referent act out the complement verb and he selected N1 as complement verb actor on the comprehension task. The remaining performances with [N1VN2toV] sentences restricted the complement verb actor to a sentence internal NP. As reported above, the majority of the responses involved N2 as complement verb actor on both tasks. There were also a number of performances in which the child allowed either NP to perform the complement verb action (coded as MIX in Table 13).

The following terminology is used in reporting the interpretations on the production and comprehension tasks. A sentence internal NP selected to perform the complement verb action is referred to as an antecedant for the complement subject. Interpretions which allow a non-mentioned entity as complement verb actor will be referred to as involving arbitrary reference. This terminology does not assume or necessitate any particular claim about how a child analyzes the structure of the infinitival complements or about the principles on which a child bases the interpretation.

The comparisons for each verb pair are reported separately below.

Want and Like

On the [NmVtoV] form, twenty-one children showed identical performances of having Nm as antecedant for the complement subject on both tasks. There were four children (Dara, Colin, Kaitlin, and Jason) who allowed arbitrary reference; they selected only Nm as complement verb actor on the comprehension task but produced [NmVtoV] sentences for which they allowed an ONP as complement verb actor.

On the [N1VN2toV] items, sixteen children gave identical responses of selecting only N2 as antecedant for the complement subject on both the production and comprehension tasks. On the comprehension task, there were four children (Jerry, Becky, Kris, and Denise) who allowed either NP to be the antecedant for the complement subject on the comprehension task; they made N1 act out the complement verb on one [N1VN2toV] sentence with either want or like and selected N2 to act out the other [N1VN2toV] sentence. All four of these children produced at least one [N1VN2toV] sentence with want and/or like; and on these sentences, only N2 was selected as antecedant for the complement subject. One other child (Ryan) selected N1 as complement verb actor on the comprehension items with both want and like but produced an [N1VN2toV] sentence with want with N2 as actor of the

complement verb. This child's responses on the two tasks might seem to be discrepant, but is not so. He, like the four children above, allowed either sentence internal NP to be the antecedant for the complement subject.

There were three children who interpreted the [N1VN2toV] sentence form but appeared unable to produce the form with want or like. Stacey produced only single clause and coordinated sentences with these verbs. Lindsay produced only [NmVtoV] forms. Perry produced only [NmVtoV] with want and produced an indirect object with like ("Mickey likes to Ernie to swim."). All three of these children produced the [N1VN2toV] form with verbs other than want and like. As all three correctly interpreted [N1VN2toV] sentences with want and like by selecting N2 to perform the complement clause, it seems that they were able to interpret a sentence form that they did not produce.

Tell and Force

Only the [N1VN2toV] sentence form can be compared between the two tasks since ungrammatical [NmVtoV] sentences with tell and force were not included on the comprehension task. Responses to these two verbs are reported separately as the children treated the two verbs very differently. For both of these verbs, there were two [N1VN2toV] sentences each on the comprehension task; on the production task, there were two Ac/Am and one Ac=Am items .

Tell

Thirteen children gave identical performances on [N1VN2to] sentences with tell of having N2 act out the complement verb on both the production and the comprehension tasks. Five children allowed either N1 or N2 to be the antecedant of the complement subject. Three of these children (Stephanie, Nat, and Perry) produced [N1VN2toV] with either NP as complement verb actor while selecting only N2 as complemnt verb actor on the comprehension task. Two other children (Becky and Lindsay) selected either NP as antecedant on the comprehension task while producing [N1VN2toV] only with N2 as complement verb actor.

There were children who appeared unable to produce the [N1VN2toV] form with tell and yet were able to correctly interpret this form. Three children (Julia, Ryan, and Alanna) only produced [NmVtoV], and these productions included the meaning of a non-mentioned referent acting out the complement clause. Another child (Kaitlin) produced [NmVtoV] sentences with a non-mentioned referent as complement verb actor or produced the sentence in (89) with a reflexive pronoun coindexed with the sentence subject, who served as the complement verb actor.

(89) "Mickey$_i$ tells himself$_i$ to go pick him$_j$ up."

This child also appeared unable to produce the [N1VN2toV] form with the meaning that the complement verb actor would corefer with the object NP.

One other child (Kris) correctly interpreted the [N1VN2toV] sentences with tell but produced only a for complement with the N2 object of the for complementizer as antecedant for the complement subject.

Force

Fifteen children gave identical responses to the [N1VN2toV] sentences with force of having N2 act out the complement verb on both tasks. One child (Becky) selected either sentence internal NP, N1 or N2, as antecedant for the complement subject on the comprehension task but produced [N1VN2toV] only with N2 as complement verb actor. Another child (Ryan) selected only N1 as complement verb actor on the comprehension task, but allowed arbitrary reference for the [N1VN2toV] sentence that he produced.

Two children (Alanna and Kaitlin) correctly interpreted the [N1VN2toV] sentences with force but produced only for complements with this verb. Apparently, they (as did Kris above with tell) interpreted N2 as the subject of the complement clause rather than as the object of the main clause.

Six children correctly interpreted the [N1VN2toV] comprehension items but did not produce this form with force. Three of these children (Dara, Lindsay, and

Taylor) produced only single clause utterances with force. Three other children (John, Nat, and Kris) produced single clause utterances on the AC/Am items and produced [NmVtoV] with Nm as the complement verb actor. All eight of these children apparently interpreted a form that they did not produce.

Say

Only the [NmVtoV] sentence form is available for comparison between the two task since the ungrammatical [N1V N2toV] form was not included on the comprehension task.

There were three children (Stephanie, Kris, and Denise) who gave identical performances on the two tasks and showed consistent selection of the sentence subject as antecedant for the complement subject.

There were twelve children who allowed arbitrary reference. Three children (Daine, Nat, and Jay) selected either Nm or an ONP as complement verb actor on the comprehension task and produced [NmVtoV] sentences with either meaning as well. Two children (Julia and Stacey) selected either Nm or an ONP referent as complement verb actor on the comprehension task, but produced [NmVtoV] infinitives with only one of these meanings. Seven children produced [NmVtoV] with either the sentence subject or a non-mentioned referent performing the complement verb action, but on the comprehension task selected only one of these possible referents.

There were two children who appeared to give contradictory responses to the two tasks; but actually their performances on the two tasks are reconcilable. Alanna selected an ONP as referent for the complement subject on the comprehension task items but produced [NmVtoV] infinitives only with Nm as complement verb actor. Perry produced [NmVtoV] with a non-mentioned referent to perform the complement verb action but on the comprehension task selected only Nm. Both of these children allowed arbitrary reference so that anyone could act out the complement verb. Either choice of referent is, therefore, consistent.

Try and Pretend

Only the [NmVtoV] form is available for comparison since the ungrammatical [N1VN2toV] form was not included on the comprehension task.

Twenty one of the children gave identical performances on the two tasks of having only Nm perform the complement verb action. Four other children (Julia, Taylor, Nat, and Denise) allowed arbitrary reference on the production task, but they selected only Nm on the comprehension task.

Ask and Beg

On [NmVtoV] sentences, there were twelve children who gave identical performances on the two tasks of having Nm perform the complement verb action. One child

(Alanna) allowed arbitrary reference on both the comprehension items and in her own productions. That is, she selected either Nm or an ONP on the comprehension task to act out the complement verb and she produced sentences with both meanings as well. Three children (Kaitlin, Daine, and Jay) selected only Nm to perform the complement verb on the comprehension task but produced [NmVtoV] sentences with either Nm or a non-mentioned referent acting out the complement verb.

Three children (Stephanie, Becky, and Colin) did not produce [NmVtoV] utterances but produced [N1VN2toV] utterances with N1 as antecedant for the complement subject. Apparently they preferred the [N1VN2toV] form with an object NP but would have no problem interpreting an [NmVtoV] utterance without this object NP as also involving the sentence subject as antecedant for the complement subject.

On [N1VN2toV] sentences with ask and beg, only 6 children gave identical responses on both tasks of having N2 act out the complement verb. Seven children allowed either sentence internal NP as antecedant for the complement subject. Four of these children (Rachel, Casey, Colin, and Perry) selected either N1 or N2 as antecedant for the complement subject but produced this form only with one of these meanings. Three other children (Stephanie, Becky, and Nat) selected only N2 as

antecedant for the complement subject and produced [N1VN2toV] utterances with either meaning.

Only one child apparently interpreted the [N1VN2toV] form without being able to produce it. Kaitlin produced only [NmVtoV] infinitives with either Nm or an ONP to act out the complement verb. Five children (Jerry, Alanna, Daine, Jackie, and Jay) interpreted the [N1VN2toV] sentences with ask and beg by selecting N2 as antecedant and produced only for complements with these verbs.

Promise and Threaten

Performances on [NmVtoV] sentences for these two verbs are separately reported since threaten was an unfamiliar verb to most of the children and there were two items each on each task. Responses on the [N1VN2toV] items were grouped together because there was only one item per verb.

Sixteen children gave identical performances on [NmVtoV] sentences with the matrix verb promise of having Nm act out the complement verb. Two other children (Julia and Becky) allowed arbitrary reference on the production task but restricted their interpretations on the comprehension task. That is, they produced [NmVtoV] sentences with either Nm or an ONP referent for the complement subject but selected only Nm on the comprehension task items of this form.

Nine children gave identical performances of Nm performing the complement verb action on both tasks on

[NmVtoV] sentences with the matrix verb threaten. One child (Alanna) allowed arbitrary reference; she selected an ONP as complement verb actor on the comprehension task item and produced [NmVtoV] with Nm acting out the complement verb. The two youngest children neither produced the infinitive form nor interpreted it. On the comprehension task, they either did not act out the complement verb or omitted the complement verb on repetition. Nine children produced only single clause or coordinated sentences with threaten although correctly interpreting the [NmVtoV] sentence on the comprehension task. These nine children apparntly interpreted a form that they could not produce.

Four children gave identical performances on [N1VN2toV] sentences on both tasks of having only N2 act out the complement verb. Four other children (Stephanie, Jackie, Denise, and Perry) allowed either sentence internal NP to be the antecedant for the complement subject; they selected N1 as complement verb actor on the comprehension task but produced [N1VN2toV] sentences only with N2 as complement verb actor. One child (Daine) allowed arbitrary reference on the production task but restricted reference to a mentioned NP on the comprehension task. He produced [N1VN2toV] with either N1 or an ONP acting out the complement verb action but only selected either N1 or N2 on the comprehension task.

There were thirteen children who interpreted the [N1VN2toV] sentences by selecting N2 to perform the complement verb action but who did not produce infinitives of this form. Six of these children (Julia, Ryan, Dara, Taylor, Kris, and Jay) did not produce the [N1VN2toV] form with either promise or threaten. It seems likely that they were interpreting a form that they could not produce. The remaining seven children did produce some other multi-verb form with promise so we cannot conclude that they did not have the infinitive form with this verb. They did, however, interpret the [N1VN2toV] form with threaten and yet did not produce a multi-verb form with this verb.

4. Judgment Task Results

Nineteen subjects completed the judgment task. Of these, fifteen correctly judged all four of the control items and were included in the analysis of the judgment task results. These fifteen children included all five children in age group IV, three of four children in age group III, three of four children in age group II, and four of seven children in age group I. Judgments were only counted for items that had been acceptably repeated.

4.1. Judgments of [NVtoV] and [NVNtoV] Sentences

Judgment task items were listed in Appendix B. [NVtoV] items included items J1-J6; [NVNtoV] items

included items J7-J12. Ungrammatical sentences are marked with an asterisk (*).

Four subjects gave responses in which a target sentence was not acceptably imitated. Four of these unacceptable imitations were made by three children, two in age group IV (Jason and Jackie) and one in age group II (Alanna). All three children produced the [NVNtoV] sentence with promise as a for complement. Jackie also produced the [NVNtoV] sentence with ask as a for complement. One other child in age group I (Dara) did not acceptably repeat nine of the twelve items. On three of the [NVtoV] items, she changed the main verb to the modal s'posed; on the [NVNtoV] items, she either omitted the second noun or omitted the subject noun and main verb.

Tables 14 and 15 give the number of subjects who judged each of the [NVtoV] and [NVNtoV] items as "right" or "wrong". Table 16 shows the percentage of correct judgments on grammatical and on ungrammatical sentences.

Subjects were more likely to judge [NVNtoV] sentences as "right", regardless of grammaticality, than [NVtoV] sentences. As can be seen in Table 16, only 39% of ungrammatical [NVNtoV] items were correctly judged as "wrong" (so 61% were judged incorrectly as "right"); likewise there was a high percentage (94%) of correct "right" judgments to the grammatical [NVNtoV] items. This was in contrast to the higher percentage (57%) of

correct "wrong" judgments on the ungrammatical [NVtoV] sentence with tell. The percentage of "right" judgments on the grammatical [NVtoV] items was lower (83%) than for the gramatical [NVNtoV] sentences but still high. The children thus appeared to be biased towards answering with "right".

4.2. Judgments of Ungrammatical Sentences with Coindexed NPs

Sentences with coindexed lexical NPs are shown as items J13 and J14 in Appendix B. All of the children who correctly judged the four control items judged these items correctly as "wrong".

4.3. Judgments of For Complements

Sentences with for complements are shown as items J15-J18 in Appendix B. The percentage of correct judgments on the for complements is shown in Table 16. This data is based on fourteen of the fifteen children who correctly judged the control items as one of these children (Dara) did not correctly repeat any of the for complements. On the three grammatical for complements, 98% of the judgments were correct. One child incorrectly judged the for complement with like as "wrong". On the ungrammatical for complements, 54% of the judgments were correct; six children incorrectly judged this item as "right". One other child (in addition to Dara) did not correctly repeat the ungrammatical for complement with try.

4.4. Judgments of That complements

Sentences with that complements were listed as items J19-J21 in Appendix B. The percentage of children who gave correct judgments on that complement items is shown in Table 16. Only judgments on the want and say items were included as adults judged the that complement with like to be questionable. Only judgments from fourteen of the children wereincluded as Dara did not acceptably repeat any of the that complements. On the grammatical that complement with say, 93% of the judgments were correct. On the ungrammatical that complement with want, 70% of the judgments were correct with three children incorrectly judging this item as "right". Four children (in addition to Dara) did not repeat the stimulus sentence but produced an infinitive with want instead.

4.5. Summary of Judgement Task Results

There was an increase with age in percentage of children who correctly judged the control items.

Overall there was not a relationship with age for percentage of correct judgments. Age groups II and III had the lowest percentage of correct judgments, 72% and 75%, respectively, compared to 83% by age group I and 88% by age group IV. There was some relationship of correct judgments to age as the children who gave correct judgments tended to be in age groups III and IV. The only child who correctly judged all four of the [NVtoV]

items was in age group IV. The two children correctly judging [NVNtoV] items were in age groups III and IV. Seven of the children in age groups III and IV correctly judged the for complements with only one other child, in age group I, correctly judging these items. On the that complements, five children in age groups III and IV and one from age group I correctly judged the sentences.

There was a higher percentage of "right" responses on [NVNtoV] items than on [NVtoV] items. More children accepted the ungrammatical [NVNtoV] sentences than did the ungrammatical [NVtoV] sentences. This was not unexpected. Overall, there appeared to be a response bias towards judging the sentences as "right".

As noted above, correct judgments of both _for_ and _that_ complements was limited to children in age groups III and IV (with one exception). This judgment task result on for complements was consistent with the production task results in showing for complements to be a later development.

4.6. Comparison of Responses on the Production and Judgment Tasks

The comparisons between the production and judgment tasks are shown in Tables 17-19.

4.6.1. [NVtoV] sentences

Comparisons of performances on [NVtoV] sentences are given in Table 17. The majority of performances, particularly with the matrix verbs _want_, _try_, and

promise, involved both acceptance of the [NVtoV] form on the judgment task and production of this sentence form. With the matrix verbs tell, say, and ask, there were performances in which the child both rejected the [NVtoV] form and did not produce it. There were also performances in which a child produced the [NVtoV] form but had rejected that form on the judgment task. These are coded in Table 17 with an asterisk (*) to denote productions that were at variance with the child's judgments.

Comparisons between the tasks are separately reported below for each matrix verb.

Want

Fourteen of the children judged the [Nm-WANTS-to-V] sentence as "right" and also produced this sentence form. One child (John) judged this sentence form as "wrong" and yet produced a sentence of this form.

Tell

Three children (Kris, Stephanie, and Jerry) judged the [Nm-TELLS-to-V] sentence as "right" and produced this sentence form. Three other children who judged the [NVtoV] sentence with tell as "right" produced the [NVtoV] form with force, although not with tell (these productions are underlined in Table 17). There were two children who judged the [N_m-TELLS-to-V] form as "wrong" and did not produce this ungrammatical form; both of

these children produced [N1-TELLS-N2-to-V]. Two children (Alanna and Kaitlin) judged [Nm-TELLS-to-V] as "'wrong"' and yet produced this ungrammatical form. Four other children correctly judged the ungrammatical tell item as "wrong" and produced the [NVtoV] form with force but not with tell.

Say

Five children both accepted the [Nm-SAYS-to-V] item and produced a sentence of this form. Two children judged this item as "wrong" and did not produce the sentence form. There were three children (Alanna, Kaitlin, and Jay) who judged this item as "wrong" and yet produced a sentence of this form.

Try

Thirteen children both judged the [Nm-TRIES-to-V] item as "right" and produced a sentence of this form. Two children (Janine and Jerry) rejected this item and yet produced a sentence of this form.

Ask

Four children accepted the [Nm-ASKS-to-V] item and produced a sentence of this form. Five other children accepted the ask item and produced an [NVtoV] sentence with beg but not with ask. Three children judged [Nm-ASKS-to-V] to be "wrong" and did not produce this form. Only one child (Alanna) judged this item as "wrong" and yet produced a sentence of this form.

Promise

Thirteen of the children both accepted the [Nm-PROMISES-to-V] sentence and produced a sentence of this form. None of the children judged this from as "wrong".

4.6.2. [NVNtoV] Sentences

Comparisons for the [NVNtoV] sentences are given in Table 18. As with the [NVtoV] sentences, the majority of responses involved both accepting the sentence on the judgment task and producing that form. There were also performances in which a child both rejected this form and did not produce it. There were only two instances in which a child produced the form but rejected it on the judgment task. Comparisons for each verb are separately reported below.

Want

Ten children both accepted and produced an [NVNtoV] sentence with the matrix verb want. Two other children who accepted this form produced an [NVNtoV] form with like although not with want. There was one child (Jackie) who accepted the [NVNtoV] form with want but produced only an infinitive with an explicit for complementizer. One other child (Jason) accepted but did not produce the [NVNtoV] form with want; he produced

instead the [NVtoV] with an ONP referent for the complement verb actor. (This is coded as x on Table 18.)

Tell

Ten children both accepted and produced an [NVNtoV] sentence with the matrix verb tell. There was one child (Kris) who accepted the [NVNtoV] form with tell but produced only an infinitive with an explicit for complementizer. Two children (Alanna and Kaitlin) accepted the [NVNtoV] form with tell but produced only [N_m-TELLS-to-V] without a direct object (coded as x in Table 18).

Say

Four children correctly rejected the [NVNtoV] sentence with say and did not produce this form. There was one child (Stephanie) who accepted the ungrammatical [NVNtoV] form with say and also produced this form. One child (Jay) accepted the [NVNtoV] form but produced only grammatical sentences with a for complementizer.

Try

Six children both rejected the ungramatical [NVNtoV] sentence with try and did not produce this form. There was one child (Jay) who did reject the [NVNtoV] form with try but produced a sentence with a for complementizer. One other child (Alanna) accepted the ungrammatical [NVNtoV] form and produced an ungrammatical for complement with try.

Ask

Five children both accepted the [NVNtoV] sentence with ask and produced a sentence of this form. Two children accepted the [NVNtoV] sentence but produced only a sentence with a for complementizer; three other children who accepted the [NVNtoV] form with ask produced for complements with beg but not with ask. One child (Kaitlin) accepted the [NVNtoV] sentence with ask but only produced [NVtoV] with this matrix verb. There was also one child (Janine) who both rejected the [NVNtoV] with ask and did not produce this form.

Promise

There was only one child who judged the [NVNtoV] sentence with promise as "right" and produced a sentence of this form. One other child accepted this form but produced [NVNtoV] only with beg and not with ask. One child (Kaitlin) rejected the [NVNtoV] sentence with ask and did not produce it; she produced only the [NVtoV] form and allowed an ONP as complement verb actor. One child (Jay) rejected the [NVNtoV] form and produced a sentence with a for complementizer with ask. There was one child (Jackie) who rejected the [NVNtoV] form with ask but did produce this form.

4.6.3. For complements

Comparisons of productions and judgments of for complements is given in Table 19.

There was only one child, Jerry, who correctly judged the for complement items and did not produce any ungrammatical for complements. Two children who had judged all of the for complements as 'right', including the ungrammatical try item, produced at least one ungrammatical for complement. Kris produced a for complement with tell as the matrix verb and Alanna produced for complements with both try and force.

Only one child judged a for complement to be "wrong" but produced a sentence of that form. Jay correctly rejected the for complement with try but produced a for complement with try as the matrix verb as well as producing ungrammatical for complements with force, tell, and threaten. Two other children (Kaitlin and Jackie) who had correctly judged all four of the for complement sentences produced an ungrammatical for complement with force as the matrix verb.

5. Comparison of Data from the Three Experimental Tasks

In this section, the data from all three experimental tasks was used in two ways. The data was first combined for complement subject selection responses. The analysis looked for group interpretation patterns for each infinitive type and for particular verbs. This analysis is presented in section 5.1. The

data from individual children was then looked at for use of control principles and knowledge of subcategorization. These case studies are presented in section 5.2.

5.1. Complement Subject Selections

In the sections above, separate comparisons of the production and comprehension tasks and of the production and judgment tasks were presented. In this section, the complement subject selection responses from all three tasks were combined. Table 20 gives the interpretations of [NVtoV] sentences; and Table 21 gives the interpretations of [NVNtoV] sentences.

For this analysis, the interest was less on comparing responses and determining consistencies and contradictions among responses than had been the case for the comparisons above. Rather, the concern was to determine what each child allowed as possible referents for the complement subject for each matrix verb. The analysis used whatever data were available on each matrix verb for each of the infinitive forms. Some of the interpretations given in Tables 20 and 21 are based on data from all three tasks; some others of the interpretations might be based on data from a single task.

One additional explanation of the analysis is needed. If interpretations from two tasks were different or if the child gave two different interpretations on a single task, it was assumed that the child allowed either

interpretation. If the child selected a non-mentioned referent on any item on the three tasks, it was assumed that the child allowed arbitrary reference in sentences with that matrix verb.

Comparing the interpretations on the two infinitive forms listed in Tables 20 and 21 reveals an important difference in how the two forms were interpreted. With only two exceptions, the [NVNtoV] form was interpreted with a sentence internal NP as complement subject actor. In contrast, on the [NVtoV] sentences, arbitrary reference was allowed by at least one child on every verb.

On the [NVtoV] sentences, arbitrary reference was allowed most often (and correctly) with the matrix verb <u>say</u>. Seventeen children selected a non-mentioned referent for the complement subject at least once on [N_mVtoV] sentences with the matrix verb <u>say</u>. Nine of these seventeen children also allowed arbitrary reference on [NVtoV] sentences with another matrix verb as well. There were also six other children who did not allow arbitrary reference on [NVtoV] sentences with <u>say</u> but did select a non-mentioned referent for the complement subject on [NVtoV] sentences with matrix verbs other than <u>say</u>.

It can be seen in Table 21 that many of the responses on [NVNtoV] sentences involved allowing either of the mentioned NPs as antecedent of the complement

subject (coded as MIX). This variability in interpretation occurred as often on sentences with want and like, which do not have an anaphoric complement subject in the adult grammar, as with other matrix verbs. The lack of variability in interpretations on the say and try sentences seen in Table 21 is misleading; data on each of these two verbs were almost exclusively from a single item on the judgment task since children did not produce [NVNtoV] sentences with these verbs and ungrammatical [NVNtoV] sentences were not included on the comprehension task.

5.2. Case Studies Relating to Control

Six children were selected as case studies because they demonstrated patterns of interest. Three children (Dara, Julia, and Kaitlin) evidenced lack of control. Two other children (Stephanie and Dana) show some knowledge of control principles. One other child, Becky, is interesting because she lacks infinitives with lexical subjects.

Each of these children is presented in greater detail below. The children's own productions are indicated by quotation marks to distinguish them from interpretations of items on the comprehension and judgment tasks.

5.2.1. Dara (CA 3;8)

Dara allowed both the sentence subject and a non-mentioned entity as complement verb actor in infinitives with two matrix verbs (want and say) on [NVtoV] sentences, as in (1).

(1a) "Ernie wants to stand up."
(b) x"Bert wants to find Mickey." (Ernie)

For all other verbs, she selected only Nm as complement verb actor. She produced only the [NVNtoV] sentence in (2) with the matrix verb want; that is only with a matrix verb that takes a complement with a lexical subject.

(2) "Ernie wants Mickey to carry Bert."

On her attempts to repeat the [NVNtoV] sentences, she tended to omit N2 and also sometimes to omit the matrix verb as well. On the few [NVNtoV] sentences that were correctly repeated, she selected N2 as complement verb actor. Dara thus produced no sentences with both an infinitival complement and a nominal object. Furthermore, her quotation form sentences with tell, such as the sentence in (3), did not include a direct object.

(3) *"Ernie tells, 'You go to sleep'". (Bert)

To sum, Dara both allowed arbitrary reference for {NV [Pro...]} and did not allow two complements -- a sentential complement and an NP complement -- within a single sentence. The only instances of an N2 that she produced were when N2 was the lexical subject of the infinitive with the matrix verb want.

5.2.2. Julia (CA 3;10)

Julia allowed both the sentence subject and a non-mentioned actor to perform the complement verb action on [NVtoV] sentences with the matrix verbs tell and force, say, try and pretend, and promise as in the sentences in (4)-(6).

(4a) *"Mickey tells to do it, to pick Bert up."
(b) *"Bert tells to pick him up." (Ernie)

(5a) x"Bert says to do it."
(b) "Mickey says to go in." (Ernie)

(6a) "Bert tries to fall in the pool."
(b) x"Ernie tries to fall into the pool." (Bert is tripped by Ernie into the water)

She has not learned that, for most verbs, the complement verb actor must be the mentioned noun; that is, that the complement subject, PRO, must be controlled. She has also not learned that verbs like tell and force must have NP objects, so she produced unallowable sentences of the form [NVtoV] with these verbs, as in (4) above. The only [NVNtoV] sentence that she was produced was the one in (7) with want, in which N2 was the lexical subject.

(7) "Bert wants Mickey to find Ernie."

Julia also did not allow both an NP object and a sentence complement to occur within a sentence. She also did not produce an [NVNtoV] sentence with a PRO complement subject, although she did interpret [NVNtoV] sentences with tell by having N2 act out the complement verb.

5.2.3. Kaitlin (CA 4;6)

Kaitlin allowed arbitrary reference on [NVtoV] sentences with the matrix verbs force, say, ask and beg, and promise as in the sentences in (8) and (9).

(8a) x"Bert says to pickhim up."
(b) "Ernie says to hug Mickey." (Bert)

(9a) "Ernie begs to swim in the pool."
(b) x"Ernie begs to hold Bert." (Mickey)

She produced only the one [NVNtoV] utterance in (10) and this was with the matrix verb like; that is, with a lexical subject of the infinitive.

(10) "Mickey likes Ernie to swim."

She did, however, accept [NVNtoV] sentences with tell, ask, and try as well as with want. She interpreted [NVNtoV] sentences with the matrix verb pairs ask/beg and promise/threaten by having either N1 or N2 perform the complement verb action. On her interpretations of [NVNtoV] sentences with the other matrix verbs, she allowed only N2 as complement verb actor.

With tell, she produced a reflexive pronoun object when the sentence subject was the complement verb actor but omitted an NP object when the sentence subject was not the one to do the complement verb action, although she had judged this form to be ungrammatical. She also produced a tensed complement with tell that included a direct object that was coreferential with the pronominal

subject of the complement clause. These sentences are listed in (11).

(11a) "Mickey$_i$ tells himself$_i$ to go pick him up.
(b) *"Bert tells to pick Mickey up." (Ernie)
(c) "Ernie tells Bert that he should go to bed now."

Kaitlin seems to be avoiding utterances in which the antecedant of the complement subject PRO is the object; so she omits the object when the sentence subject is not the antecedant.

5.2.4. Stephanie (CA 4;4)

Stephanie restricted her productions of [NVtoV] sentences to the meaning of Nm performing the complement verb action. She allowed arbitrary reference in her interpretations of [NVtoV] sentences with the matrix verbs try and ask, choosing either the sentence subject or a non-mentioned noun to do the complement verb action. This is illustrated in (12).

(12a) "Mickey tries to find Bert."
(b) Ernie tries to stand up. (Bert is made to stand up by Ernie)

She produced [NVNtoV] sentences with both a lexical complement subject, as in (13), and with an NP object and anaphoric complement subject, as in (14).

(13) "Mickey likes Bert and Ernie to swim."
(14) "Bert tells Ernie to pick him up."

For sentences such as (13) above with the main verbs want and like, she always selected N2 as complement verb actor; this would be consistent with an analysis of

these sentence in which N2 was the lexical subject. On the items in which N2 was the object, her interpretations allowed either N2, as in (14) above and (16a) below, or N1, as in (15) and (16b) below.

(15) x"Mickey tells Bert to pick him up."
(16a) "Bert begs Mickey to carry him."
(b) "Bert asks Mickey to pick Ernie up."

Stephanie has learned that there are two different structures underlying the [NVNtoV] form and that this is a property of specific verbs. She differentiates the rules for control between the two infinitive forms by allowing arbitrary reference on the [NV{PRO-toV}] form and restricting [NVN{PRO-toV}] sentence to a mentioned antecedent. She has not learned how the control properties vary for specific verbs.

5.2.5. Dana (CA 4;1)

Dana produced [NmVtoV] with only Nm as the complement verb actor for all main verbs except say and including ungrammatical sentences with tell and force. With say, she allowed arbitrary reference. Samples of her [NVtoV] utterances are given in (17) and (18).

(17a) "Ernie wants to stand up."
(b) *"Mickey tells to pick Bert up."
(c) "Bert tries to fall into the water."

(18a) x"Mickey says to stand up."
(b) "Mickey says to swim." (Ernie)

Dana produced [NVNtoV] sentences, as in (19), with want and like, tell and force, and threaten.

(19a) "Bert wants Mickey to find Ernie."
(b) "Ernie tells Bert to go to bed."

(c) x"Mickey threatens Ernie to fall."

She allowed only N2 as complement verb actor for all of the matrix verbs except ask, for which she allowed either N1 or N2 as antecedent, as shown in (20).

(20a) Mickey asks Bert to hug Ernie.
(b) Mickey asks Ernie to fall.

Dana has learned the general pattern of obligatory subject control for [N_mV{PROtoV}] forms and object control for [NVN{PROtoV}]. She now seems to be learning the exceptions to these general patterns.

5.2.6. Becky (CA 5;2)

Becky restricted complement subject selection to Nm on the [NmVtoV] sentences with all matrix verbs except say. With this matrix verb, she allowed arbitrary reference in her interpretations although she did not produce this sentence form and rejected it on the judgment task. She allowed either mentioned NP, N1 or N2, to be the antecedent for the complement subject on [N1VN2toV] sentences, including the sentences with like. On [NVNtoV] sentences with want, she only made N2 perform the complement verb action. Samples are given in (21)-(23).

(21a) "Bert wants Mickey to find Ernie."
(b) Mickey likes Bert to fall.

(22a) "Ernie tells Bert to go to bed."
(b) Mickey tells Ernie to find Bert.

(23a) xMickey promises Ernie to swim.
(b) Mickey promises Bert to stand up.

Becky may have misanalyzed the infinitive sentences with like as having an NP object and an infinitival complement with an anaphoric subject. She has learned that PRO must be controlled but has not learned the rule for determining the antecedent for PRO.

5.3. Case Studies of Children Producing For Complements

Three children were selected (Jackie, Jay, and Alanna) who overgeneralized for complement production and produced ungrammatical sentences with for complements.

5.3.1. Jackie (CA 5;2)

Jackie produced for complements with want and like, ask and beg, say, try, force, and promise. Samples are listed in (24).

(24a) "Bert wants for Mickey to find Ernie."
(b) "Ernie begs for Mickey to carry him."
(c) *"Bert forces for Mickey to hug him."
(d) *"Ernie tries for Mickey to fall."

She produced only the two [NVNtoV] sentences in (25) with the matrix verbs force and threaten.

(25a) "Mickey forces Bert to fall into the water."
(b) x"Mickey threatens Ernie to fall."

She selected N2 as complement verb actor on [N1VN2toV] sentences with all matrix verbs except promise, for which N1 performed the complement verb action. Jackie did not produce an [NVNtoV] sentence with tell but produced only tensed complements with this verb, one of which did not have a direct object as shown in (26).

(26a) "Ernie tells Bert$_i$ that Bert$_i$ should go to sleep."
(b) *"Bert tells that my hands are full and can you pick up Mickey." (Ernie)

Jackie is overgeneralizing production of for complements. She produced few [NVNtoV] sentences and these were only produced with verb types for which she was also producing a for complement.

5.3.2. Jay (CA 5;3)

Jay produced for complements with the matrix verbs like, say, ask, tell and force, try, and threaten. Samples of his utterances are given in (27).

(27a) "Mickey says for him (Ernie) to swim."
(b) "Bert likes for Ernie to carry the cake."
(c) *"Ernie tells for him (Bert) to go to bed."
(d) *"Ernie tries for him (Bert) to fall."

The for complement attached to force in (28) did not have a lexical object of the for complementizer.

(28) *"Bert forces for to hug Ernie." (Mickey)

On the judgment task, he correctly judged the for complement items, including rejection of the ungrammatical sentence with try, although he had produced this form.

Jay produced [N1VN2toV] sentences, such as those in (29), with N2 as the complement verb actor with the matrix verbs want, tell, and force.

(29a) "Bert wants Mickey to find him."
(b) "Ernie tells him (Bert) to pick up Mickey."

He interpreted [N1VN2toV] sentences with all verbs except ask by selecting N2 to perform the complement verb action; on sentences with ask, he allowed either N1 or N2 to act out the complement verb action.

Jay has overgeneralized for complements and is learning this form as a general pattern rather than with particular matrix verbs. The only verb for which he allowed either NP as antecedent of the complement subject in [NVNtoV] sentences was ask and this verb was not produced in for complements. All other verbs - want, tell, and force - that he used in [NVNtoV] sentences were also used in for complements.

5.3.3. Alanna (CA 4;0)

Alanna produced for complements, such as those in (30), with say, beg, tell and force, try, promise and threaten as matrix verbs.

(30a) "Ernie says for Bert to fall."
(b) "Ernie begs for Mickey to carry him."
(c) *"Bert tells for Ernie to fall."
(produced as a correction on the judgment task)
(d) *"Ernie tries for Bert fall in water but he can't do it."

She accepted all for complement items, including the ungrammatical sentence with try.

Alanna produced [N1VN2toV] only with the verb want in the sentences in (31), but she allowed either N1 or N2 to act out the complement verb.

(31a) "Bert wants Mickey to find Ernie for him."
(b) x"Ernie wants Bert to stand up."

With tell and ask, she produced the ungrammatical sentences in (32) of the form [NVtoV] with an ONP performing the complement verb action although she rejected these sentences on the judgment task.

(32a) *"Bert tells to pick Mickey up cause his hands are full." (Ernie)
(b) x"Mickey asks to get off Mickey's foot." (Ernie)

Alanna is also overgeneralizing for complements rather than learning this complementizer with specific matrix verbs and she may be deriving the [N1VN2toV] form from this for complement form for most verbs. It is puzzling that want should be an exception to this.

6. Success of the Production Task in Eliciting the Target Form

6.1. Introduction

A goal of the present project was to develop a task for eliciting productions of infinitival complements with a variety of matrix verbs. A child might fail to produce infinitives for several reasons. The child might be unable to produce infinitives in general or with a particular matrix verb; the child might prefer some other sentence form with that matrix verb; or he might have problems with the elicited production task or with an item on the task.

As a first step in evaluating the story completion format as a means for eliciting utterances, the success in training children to the task demands was evaluated. Only one child, aged 4;0, was eliminated from the study

because he did not train to the task of producing an utterance that began with the NP-V modeled by the examiner.

To evaluate the production task further, criteria were determined for successful responding on the task. The rate of successful responding was determined according to subject characteristics, task variables (the grammaticality condition), and specific item content.

Responses on the production task were separated according to whether the child had correctly interpreted the story, an ON-TARGET response, or had incorrectly interpreted the story, an OFF-TARGET response. The criteria for on-target responding was outlined in section 7 of the Methods with an example provided in Table 3.

As previously reported, the overall percentage of on-target responses was 85% (638 out of 750 items) with an average of 25.5 on-target responses per child out of a possible 30. No subject gave less than 67% on target responses (20 out of 30 items).

6.2. Relationship of age to on-target responding

Table 22 gives the percentage of on-target responding and the mean number of off-target responses per child for each age group. As shown in this table, age groups III & IV produced more on-target responses than did age groups I & II.

6.3. Types of off-target responses

Table 23 lists the types of off-target responses with the number and percentage of each type. There were two major types of responses that were judged as off-target: misinterpretation errors and failing to act out an item. Fifty four of the responses were judged to be misinterpretation errors since the child chose an actor other than the actor designated by the story content to perform the complement verb action. On forty seven of the responses, the experimenter could not tell who the child had intended to be the actor of the complement verb. Of these, forty three involved a failure to act out the complement verb and four involved an ambiguous action.

6.3.1. Misinterpretation errors

Table 24 gives the mean number of misinterpretation responses according to age group. As shown, the two younger age groups made more misinterpretation errors than did the two older age groups or the adult group.

Table 25 shows the mean number of misinterpretation errors for each grammatical relation condition. As discussed above, items were divided into two grammatical relation conditions. In one condition, the complement verb actor was the same as the main verb actor (Ac=Am). In the other condition, the complement verb actor was different from the main verb actor (Ac/Am). As shown in Table 25, there were a higher number of misinterpretation

errors per item on the items in which the complement verb actor was different from the main verb actor (Ac/Am).

In Table 26, misinterpretation errors for each grammatical relation condition were separated according to age group. As can be seen from Table 26, all age groups were slightly more likely to misinterpret the item when the sentence subject (the actor mentioned by the examiner and the first mentioned noun) was not the targeted actor of the complement verb. This tendency to misinterpret the Ac/Am items was most prominent in the younger age groups.

Three items (P11, P16, and P30) accounted for one-third of the misinterpretation responses. These stories were given in Appendix C. On review, these stories do seem to be pragmatically odd. In item P11 with the main verb <u>say</u>, the targeted actor had to say to himself to stand up; children tended to interpret the story by having this actor tell someone else to stand up. In item P16, with the main verb <u>pretend</u>, the targeted actor had to pretend that someone else was doing an action; the children tended to interpret the item so that that actor pretended that he himself was doing the action. In item P30, with the main verb <u>threaten</u>, the targetted actor had to make a threat that he himself would fall; adults objected that this was not really a threat and they, like the children, had that actor make a threat that someone else would fall.

6.3.2. Failure to act out the Complement Verb

The two younger age groups failed to act out the complement verb much more frequently than did the two older age groups. Table 27 gives the mean number per child according to age group of responses involving failure to act out the complement verb.

Four items (P7, P17, P29, and P30) accounted for over one-half of these off-target responses. Once again, these stories were given in Appendix C. Of these, item P29, with the main verb pretend, was the only one that might bias the subjects towards not acting out the item since the complement verb would be a pretended action. Failure to act out the other three items was probably related to the unfamiliarity of the main verbs (either force on item P17 or threaten on items P29 and P30).

CHAPTER FIVE

SUMMARY AND DISCUSSION

1. Introduction

In this chapter, the findings relevant to each of the three experimental tasks will first be summarized and discussed. This will lead to discussion of the issues introduced in chapter 2, section 7, dealing with children's knowledge of subcategorization and control and with the basis for interpreting sentences on experimental tasks.

2. Summary of The Experimental Tasks

2.1. Production task

2.1.1. Elicitation of infinitives

The production task was successful in eliciting complement constructions in general and infinitival complements in particular. More than two-thirds of the children's responses involved a complement construction; more than half of their responses were infinitives.

Several trends in utterance type were observed. Children in the youngest age group produced the most single clause utterances. Children in the two older age groups produced a higher percentage of complement constructions than did the children in the younger two

age groups. Both of these trends were consistent with an increase in linguistic complexity with age.

The DSS score as a general index of language development was less sensitive to these developmental trends than was age. The two children in the lowest DSS group did produce the most single clause utterances. However, higher DSS scores were not related to a higher percentage of complement productions. Apparently, this measure of linguistic development does not accurately reflect the child's knowledge of clausal structure.

Although the percentage of complements in general did increase with age, there was no relationship between age and the percentage of either infinitival or tensed complements produced. Rather, the type of complement produced related both to the specific matrix verb and to individual preferences by the children. Matrix verbs that were also subcategorized for complements other than infinitives tended to elicit fewer infinitives. So, for example, fewer infinitives were produced with the matrix verb pretend, which is also subcategorized for tensed complements, than with the matrix verb try, which cannot take tensed complements.

The subcategorization properties did not account for all of the differences in the relative percentage of infinitives produced. There were verbs for which infinitives were grammatical and yet were apparently avoided in favor of another preferred sentence form. The

matrix verb say elicited few infinitives, even on the Ac/Am items for which the [NVtoV] form would be grammatical. Children and adults produced quotation form utterances or tensed complements in preference to producing an infinitive.

There was also considerable individual variation among children in their preference for tensed versus infinitival complements. For example, Julia produced infinitives on 29 of the 30 items, many of which were ungrammatical, and she produced no tensed complements. Lindsay, in contrast, produced the fewest infinitives, only 10, and produced the most tensed complements, 13, including several that were ungrammatical.

2.1.2. Overgeneralization versus caution in sentence production

All of the matrix verbs included on the tasks were subcategorized for infinitival complements. Only some of the verbs were also subcategorized for tensed or participial complements. Children produced no participial complements with matrix verbs that were not subcategorized for this complement type. Only one child produced a tensed complement with a matrix verb that was not subcategorized for tensed complements. This was Lindsay, the child previously mentioned as preferring the tensed complement form, who produced ungrammatical tensed complements with two of the less familiar verbs, force and beg. She may have been showing overgeneralization of

a preferred sentence form to unfamiliar verbs. There were no other instances of overgeneralization for complement type.

There were three predominate infinitive forms produced by the children. These included [NVtoV], [NVNtoV], and for complements. All children produced the [NVtoV] form; and this form was produced with every matrix verb type, including tell-type verbs - classified as +sf4 in Table 1 - which obligatorily take an object NP. Only children aged 4;6 and younger produced the [NVtoV] form with tell. Children in all age groups produced the [NVtoV] form with the unfamiliar verb force. In contrast, the [NVNtoV] form was restricted to only those verbs that can take object NPs - including tell-type verbs that obligatorily take object NPs (+sf4 in Table 1) and verbs such as ask or promise that optionally take object NPs (+sf3) - or that take lexical complement subjects (+sf1). There were no [NVNtoV] sentences produced with the other verb types that cannot take object NPs. Children thus did not overgeneralize object NPs to verbs that were not subcategorized for them; but they did show omissions involving not producing object NPs when they were required. In learning subcategorization for object NPs, children proceeded with caution and did not assume either that a matrix verb could take an object NP or that a verb could take an infinitive with a lexical subject.

All children produced the [NVtoV] form with the familiar matrix verbs want, try, and pretend. In contrast, the younger children produced many fewer infinitives with the unfamiliar verbs force and threaten and produced single clause utterances instead. Some of the children apparently proceded cautiously in producing infinitives with new verbs. That is, they did not assume generally that infinitives could be produced with any matrix verb.

For the [NVNtoV] form, there were children who produced this form with only one or a limited number of matrix verbs and did not produce this form with other matrix verbs. For some of these children, no judgment could be made about their knowledge of the [NVNtoV] infinitive form with the matrix verbs not used with this infinitive form since they produced an alternative complex form. There were other children for whom it was possible to conclude that they did not know the [NVNtoV] form with specific matrix verbs. These children produced [NVtoV] sentences with an ONP referent or produced single clause utterances in which the complement action was not encoded although it was acted out. Acquisition of the [NVNtoV] form thus proceeded verb-by-verb rather than being learned as a general form which could be used with all verbs. Children did not assume that a syntactic form learned with one verb could be used with any verb. This

demonstrates caution in the acquisition of a syntactic form.

For complements were produced as frequently with verbs that could not take a for complementizer as with verbs that were subcategorized for a for complementizer. Ungrammatical for complements were produced with the familiar verbs tell and try as well as with the unfamiliar verbs force and threaten. Children thus showed overgeneralization of complementizer choice for the complementizer for.

2.1.3. Meanings encoded by infinitives

Children produced the [NVtoV] form on both Ac=Am items and Ac/Am items. They thus produced this form with the meaning of a non-mentioned entity performing the complement verb action as well as with the meaning of the sentence subject performing the the complement action. The [NVNtoV] form was produced predominately with the meaning that the second mentioned noun acted out the complement verb action. There were also a few productions of [NVNtoV] form for which the sentence subject acted out the complement verb action. There were two instances in which a child produced the [NVNtoV] form with an interpretation that an outside NP acted out the complement (Arb in Table 18). I will have more to say about the interpretations below.

2.2. Comprehension task

Children in the two younger age groups gave more incorrect repetitions of [NVNtoV] sentences than of [NVtoV] sentences. These incorrect repetitions of the [NVNtoV] sentences usually involved omission of the second NP. This is consistent with the [NVNtoV] form's being a later development than the [NVtoV] form. I am not claiming here that sentence repetition reflects the children's knowledge of language. I am concluding that children would have more difficulty repeating a less familiar form and might assimilate a difficult item to fit a more familiar, previously acquired form.

Interpretations of the [NVtoV] items most often involved making the sentence subject perform the complement verb action. There were also interpretations in which a non-mentioned actor performed the complement verb action (Arb in Table 17). The majority of the Arb interpretations occurred on sentences with _say_ , for which this is the correct interpretation. There were also Arb responses to sentences with _beg_, _ask_, and _threaten_.

In contrast, all interpretations of [NVNtoV] sentences on the comprehension task involved selection of a mentioned NP to act out the complement verb. The majority of the interpretations involved selection of N2 as complement verb actor. There were few N1 selections. Usually when a child allowed N1 to be the complement verb

actor with a particular matrix verb type, that child also allowed N2 to be complement verb actor for infinitives with that verb type (coded MIX in Table 18).

The N1 interpretations of [NVNtoV] sentences occurred with all matrix verbs (except _say_ which was included in a _for_ complement). Most interesting were the N1 interpretations on [NVNtoV] sentences with _want_ and _like_ There were 6 children who allowed N1 to be the antecedant of the complement subject for _want_-type verbs. For these verbs, in adult grammar, the second NP is the explicit subject of the complement and there is no PRO subject to interpret. Selection of N1 as complement verb actor is not consistent with an analysis of [NVNtoV] sentence with _want_-type verbs in which N2 functions as the complement subject. It appears that these children may not have acquired exceptional case marking of the seccond noun as the complement subject. They, therefore, analyze these sentences as having an object NP and a PRO complement subject. This would be an overgeneralization of a structural analysis to verbs whose complement structure does not follow the general pattern. More will be said about this below.

Children's interpretations of the infinitive sentences on the comprehension task were compared to their productions and meanings on the production task. For all verb types except _say_, children's interpretations of [NVtoV] sentences on the comprehension task tended to

be more restricted than the meanings expressed in their own productions of infinitives. (See Table 17) Their interpretations were mostly limited to selection of the sentence subject (coded as Nm) as complement verb actor whereas the meanings expressed included outside NP referents for the complement verb actor (coded as Arb). The preferred interpretation of the [NVtoV] form was thus to have the sentence subject perform the complement verb action, and this preference was followed even by children who allowed arbitrary reference.

The variability in the meanings expressed by their productions of the [NVtoV] form can be explained by considering the interaction between the children's knowledge of infinitive structure and the production task itself. The children were presented with story contexts which involved the meaning of a complement verb actor that was not the sentence subject. In the absence both of knowing the [NVNtoV] form for a particular verb and of knowing that the [NVtoV] form was not allowable for the Ac/Am meaning, a child would be likely to use the [NVtoV] form to encode this meaning.

For the [NVNtoV] sentences, the comparison of the interpretations on the comprehension task and the expressed meanings on the production task were shown in Table 18. With tell and the ask-type verbs, there were children who allowed either mentioned NP as complement verb actor on one of the tasks (coded as MIX) while

restricting the interpretation or meaning to N2 on the other task. With the want-type and promise-type verbs, there were children who allowed the MIX interpretation on the comprehension task but only produced the [NVNtoV] form with the meaning of N2 as complement verb actor. The remaining children limited both their interpretations on the comprehension task and the meanings expressed in their productions to N2 as complement verb actor. The children therefore did not show the greater variability in their encoded meanings on the [NVNtoV] form as they did for the [NVtoV] form.

This pattern is explainable. For story contexts in which the sentence subject was the actor for the complement verb, children tended to use the [NVtoV] form. That is, the [NVtoV] form was available to encode this meaning so that the children did not need to use the [NVNtoV] form. The [NVNtoV] form was thus largely restricted to the meaning of the complement verb actor's being different from the sentence subject in production as well as in comprehension.

In section 2.1.2 above, I differentiated children who produced a complex form other than an infinitive with a matrix verb from children who could be judged as not knowing the [NVNtoV] form with that particular matrix verb. These latter children had produced either single clause utterances or [NVtoV] sentences with an ONP referent but had not produced the [NVNtoV] form for that

matrix verb. These same children did, however, correctly interpret [NVNtoV] sentences with the matrix verb. There were, therefore, children who interpreted the [NVNtoV] form with a particular verb but did not produce this form with that same matrix verb. It seems likely that these children are basing these interpretations on a strategy rather than on their structural knowledge of the [NVNtoV] form. I will discuss the issue of comprehension strategies below.

2.3. Judgment task

At the time when the methodology for this project was being developed, there were no studies that had successfully elicited judgments from three year-olds. Rather the general conclusion was that the ability to make judgments about language does not emerge until the age of about six ((need a reference)). I had observed spontaneous judgments of utterance form by three year old children. It was therefore my opinion that it should be possible to elicit judgments from this age group. The judgment task was designed to reduce the cognitive load by providing a situational context for the target sentences rather than presenting sentences out of context.

Twenty children were given the judgment task. Of these, fifteen children correctly judged all four of the control items. These included four out of seven three year olds (age group I), six out of eight four year olds

(age groups II and III), and all five of the five year olds (age group IV). The judgment task was therefore only moderately successful in eliciting judgments from the younger children.

There were children who judged a particular sentence form as 'wrong' and yet produced a sentence of that form. (See Tables 24 and 25.) That is, children produced a form that they did not accept. Most of this response type occurred with the [NVtoV] form although there was one response of this type on the [NVNtoV] form. There was also one response of this type with for complements.

3. Discussion

3.1. Children's acquisition of subcategorization

Subcategorization constraints are a lexical property of individual verbs. In the current study, observations were made concerning complementizer type, choice of complementizer, object NPs, and infinitives with lexical subjects. Consistent with Hyams' claim that idiosyncratic properties associated with specific verbs must be learned through positive evidence (Hyams, 1985), I expected there to be no overgeneralization for these aspects of subcategorization.

3.1.1. Complement type

There was only one child (Lindsay) who made any errors in producing a complement type with a verb that is not subcategorized for that complement type. Lindsay

showed a preference for tensed complements and she produced this complement type in ungrammatical sentences with the unfamiliar verbs force and beg. She did not produce tensed complements with the familiar verbs want, like, or try. Lindsay apparently overgeneralized tensed complements to unfamiliar verbs.

All of the matrix verbs in the present study were subcategorized for infinitival complements. The children were much less likely to produce an infinitive with an unfamiliar verb. That is, children showed caution in producing infinitival complements with unfamiliar verbs and did not assume that all verbs could take infinitives.

3.1.2. Choice of complementizer

Five children produced for complements with verbs that are not subcategorized for this complementizer. Alanna produced ungrammatical for complements with force and try. Kris produced ungrammatical for complements with tell. Jay produced ungrammatical for complements with force, tell, try, and threaten. Kaitlin and Jackie produced ungrammatical for complements with only the unfamiliar verb force. All of these children except Kaitlin had also produced at least one grammatical for complement with the matrix verb beg. Apparently, they were overgeneralizing choice of complementizer in production.

One child, Stephanie, produced an ungrammatical [NVNtoV] sentence with say. This may also be an

overgeneralization for complementizer choice, in this case of a null complementizer.

3.1.3. Object NPs

There were no errors of producing an object NP with verbs that do not take this complement type. Specifically, children did not produce object NPs with the verbs try or pretend.

Children did make errors of not producing an object NP with verbs that require one. These errors occurred with both tell and force (the only two verbs included that obligatorily take object NPs). Only children in the younger two age groups made this error with the familiar verb tell. In contrast, many more children, including children in the older age groups, made the error of not producing an object NP with the unfamiliar verb force.

The two findings together -- that children do make errors of not producing a required object NP and that children do not make errors of producing an object NP with verbs that cannot take this complement -- demonstrate that children precede cautiously in their learning of subcategorization for object NPs. They do not assume that unfamiliar verbs can be produced with an object NP and do not show overgeneralization errors.

There is evidence on early relative clause acquisition showing that children acquire aspects of relative clauses piece-by-piece (Hamburger & Crain, 1982). Likewise the learning about object NPs can be

divided into at least two notions. Children need to learn that some matrix verbs can take both an object NP and a sentential complement and that for some verbs object NPs are obligatory. It is not necessarily the case that children learn these two things concurrently. There were four children (Julia, Ryan, Alanna, and Kaitlin) who only produced tell in the [NVtoV] form and did not produce an object NP with tell. These children apparently do not know that tell can take both an object NP and a sentential complement. Two children (Dana and Kris) produced tell in both [NVtoV] sentences and in [NVNtoV] sentences. They know that tell can take both NP and sentential complements but do not know that the object NP is obligatory for this matrix verb. Ten other children allowed an optional object NP with force and produced both [NVtoV] and [NVNtoV] forms with this matrix verb.

3.1.4. Infinitives with lexical NPs

I looked for children who were misanalyzing infinitives with lexical subject NPs as having an object NP and a PRO subject. Such children will allow N1 as well as N2 to perform the complement verb action on [NVNtoV] sentences with either want or like. This interpretation would not be consistent with an analysis in which the second noun is the explicit subject of the complement verb.

There were six children who may have shown such a misanalysis. One child, Ryan (age 4;0), acted out the [NVNtoV] items with both want and like by selecting N1 as the complement verb actor. There were four children who selected N1 only on the [NVNtoV] item with want. One other child, Becky (age 5;2), allowed N1 to perform the complement verb action on the [NVNtoV] sentence with like, although her interpretations of want sentences were restricted to selecting N2 as complement verb actor. These children show evidence of lacking knowledge of exceptional case marking of the complement subject with want-type verbs. They apparently analyze the second noun as an object NP and therefore analyze the infinitive as having a PRO subject. They may thus be overgeneralizing the general structure of [NVNtoV] infinitives to exceptional verbs that take infinitives with a lexical subject.

3.2. Want versus Tell

One aim of the present study was to investigate two opposing claims regarding the order of development of [NVNtoV] infinitives with tell-type verbs and with want-type verbs. Tell-type verbs obligatorily take object NPs and have a PRO complement subject. Want-type verbs take infinitives with an explicit lexical subject. As stated above, Hyams (1985) has hypothesized that infinitives with lexical subjects will be a later acquisition. If this hypothesis is correct, infinitives with want-type

verbs should be a later acquisition or, alternatively, there should be an early misanalysis of infinitives with want-type verbs as having an object NP and a PRO complement subject. In contrast to Hyams' claim, Limber (1973) has claimed that want serves as the model for infinitive acquisition. If this is true, then infinitives with want should be the earliest to develop and there should be errors of misanalyzing infinitives with other verbs as having a lexical subject.

In section 2.2. above, I suggested that allowing an NP other than N2 to perform the complement verb action would be evidence that an [NVNtoV] sentence with want had not been analyzed as having a lexical complement subject. There were six children who showed this interpretation. I suggested that these children misanalyze infinitives with want-type verbs as having an object NP and a PRO complement subject.

I also considered what might constitute evidence that the analysis of infinitives as having a lexical complement subject as in (1) had been learned prior to the structure in (2) in which the second noun is analyzed as an object NP and the infinitive has a PRO complement subject.

(1) $[_{S}\ N_i\ V\ [_{S}\ N_j$ to VP]]

(2) $[_{S}\ N_i\ V\ N_j\ [_{S}\ PRO_j$ to V]]

There were four children who produced the [NVNtoV] form only with want-type verbs and did not produce this form with any matrix verb subcategorized for an object NP with an infinitive having a PRO subject. All four children produced utterances with tell in which there was no direct object. Dara (age 3;8) did not produce any infinitives with verbs subcategorized for an object NP and produced quotation form utterances with tell that lacked a direct object. Julia (age 3;10) produced the [NVNtoV] form only with want and produced [NVtoV] with an ONP as complement verb actor with tell and force, as well as with say, pretend, try, and promise. Alanna (age 4;0) produced an [NVtoV] infintives with tell with an ONP referent for the complemnt subject and also produced a tensed complement with tell that lacked a direct object. Jay (age 5;3) produced [NVtoV] with an ONP referent for the complement subject with the matrix verbs force and ask. He produced for complements ([NVforNtoV]) with the matrix verbs tell, force, beg, say, threaten, and try.

The children mentioned above, therefore, show no evidence of producing any [NVNtoV] sentences that have a PRO complement subject. All four of the children consistently interpreted [NVNtoV] sentences by selecting only N2 to perform the complement verb action. This is consistent with an analysis of N2 as the lexical complement subject although it does not provide

confirmation that the infinitives are in fact analyzed in that way in the children's grammars.

The data on these latter four children seems to falsify Hyams' hypothesis. Children apparently can learn infinitives with lexical subjects as their first [NVNtoV] forms. It seems that Limber's claim may hold true for some children. That is, some children may first produce the [NVNtoV] infinitive form with want-type verbs and overgeneralize the analysis in (1) above to other verbs; other children did not follow this route but appear to first learn the structure in (2).

Limber's claim that [NVNtoV] infinitives with want would be the first to be produced (Limber, 1973) was based on empirical evidence rather than on a theory about language and language acquisition. I considered what might account for this observation. Bloom, et. al (in press) reported early productions (when MLU was 3.5) by one child of infinitives with want that had a second NP and that did not have the infinitive marker to as in (3) and (4) below. (Utterances were taken from an earlier report by Bloom, et. al., 1984.)

(3) want the man stand up.
(4) I want Mommy get it.

I also observed unmarked infinitives with a second NP with the matrix verb want by my two year old son as in (5) and (6).

(5) I want you get it (2;2)
(6) want Grandpa come outside. (2;3)

These sentences pattern together with other complements that are not infinitives, including small clause complements such as (7):

(7) watch it turns back (2;3)

and tensed complements (although without the tense specification) as in 8:

(8) think I make another car. (2;3)

What I think is happening is that children learn to attach sentential complements as a general pattern. Want is likely to be used as a matrix verb for sentence complements because it is a commonly used verb and encodes a basic need. Subsequently, they will learn the grammatical morphemes that are required, such as the infintive marker, to, and this does not necessarily have to wait on more productive use of the sentence form. My son began to produce the infinitive marker in infinitives with a second NP when he was 2;6; he began inconsistently producing this morpheme in [NVtoV] infinitives at the age of 2;3. At the present time, he is 2;7 and still producing infinitives of the [NVNtoV] form only with the matrix verb want. He is thus producing a grammatical form that is restricted to a single matrix verb and does not reflect knowledge of a general rule for infinitive production.

It may therefore be the case that children can first learn the infinitive form with the matrix verb want because it follows the overall pattern for sentence

complements with a lexical subject. They are also likely to hear this form quite frequently in the speech addressed to them and this may influence the likelihood of acquiring this form specific to the matrix verb want. Goodluck (1986) has suggested that the ordering of syntax learning may follow the forms the child is exposed to rather than the sequence that follows from linguistic theory. As an example, she cites the earlier learning by English-speaking children of preposition-final forms, such as the sentence in (9), than of preposition-initial forms, such as the sentence in (10).

(9) John sees the donkey which the camel pushes the zebra to.
(10) John sees the donkey to which the camel pushes the zebra.

The early learning of [NVNtoV] infinitives with the matrix verb want may be also an example of the impact of linguistic input on order of acquisition.

3.3. Overgeneralization versus caution in learning subcategorization

Many of the children showed caution in producing object NPs with various matrix verbs and, in particular, with unfamiliar verbs. This evidence from production of object NPs is consistent with a conservative strategy involving verb-by-verb learning. This was the anticipated learning pattern for a verb specific property.

Overgeneralization errors did, however, occur for other verb specific properties. The evidence from

complement type was mostly consistent with verb-by-verb learning, the one exception being a child who produced tensed complements with unfamiliar verbs. In contrast, complementizer type, specifically production of the for complementizer, and infinitive structure, specifically the analysis of infinitives as having either a PRO rather than a lexical subject, were overgeneralized across verbs by several children. These overgeneralizations show use of a productive strategy for language learning.

Based on these data, one can conclude that both conservative and productive learning strategies are operating in language learning. An account of language acquisition would need to consider how and why different strategies would are used for learning different aspects of language.

One prediction about how learning strategy will vary as a function of what is being learned is based on a Government-Binding Theory of grammar. Hyams (1985) has predicted that "core" aspects of grammar will be learned in a productive manner and that "peripheral" aspects will be acquired conservatively. These latter "peripheral" aspects include exceptional case marking, complementizer choice, and object NP attachment. Hyams suggests that "the acquisition of peripheral aspects is strongly 'data-driven'; that is, such properties are learned in association with particular lexical items on the basis of

positive evidence" and that such properties "are not generalized" (p. 13).

The data from the current project provide counter-evidence to Hyams' claim. The evidence is most clear regarding complementizer choice. The children in the present study showed use of the complementizer for as frequently with verbs that are not subcategorized for for complements as for verbs that are so subcategorized. It also seems that there were some children who overgeneralized the exceptional structure of infinitives with lexical subjects to other verbs.

Although many of the children did not produce infinitives with the unfamiliar verbs, there were children who did produce infinitives with these verbs. Similarly, children varied with respect to their production of object NPs with the unfamiliar verbs. This result suggests that children may vary with respect to learning strategy with some children showing a more conservative learning pattern and other children showing a more productive learning pattern.

A productive approach might have been used by the one child who showed overgeneralization for complement type. This child, Lindsay, showed a preference for the tensed complement form. She may have adopted the strategy of using this preferred form with unfamiliar verbs in order to express a particular meaning. The question remains about whether this reflected a

communicative strategy or whether this represents an overgeneralization based on her current grammar.

3.4. The Evidence Problem in Learning Subcategorization

Children's initial hypotheses about language structures and rules frequently do not match the adult rules. In the current study, there were several areas in which the children's hypotheses differed from adult grammar. One of these involved subcategorization for object NPs. The other involved the previously cited overgeneralizations for domain of application. The overgeneralization patterns will be discussed first.

A concern for language development research is to account for how children can learn to narrow the domain of application of overgeneralized rules and learn exceptions. The problem here is that children do not recieve negative evidence that would demonstrate that the initial hypotheses are incorrect. In the absence of this negative evidence, the reformulation of the child's initial hypotheses must be accomplished through exposure to positive evidence and indirect negative evidence.

The analysis of infinitives with a lexical subject as taking an object NP and a PRO subject involved the application of a general pattern to exceptional cases. This type of overgeneralization to exceptions has been reported for other aspects of language (Bowerman, 1983; Brown, 1973) and was expected. The child must learn that want-type verbs are exceptions to the general form and

take infinitives with lexical subjects. Possible positive evidence might come from exposure to sentences such as (11) (McDaniel, personal communication).

(11) I want there to be a party.

In this sentence, there must be the complement subject. There might also be negative evidence available from non-occurances of question forms such as the one in (12a) with the want-type verbs contrasted with occurances of these questions with tell-type verbs as in (12b).

(12a) *What did you want Bob?
(b) What did you tell Bob?

Exposure to data of these sorts would then have to trigger a re-analysis of the second NP. Any theory of language acquisition will need to account for how reanalyses of this sort might be accomplished.

The overgeneralization of the for complementizer seems different in kind from the overgeneralization of the PRO infinitive subject. The overgeneralization of complementizer choice is consistent with "unconstrained productivity" (Pinker, et. al. 1987). Three were children who apparently did not realize that complementizer choice is a verb-specific property. Instead, they inferred a general pattern that does not, in fact, exist and applied that pattern across a wide range of verbs. This overgeneralization pattern was not expected.

The children will need to learn that complementizer choice is verb specific and with which verbs the for

complementizer can be used. As discussed above, this is a problem in the absence of negative evidence to indicate when the output of this overgeneral hypothesis is ungrammatical. Indirect negative evidence would be a problem since for complements are infrequent in adult speech. Exposure to positive evidence could confirm that the for complementizer can be used with particular verbs but it is unclear whether this exposure could trigger a reanalysis to restrict the set of verbs. The question remains about what would lead children to reformulate such overly general hypotheses and move towards the adult grammar.

In learning subcategorization for object NPs, the children did not make overgeneralization errors but applied a conservative strategy. Three stages for object NP use with a matrix verb were shown. In a first stage, the child does not allow an object NP with the matrix verb. Julia, for example, did not produce an object NP in her infinitive sentences with any matrix verb.

In a second stage, the child hypothesizes that the object NP is optional with the matrix verb. Dana, for example, produced infinitive sentences with the matrix verb tell both with and without an object NP. This modification in the child's grammar would obviously come about through positive evidence of hearing tell sentences with an object NP. At this stage, the child continues to show caution in rule application. The matrix verb domain

for allowing object NPs is restricted so that there are no over-generalization errors. In addition, the child does not assume the object NP to be obligatory. This may be due to a conservative learning strategy, as described by Pinker, et. al. (1987). Additionally, the child may hear tell sentences such as (13) in which the object NP is optional.

(13) Tell (me) a story.

A third stage would involve the child's learning that object NPs are obligatory for the matrix verb. The problem here is to account for what evidence would be necessary to trigger a reanalysis of the earlier hypotheses. Once again, the child does not recieve negative evidence to indicate that the objectless sentences are ungrammatical. The child will recieve positive evidence about use of object NPs with specific verbs. Indirect negative evidence might also be available regarding non-occurrance of an object NP with verbs. The question remains about how such evidence might be used for learning which verbs can take object NPs and for learning with which verbs the object NP is obligatory.

3.5. Acquisition of control

As reported in section 5 of chapter 3, there was a marked difference in how the two infinitive forms were treated with reference to the meanings allowed. Twenty-two of the children allowed arbitrary reference on the

[NVtoV] form with at least one matrix verb. (See Table 26.) Seven of these children allowed arbitrary reference only on [NVtoV] with say for which this interpretation is correct. The other fifteen of these children allowed arbitrary reference on at least one matrix verb that was not say. In contrast, on the [NVNtoV] form the meaning was limited to a sentence internal NP as complement verb actor. (See Table 27.)

From the above data, it seems that overall children learn the general rule that PRO must be controlled for the [NVNtoV] form before they learn this general rule for the [NVtoV] form. This finding was somewhat surprising in that children were expected to learn control first for the earlier developing [NVtoV] form. It is, however, explainable. Goodluck (1986) reviewed the literature on pronoun and reflexive interpretation. She noted that children make more errors in the direction of treating definite pronouns (such as he) as if they were reflexives than in the direction of treating reflexives (such as himself) as definite pronouns. Likewise in the adult grammar, there is variability in use of definite pronouns in place of reflexives (as in the sentence 'John saw a snake near him') but there is not this same variability in use of reflexives in place of definite pronouns. She concludes that children show variable performance just for those structures which allow exceptions in the adult grammar and that performance is less variable (and more

adult-like) for structures that do not allow this variability in the adult grammar.

The greater variability in interpreting and allowing arbitrary reference for [NVtoV] sentences than for [NVNtoV] sentences is also consistent with greater variability in adult grammar. Although in the present study, the adult subjects avoided use of the [NVtoV] infinitive with say, this is most probably a common utterance type in speech addressed to young children. That is, in repeating requests for action to young children, it seems likely that parents produce infinitival sentences with say such as "I said to pick that up.". Children therefore hear [NVtoV] sentences with arbitrary reference but only hear [NVNtoV] sentence with a mentioned antecedant.

The present study identified young children who lack knowledge of control. Dara, Julia, and Kaitlin allowed arbitrary reference on [NVtoV] sentences and did not produce any [NVNtoV] form on which control principles would apply - that is, with a PRO complement subject. There is thus an early stage in acquisition in which children do not base interpretations on control principles. McDaniel, et. al., (1987) also identified children in their study for whom PRO had arbitrary reference in similar structures.

There were also children who showed partial knowledge of control principles. One example of this was

Stephanie, who allowed arbitrary reference on [NVtoV] sentences and restricted the referent for PRO to either mentioned antecedant in [NVNtoV] sentences. That is, she has learned only that [NVNtoV] sentences with a PRO subject must be controlled, even though she does not know the rule for determining the controller of PRO. Another example discussed above was Dana, who restricted reference to a mentioned antecedant both for [NVtoV] sentences and for [NVNtoV] sentences with all matrix verbs except say. She knows that PRO must be controlled and she has also learned the general rule for determining the controller of PRO; she is now learning the exceptions to these general rules.

5. Comprehension strategies

A finding of the present study was that there were children who interpreted the [NVNtoV] form on the comprehension task although they could not produce that form. As stated above, children were judged not to know the [NVNtoV] form with a matrix verb if they produced [NVtoV] with an ONP referent or if they produced only single clause utterances while acting out the unencoded target complement verb action. All of these children selected a mentioned NP as antecedant of the complement subject with the majority selecting N2 to act out the complement verb. It seems likely that these children are not basing their interpretations on control principles but are using a linear strategy to determine the

antecedant of PRO. (Some of them may also not be analyzing the [NVNtoV] sentence as having a PRO complement subject.) There were also the children cited above who showed lack of control principles and so could not be basing their interpretaions of the sentences on these principles.

The majority of children showed the strategy in (14) that looks like the minimal distance principle discussed by C. Chomsky (1969).

(14) Select the NP that most closely precedes the complement verb as the subject of that verb.

Other children showed a less specific strategy as in (15).

(15) Select a mentioned NP as the subject of the complement verb.

There was no child who showed a MIX pattern of interpretation for all matrix verbs. It was not possible to tell if this was a general strategy for all [NVNtoV] infinitives with any matrix verbs or if the interpretation strategy was verb specific. In the present study, there were no children who selected only the sentence subject to act out the complement verb on the comprehension task, as was suggested as an early strategy by Tavakolian, even for a specific matrix verb.

There was no relationship of age to interpretative strategy used. That is, the children who used strategies used either or both of the strategies in 8 and 9 and this did not relate to their age. This finding is in

agreement with the conclusion by McDaniel, et. al., (1987) that children who lack control will adopt some interpretative strategy of selecting the subject, object, or either NP.

CHAPTER SIX

CONCLUDING REMARKS

1. Review

The present study investigated the development of infinitival complements in children between the ages of 3;6 and 5;4. Experimental tasks were developed to elicit productions, act-out responses, and grammaticality judgments of infinitive sentences.

All of the children produced infinitives of the form [NVtoV] with a variety of matrix verbs. Many of the children produced this form even with an unfamiliar verb. The infinitive form thus appears to be well established by the age of 3 and 1/2 years.

The [NVNtoV] was less productive for the children. The present study included eight matrix verbs of four verb types that could enter into this infinitive form. Half of the children produced the [NVNtoV] form with less than four of the matrix verbs and with only one or two of the matrix verb types. For some of the younger children, there was limited production of the [NVNtoV] form together with production of single clause utterances and [NVtoV] infinitive sentences in the contexts in which the [NVNtoV] form would have been expected. Bloom, et al. (1984) have reported that 2 year-old children's

productions of an intervening NP between the matrix and complement verbs is restricted to a limited set of verbs and structures. The present study showed that this restriction continues for some children until they are 3 and 4 years of age.

The present study included two matrix verbs, tell and force, that are obligatorily subcategorized for an object NP. Only four of the younger children produced tell sentences such as "Mickey tells to go" without the object NP. With the unfamiliar verb force, however, there were fifteen children in all four age groups who produced infinitive sentences without the object NP. Four other matrix verbs included in this study are optionally subcategorized for an object NP. Of these, only the most familiar verb, ask, was frequently produced with an object NP. Only a small number of children produced an object NP with the less familiar verbs promise, threaten, and beg. In general, then, the children showed caution in allowing a matrix verb to take an object NP and in subcategorizing the object NP as obligatory.

Although there was no systematic effort in the present study to elicit it, there were a number of children who produced infinitives headed by a for complementizer. These children tended to be in the older age groups. The for complementizer was produced as frequently with matrix verbs that cannot take this

complementizer as with matrix verbs that are subcategorized for it. This finding was unexpected and is counter to Hyams'(1985) prediction that peripheral properties will be learned for specific lexical items through exposure to positive evidence and will not be generalized.

The present study identified children who showed evidence of lacking control principles. That is, these children did not base their interpretations of the infinitival complement on control principles for determining the antecedant of the complement subject, PRO. Instead, they allowed arbitrary reference on [NVtoV] sentences and only produced [NVNtoV] for infinitives in which the complement has a lexical subject.

There were also children who showed partial knowledge of control principles. These children restricted the referent of PRO in the [NVNtoV] sentences to a mentioned antecedant but allowed arbitrary reference on [NVtoV] sentences. Finally, there were children who showed consistent subject control for [NVtoV] sentences and object control for [NVNtoV] sentences; these latter children have acquired the general principles for interpreting PRO and need to learn the exceptions.

Two competing claims about infinitive development have been advanced in the literature. Based on linguistic theory, Hyams (1985) predicted that

infinitives with an object controlled PRO subject would be acquired prior to infinitives with lexical subjects. Based on empirical observation, Limber (1973) claimed that children would first learn [NVNtoV] sentences with want-type verbs for which the second noun is the lexical subject of the infinitival complement.

The present study identified six children who appeared to analyze [NVNtoV] sentences with want or like as having an object NP with a PRO subject, consistent with Hyams' prediction. There were, however, four other children who produced the [NVNtoV] form only with want-type verbs and produced complex sentences with tell in which there was no object NP, performance consistent with Limber's prediction. There were, therefore, children whose development of infinitives was consistent with each of the two claims.

These data suggest alternative routes for acquiring infinitive structure. There were children who appeared to be following the path predicted by Hyams of learning the general pattern and overgeneralizing this pattern to exceptional cases. Subsequent development by these children would involve learning the exceptional structure of infinitives with lexical subjects and determining which matrix verbs are the exceptions. There were also children who appeared to have learned infinitives having lexical complement subjects with the matrix verb want as their earliest [NVNtoV] sentences, as claimed by Limber,

perhaps through an analogy with other multi-clause constructions. Subsequent learning of [NVNtoV] infinitives by these latter children could take several possible directions. This exceptional structure might be overgeneralized to matrix verbs that take an object NP and a PRO complement subject. Alternatively, the [NVNtoV] sentences with want might be reanalyzed after the children learn the general analysis of infinitives with a PRO subject and an object NP. An additional possibility is that children will retain the exceptional analysis of infinitives with want-type verbs while learning the general pattern. Longitudinal data are needed to investigate the alternative routes suggested by this study.

Included in the present study was an act-out comprehension task. This type of task has been widely used to investigate children's knowledge of syntactic structure and interpretive principles. The act-out responses on the comprehension task were compared to the children's acting out of their intended meanings on the production task. This comparison showed the act-out responses on the comprehension task to be more constrained than the meanings encoded by the children's utterances. The present study also identified several children who interpreted [NVNtoV] infinitive sentences but showed evidence of being unable to produce them. These children used a strategy of selecting a mentioned

antecedant, most often the noun closest to the complement verb, to act out the complement verb. These two findings -- that children use strategies to comply with instructions to act out difficult sentences and that the act-out responses do not reveal the full range of interpretations allowed by the child -- call into question the validity of using comprehension task data alone to draw conclusions about developing grammar.

2. The process and problem of language acquisition

The present study identified several ways in which the developing grammars of children differed from adult grammar. One such difference involved the analysis of infinitive structures across a varity of verbs. There were children who, having inferred the general structure of infinitives as involving a PRO subject, applied this analysis in an overly general way to exceptional verbs that take infinitives with lexical subjects. Conversely, there were also children who initially learned infinitives with lexical subjects and applied this analysis to other verbs that would take infinitives with PRO subjects. Thus, in their early hypotheses about infinitive structure, children make overgeneralization errors, applying a single structure incorrectly across many verbs.

Developing grammars also differed from adult grammar with respect to the hypotheses about subcategorization of verbs for object NPs within infinitive sentences.

Several stages were suggested in the discussion chapter, each of which was shown by children for specific verbs, in particular for unfamiliar verbs. The earliest stage was one in which object NPs were not allowed to co-occur in sentences with infinitives. In a second stage, object NPs were allowed but were optional. In a third stage, children showed obligatory use of object NPs. The early hypotheses about subcategorization of verbs for object NPs thus showed a restriction on the occurrence of object NPs. In addition, the early hypotheses involved optional rather than obligatory subcategorization for object NPs of verbs that must take object NPs in the adult grammar.

A third way in which the developing grammars differed from adult grammar was in knowledge of control principles for interpreting grammatical relations within the complement clause. There was evidence of an early stage in which children lack knowledge of control principles and, instead, use strategies for interpreting infinitive sentences. Many of the children allowed arbitrary reference for infinitival subjects across a variety of matrix verbs. There were also children who allowed only obligatory control, in particular object control on [NVNtoV] infinitive sentences, and overgeneralized this control property to exceptional verbs, such as promise.

There are several mechanisms by which children might establish their initial hypotheses. One possibility is

to adopt a conservative strategy of learning an aspect of grammar verb-by-verb. This strategy was apparently applied to the learning of subcategorization of verbs for object NPs. Another possible strategy is a more experimental one in which the child allows a rule to be applied across all verbs or across some class of verbs. This latter strategy was apparently applied to complementizer choice.

A problem for accounts of language acquisition is to determine how these early hypotheses become modified towards the adult grammar. In the absence of negative evidence about ungrammatical sentences, it would seem that children must receive positive evidence that will contradict the early hypotheses. There is also the possibility that children might alter an initial hypothesis as a result of not hearing a form predicted by their grammar, that is through indirect negative evidence.

Positive evidence in its most narrow definition would involve the child's hearing a specific structure with a specific lexical item. It seems unlikely, though, that such exact sentences will be available at just the right time to lead the child to modify an existing hypothesis or develop a new one. Positive evidence, therefore, needs to be considered in a broader sense. This will include information about other structures in

which that lexical item occurs and about the behavior of similar lexical items.

The timing of evidence is also likely to be a factor in acquisition. It is clearly not the case that children learn all aspects of their language simultaneously, although all evidence would be available at all times. One influencing factor will be developmental readiness. That is, the accessibility of evidence to the child must await prerequisite developments that enable the child to use that particular data. It is not, therefore, sufficent to show that some data are available to the language learner. Additionally, an account of language acquisition must how such data interact with the child's current grammar.

3. The experimental tasks

The story completion task proved to be a successful means for eliciting infinitival complements. It was particularly successful in sampling across a variety of verb types and showing restrictions on knowledge of infinitives that were verb specific. The efficacy of the task could be increased through some modifications in specific items and in the administration of the task. This would eliminate most of the off-target respondes in which the child failed to act out the complement verb or misinterpreted the story content. In addition, the task could also be used to sample other complement types, including tensed and participial complements, through

inclusion of verbs that are subcategorized for these complements and not for infinitives.

Both the comprehension and the judgment tasks were designed to match the procedure for the production task. Story contexts were, therefore, introduced in both of these tasks. This proved detrimental to the success of the judgment task. There were children who appeared to judge the sentences as "right" based on their interpretability rather than on their grammatical acceptability.

4. Language Development and Linguistic Theory

Strategies for studying language acquisition can be characterized as falling into two general types. In one approach, the investigator starts from child language data and seeks to uncover regularities in children's language at various points in time with the aim of discovering the stages and processes involved in acquisition. The alternate approach has been to start with a theory about adult grammar, the presumed endpoint of grammatical development, in terms of principles which constrain the possible hypotheses available to the child. These two approaches are not incompatible.

In the present study, data were gathered on children's productions, interpretations, and judgments of infinitival sentences. The organization of the data was motivated at the outset by questions that developed from linguistic theory. The data were finally interpreted,

however, both by reference to internal consistency in the children's performance and by linguistic principles.

This approach can be illustrated with the data on infinitives with lexical subjects. The initial prediction about development was based on the distinction in linguistic theory between "core" and "peripheral" aspects of grammar. Based on this, Hyams (1985) predicted that the peripheral aspects of grammar, which include lexical infinitival subjects, would be more difficult to acquire than the core aspects and would, therefore, be acquired later. It was predicted, therefore, that [NVNtoV] infinitives with tell-type verbs that involve a PRO complement subject would be acquired prior to [NVNtoV] infinitives with want-type verbs that involve a lexical subject.

In the present study, I identified children who appeared to have generalized an analysis of [NVNtoV] infinitives in which the second NP is the object and there is a PRO complement subject. These children's language showed the developmental ordering that had been predicted based on linguistic theory. There were, however, also children who were producing infinitives with lexical subjects as their earliest [NVNtoV] forms, that is counter to this predicted order.

Further comparison of these two groups of children revealed an apparent difference in the extent to which the [NVNtoV] form was produced. Children who had first

learned the [NVNtoV] form with want produced fewer [NVNtoV] infinitives overall and produced this form with fewer matrix verbs than did the children who had learned the [NVNtoV] form with tell. Children who learned the exceptional property first thus adopted a conservative strategy and did not show generalizations of the lexical subject analysis to other verbs. Children who had acquired the general pattern of analyzing [NVNtoV] infinitives as having a PRO subject showed productive use of this analysis and overgeneralized it to want-type verbs.

A consideration of linguistic theory thus motivated the comparison between performances with want-type verbs and tell-type verbs. Looking at actual child language data provided evidence that there might be alternative developmental orderings rather than the single order predicted from linguistic theory. There were also differences in learning strategy adopted by the children that appeared to be motivated by the relative difficulty of learning verb-specific properties as compared to general properies.

5. Directions for Further Research

The present project provides some preliminary data on the developing knowledge of infinitives. These data can be expanded on in several ways. In order to test my hypotheses about the children's knowledge of infinitives, infinitives need to be sampled across other performance

domains. The most interesting data from the present study came from the production task. Based on the findings of this project, the comprehension responses seem to be less revealing about the child's linguistic knowledge. Future research should seek to elicit more valid judgments from the children about interpretations as well as grammaticality together with sampling of production.

In the original design of the study, I attempted to limit matrix verbs to those that would be familiar to young children. That I was unable to do this for all of the verb types proved to be fortuitous and yielded some very interesting data. Further exploration of children's productions and judgments of infinitives with unfamiliar verbs is warranted. Specifically, further studies will need to include unfamiliar verbs that are not subcategorized for infinitives as well as more unfamiliar verbs that can take infinitives. Data from unfamiliar verbs could be used to investigate the lexical properties on which children base decisions about generalization.

The present study suggested early hypotheses embodied in the children's developing grammars. These suggested hypotheses are based on small numbers of productions from a small number of children and need to be further documented. In addition, longitudinal data need to be obtained to show if these hypotheses represent successive stages in developing grammar. Knowing the

modifications in children's hypotheses about aspects of language could guide us in seeking possible sources of evidence that lead children to make revisions in their initial hypotheses.

One other avenue for research would be to obtain information from individual children about a variety of syntactic forms. It can clearly not be the case that children learn each aspect of their language separately. Rather, what they learn about one aspect of langauge will likely have entailments for the hypotheses that they make about other aspects of language.

6. Clinical Implications

In working with language disordered children, one clinical strategy is to follow the sequence of normal development, yet there is little available information on the development of complex sentence forms. What data are available is largely lacking in detail. This leaves the language clinician with no basis for planning a therapy program for the development of infinitives and other complex forms. Studies such as the current project can provide useful data concerning the separate notions that must be learned in the acquisition of particular complex constructions. In addition, the production task developed for this project is likely to have clinicial utility in assessing the production of infinitives and other complement types.

Table 1: Verb Type according to Subcategorization for Direct Object and Control Properties

Sentence Frames	Verb Types					
	I	II	III	IV	V	VI
	want	tell	try	ask	promise	
	like	force	pretend	beg	threaten	say
sf1. NP_i-V [NP_j-to-V]	+	-	-	-	-	-
sf2. NP_i-V [PRO_i-to-V]	+	-	+	-	-	-
sf3. NP_i-V(NP_j)[PRO_i-to-V]	-	-	-	+	+	-
sf4. NP_i-V-NP_j [PRO_j-to-V]	-	+	-	+	-	-
sf5. NP_i-V [PRO_j-to-V]	-	-	-	-	-	+

Table 2: Subject Characteristics for Each Age Group

Age Group	Age Range	Mean Age	N
I	3;7-3;10	3;9	9
II	4;0-4;5	4;2	7
III	4;6-4;10	4.8	4
IV	5;2-5;4	5;3	5

Table 3: Examples of On-Target and Off-Target Responses for Each Criterion

Sample Item #21:
(Bert, Ernie & Mickey standing by the pool) THIS IS BERT'S POOL. IT'S HOT OUTSIDE. IT'S A GOOD DAY FOR A SWIM. (Ernie to Bert:) "CAN I SWIM, BERT? PLEASE." ERNIE BEGS...

	Criteria	
	a. Main verb	b. V_c Actor
On-Target	"Ernie begs to go swimming."	Child makes Ernie swim
Off-Target	"Ernie wants to swim."	Child makes Bert swim.

Table 4: Percentage of On-Target Responses for Each Construction Type Produced By Each Age Group

	Child Total	Age Groups I	II	III	IV	Adult
infinitives	67%	65%	69%	68%	69%	67%
tensed complements	16%	16%	12%	18%	19%	13%
quotation form	6%	5%	7%	6%	5%	14%
participial complements	<1%	1%	1%	1%	0	0%
subordination	3%	1%	3%	3%	4%	2%
coordinated sentences	2%	0	4%	4%	1%	4%
nonconjoined sentences	<1%	1%	0	0	0	0%
single clause utterances	5%	11%	3%	2%	1%	0%

Table 5: Average Number of Each Construction Type Produced per Child in On-Target Responses

	Age Groups				
	I	II	III	IV	Adult
infinitives	15.9	16.7	18.2	19.0	19.0
tensed complements	3.9	3.0	4.8	5.2	3.8
TOTAL COMPLEMENTS	19.8	19.7	23.0	24.2	22.8
quotation form	1.3	1.7	1.5	1.4	4.0
participial complements	.2	.1	.3	0	0
subordination	.2	.7	.8	1.2	.5
coordinated sentences	0	1.0	1.0	.4	1.0
nonconjoined sentences	.2	0	0	0	0
single clause utterances	2.7	.7	.5	.4	0

Table 6: Percentage of Complex Construction Types Produced With Individual matrix Verbs in Each Age Group

a. tell with transitive complement verb

	Child Total	Age Group I	II	III	IV	Adult
infinitives						
Ac=Am	38%	29%	83%	20%	0	0
Ac/Am	84%	89%	85%	100%	80%	75%
tensed complements						
Ac=Am	48%	57%	17%	60%	75%	75%
Ac/Am	8%	0	0	0	20%	0
quotation form						
Ac=Am	14%	14%	0	20%	25%	25%
Ac/Am	8%	11%	15%	0	0	25%

b. say

	Child Total	Age Group I	II	III	IV	Adult
infinitives	43%	45%	48%	47%	32%	0
tensed complements	28%	34%	12%	27%	42%	13%
quotation form	26%	21%	32%	27%	26%	81%

c. pretend with transitive complement verb

	Child Total	Age Group I	II	III	IV	Adult
infinitives						
Ac=Am	47%	57%	25%	50%	59%	25%
Ac/Am	27%	60%	0	25%	0	0
tensed complements						
Ac=Am	53%	43%	75%	59%	50%	75%
Ac/Am	73%	40%	100%	75%	100%	100%

d. ask

	Child Total	Age Group I	II	III	IV	Adult
infinitives						
Ac=Am	42%	63%	50%	40%	0	50%
Ac/Am	71%	75%	67%	80%	60%	100%
quotation form						
Ac=Am	13%	12%	17%	0	20%	0
Ac/Am	16%	25%	17%	20%	0	0
subordination						
Ac=Am	46%	25%	33%	60%	80%	50%
Ac/Am	13%	0	17%	0	40%	0

e. promise with transitive complement verb

	Child Total	Age Group I	II	III	IV	Adult
infinitives						
Ac=Am	55%	63%	80%	25%	40%	100%
Ac/Am	35%	29%	75%	0	0	0
tensed complements						
Ac=Am	45%	37%	20%	75	60%	0
Ac/Am	65%	71%	25%	100%	100%	100%

Table 7: Form of Infinitives Produced on Ac=Am items

Item # (verb)	Total	[N_mVtoV$_c$]	[N_1VN_2toV$_c$]	Other
1 (want)	24	22 (92%)	1 (4%)	1 (4%)
3 (like)	17	17 (100%)	0	0
5 (force)	19	17 (89%)	0	2 (11%)
8 (tell)	8	4 (50%)	3 (38%)	1 (12%)
11 (say)	5	5 (100%)	0	0
13 (say)	14	14 (100%)	0	0
15 (pretend)	11	11 (100%)	0	0
17 (pretend)	9	9 (100%)	0	0
18 (try)	24	24 (100%)	0	0
20 (try)	23	23 (100%)	0	0
21 (beg)	16	13 (81%)	2 (13%)	1 (6%)
23 (ask)	10	8 (80%)	2 (20%)	0
25 (promise)	17	17 (100%)	0	0
27 (promise)	12	12 (100%)	0	0
28 (threaten)	9	9 (100%)	0	0
30 (threaten)	9	3 (33%)	0	6 (67%)
Total	227	208 (92%)	8(3%)	10 (5%)

Table 8: Form of Infinitives Produced on Ac/Am Items

Item # (verb)	Total	[$N_1VN_2toV_c$]	[N_mVtoV_c]	For Comp	Other
2 (want)	20	16 (80%)	2 (10%)	1 (5%)	1 (5%)
4 (like)	19	12 (63%)	2 (11%)	1 (5%)	4 (21%)
6 (force)	18	15 (83%)	1 (6%)	2 (11%)	0
7 (force)	17	12 (70%)	2 (12%)	3 (18%)	0
9 (tell)	23	18 (79%)	4 (17%)	1 (4%)	0
10 (tell)	18	15 (83%)	1 (6%)	2 (11%)	0
12 (say)	8	1 (13%)	7 (87%)	0	0
14 (say)	10	0	8 (80%)	2 (20%)	0
16 (pretend)	4	0	4 (100%)	0	0
19 (try)	17	0	1 (6%)	2 (12%)	14 (82%)
22 (beg)	13	4 (31%)	2 (15%)	6 (46%)	1 (8%)
24 (ask)	17	13 (76%)	3 (18%)	1 (6%)	0
26 (promise)	6	3 (50%)	2 (33%)	0	1 (17%)
29 (threaten)	11	6 (55%)	0	1 (9%)	4 (36%)
Total	202	115 (57%)	39 (20%)	22 (11%)	25 (12%)

Table 9: Percentage of Ungrammatical Infinitives for Each Verb

Verb	Total # Infinitives	# (%) Ungrammatical Infinitives Ac=Am[a]	Ac/Am[b]	Total[c]
want	44	2 (8%)	3 (15%)	5 (11%)
like	35	0	5 (26%)	5 (14%)
force	54	17 (89%)	9 (26%)	26 (48%)
tell	49	7 (88%)	7 (17%)	14 (29%)
say	37	19 (100%)	1 (6%)	20 (54%)
pretend	24	0	4 (100%)	4 (17%)
try	41	0	3 (18%)	3 (7%)
beg	29	1 (6%)	3 (23%)	4 (14%)
ask	27	0	3 (18%)	3 (11%)
promise	35	0	5 (83%)	5 (14%)
threaten	29	4 (12%)	7 (64%)	11 (38%)

a: percent of infinitives produced on Ac=Am items
b: percent of infinitives produced on Ac/Am items
c: percent of total infinitives produced

Table 10: Number of Subjects Selecting the Subject or an Outside Noun on [NVtoV] Sentences

Item (Verb)	Subject NP	Outside NP	Failure to Repeat Item	Failure to Act Out
#1 (want)	25	0	0	0
#3 (like)	25	0	0	0
#9 (say)	14	10	1	0
#11 (say)	19	6	0	0
#13 (pretend)	25	0	0	0
#14 (pretend)	24	0	0	1
#15 (try)	25	0	0	0
#16(try)	25	0	0	0
#17 (beg)	24	1	0	0
#20 (ask)	21	3	0	1
#21 (promise)	24	0	1	0
#24 (threaten)	21	1	2	1
Total	272	21	4	3

Table 11: Number of Subjects Selecting the Subject or Second Noun on [NVNtoV] Sentences

Item (Verb)	Subject NP	Second NP	Failure to Repeat Item	Failure to Act Out
#2 (want)	4	18	3	0
#4 (like)	2	23	0	0
#5 (force)	1	24	0	0
#6 (force)	1	20	2	2
#7 (tell)	2	22	1	0
#8 (tell)	0	25	0	0
#10 (say for)	0	18	7	0
#12 (say for)	0	20	5	0
#18 (beg)	2	21	2	0
#19 (ask)	4	19	1	1
#22 (promise)	3	18	4	0
#23 (threaten)	2	19	3	1
Total	21	247	28	4

Table 12: Comparison of Performances Between the Production and Comprehension Tasks on [N_mVtoV] Sentences

Subject Names	Verbs											
	WANT/ LIKE		SAY		PRETEND/ TRY		ASK/ BEG		PROMISE		THREATEN	
	P	C	P	C	P	C	P	C	P	C	P	C
Colin	Arb	N_m	-	N_m	N_m	N_m	-	N_m	N_m	N_m	-	-
Dara	Arb	N_m	Arb	N_m	N_m	N_m	N_m	N_m	N_m	-	-	-
Daine	N_m	N_m	Arb	Arb	N_m	N_m	Arb	N_m	-	N_m	-	N_m
Taylor	N_m	N_m	-	Arb	Arb	N_m	-	Arb	-	N_m	-	N_m
John	N_m	N_m	N_m	Arb	N_m	N_m	N_m	N_m	N_m	N_m	-	N_m
Nat	N_m	N_m	Arb	Arb	N_m	N_m	N_m	N_m	N_m	N_m	-	N_m
Julia	N_m	N_m	Arb	N_m	Arb	N_m	N_m	N_m	Arb	N_m	-	N_m
Lindsay	N_m	N_m	-	N_m	N_m	N_m	-	N_m	-	N_m	-	N_m
Janine	N_m	N_m	-	Arb	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m
Alanna	N_m	N_m	N_m	Arb	N_m	N_m	N_m	Arb	N_m	N_m	N_m	Arb
Kris	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m	-	N_m
Dana	N_m	N_m	N_m	Arb	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m
Ryan	N_m	N_m	Arb	N_m	N_m	N_m	N_m	N_m	N_m	N_m	-	N_m
Stacey	N_m	N_m	N_m	Arb	N_m	N_m	N_m	N_m	-	N_m	-	-
Stephanie	N_m	N_m	N_m	N_m	N_m	N_m	-	N_m	N_m	N_m	N_m	N_m
Perry	N_m	N_m	Arb	N_m	N_m	N_m	-	N_m	N_m	N_m	-	N_m
Kaitlin	Arb	N_m	Arb	N_m	N_m	N_m	Arb	N_m	Arb	N_m	-	N_m
Rachel	N_m	N_m	-	N_m	N_m	N_m	N_m	N_m	-	N_m	-	N_m
Denise	N_m	N_m	N_m	N_m	Arb	N_m	N_m	N_m	-	N_m	-	N_m
Jerry	N_m	N_m	Arb	Arb	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m
Becky	N_m	N_m	-	Arb	N_m	N_m	-	N_m	-	N_m	-	N_m
Jackie	N_m	N_m	-	N_m	N_m	N_m	-	N_m	N_m	N_m	N_m	N_m
Casey	N_m	N_m	-	N_m	N_m	N_m	-	N_m	N_m	N_m	N_m	N_m
Jay	N_m	N_m	Arb	Arb	N_m	N_m	Arb	N_m	N_m	N_m	N_m	N_m
Jason	Arb	N_m	Arb	Arb	N_m	N_m	N_m	N_m	N_m	N_m	N_m	N_m

Nm: selection of the sentence subject (the mentioned noun) as complement verb actor
Arb: gave both N_m and ONP as responses
- : no applicable response given to that item

Table 13: Comparison of Performances Between the Production and Comprehension Tasks on $[N_1VN_2toV]$ Sentences

Subject Names	Verbs									
	WANT/ LIKE		TELL		FORCE		ASK/ BEG		PROMISE/ THREATEN	
	P	C	P	C	P	C	P	C	P	C
Colin	N_2	N_2	N_2	N_2	N_2	N_2	N_2	MIX	N_2	N_2
Dara	N_2	N_2	-	-	-	N_2	-	-	-	N_2
Daine	N_2	N_2	N_2	N_2	N_2	N_2	FOR	N_2	ARB	MIX
Taylor	N_2	N_2	N_2	N_2	-	N_2	N_2	N_2	-	N_2
John	N_2	N_2	N_2	N_2	-	N_2	N_2	N_2	-	N_2
Nat	N_2	N_2	MIX	N_2	-	N_2	MIX	N_2	-	N_2
Julia	N_2	N_2	x	N_2	x	N_2	-	N_2	x	N_2
Lindsay	N_2	N_2	N_2	MIX	-	N_2	N_2	N_2	-	N_2
Janine	N_2	N_2	N_2	N_2	N_2	N_2	-	N_2	N_2	N_2
Alanna	N_2	N_2	x	N_2	FOR	N_2	FOR	N_2	-	-
Kris	N_2	MIX	FOR	N_2	-	N_2	FOR	N_2	-	N_2
Dana	N_2	N_2	N_2	N_2	N_2	N_2	-	N_2	N_2	N_2
Ryan	N_2	N_1	x	N_2	ARB	N_2	N_2	-	x	N_2
Stacey	-	N_2	N_2	N_2	N_2	N_2	N_2	N_2	-	N_2
Stephanie	N_2	N_2	MIX	N_2	N_2	N_2	MIX	N_2	N_2	MIX
Perry	-	N_2	MIX	N_2	N_2	N_2	N_2	MIX	-	-
Kaitlin	N_2	N_2	x	N_2	FOR	N_2	x	MIX	x	MIX
Rachel	N_2	N_2	N_2	N_2	N_2	N_2	N_2	MIX	-	N_2
Denise	N_2	MIX	N_2	N_2	N_2	N_2	N_2	N_2	N_2	MIX
Jerry	N_2	MIX	N_2	N_2	N_2	N_2	FOR	N_2	-	N_2
Becky	N_2	MIX	N_2	MIX	N_2	MIX	MIX	N_2	-	N_2
Jackie	N_2	N_2	-	N_2	N_2	N_2	FOR	N_2	N_2	MIX
Casey	N_2	N_2	N_2	N_2	N_2	N_2	N_2	MIX	N_2	N_2
Jay	N_2	N_2	N_2	N_2	N_2	N_2	FOR	MIX	FOR	N_2
Jason	x	N_2	N_2	N_2	N_2	N_2	-	NA	-	NA

MIX: gave both N_1 and N_2 as complement verb actor
Arb: allowed an ONP as complement verb actor
FOR: produced FOR complement but did not produce $[N_1VN_2toV]$
x : produced $[N_mVtoV]$ with an ONP referent for the complement subject but did not produce $[N_1VN_2toV]$
- : all other productions

Table 14: Number of Subjects Judging [NVtoV] Sentences as "right" or "wrong"

Verb	Judged "right"	Judged "wrong"	Failure to Repeat Item
	Grammatical Sentences		
want	14	1	0
say	8	6	1
try	13	2	0
ask	10	4	1
promise	15	0	0
Total	60	12	2
	Ungrammatical Sentences		
tell	6	8	1

a: Subjects who correctly judged all four of the control items

Table 15: Number of Subjects Judging [NVNtoV] Sentences as "right" or "wrong"

Verb	Judged "right"	Judged "wrong"	Failure to Repeat Item
Grammatical Sentences			
want	14	0	1
tell	14	0	1
ask	12	1	2
promise	9	2	4
Total	49	3	8
Ungrammatical Sentences			
say	9	5	1
try	8	6	1
Total	17	11	2

a: Subjects who correctly judged all four of the control items

Table 16: Percentage of Correct Judgements For Subjects Correctly Judging the Control Items

	grammatical	ungrammatical	Total
[NVtoV]	83%	57%	79%
[NVNtoV]	94%	39%	75%
Total	88%	45%	77%
FOR complements	98%	54%	
THAT complements	93%	70%	

Table 17: Comparison of Performances Between the Production and Judgement Tasks on [N_mVtoV] Sentences For Subjects Correctly Judging the Control Items

Subjects	Verbs											
	WANT		TELL		SAY		TRY		ASK		PROMISE	
	P	J	P	J	P	J	P	J	P	J	P	J
Dara	Arb	+	-	-	Arb	-	N_m	+	N_m	-	N_m	+
John	N_m	*	$\underline{N_m}$	*	N_m	+	N_m	+	$\underline{N_m}$	+	N_m	+
Nat	N_m	+	$\underline{N_m}$	+	Arb	+	N_m	+	$\underline{N_m}$	+	N_m	+
Janine	N_m	+	$\underline{N_m}$	+	-	-	N_m	*	$\underline{N_m}$	+	N_m	+
Alanna	N_m	+	Arb	*	N_m	*	N_m	+	$\underline{N_m}$	*	N_m	+
Kris	N_m	+	N_m	+	N_m	-	N_m	+	N_m	+	N_m	+
Stephanie	N_m	+	Arb	+	N_m	+	N_m	+	-	*	N_m	+
Kaitlin	Arb	+	Arb	*	Arb	*	N_m	+	Arb	+	Arb	+
Rachel	N_m	+	-	*	-	*	N_m	+	N_m	+	-	+
Jerry	N_m	+	N_m	+	Arb	+	N_m	*	$\underline{N_m}$	+	N_m	+
Becky	N_m	+	-	*	-	*	N_m	+	-	*	-	+
Jackie	N_m	+	$\underline{N_m}$	*	-	+	N_m	+	-	+	N_m	+
Casey	N_m	+	$\underline{N_m}$	*	-	+	N_m	+	-	*	N_m	+
Jay	N_m	+	$\underline{N_m}$	*	Arb	*	N_m	+	$\underline{N_m}$	+	N_m	+
Jason	Arb	+	$\underline{N_m}$	-+	Arb	+	N_m	+	$\underline{N_m}$	+	N_m	+

Nm: produced the [NVtoV] form with Nm as complement verb actor
Arb: produced the [NVtoV] form and allowed an ONP as complement verb actor
- : did not produce/judge the [NVtoV] form
+ : judged the item as grammatical
* : judged the item as ungrammatical
underlined: produced [NVtoV] only with the other verb in the pair and not with the verb included on the judgement task

Table 18: Comparison of Performances Between the Production and Judgement Tasks on [N_1VN_2toV] Sentences For Subjects Correctly Judging the Control Items

Subjects	Verbs											
	WANT		TELL		SAY		TRY		ASK		PROMISE	
	P	J	P	J	P	J	P	J	P	J	P	J
Dara	N_2	-	x	-	x	-	-	-	-	-	-	-
John	N_2	+	N_2	+	-	+	-	+	N_2	+	-	+
Nat	N_2	+	MIX	+	x	+	-	+	MIX	+	-	+
Janine	N_2	+	N_2	+	-	+	-	*	-	*	$\underline{N_2}$	+
Alanna	N_2	+	x	+	-	+	FOR	+	$\underline{FOR}$	+	-	-
Kris	N_2	+	FOR	+	-	+	-	+	FOR	+	-	+
Stephanie	$\underline{N_2}$	+	MIX	+	N2	+	-	+	MIX	+	N_2	+
Kaitlin	$\underline{N_2}$	+	x	+	x	*	-	+	x	+	x	*
Rachel	$\underline{N_2}$	+	N_2	+	-	*	-	*	N_2	+	-	+
Jerry	N_2	+	N_2	+	x	+	-	*	$\underline{FOR}$	+	-	+
Becky	N_2	+	N_2	+	-	*	-	*	MIX	+	-	+
Jackie	FOR	+	-	+	-	*	-	*	$\underline{FOR}$	-	N_2	*
Casey	N_2	+	N_2	+	-	*	-	+	N_2	-	N_2	-
Jay	N_2	+	N_2	+	FOR	+	FOR	*	FOR	+	FOR	*
Jason	x	+	N_2	+	x	+	-	+	-	+	-	-

N2: produced [NVNtoV] with N2 as complement verb actor
MIX: produced [NVNtoV] with either N1 or N2 as complement verb actor
x : produced [NmVtoV] with an ONP as complement verb actor
and did not produce [NVNtoV]
FOR: produced a FOR complement and did not produce [NVNtoV]
+ : judged the [NVNtoV] sentence as "right"
* : judged the [NVNtoV] sentence as "wrong"
- : did not produce/judge the [NVNtoV] form
underlined: produced [NVNtoV] only with the other verb in the pair and not with the verb included on the judgement task

Table 19: Comparison of For Complement Sentences on the Production and Judgement Tasks For Subjects Correctly Judging the Control Items

Subjects who produced FOR complements:

Subjects Names	Verbs WANT		LIKE		SAY		*TRY		Other productions
	Prod	Judg	Prod	Judg	Prod	Judg	Prod	Judg	
Alanna	-	R	-	R	-	R	+	R	*force *try
Kris	-	NA	-	R	-	R	-	R	*tell
Kaitlin	-	R	-	R	-	R	-	W	*force
Rachel	-	R	-	W	-	R	-	R	beg
Jerry	-	R	-	R	-	R	-	W	beg
Jackie	+	R	+	R	-	R	-	W	*force beg
Jay	-	R	-	R	+	R	+	W	*force *tell beg *threaten

Subjects who did not produce FOR complements

Subjects Names	Verbs WANT		LIKE		SAY		*TRY	
	Prod	Judg	Prod	Judg	Prod	Judg	Prod	Judg
Dara	-	-	-	-	-	-	-	-
John	-	R	-	R	-	R	-	W
Nat	-	R	-	R	-	R	-	NA
Janine	-	R	-	R	-	R	-	NA
Stephanie	-	R	-	R	-	R	-	NA
Becky	-	R	-	R	-	R	-	W
Casey	-	R	-	R	-	R	-	R
Jason	-	R	-	R	-	R	-	W

+ : FOR complement produced with that verb
- : FOR complement not produced with that verb
* : an ungrammatical FOR complement in adult grammar

Table 20: Interpretations of Complement Subject Reference on [N_mVtoV] Sentences

For Subjects Who Had Correctly Judged Control Items on the Judgement Task

Subjects Names	Verbs					
	WANT/ LIKE	TELL (FORCE)	SAY	TRY/ PRETEND	ASK/ BEG	PROMISE/ THREATEN
Dara	Arb	NA	Arb	N_m	N_m	N_m
John	*N_m	*(N_m)	Arb	N_m	N_m	N_m
Nat	N_m	N_m	Arb	Arb	N_m	N_m
Janine	N_m	N_m	Arb	*N_m	N_m	N_m
Alanna	N_m	*Arb	*	N_m	*Arb	N_m
Kris	N_m	Arb	N_m	N_m	N_m	N_m
Stephanie	N_m	N_m	*N_m	Arb	*N_m	N_m
Kaitlin	Arb	*Arb	*Arb	N_m	Arb	Arb
Rachel	N_m	*	*	N_m	N_m	N_m
Jerry	N_m	Arb	Arb	*N_m	N_m	N_m
Becky	N_m	*	*	N_m	N_m	N_m
Jackie	N_m	*N_m	N_m	N_m	N_m	N_m
Casey	N_m	*(N_m)	Arb	N_m	*	N_m
Jay	N_m	*(N_m)	*Arb	N_m	Arb	N_m
Jason	Arb	N_m	Arb	N_m	N_m	N_m

For Subjects Who Had Incorrectly Judged Control Items or Had Not Completed the Judgement Task

Subjects Names	Verbs					
	WANT/ LIKE	TELL (FORCE)	SAY	TRY/ PRETEND	ASK/ BEG	PROMISE/ THREATEN
Colin	Arb	N_m	N_m	N_m	N_m	N_m
Daine	N_m	NA	Arb	N_m	N_m	N_m
Taylor	N_m	NA	Arb	Arb	Arb	N_m
Julia	N_m	Arb	Arb	Arb	Nm	Arb
Lindsay	N_m	-	N_m	N_m	Arb	N_m
Dana	N_m	N_m	Arb	N_m	N_m	N_m
Ryan	N_m	Arb	Arb	N_m	N_m	N_m
Stacey	N_m	-	Arb	N_m	N_m	N_m
Perry	N_m	-	Arb	N_m	N_m	N_m
Denise	N_m	N_m	N_m	Arb	N_m	N_m

Nm: allowed only the sentence subject (the mentioned noun)
as complement verb actor
Arb: allowed an ONP as complement verb actor
(): produced [NVtoV] only with FORCE and not with TELL
* : judged the [NVtoV] form as ungrammatical
- : no available data

Table 21: Interpretations of Complement Subject Reference on [N_1VN_2toV] Sentences

For Subjects Who Had Correctly Judged Control Items on the Judgement Task

Subject Names	Verbs					
	WANT/ LIKE	TELL/ FORCE	SAY	TRY/ PRETEND	ASK/ BEG	PROMISE/ THREATEN
Dara	N_2	N_2	NA	NA	N_2	MIX
John	N_2	N_2	MIX	MIX	N_2	MIX
Nat	N_2	MIX	N_2	N_2	MIX	N_2
Janine	N_2	N_2	N_2	*	*N_2	N_2
Alanna	N_2	N_2	N_2	N_2	N_2	N_2
Kris	MIX	MIX	N_1	N_2	N_2	N_2
Stephanie	N_2	MIX	N_2	N_2	MIX	MIX
Kaitlin	N_2	N_2	*	N_2	MIX	MIX
Rachel	N_2	N_2	*	*	MIX	N_2
Jerry	MIX	N_2	N_2	*	N_2	MIX
Becky	MIX	MIX	*	*	MIX	N_2
Jackie	N_2	N_2	*	*	N_2	MIX
Casey	N_2	N_2	*	N_2	MIX	-
Jay	N_2	N_2	N_2	*	N_2	*
Jason	N_2	N_2	N_2	N_2	N_2	N_2

For Subjects Who Had Incorrectly Judged Control Items or Had Not Completed the Judgement Task

Subject Names	Verbs					
	WANT/ LIKE	TELL/ FORCE	SAY	TRY/ PRETEND	ASK/ BEG	PROMISE/ THREATEN
Colin	N_2	N_2	N_2	N_1	MIX	N_2
Daine	N_2	N_2	-	-	N_2	Arb
Taylor	N_2	N_2	-	-	N_2	N_2
Julia	N_2	N_2	-	-	N_2	N_2
Lindsay	MIX	MIX	-	-	MIX	-
Dana	N_2	N_2	N_1	-	MIX	N_2
Ryan	MIX	N_2(Arb)	-	-	N_2	N_2
Stacey	N_2	N_2	-	-	N_2	-
Perry	N_2	MIX	-	-	MIX	N_2
Denise	MIX	N_2	N_2	N_2	MIX	MIX

N_2: allowed only the second noun as complement verb actor
MIX: allowed either N_1 or N_2 as complement verb actor
Arb: allowed an ONP as complement verb actor
(): produced the [NVNtoV] form with the enclosed interpretation with FORCE but not with TELL
*: judged the [NVNtoV] form ungrammatical
-: no available data

Table 22: On-Target Responding by Each Age Group

Age group	On-Target Responses %	On-Target Responses Range	Off-Target Responses Average # per Child	Off-Target Responses Range per Child
I (N=9)	82%	67-90%	5.4	3-10
II (N=7)	81%	67-93%	5.6	2-10
I & II Combined	82%	67-93%	5.5	2-10
III (N=4)	90%	83-97%	3.0	1-5
IV (N=5)	92%	83-100%	2.4	0-5
III & IV Combined	91%	83-100%	2.7	0-5

Table 23: Types of Off-Target responses

Type	Number	% Total Responses	% Off-Target Responses
Misinterpretation	54	7%	48%
Failure to Act Out Complement Verb	43	6%	38%
Ambiguous Action	4	<1%	4%
Change Main Verb	5	<1%	4%
Incomplete Utterance	2	<1%	2%
No Response	4	<1%	4%
Total	112	15%	

Table 24: Number of Misinterpretation Responses According to Age Group

Age Group	Mean # per Subject	Range
I & II Combined	2.3	0-4
III & IV Combined	1.9	0-4
Adult	1.4	1-2

Table 25: Effect of Grammatical Relation Condition on Misinterpretation Responses

Condition	Mean # per Item	Action
Ac=Am	1.4	child did not choose Am to do complement verb action
Ac/Am	2.3	child did choose Am to do the complement verb action

Table 26: Number of Misinterpretation Responses for Each Age Group According to Grammatical Relation Condition

a. Ac=Am Items:

Age Group	Mean # per Item per Subject
I & II Combined	.059
III & IV Combined	.056
All Children	.058
Adult	.031

b. Ac/Am Items:

Age Group	Mean # per Item per Subject
I & II Combined	.098
III & IV Combined	.071
All Children	.091
Adult	.053

Table 27: Number of Failures to Act Out the Complement Verb According to Age Group

Age Group	Mean # per Subject	Range
I & II Combined	2.3	0-7
III & IV Combined	.8	0-2
Adult	.5	0-1

APPENDIX A: Subject Names, Ages, and DSS Scores

Age Group	Name	Age	Dss
I	Colin	3;7	8.76
I	Daine	3;8	8.38
I	Dara	3;8	7.22
I	Taylor	3;8	8.38
I	John	3;9	7.12
I	Janine	3;10	9.12
I	Julia	3;10	7.46
I	Lindsay	3;10	8.16
I	Nat	3;10	6.46
II	Alanna	4;0	8.58
II	Dana	4;1	9.96
II	Kris	4;1	7.76
II	Ryan	4;2	7.22
II	Stacey	4;2	11.28
II	Stephanie	4;4	7.92
II	Perry	4;5	8.16
III	Rachel	4;6	12.32
III	Kaitlin	4;6	8.14
III	Denise	4;8	10.40
III	Jerry	4;10	9.10
IV	Becky	5;2	10.30
IV	Jackie	5;2	10.56
IV	Casey	5;3	8.36
IV	Jay	5;3	10.50
IV	Jason	5;4	10.64

APPENDIX B: Experimental Task Items

I. Production Task Items and Sample Infinitive Sentences for Each Item

Items in Which the Complement Verb Actor is the Same as the Main Verb Actor:

P1. ERNIE WANTS - ERNIE STANDS UP
Ernie wants to stand up.

P3. BERT LIKES - BERT CARRIES MICKEY
Bert likes to carry Mickey.

P5. ERNIE FORCES - ERNIE FALLS
*Ernie forces to fall.

P8. MICKEY TELLS - MICKEY PICKS UP BERT
*Mickey tells to pick up Bert.

P11. MICKEY SAYS - MICKEY STANDS UP
*Mickey says to stand up.

P13. BERT SAYS - BERT PICKS UP ERNIE
*Bert says to pick up Ernie.

P15. BERT PRETENDS - BERT SLEEPS
Bert pretends to sleep.

P17. MICKEY PRETENDS - MICKEY CARRIES BERT
Mickey pretends to carry Bert.

P18. MICKEY TRIES - MICKEY FINDS BERT
Mickey tries to find Bert.

P20. BERT TRIES - BERT FALLS
Bert tries to fall.

P21. ERNIE BEGS - ERNIE SWIMS
Ernie begs to swim.

P23. BERT ASKS - BERT PICKS UP ERNIE
Bert asks to pick up Ernie.

P25. MICKEY PROMISES - MICKEY SLEEPS
Mickey promises to sleep.

P27. BERT PROMISES - BERT HUGS ERNIE
Bert promises to hug Ernie.

P28. ERNIE THREATENS - ERNIE FINDS MICKEY
Ernie threatens to find Mickey.

P30. BERT THREATENS - BERT FALLS
Bert threatens to fall.

Items in Which the Complement Verb Actor is Different from the Main Verb Actor:

P2. BERT WANTS - MICKEY FINDS ERNIE
Bert wants Mickey to find Ernie.

P4. MICKEY LIKES - ERNIE SWIMS
Mickey likes Ernie to swim.

P6. MICKEY FORCES - BERT FALLS
Mickey forces Bert to fall.

P7. BERT FORCES - MICKEY HUGS ERNIE
Bert forces Mickey to hug Ernie.

P9. BERT TELLS - ERNIE PICKS UP MICKEY
Bert tells Ernie to pick up Mickey.

P10. ERNIE TELLS - BERT SLEEPS
Ernie tells Bert to sleep.
P12. ERNIE SAYS - BERT HUGS MICKEY
Ernie says to hug Mickey.
P14. MICKEY SAYS - ERNIE SWIMS
Mickey says to swim.
P16. BERT PRETENDS - ERNIE CARRIES MICKEY
*Bert pretends Ernie to carry Mickey.
P19. ERNIE TRIES - BERT FALLS
*Ernie tries Bert to fall.
P22. ERNIE BEGS - MICKEY CARRIES BERT
Ernie begs Mickey to carry Bert.
P24. MICKEY ASKS - ERNIE STANDS UP
Mickey asks Ernie to stand up.
P26. ERNIE PROMISES - MICKEY HUGS BERT
*Ernie promises Mickey to hug Bert.
P29. MICKEY THREATENS - ERNIE FALLS
*Mickey threatens Ernie to fall.

II. Comprehension Task Items

Sentences of the Form [NP-V-to-V]:
C1. Mickey wants to sleep.
C3. Bert likes to pick up Ernie
C9. Ernie says to fall.
C11. Ernie says to carry Bert.
C13. Mickey pretends to swim.
C14. Ernie pretends to hug Mickey.
C15. Bert tries to pick up Mickey.
C16. Mickey tries to stand up.
C17. Ernie begs to sleep.
C20. Bert asks to fall.
C21. Bert promises top carry Mickey.
C24. Ernie threatens to stand up.

Sentences of the form [NP-V-NP-to-V]:
C2. Ernie wants Mickey to hug Bert.
C4. Mickey likes Bertto fall.
C5. Ernie forces Bert to stand up.
C6. Bert forces Mickey to carry Ernie.
C7. Mickey tells Ernie to find Bert.
C8. Ernie tells Mickey to swim.
C10. Mickey says to Bert to find Ernie.
C12. Bert says to Ernie to swim.
C18. Bert begs Ernie to find Mickey.
C19. Mickey asks Bert to hug Ernie.
C22. Mickey promises Ernie to swim.
C23. Ernie threatens Mickey to pick up Bert.

III. Judgement Task Items

[NP-V-to-V] items:

J1. Bert wants to stand up.
J2. *Bert tells to fall.
J3. Ernie says to fall.
J4. Ernie tries to stand up.
J5. Mickey asks to swim.
J6. Mickey promises to sleep.

[NP-V-NP-to-V] items:

J7. Ernie wants Bert to swim.
J8. Bert tells Mickey to sleep.
J9. *Bert says Ernie to sleep.
J10.*Ernie tries Mickey to swim.
J11. Mickey asks Ernie to fall.
J12. Mickey asks Bert to stand up.

Redundant NP Items:

J13.*Ernie wants Ernie to swim.
J14.*Mickey tries Mickey to fall.

For Complement Items:

J15. Mickey wants for Ernie to sleep.
J16. Bert likes for Ernie to carry the cake.
J17.*Bert tries for Mickey to fall.
J18. Ernie says for Bert to stand up.

That Complement Items:

J19.*Ernie wants that Mickey sleeps.
J20. Bert likes that Ernie carries the cake.
J21. Mickey says that Bert swims.

APPENDIX C: Production Task Stories

1. ERNIE WANTS- ERNIE TO STAND UP
(Ernie & Mickey sitting; Bert facing them) ERNIE, MICKEY AND BERT ARE PLAYING SCHOOL. BERT IS THE TEACHER. (Raise Ernie's hand) ERNIE RAISES HIS HAND. (Ernie:) "CAN I STAND UP?" ERNIE WANTS...

2. BERT WANTS - MICKEY TO FIND ERNIE
(Bert & Mickey standing; Put Ernie under steps) ERNIE IS HIDING. (Make Bert look) BERT CAN'T FIND ERNIE. (Bert to Mickey:) "PLEASE FIND ERNIE FOR ME." BERT WANTS...

3. BERT LIKES - BERT TO CARRY MICKEY
(Bert, Ernie & Mickey walking) BERT, ERNIE AND MICKEY ARE WALKING. (Make Mickey sit) MICKEY IS TIRED AND CAN'T WALK ANYMORE. (Put Mickey in Bert's arms) SO BERT CARRIES MICKEY. (Stand Mickey up; Bert:) "THAT WAS FUN! I'LL CARRY MICKEY SOME MORE." BERT LIKES...

4. MICKEY LIKES - ERNIE TO SWIM
(Bert, Ernie & Mickey standing in pool) BERT, ERNIE AND MICKEY ARE IN THE POOL. MICKEY IS SWIMMING. (Mickey:) "C'MON ERNIE, SWIM!" ERNIE SHOULD SWIM. THAT WILL MAKE MICKEY HAPPY. MICKEY LIKES...

5. ERNIE FORCES - ERNIE TO FALL
(Ernie, Bert & Mickey on steps by pool) ERNIE, BERT AND MICKEY ARE PLAYING A GAME. THEY CLIMB UP THE STEPS AND FALL INTO THE WATER. BERT GOES FIRST; BERT FALLS INTO THE WATER. (Knock Bert into the water) NOW IT'S ERNIE'S TURN. ERNIE IS A LITTLE BIT AFRAID. BUT HE WILL FALL ANYWAY. THAT'S THE GAME. ERNIE FORCES...

6. MICKEY FORCES - BERT TO FALL
(Ernie, Bert & Mickey standing on top of steps) ERNIE, MICKEY AND BERT ARE PLAYING A GAME. THEY CLIMBED UP THE STEPS. NOW THEY WILL FALL INTO THE WATER. ERNIE GOES FIRST; HE FALLS INTO THE WATER. (Knock Ernie into water) NOW IT'S BERT'S TURN. BERT IS A LITTLE BIT AFRAID. BUT HE WILL FALL INTO THE WATER ANYWAY. THAT'S THE GAME. MICKEY FORCES...

7. BERT FORCES - MICKEY TO HUG ERNIE
(Bert & Mickey facing Ernie;) MICKEY AND ERNIE ARE FIGHTING. (Make Mickey hit Ernie) MICKEY HITS ERNIE. NOW ERNIE IS CRYING. BERT YELLS AT MICKEY. (Bert:) "YOU SHOULD HUG ERNIE! THEN ERNIE WILL FEEL BETTER!" (Mickey:) "NO, I WON'T HUG ERNIE!" NOW BERT IS ANGRY. BERT FORCES...

8. MICKEY TELLS - MICKEY TO PICK UP BERT

(Bert & Ernie walking; Ernie carrying cake) BERT AND ERNIE ARE GOING TO A PARTY. (Knock Bert over) OH OH! BERT FALLS AND GETS HURT. ERNIE CAN'T PICK BERT UP. ERNIE'S HANDS ARE FULL. (Make Mickey walk towards Bert & Ernie) HERE COMES MICKEY. (Mickey:) "I WILL PICK BERT UP." MICKEY TELLS...

9. BERT TELLS - ERNIE TO PICK UP MICKEY

(Bert & Mickey walking; Bert carrying cake) BERT AND MICKEY ARE GOING TO A PARTY. (Knock Mickey over) OH OH! MICKEY FALLS AND GETS HURT. BERT CAN'T PICK MICKEY UP. BERT'S HANDS ARE FULL. (Make Ernie walk towards Bert & Mickey) HERE COMES ERNIE. ERNIE SHOULD PICK MICKEY UP. BERT TELLS...

10. ERNIE TELLS - BERT TO SLEEP

(Ernie & Bert sitting by toys) ERNIE IS BABYSITTING FOR BERT. IT'S BEDTIME. BERT IS STILL PLAYING. BUT HE SHOULD BE SLEEPING. ERNIE TELLS...

11. MICKEY SAYS - MICKEY TO STAND UP

(Bert sitting on ground, feet out; Mickey standing;) BERT IS SITTING. (Sit Mickey on Bert's feet) MICKEY SITS DOWN TOO. OOPS! MICKEY SITS ON BERT'S FEET. MICKEY SHOULD STAND UP. MICKEY SAYS SO. MICKEY SAYS...

12. ERNIE SAYS - BERT TO HUG MICKEY

(Make Bert hit Mickey; Ernie standing nearby) BERT HIT MICKEY. MICKEY CRIES. (Make Mickey cry) BERT SHOULD HUG MICKEY. ERNIE SAYS SO. THAT WILL MAKE MICKEY FEEL BETTER. ERNIE SAYS...

13. BERT SAYS - BERT TO PICK UP ERNIE

(Ernie lying on ground) ERNIE IS LYING ON THE GROUND. ERNIE IS HURT; HE CAN'T GET UP BY HIMSELF. (Make Bert & MIckey walk over to Ernie) HERE COME BERT AND MICKEY. BERT SHOULD PICK UP ERNIE. BERT SAYS SO. BERT SAYS...

14. MICKEY SAYS - ERNIE TO SWIM

(Mickey & Bert swimming; Ernie standing by pool) MICKEY AND BERT ARE SWIMMING. ERNIE IS NOT SWIMMING. ERNIE SHOULD SWIM. MICKEY SAYS SO. MICKEY SAYS...

15. BERT PRETENDS - BERT TO SLEEP

(Bert & Ernie sitting in bed) BERT AND ERNIE ARE IN BED. THEY ARE NOT SLEEPING. (Make Mickey walk over to bed; make Bert lie down) MICKEY GOES OVER AND LOOKS AT BERT. BERT ISN'T REALLY ASLEEP. HE ONLY PRETENDS. (Make Mickey go away; and Bert sit up) BERT PRETENDS...

16. BERT PRETENDS - ERNIE TO CARRY MICKEY
(Bert & Ernie standing) BERT AND ERNIE ARE PLAYING A PRETEND GAME. WHAT CAN THEY PRETEND? (Put Ernie's arms out) ERNIE HOLDS OUT HIS ARMS. (Bert:) "YOU'RE CARRYING MICKEY!" ERNIE DOESN'T REALLY CARRY MICKEY. BERT ONLY PRETENDS. (Put Ernie's arms down) BERT PRETENDS...

17. MICKEY PRETENDS - MICKEY TO CARRY BERT
(Mickey & Ernie standing) MICKEY AND ERNIE ARE PLAYING A PRETEND GAME. WHAT CAN THEY PRETEND? MICKEY HAS AN IDEA. (Put out Mickey's arms; Mickey:) "I'M CARRYING BERT!" MICKEY DOESN'T REALLY CARRY BERT. MICKEY ONLY PRETENDS. (Put down Mickey's arms) MICKEY PRETENDS...

18. MICKEY TRIES - MICKEY TO FIND BERT
(Bert, Ernie & Mickey standing) ERNIE, MICKEY AND BERT ARE PLAYING HIDE AND SEEK. (Hide Bert under steps) BERT HIDES. MICKEY MUST FIND BERT. (Make Mickey look around) MICKEY TRIES...

19. ERNIE TRIES - BERT TO FALL
(Bert, Ernie & Mickey standing by pool) ERNIE, MICKEY AND BERT ARE AT THE POOL. (Stick out Ernie's foot) ERNIE STICKS HIS FOOT OUT. (Make Mickey fall over Ernie's foot into pool) SO MICKEY FALLS INTO THE WATER. (Move Ernie's foot back) ERNIE WILL STICK HIS FOOT OUT AGAIN. THEN BERT WILL FALL INTO THE POOL,TOO. ERNIE TRIES...

20. BERT TRIES - BERT TO FALL
(Bert, Ernie & Mickey standing at pool) BERT, ERNIE AND MICKEY ARE AT THE POOL. ERNIE TRIPS AND FALLS INTO THE POOL. THAT LOOKS LIKE FUN. MAYBE BERT WILL FALL INTO THE POOL, TOO. BERT TRIES...

21. ERNIE BEGS - ERNIE TO SWIM
(Bert, Ernie & Mickey standing by pool) THIS IS BERT'S POOL. IT'S HOT OUTSIDE. IT'S A GOOD DAY FOR A SWIM. (Ernie to Bert:) "CAN I SWIM, BERT? PLEASE?" ERNIE BEGS...

22. ERNIE BEGS - MICKEY TO CARRY BERT
(Ernie carrying Bert) ERNIE IS CARYING BERT. BUT ERNIE IS TIRED. (Make Ernie drop Bert) ERNIE CAN'T CARRY BERT ANYMORE. (Make Mickey walk towards them) HERE COMES MICKEY. MAYBE MICKEY WILL CARRY BERT. ERNIE BEGS...

23. BERT ASKS - BERT TO PICK UP ERNIE
(Ernie lying on ground) ERNIE IS LYING ON THE GROUND. HE ISN'T FEELING WELL. (Make Bert & Mickey walk over) MAYBE BERT CAN PICK ERNIE UP. (Bert to Mickey:) "MICKEY, CAN I PICK ERNIE UP?" BERT ASKS...

24. MICKEY ASKS - ERNIE TO STAND UP
(Ernie sitting on Mickey's foot) ERNIE IS SITTING ON MICKEY'S FOOT. ERNIE SHOULD STAND UP. MICKEY'S FOOT HURT. MICKEY ASKS...

25. MICKEY PROMISES - MICKEY TO SLEEP
(Mickey, Bert & Ernie standing near bed) MICKEY IS SICK. HE SHOULD SLEEP. (Ernie:) "YOU SHOULD SLEEP, MICKEY." (Mickey:) "OK, ERNIE. I'LL SLEEP. I PROMISE." MICKEY PROMISES...

26. ERNIE PROMISES - MICKEY TO HUG BERT
(Mickey & Ernie walking towards Bert) MICKEY AND ERNIE ARE WALKING. THEY SEE BERT. MICKEY LIKES BERT. MAYBE MICKEY CAN HUG BERT. (Ernie to Mickey:) "YOU CAN HUG BERT. I PROMISE." ERNIE PROMISES...

27. BERT PROMISES - BERT TO HUG ERNIE
(Mickey & Bert walking towards Ernie) BERT AND MICKEY ARE WALKING. THEY SEE ERNIE. BERT LIKES ERNIE. MAYBE BERT WILL HUG ERNIE. (Bert:) "I WILL HUG ERNIE. I PROMISE." BERT PROMISES...

28. ERNIE THREATENS - ERNIE TO FIND MICKEY
(Mickey & Ernie fighting) MICKEY AND ERNIE FIGHT. (Make Mickey run away; put Mickey under steps) MICKEY RUNS AWAY FROM ERNIE AND HIDES. MICKEY BETTER WATCH OUT. ERNIE WILL FIND HIM. (Ernie:) "I WILL FIND YOU, MICKEY!" ERNIE THREATENS...

29. MICKEY THREATENS - ERNIE TO FALL
(Mickey & Ernie on top of steps) MICKEY AND ERNIE ARE ON THE STEPS. (Make Mickey push Ernie) MICKEY PUSHES ERNIE. HE SHOULDN'T DO THAT. ERNIE COULD FALL. (Mickey:) "ERNIE, YOU WILL FALL! I WILL MAKE YOU!" MICKEY THREATENS...

30. BERT THREATENS - BERT TO FALL
(Bert & Ernie standing on steps) BERT AND ERNIE ARE ON THE STEPS. (Make Ernie push Bert) ERNIE PUSHES BERT. ERNIE SHOULDN'T DO THAT; BERT MIGHT FALL. (Make Ernie push Bert) ERNIE PUSHES BERT AGAIN. NOW BERT IS ANGRY. (Bert:) "STOP THAT, ERNIE! OR I'LL FALL!" BERT THREATENS...

APPENDIX D: Production Task Instructions and Training Items

I BROUGHT SOME TOYS AND WE CAN PLAY WITH THEM. LET'S SEE WHAT I BROUGHT.

I. FIGURES

DO YOU KNOW WHO THESE ARE? (Pick up each figure.) WHAT'S HIS NAME?

BERT _____
MICKEY _____
ERNIE _____

(If any incorrect, check identification for each figure: WHICH ONE IS _____? Then recheck naming.)

II. MATRIX VERBS

BERT, ERNIE & MICKEY WILL DO SOME THINGS. I'LL TELL YOU WHAT THEY DO AND YOU MAKE THEM DO IT.

__ 1. MICKEY SAYS HELLO. (MAKE HIM DO IT.)
__ 2. ERNIE TELLS HIS NAME. (MAKE HIM DO IT.)
__ 3. ERNIE HAS A CAKE. BERT WANTS THE CAKE. WHAT DOES HE DO? SHOW ME.
__ 4. BERT LIKES ERNIE. HOW CAN HE SHOW IT?
__ 5. ERNIE ASKS ABOUT DINNER. (MAKE HIM DO IT.)
__ 6. MICKEY THREATENS BERT. (MAKE HIM DO IT.)
__ 7. ERNIE WON'T SIT DOWN. BUT BERT FORCES HIM. (MAKE HIM DO IT.)
__ 8. BERT TRIES A NEW DANCE. (MAKE HIM DO IT.)
__ 9. ERNIE BEGS FOR A PIECE OF CAKE. (MAKE HIM DO IT.)
__ 10. MICKEY PROMISES THAT HE'LL BE GOOD. (MAKE HIM DO IT.)
__ 11. BERT PRETENDS THAT HE'S A BIRD. (MAKE HIM DO IT.)

III. COMPLEMENT VERBS

(Point to board.) THIS IS WHERE MICKEY, BERT, & ERNIE PLAY. I'LL TELL YOU SOMETHING THEY DO; THEN YOU MAKE THEM DO IT.

__ 1. MICKEY SLEEPS.
__ 2. ERNIE FALLS.
__ 3. BERT PICKS UP ERNIE.
__ 4. BERT SWIMS.
__ 5. MICKEY STANDS UP.
__ 6. ERNIE FINDS A TOY.
__ 7. MICKEY CARRIES BERT.
__ 8. ERNIE HUGS MICKEY.

IV. TRAINING ITEMS

NOW WE'LL DO SOMETHING DIFFERENT. I'LL TELL YOU A STORY ABOUT BERT, MICKEY & ERNIE. THEN YOU FINISH THE STORY. LET'S TRY ONE.

1. IT'S BEDTIME. BERT & ERNIE GET INTO BED. (Put Bert & Ernie into bed; Ernie:) "ARE YOU SLEEPING, BERT?" THERE'S NO ANSWER FROM BERT. BERT IS WHAT? YOU FINISH THE STORY. BERT ___ (Cue: WHAT IS BERT DOING? BERT___)

GOOD, YOU FINISHED THE STORY. BERT IS SLEEPING. LET'S TRY ANOTHER ONE.

2. (Ernie hiding) ERNIE IS HIDING. (Mickey looking for Ernie.) MICKEY CAN'T FIND ERNIE. (Mickey to Bert) "WHERE'S ERNIE? I CAN'T FIND ERNIE. CAN YOU FIND ERNIE?" BERT WILL... YOU FINISH IT. BERT ___ (Cue:WHAT WILL BERT DO? BERT___)

GOOD, YOU FINISHED THE STORY. BERT WILL FIND ERNIE. NOW CAN YOU MAKE BERT DO THAT? --- THAT'S RIGHT. YOU MADE BERT FIND ERNIE.

NOW I'LL TELL YOU ANOTHER STORY. YOU FINISH THE STORY. AND THEN SHOW ME WHAT THE DOLLS DO.

3. (Ernie lying on floor) ERNIE & MICKEY ARE PLAYING HOUSE. ERNIE IS THE BABY. MICKEY IS THE DADDY. (Ernie:) "CARRY ME, DADDY." MICKEY WILL... YOU FINISH THE STORY AND MAKE THEM DO IT. MICKEY___

4. (Bert sitting on floor) MICKEY WANTS SOME ATTENTION. MICKEY WALKS OVER TO BERT. (Mickey:) "STAND UP, BERT. PICK ME UP." BERT WILL... YOU FINISH IT. BERT ___ (Cue: BERT DOES 2 THINGS. FIRST HE DOES WHAT? AND THEN? SO BERT WILL... YOU FINISH IT AND SHOW ME. BERT ___)

GOOD. BERT DID 2 THINGS. FIRST HE STOOD UP. THEN HE PICKED UP MICKEY

5. (Bert standing on head) BERT IS STANDING ON HIS HEAD. (Stand Bert upright; Ernie walks to Bert) BERT SEES ERNIE. (Bert:) "WATCH ME, ERNIE. I CAN STAND ON MY HEAD!". ERNIE WATCHES... YOU FINISH IT AND MAKE THEM DO IT. ERNIE...

NOW I'LL TELL YOU SOME MORE STORIES. FIRST YOU FINISH THE STORY AND THEN SHOW ME WHAT THE DOLLS DO.

After each item, say YOU FINISH IT and repeat the sentence with rising intonation. Cue the child to perform the actions (MAKE THEM DO IT).

APPENDIX E: Comprehension Task Stories

1. (Bert, Ernie & Mickey sitting by toys) BERT, ERNIE AND MICKEY ARE PLAYING. IT'S BEDTIME NOW. WHO WILL SLEEP? MICKEY WANTS TO SLEEP.

2. (Bert sitting on ground; Ernie & Mickey standing nearby) BERT IS CRYING. (Make Bert cry) A HUG WILL MAKE BERT FEEL BETTER. WHO WILL HUG BERT? ERNIE WANTS MICKEY TO HUG BERT.

3. (Ernie lying on ground; Bert & Mickey standing nearby) ERNIE IS LYING ON THE GROUND. WHO WILL PICK ERNIE UP? BERT LIKES TO PICK UP ERNIE.

4. (Bert, Ernie & Mickey standing on steps) BERT, ERNIE AND MICKEY ARE ON TOP OF THE STEPS. WHO WILL FALL INTO THE WATER? MICKEY LIKES BERT TO FALL.

5. (Bert, Ernie & Mickey sitting) MICKEY, BERT AND ERNIE ARE SITTING ON THE FLOOR. WHO WILL STAND UP? ERNIE FORCES BERT TO STAND UP.

6. (Bert, Ernie & Mickey standing on road) ERNIE, BERT AND MICKEY ARE GOING TO A PARTY. ERNIE IS TIRED AND CAN'T WALK ANYMORE. (Knock Ernie over) WHO WILL CARRY ERNIE? BERT FORCES MICKEY TO CARRY ERNIE.

7. (Bert, Ernie & Mickey standing) ERNIE, BERT AND MICKEY ARE PLAYING HIDE AND SEEK. BERT HIDES. (Hide Bert under steps) WHO WILL FIND BERT? MICKEY TELLS ERNIE TO FIND BERT.

8. (Bert, Ernie & Mickey standing by pool) MICKEY, BERT AND ERNIE ARE AT THE POOL. WHO WILL SWIM? ERNIE TELLS MICKEY TO SWIM.

9. (Bert & Ernie standing on steps) ERNIE AND BERT ARE ON TOP OF THE STEPS. WHO WILL FALL INTO THE WATER? ERNIE SAYS TO FALL.

10. (Bert, Ernie & Mickey standing) MICKEY, ERNIE AND BERT ARE PLAYING HIDE AND SEEK. ERNIE HIDES. (Put Ernie behind bed) WHO WILL FIND ERNIE? MICKEY SAYS TO BERT TO FIND ERNIE.

11. (Bert, Ernie & Mickey standing on road) MICKEY, ERNIE AND BERT ARE WALKING. BERT IS TIRED AND CANNOT WALK ANYMORE. (Knock Bert over) WHO WILL CARRY BERT? ERNIE SAYS TO CARRY BERT.

12. (Bert, Ernie & Mickey sitting by toys) ERNIE, BERT AND MICKEY ARE PLAYING. IT'S BEDTIME NOW. WHO WILL SLEEP? BERT SAYS TO ERNIE TO SLEEP.

13. (Bert, Ernie & Mickey standing by pool) ERNIE,BERT AND MICKEY ARE AT THE POOL. WHO WILL SWIM? MICKEY PRETENDS TO SWIM. MICKEY CAN'T REALLY SWIM. MICKEY ONLY PRETENDS. MICKEY PRETENDS TO SWIM.

14. (Bert, Ernie & Mickey standing) BERT, MICKEY AND ERNIE ARE PLAYING A PRETEND GAME. WHAT CAN THEY PRETEND? MICKEY HAS AN IDEA. (Mickey:) "GIVE ME A PRETEND HUG." WHO WILL HUG MICKEY? ERNIE PRETENDS TO HUG MICKEY.

15. (Mickey lying down on ground; Bert & Ernie standing nearby) MICKEY IS ON THE FLOOR. WHO WILL PICK MICKEY UP? BERT TRIES TO PICK UP MICKEY.

16. (Bert, Ernie & Mickey sitting on ground) BERT, ERNIE AND MICKEY ARE SITTING ON THE GROUND. WHO WILL STAND UP? MICKEY TRIES TO STAND UP.

17. (Bert, Ernie & Mickey sitting by toys) MICKEY, ERNIE AND BERT ARE PLAYING. IT'S BEDTIME NOW. WHO WILL SLEEP? ERNIE BEGS TO SLEEP.

18. (Bert, Ernie & Mickey standing) BERT, ERNIE AND MICKEY ARE PLAYING HIDE AND SEEK. MICKEY HIDES. (Put Mickey under steps) WHO WILL FIND MICKEY? BERT BEGS ERNIE TO FIND MICKEY.

19. (Ernie sitting on ground; Bert & Mickey standing nearby) ERNIE IS CRYING. (Make Ernie cry) A HUG WILL MAKE ERNIE FEEL BETTER. WHO WILL HUG ERNIE? MICKEY ASKS BERT TO HUG ERNIE.

20. (Bert, Ernie & Mickey standing on steps) ERNIE, MICKEY AND BERT ARE ON TOP OF THE STEPS. WHO WILL FALL INTO THE WATER? BERT ASKS TO FALL.

21. (Bert, Ernie & Mickey standing on road) BERT, MICKEY AND ERNIE ARE WALKING. MICKEY IS TIRED AND CAN'T WALK ANYMORE. (Knock Mickey over) WHO WILL CARRY MICKEY? BERT PROMISES TO CARRY MICKEY.

22. (Bert, Ernie & Mickey standing by pool) BERT, ERNIE AND MICKEY ARE AT THE POOL. WHO WILL SWIM? MICKEY PROMISES ERNIE TO SWIM.

23. (Bert lying on ground; Ernie & Mickey standing nearby) BERT IS ON THE GROUND. WHO WILL PICK BERT UP? ERNIE THREATENS MICKEY TO PICK UP BERT.

24. (Bert, Ernie & Mickey sitting) ERNIE, MICKEY AND BERT ARE SITTING. WHO WILL STAND UP? ERNIE THREATENS TO STAND UP.

APPENDIX F: Comprehension Task Instructions and Training Items

BERT, ERNIE & MICKEY WILL DO SOME MORE THINGS TODAY. I'LL TELL YOU WHAT THEY DO AND YOU MAKE THEM DO IT.

I. REVIEW ACTING OUT MATRIX VERBS

1. MICKEY SAYS HIS NAME.
2. BERT LIKES ERNIE. HOW CAN HE SHOW IT?
3. ERNIE PROMISES THAT HE'LL BE GOOD.
4. BERT TELLS MICKEY A SECRET.
5. MICKEY ASKS FOR A PIECE OF CAKE.
6. ERNIE PRETENDS THAT HE'S A PUPPY.
7. BERT BEGS FOR A PIECE OF CAKE.
8. MICKEY TRIES A HEADSTAND.
9. ERNIE THREATENS MICKEY.
10. ERNIE WANTS THE CAKE. WHAT DOES HE DO?
11. BERT WON'T GET OFF THE BED. BUT ERNIE FORCES HIM.

II. TRAINING ITEMS

I WANT YOU TO MEET SOMEONE. (Hold up puppet) THIS IS LEON. I'LL TELL A STORY AND LEON WILL FINISH THE STORY. THEN YOU SAY WHAT LEON SAID. LET'S TRY ONE.

1. (Mickey at pool) MICKEY IS AT THE POOL. WHAT DOES MICKEY DO? (Puppet:) "MICKEY JUMPS INTO THE WATER AND SWIMS." NOW YOU SAY WHAT LEON SAID. (Puppet repeats, if needed) NOW MAKE MICKEY DO THAT.

GOOD. YOU MADE MICKEY JUMP INTO THE WATER. THEN YOU MADE MICKEY SWIM. (If child doesn't act out both actions, cue: MICKEY DOES 2 THINGS. LISTEN TO LEON AGAIN.) LET'S TRY ANOTHER ONE.

2. (Sit Ernie behind bed) ERNIE IS SITTING BEHIND THE BED. (Make Bert look for Ernie) BERT LOOKS FOR ERNIE. WHAT WILL BERT AND ERNIE DO? (Puppet:) "BERT FINDS ERNIE AND ERNIE STANDS UP." NOW YOU SAY IT. (Puppet repeats if needed) GOOD, NOW MAKE THEM DO THAT.

THAT'S RIGHT. BERT FOUND ERNIE; THEN ERNIE STOOD UP.

I'LL TELL ANOTHER STORY AND LEON WILL FINISH IT. FIRST YOU SAY WHAT LEON SAID. THEN SHOW WHAT THE DOLLS DO.

3. (Mickey standing on road; Bert standing behind Mickey; Make Ernie walk towards Mickey) ERNIE IS WALKING AND SEES MICKEY. WHAT WILL ERNIE DO? (Puppet:) "ERNIE SAYS HELLO AND HUGS MICKEY." (After child's response) COULD I DO IT THIS WAY? (Repeat the sentence; make Bert hug Mickey) DOES THAT GO WITH LEON'S STORY? (Prompt: IS THAT WHAT LEON SAID?/IS THAT HOW LEON FINISHED THE STORY? WHO HUGS MICKEY?)

SO ERNIE DID THE HUGGING. IT HAD TO BE ERNIE. THAT WAS LEON'S STORY.

4. (Bert & Mickey on road; cake on ground in front of them) BERT AND MICKEY ARE GOING TO A PARTY. WHO WILL CARRY THE CAKE? (Puppet:) SOMEBODY WILL CARRY THE CAKE. (After child's action:) COULD I DO IT THIS WAY? (Make the non-chosen doll carry the cake) DOES THAT GO WITH LEON'S STORY?

SO BERT OR MICKEY COULD DO THE CARRYING. IT DIDN'T HAVE TO BE____. IT COULD BE EITHER ONE.

I'LL START SOME MORE STORIES AND LEON WILL FINISH THE STORIES. FIRST YOU SAY WHAT LEON SAID. THEN SHOW WHAT THE DOLLS DO.

For each item: the puppet "says" the stimulus sentence. The child repeats the sentence and acts it out. Repeat the sentence and demonstrate alternate actor for complement subject. Cue: CAN I DO IT THIS WAY? DOES THIS GO WITH LEON'S STORY?

APPENDIX G: Judgement Task Stories

I. NP-V-to-V

1. (Bert and Ernie sitting) BERT AND ERNIE ARE SITTING ON THE FLOOR. WHO WILL STAND UP, HARRY? BERT WANTS TO STAND UP.

2. (Bert & Ernie standing on steps) ERNIE AND BERT ARE ON TOP OF THE STEPS. WHO WILL FALL INTO THE WATER, HARRY? *BERT TELLS TO FALL.

3. (Bert & Ernie standing on steps) BERT AND ERNIE ARE ON THE STEPS. WHO WILL FALL INTO THE WATER, HARRY? ERNIE SAYS TO FALL.

4. (Bert & Ernie sitting) BERT AND ERNIE ARE SITTING ON THE GROUND. WHO WILL STAND, HARRY? ERNIE TRIES TO STAND UP.

5. (Mickey & Ernie standing by pool) MICKEY AND ERNIE ARE AT THE POOL. IT'S HOT OUTSIDE. IT'S A GOOD DAY FOR A SWIM. WHO WILL SWIM, HARRY? MICKEY ASKS TO SWIM.

6. (Bert & Mickey standing by bed) IT'S NIGHTTIME AND TIME FOR BED. WHO WILL SLEEP, HARRY? MICKEY PROMISES TO SLEEP.

II. NP-V-NP-to-V

7. (Bert & Ernie at pool) BERT AND ERNIE ARE AT THE POOL. WHO WILL SWIM, HARRY? ERNIE WANTS BERT TO SWIM.

8. (Bert & Mickey sitting by toys) BERT AND ERNIE ARE PLAYING. IT'S BEDTIME. WHO WILL SLEEP, HARRY? BERT TELLS MICKEY TO SLEEP.

9. (Bert & Ernie sitting by toys) BERT AND ERNIE ARE PLAYING. IT'S BEDTIME. WHO WILL SLEEP, HARRY? *BERT SAYS ERNIE TO SLEEP.

10. (Mickey & Ernie by pool) IT'S HOT OUTSIDE. MICKEY AND ERNIE ARE AT THE POOL. WHO WILL SWIM, HARRY? *ERNIE TRIES MICKEY TO SWIM.

11. (Mickey & Ernie on steps) ERNIE AND MICKEY ARE PLAYING A GAME. THEY CLIMBED UP THE STEPS. NOW THEY WILL FALL INTO THE WATER. WHO WILL FALL, HARRY? MICKEY ASKS ERNIE TO FALL.

12. (Bert & Mickey sitting on bed) BERT AND MICKEY ARE SITTING ON THE BED. WHO WILL STAND UP, HARRY? MICKEY PROMISES BERT TO STAND UP.

III. REDUNDANT NP

13. (Bert & Ernie at pool). BERT AND ERNIE ARE AT THE POOL. WHO WILL SWIM, HARRY? *ERNIE WANTS ERNIE TO SWIM.

14. (Bert & Mickey on the steps) BERT AND MICKEY ARE ON THE STEPS. WHO WILL FALL INTO THE WATER, HARRY? *MICKEY TRIES MICKEY TO FALL.

IV. FOR COMPLEMENTS

15. (Ernie & Mickey sitting by the toys) MICKEY AND ERNIE ARE PLAYING. IT'S BEDTIME NOW. (Mickey:) "YOU SHOULD SLEEP, ERNIE." WHO WILL SLEEP, HARRY? MICKEY WANTS FOR ERNIE TO SLEEP.

16. (Bert & Ernie at pool) ERNIE AND BERT ARE AT THE POOL. (Bert:) "C'MON, ERNIE. SWIM!" WHO WILL SWIM, HARRY? BERT LIKES FOR ERNIE TO SWIM.

17. (Bert & Mickey on top of steps) MICKEY AND BERT ARE ON TOP OF THE STEPS. (Make Bert push Mickey) BERT PUSHES MICKEY. WHO WILL FALL INTO THE WATER, HARRY? *BERT TRIES FOR MICKEY TO FALL.

18. (Bert sitting on Ernie's foot) BERT IS SITTING ON ERNIE'S FOOT. (Ernie:) "STAND UP, BERT!" WHO WILL STAND UP, HARRY? ERNIE SAYS FOR BERT TO STAND UP.

V. THAT COMPLEMENTS

19. (Mickey & Ernie sitting by toys) MICKEY AND ERNIE ARE PLAYING. IT'S MICKEY'S BEDTIME NOW. (Ernie:) "YOU SHOULD SLEEP, MICKEY." WHO SLEEPS, HARRY? *ERNIE WANTS THAT MICKEY SLEEPS.

20. (Bert & Ernie standing on road; the cake is in front of them) BERT AND ERNIE ARE GOING TO A PARTY. (Bert:) "YOU CARRY THE CAKE, ERNIE." WHO WILL CARRY THE CAKE, HARRY? BERT LIKES THAT ERNIE CARRIES THE CAKE.

21. (Bert standing in pool; Mickey standing by the pool) BERT AND MICKEY ARE AT THE POOL. (Mickey:) "BERT IS SWIMMING." WHO SWIMS, HARRY? MICKEY SAYS THAT BERT SWIMS.

APPENDIX H: Judgment Task Instructions and Training Items

I HAVE ANOTHER PUPPET TODAY. HIS NAME IS HARRY. TODAY HARRY WILL FINISH THE STORIES. LIKE THIS.

I. TRAINING ITEMS

1. (Bert standing on the road) BERT IS PLAYING OUTSIDE. (Make Bert jump; Examiner to Puppet) WHAT DOES BERT DO, HARRY? (Puppet:) "BERT UP AND DOWN." (E to Puppet) NO, HARRY! YOU SAID IT WRONG. (E to Child) CAN YOU HELP HARRY? WHAT DOES BERT DO? (Make Bert jump again)

(E to Puppet) HEAR THAT, HARRY? BERT JUMPS UP AND DOWN. YOU LEFT OUT THE WORD 'JUMPS'.

I'LL TELL SOME STORIES ABOUT BERT AND ERNIE AND MICKEY. HARRY WILL FINISH THE STORIES AND YOU SAY WHAT HARRY SAID. SOMETIMES HARRY WILL GET THE STORIES RIGHT. THEN YOU CAN TELL HIM, "THAT'S RIGHT!" BUT SOMETIMES HARRY MAKES MISTAKES. THEN YOU TELL HIM, "NO! THAT'S WRONG." AND YOU FINISH THE STORY THE RIGHT WAY. LET'S TRY ONE.

2. (Put Bert in bed) BERT GETS INTO BED. (E to Puppet) WHO SLEEPS, HARRY? (Puppet:) "SLEEPS." (E to Child) YOU SAY WHAT HARRY SAID. (After child's repetition) DID HARRY SAY THAT RIGHT OR WRONG? (If child says "wrong") HARRY SAID THAT WRONG. WHO SLEEPS? YOU FINISH THE STORY. (If child says "right": HARRY DIDN'T SAY WHO SLEEPS. TELL HARRY WHO SLEEPS.)

THAT'S RIGHT. BERT SLEEPS. SO HARRY SAID THAT WRONG. HE LEFT OUT 'BERT'. LET'S TRY ANOTHER ONE.

3. (Put Mickey under steps) THE DOLLS ARE PLAYING HIDE AND SEEK. (E to Puppet) WHO HIDES, HARRY? (Puppet:) "MICKEY HIDES MICKEY." (E to Child) NOW YOU SAY WHAT HARRY SAID. (After child's repetition) DID HARRY SAY THAT RIGHT OR DID HE SAY THAT WRONG? (If child says "wrong") HARRY SAID THAT WRONG. WHAT DOES MICKEY DO? (If child says "right": DOES MICKEY HIDE MICKEY? OR DOES MICKEY JUST HIDE?)

THAT'S RIGHT. MICKEY HIDES. SO HARRY SAID IT WRONG. HE SAID 'MICKEY' TOO MUCH.

4. LET'S SEE WHO FINDS MICKEY. (Stand up Ernie, Bert & boy doll; Point to boy doll) THIS IS A NEW DOLL. HIS NAME IS MICKEY. NOW WE HAVE TWO MICKEYS. (Point to Mickey Mouse) LET'S SEE WHO FINDS THIS MICKEY. (E to Puppet) HARRY, WHO FINDS MICKEY? (Puppet:) "MICKEY FINDS MICKEY." (E to Child) DID HARRY SAY THAT RIGHT OR WRONG? (If child says "right") NOW MAKE HIM DO IT. (If child says "wrong": WHO FINDS MICKEY? ... NOW MAKE HIM DO IT.)

SO HARRY SAID THAT RIGHT. THIS MICKEY (Point to boy doll) FINDS THIS MICKEY (Point to Mickey Mouse).

II. CONTROL ITEMS

1. (Bert & Mickey standing by the bed) IT'S BEDTIME. (E to Puppet) WHAT DOES BERT DO, HARRY? (Puppet:) BERT SLEEPS MICKEY IN BED. (E to child) DID HARRY SAY THAT RIGHT OR WRONG? (If child says "right": YOU CAN HUG SOMEBODY ELSE. CAN YOU SLEEP SOMEBODY ELSE?)

SO HARRY SAID IT WRONG. BERT CAN SLEEP. OR BERT CAN PUT MICKEY IN BED. HARRY REALLY MESSED UP THAT STORY. YOU CAN'T SLEEP SOMEBODY.

2. (Mickey lying on the floor; Bert standing nearby) MICKEY AND BERT ARE PLAYING HOUSE. MICKEY IS THE BABY; BERT IS THE DADDY. (E to Puppet) WHO PICKS MICKEY UP? (Puppet:) BERT PICKS MICKEY UP. (E to child) FIRST YOU SAY WHAT HARRY SAID. (After child's repetition) DID HARRY SAY THAT RIGHT OR WRONG? (If child says "right":) NOW MAKE HIM DO IT. (If child says "wrong": WHO FINDS MICKEY?...NOW MAKE HIM DO IT.)

SO HARRY SAID THAT ONE RIGHT. BERT PICKS MICKEY UP.

3. (Mickey at pool) MICKEY IS AT THE POOL. (E to Puppet) WHAT DOES MICKEY DO? (Puppet:) MICKEY SWIMS. (E to child) YOU SAY IT ... DID HARRY SAY THAT RIGHT OR WRONG? (If child says "right":) NOW MAKE HIM DO IT. (If child says "wrong": WHO SWIMS? ... NOW MAKE HIM DO IT.)

SO HARRY SAID IT RIGHT. MICKEY SWIMS.

4. (Bert & Ernie at pool) BERT AND ERNIE ARE AT THE POOL. (Stick Ernie's foot out; Make Bert fall over Ernie's foot into the pool; E to Puppet) WHO TRIPS, HARRY? (Puppet:) "ERNIE TRIPS INTO THE WATER." (E to Child) DID HARRY SAY THAT RIGHT OR WRONG? (If child says "wrong") HARRY SAID THAT WRONG. WHO DID ERNIE TRIP? (If child says "right": HOW COME BERT FELL INTO THE WATER? WHAT DID ERNIE DO?)

THAT'S RIGHT. ERNIE TRIPPED BERT. SO HARRY SAID THAT ONE WRONG. HE LEFT OUT 'BERT'.

I'LL TELL SOME MORE STORIES. HARRY WILL FINISH THE STORIES AND YOU SAY WHAT HARRY SAID. SOMETIMES HARRY WILL SAY IT RIGHT. THEN YOU SAY "THAT'S RIGHT, HARRY!" BUT SOMETIMES HARRY WILL MAKE MISTAKES. THEN YOU SAY, "THAT'S WRONG, HARRY!" AND YOU FINISH THE STORY THE RIGHT WAY.

For each item, the puppet "says" the stimulus sentence and the child repeats the puppet's sentence. Cue the child to judge the sentence: DOES HARRY SAY THAT RIGHT OR WRONG? If child says "right" prompt the child to act out the sentence: NOW MAKE HIM DO IT. For items 1 - 12, repeat the sentence and demonstrate the sentence with the other doll as the complement subject. Cue: CAN I DO IT THIS WAY? DOES THIS GO WITH HARRY'S STORY? If child says "wrong", cue child to complete the story as in the production task (NOUN-VERB... YOU FINISH THE STORY. NOUN ___?) Then let the child act out the story.

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